UNDERSTANDING FINANCIAL FEASIBILITY STUDIES AS AN ARTEFACT IN QUANTITY SURVEYING PRACTICE

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A thesis submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in fulfilment of the requirements for the degree of Doctor of Philosophy in the field of Quantity Surveying.

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DECLARATION

I declare that this thesis is my own, unaided work. It is submitted to the degree of Doctor of Philosophy in the field of Quantity Surveying to the University of the Witwatersrand, Johannesburg.

It has not been submitted before for any degree or examination in any other university.

Signature and date:

Rolien Terblanche

26 October 2022

ABSTRACT

Quantity surveying, also known as cost engineering, is a profession that administers financial services to construction projects. Among other services, quantity surveyors prepare financial feasibility study reports (feasibilities) and communicate the detail of these to developers. A feasibility offers financial information of proposed construction project investments, which informs the decision-making regarding these investments. These reports are critical to the success of construction projects. Therefore, ensuring their accuracy and reliability is vital. Yet, in the industry, these feasibilities have been classified as largely neglected, faulty, inconsistent, confusing and problematic.

As an artefact in the profession, the research aims to improve understanding around feasibilities, through exploring perspectives of both key stakeholders (quantity surveyors and developers) and by analysing the artefact itself. In this regard, the Actor-Network Theory (ANT) is a useful theoretical and analytical tool, specifically to identify the factors that form part of the feasibility process including the network showing how everything is connected. This holistic view of the feasibility process appears to be absent in literature and which would greatly help understand feasibilities. The concepts central to this study are communication, financial feasibility study reports, and ANT, within the quantity surveying profession.

Empirical research data has been collected through semi-structured interviews with 23 quantity surveyors (the compilers and communicators) as well as 23 developers (the interpreters and decision-makers). Additionally, a document analysis was done with 18 collected feasibilities. Therefore, this study is carried out through mixed-method research. This created a new approach and contribution to knowledge. An abductive approach has been adopted for this thesis, which addresses the problem from a pragmatist point of view.

The research established that the quantity surveyors and developers have different uses for these feasibilities, apply different underlying meanings to them, as well as different definitions of a successful feasibility (among various other differences). Through the document analysis, it is clear that in practice, feasibilities are inadequate in terms of efficient document design and audience expectations. Additionally, factors (known as actants in ANT) that form part of the feasibility compilation and communication process were identified through the systematic literature review, interviews, and document analysis. These identified actants forms the feasibility actor-network.

Data from these various sources were integrated, allowing a holistic view of the feasibility process to emerge. The network of the feasibility process is mapped and drawn from the findings, a framework is ultimately given. This framework contributes to a better understanding of feasibilities and could serve as a guide in practice. Subsequently, recommendations are made that could improve standardised feasibility processes in practice.

Key words: Actor-Network Theory; document design; feasibility studies; financial communication; quantity surveying.

To my loving and supportive husband

Johannes Terblanche

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ABBREVIATIONS

Abbreviations	
5D	Five dimensional
AAQS	The Africa Association of Quantity Surveyors
ANT	Actor-Network Theory
ASAQS	The Association of South African Quantity Surveyors
ARI	Automated Readability Index
BIM	Building Information Modelling
CBE	Council of the Built Environment
CLI	Coleman-Liau Index
DVFA	Society of Investment Professionals in Germany
EY	Ernst & Young Global Limited
FCABF	Financial communication in accountancy, business and finance
FCQS	Financial communication in quantity surveying practice
FID	Financial investment decisions
FKGL	Flesch-Kincaid Grade Level
FPA	Financial Planning Association
GAAP	Generally Accepted Accounting Principles
GBA	Gross Building Area
GFI	Gunning Fog Index
GLA	Gross Lettable Area
ICEC	International Cost Engineering Council
ICMSC	International Cost Management Standard Coalition
IFRS	International Financial Reporting Standards
IPMSC	International Property Measurement Standards Coalition
IT	Information Technology
JSE	Johannesburg Stock Exchange
LOD	Level of Detail
OB	Objective
QS	Quantity surveyor
QSs	Quantity surveyors
RICS	Royal Institute of Chartered Surveyors
PrQS	Professional Quantity Surveyor
SACQSP	South African Council of the Quantity Surveying Profession
SAPOA	South African Property Owners Association
SBR	Standard Business Reporting
SEC	US Securities and Exchange Commission
SMOG	Simple Measure of Gobbledygook
US	United States of America
XBRL	eXtensible Business Reporting Language

DEFINITIONS

Building Information Modelling: An intelligent 3D model-based process that gives architecture, engineering, and construction (AEC) professionals the insight and tools to plan, design, construct, and manage buildings and infrastructure more efficiently.

Construction industry: Sector of national economy engaged in preparation of land and construction, alteration, and repair of buildings, structures, and other real property.

Cost management: The process of planning and controlling the budget of a construction project.

Feasibility study: The evaluation of the viability of a development project. It is used as a tool for analysing if a proposed task can operate under a given set of assumptions, such as the technology used and the monetary aspects of the construction work.

CHAPTER 1: CONCEPTUALISING THE RESEARCH

1.1 BACKGROUND

The construction industry has developed significant difficulties in coping with the increasing complexity of construction projects (Gidado and Wood, 2008; Sohi, Hertogh, Bosch-Rekveldt and Blom, 2016; Oesterreich and Teuteberg, 2016; Zainon, Mohd-Rahim, Aziz, Kamaruzzaman and Puidin, 2018). Mills (2001) and Cattell, Bowen and Edwards (2016) explain that the construction industry is seen as one of the most dynamic, risky and challenging industries. The industry, however, has a reputation for not managing risk well and a failure to meet deadlines and budgets. In spite of this, construction projects are still growing in size, quantity and complexity. Therefore, the construction industry has been identified as a complex adaptive system and is defined as a nonlinear, complex and dynamic phenomenon, which frequently exists on the edge of chaos (Bertelsen, 2003; Wood and Gidado, 2008). Furthermore, one of the elements that increases with the complexity of a project is communication (He, Luo, Hu and Chan, 2015; Lu, Luo, Wang, Le and Shi, 2015; Luo, He, Jaselskis and Xie, 2017; Herszon, 2017).

In addition, the construction industry is changing into a service-oriented industry. As such, there is a need for effective communication in order to improve service, collaboration and to share knowledge. Consequently, integration of all individual roles involved in a construction project is imperative (Ejohwomu, Oshodi and Lam, 2017). In support of this assertion, Xu, Fernando and Tam (2018) claims that regulators and investors are concerned about increasing complexity and incomprehensibility of financial reports, which is a form of financial communication. Financial communication involves all of the tactics, strategies, and tools required to share financial information including recommendations with investors or interested parties (Hutchins, 2008).

Therefore, financial communication supports investment decision-making, and thus the accuracy and quality thereof is vital to successful investment decisions. Financial communication, as defined by Laskin (2018), is similar to other methods of communication. However, financial communication is specific to the situation and is established by the cultural and societal context where it takes place.

In this context, the quantity surveyor prepares and communicates financial communication via cost estimates, budgets, financial feasibility studies, cash flows, bills of quantities, tender documents and evaluations, cost reports, contracts, payment certificates, final accounts, value buildings for insurance, and evidence statements (Maritz and Siglé, 2016; Ashworth, Hogg and Higgs, 2013). Therefore, the quantity surveyor has been recognised as the professional that primarily manages construction costs and is the financial consultant in the real estate development industry who advises clients on the optimal expenditure of capital (Cartlidge, 2011; Udo and Abiola, 2015; Ismail, Drogemuller, Beazley and Owen, 2016; Cruywagen and Llale, 2017; The Association of South African Quantity Surveyors, 2020). The quantity surveyor is thus the advisor in terms of construction cost and has various financial functions, roles and responsibilities. Note that in other countries quantity surveyors are referred to as ‘cost engineers’ (Cruywagen and Llale, 2017), but for the purpose of this study they will be referred to as quantity surveyors (QSs), or abbreviated to ‘QS’ for a single quantity surveyor and ‘QSs’ for multiple quantity surveyors.

As the industry has evolved, an increase of value-added services have been required of quantity surveyors, which has broadened the scope of cost management services they provide. Consequently, the traditional role of a QS has evolved to be responsible for, inter alia, realising the long-term vision of construction projects (lifecycle costing), evaluating alternative options and presenting developers with invaluable information for them to make informed investment decisions (Perera, Zhou, Udeaja and Victoria, 2016).

Moreover, consultancy firms are lately being appointed for the exclusive purpose of conducting feasibilities for construction projects (Seghezzi, 2018). Arguably, feasibilities have become a specialised field within the QS profession; however, conducting feasibility studies is an expected competency of all quantity surveyors (Yogeshwaran, Perera and Ariyachandra, 2018).

This study focuses on one particular responsibility of quantity surveyors, namely financial feasibility studies. It is imperative to note the distinction between overall feasibility studies and financial feasibility studies (Costello and Preller, 2010). An overall feasibility study encompasses various aspects including technical feasibility, legal feasibility, operational feasibility, scheduling feasibility and the financial feasibility (Mukherjee and Roy, 2017). The final phase of the study is to evaluate if a proposed project would adhere the financial requirements of the developer. It provides clarity on whether the investment will generate enough cash flow to counter the debt service and provide an acceptable return to the investors (Costello and Preller, 2010). The financial feasibility (Willemse, 2019) is also referred to as the economic feasibility (Mukherjee and Roy, 2017). For the purpose of this study, the term feasibility/ies will be used to refer to financial feasibility studies.

The aim of a financial feasibility study is to present correct and reliable financial data to support informed investment decision-making within the real-estate development context (Basak, 2006). Therefore, a financial feasibility study is a tool that informs capital investment decisions. Therefore, this study will focus on financial feasibility studies conducted by quantity surveyors. This process takes place predominantly in the concept and viability stage prior to construction (Van Heerden, Burger and Van Eck, 2020).

There are six stages applicable in a construction project (as set out by the South African Council for the Built Environment Act No. 43 of 2000 for South Africa):

(i) Inception; (ii) Concept and viability; (iii) Design and development; (iv) Documentation and procurement; (v) Construction; (vi) Close. As set out by the South African Council for the Quantity Surveying Profession (SAQSP), these six stages are specifically applicable to the fees payable to the QS, but are also used as the terminology for all other professions in the built environment under the Council for the Built Environment (CBE) (Van Eck and Burger, 2016; CBE, 2019). The first stage, inception, is when the professional team receives the initial brief from the client and in turn prepares a brief for the client outlaying the strategy the professional team will follow to achieve the set goals (Van Eck and Burger, 2016). With permission from the client, the project can move on to the second stage, concept and viability. In this stage, the QS is responsible for preparing the estimated cost and financial feasibility of the proposed project to provide cost advice to the client. This is when the client is informed whether the project is feasible and the decision to proceed or not to proceed with the project is made here (Van Eck and Burger, 2016).

With approval from the client to proceed, the project moves on to the third stage, design development. During stage three, the architect develops more detailed drawings, and the QS will update the cost estimate and feasibility accordingly. The QS often needs to apply cost engineering to align the design requirements and costs to a point where it is acceptable to the client (Van Eck and Burger, 2016).

Stage four commences once the updated feasibility and designs have been approved. During the documentation and procurement stage, the QS is responsible for the procurement process, which includes the preparation of the tender documentation, facilitation of the tender process, evaluation of the tenders, and reporting on the tenders received. Finally, the QS draws up the contract document to be signed by the client (developer) and the successful tenderer (contractor) (Van Eck and Burger, 2016).

In the fifth stage, construction of the project commences, and the QS is responsible for cost management throughout. Other duties of the QS during this stage include attending site meetings and project meetings, doing monthly valuations and payment certificates, managing contractual claims, re-measuring provisional work, and preparing and issuing monthly cost reports to the client (Van Eck and Burger, 2016). The final stage of the construction project is the close-out stage. Here the QS needs to prepare the final account of the project (final gross value of the project after applicable deductions), which the contractor must agree to and sign. The final payment certificate needs be issued by the QS once the final completion certificate has been issued. The contract between the client and contractor has been concluded once the final account has been signed, and the final completion certificate and final payment certificate has been issued.

Furthermore, developers in the private sector are driven by commercial success while aiming for financial feasibility and benefits, whereas the public sector is motivated by success in development while aiming for social benefits (Rwelamila and Ogunlana, 2015). Drawn from the above, this study will focus on the private sector that utilises financial feasibility studies for private investments.

A financial feasibility study has been identified as a "*critical success factor*" of construction projects that cause projects to fail if not executed or communicated correctly (Mudi, 2016; Mukherjee and Roy, 2017). Yet, research indicates that the aforementioned feasibilities are *not* executed well and do require enhancement (Hyari and Kandil, 2009).

Drawing from the above, financial knowledge and communication skills are vital skills that should form part of the quantity surveying profession (Dada and Jagboro, 2012). Defining communication is thus imperative.

McQuail and Windahl (1993) combined three definitions of communication from three groups of authors:

(Osgood, Suci and Tannenbaum, 1957; Gerbner, 1967; Theodorson and Theodorson, 1969). McQuail and Windahl (1993) then defined communication as:

> *"In general terms, communication implies a sender, a channel, a message, a receiver, a relationship between sender and receiver, an effect, a context in which communication occurs and a range of things to which 'messages' refer."*

This definition stipulates the seven elements that are involved in the entire communication process. Arguably, if each element is taken into consideration and is optimised, adequate quality communication should emerge, which will form part of this study.

Furthermore, effective communication is defined as understanding the intentions behind the information (Abramson and Mancini, 2020). Importantly, the successful functioning of a team is largely dependent on effective communication. A team in this context comprises the quantity surveyors, developers, project managers, architects, and engineers working on real estate projects. Therefore, team members/stakeholders should have the knowledge of how to communicate in a way that is effective and fitting, that allow team goals to be reached and to maintain relationships. Ineffective communication on the other hand may add to unsuccessful interpretation of information that results in poor decisions and/or misunderstandings (Levi, 2015). The FMI/CMAA Fifth Annual Survey of Owners indicated that the element that will most significantly contribute to the improved quality of construction cost management, is the enhancement of effective communication (Basak, 2006). The financial feasibility study, where the focus lies for this study, is a segment of communication that forms part of construction cost management.

As stipulated in their definition (McQuail and Windahl, 1993), communication requires a sender, receiver and channel among others. The quantity surveyor prepares and communicates feasibilities to developers, who make the investment decision based on this communication. The quantity surveyor and the developer are thus the key participants of this communication process, even though there are other team members, such as project managers, engineers and architects. Hence, in this study, the quantity surveyor is identified as the sender, the developer as the receiver, and the feasibility study as the channel.

1.2 ARTICULATION OF THE RESEARCH PROBLEM

The feasibility produces the total capital outlay that is the benchmark budget for a project (Anees, Hussain, Khan and Abbas, 2018). The failure to set an accurate and realistic budget means that the project will likely exceed budget, therefore compromising the profitability and turning the project into an undesirable investment (Huxham, 2010).

That being said, an increasing number of projects are not remaining within budget (Hattingh, van Waveren and Chan, 2018). Through seven years of sampling, covering 258 projects across 20 nations and five continents, it was found that 90% of mega construction projects suffer cost overruns (Flyvbjerg, 2009). While these statistics were related to mega projects, it can apply to smaller-scale projects. Recent construction projects executed in South Africa, predominantly those around Durban, were reported to require budget additional to what was envisaged during the projects’ commencement (Adugna, 2015). Eight of the 10 stadiums constructed for the 2010 FIFA World Cup in South Africa, had initial budgets, but these were all finished over budget (Baloyi and Bekker, 2011).

Furthermore, according to a study done by Mukuka (2015), more than 70% of the 146 South African professional team members (quantity surveyors, architects, civil engineers, and project managers) that completed the structured questionnaire, worked on projects that went over budget. However, there is a significant number of factors leading to project cost overruns that have previously been identified by earlier studies (Aljohani, Ahiaga-Dagbui and Moore, 2017). According to Ali and Kamaruzzaman (2010), inaccurate and poor estimations of original capital outlay are the highest factors in cost overruns. According to a South African study, one of the major factors contributing to poor construction investment decisions, is poorly executed feasibilities (Mukuka, 2015) and arguably the communication process around it.

Many factors cause a gap between cost management theory and cost management practice in the construction industry (Basak, 2006). There is concern that financial reports like feasibilities (a core cost management service) are becoming more complex and less comprehensible to investors (Xu *et al.*, 2018). Moreover, feasibilities are inconsistent (Shen, Tam, Tam and Ji, 2010), neglected, problematic (Mohammed, Naji and Ali, 2019) and often incorrect in the estimation of the income (Ramawela, 2017; Kgaka, 2018), total capital outlay (Kwaku Osei, 2016; Dandan, Sweis, Sukkari and Sweis, 2019) and return (Huxham, 2010).

Financial and investment information should be communicated to all parties involved in such a way that there is little or no doubt with regards to the meaning of the message (Verster, 2006). Complexity and incomprehensibility create confusion and various interpretations, and this is the opposite of what is required. Additionally, the construction industry lacks the use of standardised communication and terminology in a number of areas of practice (Perumal and Bakar, 2011; Sullivan, 2017), which contributes to complexity and confusion (Smith, 2014).

To clarify, artefacts are items that have an influence on human behaviour and contribute to shaping the environment, including documents (MacLeod, Cameron, Ajjawi, Kits and Tummons, 2019), for example, feasibility studies that influence investment decisions. Hence, this study considers the feasibility as an artefact.

It is thus clear that well-executed and communicated feasibilities are vital to the success of developments. Yet, the compilation of feasibilities and the communication thereof seem to be faulty and in need of enhancement.

1.3 PROBLEM STATEMENT

There is a lack of understanding regarding the feasibility study as an artefact used by QS practitioners in the construction industry. The feasibility seems to be problematic; lacking consistency and standard communication procedures, comprehensibility and simplicity, resulting in confusion, inaccurate deductions, inadequate advice, and ultimately poor investment decisions.

1.4 RESEARCH RATIONALE

Accounts regarding problems that complexity could create in construction projects, is commonly found in literature. These issues include: (i) overestimation of benefits and underestimation of costs at feasibility stage; (ii) failure to achieve the client's requirements; (iii) stakeholders with misaligned or opposing views and goals, (iv) and the lack of proper tools for complex projects. All of the above lead to low performance (Flyvbjerg, Bruzelius and Rothengatter, 2013; Hass and PMP, 2008; Cooke-Davies, 2011). The tendency for early optimistic feasibility estimation to be overestimated leaves stakeholders facing the harsh reality of poor investment decisions (Rolstadås, Hetland, Jergeas and Westney, 2011).

Additionally, previous research indicates that feasibility studies emanating from quantity surveyors used in the construction industry are inconsistent in content (Shen *et al.*, 2010), problematic, neglected (Mohammed *et al.*, 2019), lacking standards to guide it (Sullivan, 2017) and creating confusion in practice (Smith, 2014; Xu *et al.*, 2018). Financial communication is becoming more complex and incomprehensible, and runs parallel with the increased complexity and size of construction projects (Lu *et al.*, 2015; He *et al.*, 2015; Luo *et al.*, 2017; Herszon, 2017). Furthermore, most feasibility studies are generated by means of traditional criteria that excludes project complexity (Herszon, 2017).

Construction projects have been identified as complex (Gidado and Wood, 2008), and the feasibility process of construction projects is then inevitably complex. A useful way to look at a complex system is through the lens of the Actor-Network Theory (ANT), especially the factors involved in the process and the network that shows how everything is connected. In summary, ANT makes it possible to include both human and non-human factors in a network. In ANT, these factors are known as actants, which is further elaborated in section 4.5.7.

This study proposes to address this issue by identifying the actants that forms part of the feasibility process; by investigating the respective perspectives of the key stakeholders; by investigating the nature and occurrence of the current feasibility study document; mapping the feasibility actor-network; and by offering a framework to support QS professionals and developers on improving the feasibility study process. This is done by bringing awareness of all the actants and guidelines to be taken into consideration in the process.

Complex systems have actants that influence projects or networks (Shenhar and Dvir, 2007); these actants can also be influenced by each other (Baccarini, 1996; Williams, 1999).

These constant influences within construction projects call for a framework that has the capability to describe the actants involved and their relationships in the feasibility study and decision-making process. Such a framework would reflect the applicable actants to better determine the influences on the network and help improve the decision-making process, based on feasibility studies conducted by QSs, who provide awareness and a set of recommendations.

There is a need for enhanced feasibility studies in quantity surveying practice, as voiced by international councils (Sullivan, 2017; Day, 2017), due to a changing construction industry (Ejohwomu *et al.*, 2017); a change in quantity surveying practices (Musa, Oyebisi and Babalola, 2010); globalisation and global alignment (Day, 2017), and construction projects becoming more complex (Gidado and Wood, 2008; Sohi *et al.*, 2016; Oesterreich and Teuteberg, 2016; Zainon *et al.*, 2018).

1.5 RESEARCH QUESTION

How can the financial feasibility study, as an artefact conducted by quantity surveyors in practice in the construction industry, and with the corresponding process, be understood better through the lens of the Actor-Network Theory?

1.6 RESEARCH SUB-QUESTIONS

The sub-questions allow the main research question to be answered systematically:

SQ1: What is known and unknown in terms of the financial feasibility study and process in QS practice?

SQ2: What is the QS perspective (a key stakeholder), in terms of feasibilities (the artefact) and the process?

SQ3: What is the developers' perspective (a key stakeholder), in terms of feasibilities (the artefact) and the process?

SQ4: What are the differences in the perspectives of the key stakeholders, QSs and developers?

SQ5: What is the current nature and occurrence of the financial feasibility study document (the artefact) in quantity surveying practice, in terms of communication and best-practice guidelines?

SQ6: What actants does the feasibility actor-network consist of, and how is the network connected?

SQ7: How can a framework be compiled to improve understanding regarding the actants in the feasibility process?

1.7 RESEARCH AIM

The aim of this study is to improve understanding around the artefact from the perspectives of both quantity surveyors and developers, and to provide a framework for optimising the success and reliability of financial feasibility studies, conducted by quantity surveyors.

1.8 RESEARCH OBJECTIVES

The following objectives have been identified to systematically achieve the aim:

OB1: Identify what is known and unknown in terms of the financial feasibility study and process in QS practice.

OB2: Understand the QS perspective, a key stakeholder, in terms of feasibilities (the artefact) and the process.

OB3: Understand the developer perspective (a key stakeholder), in terms of feasibilities (the artefact) and the process.

OB4: Identify the differences in the perspectives of the key stakeholders, QSs and developers.

OB5: Identify the current nature and occurrence of the financial feasibility study document (the artefact) in quantity surveying practice in terms of communication and best-practice guidelines.

OB6: Identify and map the actants in the feasibility actor-network, through the lens of the Actor-Network Theory.

OB7: Build a framework to improve understanding regarding the actants in the feasibility process.

1.9 RESEARCH SCOPE

The focus of this study is on the feasibility document and process in QS practice, in a global (literature) and South African (literature and primary data) context. Since developers in the private sector are driven by commercial success while aiming for financial feasibility and benefits, the feasibility document forms the centre of the project's success (Rwelamila and Ogunlana, 2015). The scope of this study is therefore as follows: Feasibility studies on construction projects that lie within the building sector and are centred on commercial success, which aim for economic feasibility and benefits, while owned by private developers. These projects include retail, offices, warehouses, large-scale residential, and hotels and other specialist buildings where the building itself is the income generator.

The feasibility and decisions around it occur prior the construction stage. As set out by the South African Council for the Built Environment Act No. 43 of 2000 for South Africa, there are six stages applicable in a construction project, as presented in Figure 1.1. The stages of a construction project under study includes the concept and viability and design development stages. However, broader fields outside construction need to be investigated, which will include communication narrowed to financial communication in the construction industry, as well as financial communication in business and accountancy.

Stage 1: Inception

Stage 2: Concept and viability

Stage 3: Design development

Stage 4: Documentation and procurement

Stage 5: Construction

Stage 6: Close

Figure 1.1: Six construction project stages

Other professional disciplines (accountancy, finance and business) will be investigated through the literature review, in order to establish how these professions have dealt with issues of financial communication and how they have resolved similar challenges and the outcomes (advantages and disadvantages) for their respective professional practice.

This study will not include the following: public projects, mining projects, civil projects, other services provided by QSs, or other professional team members like architects or engineers.

1.10 Research Assumptions

The research makes the following assumptions:

- Solutions to financial communication in other disciplines (other than quantity surveying), will contribute to solutions for better financial communication in the quantity surveying profession.
- The slow adoption of standard financial communication in quantity surveying practice is due to the perceived advantages of bespoke methods to such companies.
- Quantity surveyors do not take all risks and complexities into account when preparing feasibility studies.

- Quantity surveyors do not take communication guidelines into consideration when developing their feasibility studies (Terblanche, Ozumba and Root, 2019).

Communication is one of the skills that each quantity surveyor should have (Dada and Jagboro, 2012; Ramdav, 2018); however, many professionals in construction lack this skill (Gamil and Rahman, 2018). Due to a lack in industry standards, quantity surveying firms often develop their own management and organisational systems (Smith, 2001); however, feasibility studies conducted by quantity surveyors are, as previously mentioned, inconsistent in content (Shen *et al.*, 2010), problematic, neglected (Mohammed *et al.*, 2019), lack standards (Sullivan, 2017) and creates confusion in practice (Smith, 2014; Xu *et al.*, 2018). Therefore, the assumption is that quantity surveyors do not take communication guidelines into consideration.

- Developers seldom report on the complexity of certain communications from quantity surveyors, as it will reflect poorly on their capacity and public image.
- The construction industry is complex and requires a slightly different approach than other disciplines.

1.11 CONTRIBUTION TO BODY OF KNOWLEDGE

In short, this study contributes to the body of knowledge by portraying the detailed and opposing perspectives of the two key stakeholders on feasibility studies. Significant differences in perspectives arose. An evaluation tool emerged, based on the audience's (developers') needs and requirements that can be used to evaluate the acceptability of feasibilities in the industry. A detailed account of the contributions to the body of knowledge is given under section 10.9.

1.12 CHAPTERS OVERVIEW

This study is organised according to the following chapters:

Chapter 1: Conceptualising the research. This chapter conveys the background and context of this thesis, the research problem, the research question, and the aim and objectives to be achieved.

Chapter 2: Elaborating on the concepts. Chapter 2 elaborates on the specific concepts and ultimately presents the conceptual model.

Chapter 3: Studies on feasibilities. In this chapter, the protocol followed to execute the systematic literature review is stated, the literature identified through this review is discussed, and the gap in the literature is portrayed.

Chapter 4: Research methodology. Chapter 4 provides account of the research paradigm and approach, and explains the methodology followed during this study to address the research questions framed in the first chapter.

Chapter 5: Analysis and discussion of the QS interviews. This chapter portrays the data analysis based on the interviews with the quantity surveyors and offers an account of the actants that influence the success of financial feasibilities studies.

Chapter 6: Analysis and discussion of the developer interviews. Similar to the previous chapter, Chapter 6 presents the analysed data extracted from the interviews with the developers, offering the second perspective.

Chapter 7: Data synthesis part 1. The data collected from the interviews with quantity surveyors and developers, as well as the systematic literature review is synthesised and integrated.

Chapter 8: Analysing financial feasibility studies. Chapter 8 is the analysis of the financial feasibility study document, in terms of communication guidelines and complexities.

Chapter 9: Data synthesis part 2. The data synthesised in Chapter 7 is brought forward to this chapter and synthesised with the findings of the document analysis. The actor-network is mapped followed by the framework that emerged from the findings.

Chapter 10: Conclusions and contributions. The final chapter elucidates the contribution to the financial feasibility study process and presents the conclusion and recommendations.

1.13 SUMMARY OF THE CHAPTER

Financial feasibility studies are considered an artefact due to their impact on decisions and their environment. While it is a critical success factor for construction projects, when it comes these feasibilities, various issues are prominent. A useful way to look at the feasibility document and network, could be through the lens of the Actor-Network Theory, to contribute to better understanding of this artefact. The next chapter will give a short introduction and background on the main concepts of this study.

CHAPTER 2: ELABORATING ON THE CONCEPTS

The purpose of this chapter is to articulate the relevant concepts that form the basis of the research problem (section 1.3). Therefore, it is to understand communication and to underpin the requirements for effective financial communication in the quantity-surveying profession, particularly to improve feasibilities. Communication does not exist with words only, but is also embodied within readability, typefaces, formatting, text factors, and subheadings. This chapter seeks to set the foundation for financial communication and how disciplines, such as accountancy, business and finance, address financial communication and the issues that this gives rise to in their professional practice. The chapter then focuses on poor financial communication and its effects on the construction industry, specifically QS practice. Finally, a brief depiction of feasibilities in quantity surveying practice is presented. Figure 2.1 illustrates the structure of the presented concepts.

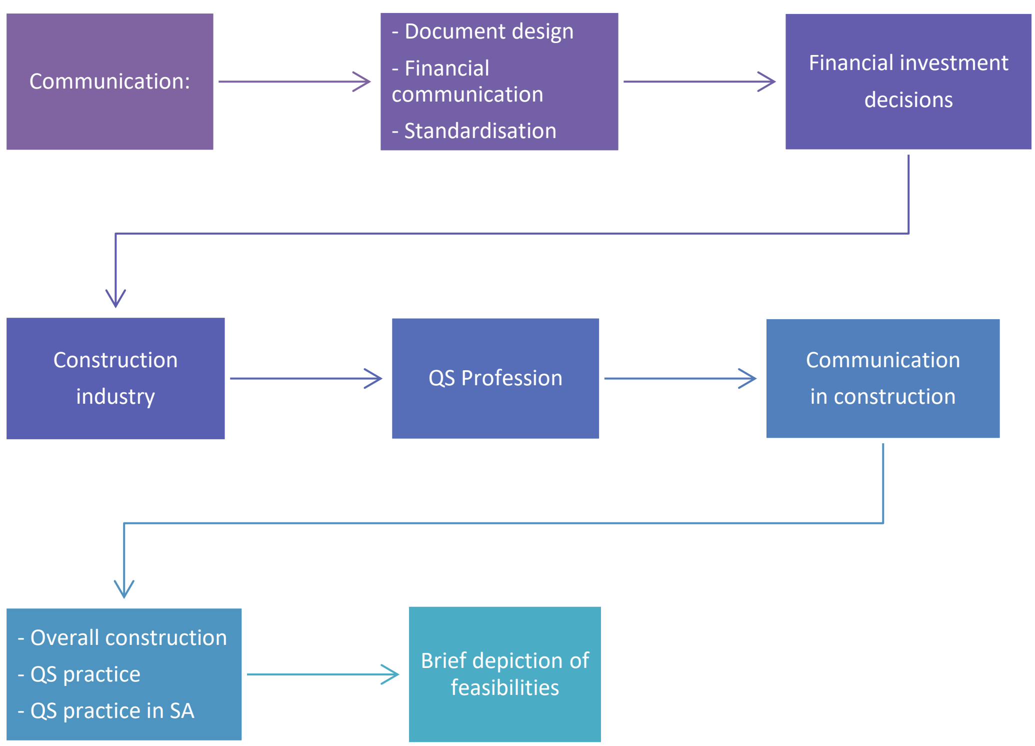

Figure 2.1: The structure of the presented concepts

This chapter is structured using the funnel approach, as illustrated in Figure 2.1. First, communication is discussed, followed respectively by document design, financial communication, standardisation, financial investment decisions, the nature of the construction industry, the QS profession in South Africa, communication in construction, and finally with a depiction of feasibilities in QS practice.

2.1 COMMUNICATION

2.1.1 Defining communication

Communication has multiple definitions defined by various people:

- Communication is the two-way creation and negotiation of meanings between oneself and others as it takes place within cultural contexts (Warren and Fassett, 2014).
- Communication is data that enters a process and ultimately leaves its contrary process (Losee, 1999).
- Further, Zulch (2014) defined communication as a process in which all applicable information is acquired, interpreted and successfully disseminated to the relevant people.

The definitions above focus more on the path of the data or information rather than all the elements that form part of the communication process. McQuail and Windahl (1993). However, a comprehensive definition of communication is as follows (McQuail and Windahl, 1993):

> "*In general terms, communication implies a sender, a channel, a message, a receiver, a relationship between sender and receiver, an effect, a context in which communication occurs and a range of things to which 'messages' refer*."

McQuail and Windahl (1993) included seven elements that form part of the communication process in their definition of communication.

Arguably, if one considers each element and optimises it, adequate quality communication should emerge. Each element can be represented within the context of this thesis. Table 2.1 pairs the element with the representative of the context of this thesis.

Table 2.1: The elements of communication paired with the context of this thesis

Element	**Representative**
Sender	Quantity Surveyor
Channel	Feasibility study document
Message	Feasibility of a project
Receiver	Developer
Relationship between sender and receiver	Professional and trusting
Effect	Start or disregard of the project
Context	Financial communication in the QS profession with the aim of providing information to inform a financial investment decision for proposed construction projects.

Powers (1995) explains that the focus of human communication circles around, "*the relation between messages and people*". Powers (1995) developed a model that adequately represents the extent of the communication discipline. The four-tiered model takes both the underlying unity of the discipline and diversity into consideration.

The first and central tier represents the characteristics of the actual message. The second tier looks at the nature of the communicator (an individual, participant of various social relationships, or an actor within a cultural context). The third tier attempts to comprehend the communication behaviour of communication levels (interpersonal communication, public context, small group) and the fourth and final tier represents the explicit communication acts that happen within overarching and recurrent social or cultural contexts (health care, legal courts, complex organisations, religion, education in schools, family setting and romantic relationships). As such, communication is a discipline that entails countless sub-disciplines, one of which is financial communication.

2.1.2 Guidelines for adequate document design

Feasibility studies serve as the 'message' in the communication process. The message in this case is a financial document, therefore understanding the core elements of an effective and quality financial document for communication is imminent. Ruesch, Bateson, Pinsker and Combs (2017) state that communication does not refer to verbal or explicit transmission of messages alone. Furthermore, Shaikh (2007) investigated typefaces as an element of a message, and the impact it has on how the document is perceived. Lexico (2020), the online version of the *Oxford Dictionary*, defines typeface as a particular design of type. Shaikh (2007) found that the typeface and its perceived appropriateness for a document affects the overall tone of the document and the probability of the viewer to take action based on the document (message), and whether or not the viewer prefers the document. Additionally, Hochhauser (2000) elucidates that the effective communication of a document can be assessed in terms of text factors, headings, subheadings, formatting, and readability tests. There are several guidelines for adequate document design (Hochhauser, 2000), set out hereunder:

- Sentences should be short, simple and direct
- Words comprising more than three syllables must be avoided
- Headings should be simple and placed close to the text
- Readability analysis must be performed
- The print style should be easy readable
- Justified left margins while the right margins remain ragged
- Use upper- and lower-case letters
- Work ought to be familiar to the reader
- Plain Language must be utilised

As such, some core elements that contribute to an effective message in the context of a document have been identified.

One of the guidelines is to conduct a readability analysis of the document. Bonsall, Leone, Miller and Rennekamp (2017) contradicted Loughran and McDonald (2014), and states that Plain Language attributes capture the financial reporting readability qualities highlighted by the Securities and Exchange Commission (SEC) best.

Matveeva, Moosally and Willerton (2017) researched Plain Language with the aim to reinstate the use of Plain Language in the professional industry. Matveeva *et al.* (2017) explain that Plain Language produces guidelines for language use and design frameworks for easily comprehensible documents. Plain Language, however, began to trend in some countries in the 1970s, and then lost momentum. Recently, it has regained momentum, due to legislation and new initiatives. The guidelines and principles for Plain Language required an audience analysis to be done, data to be organised in a logical way, easily readable formatting to be applied, as well as consistency and standard terminology applied (Matveeva *et al.*, 2017). Building on this, the usage of standardised terminology results in more effective services (Cintron, 2019), since a wealth of terminology for the same item creates confusion and adds to the complexity (Dumitru, Motoi and Budică, 2016). In addition to the aforementioned, Walker (2014) claims that the relationship between the goal of the communication, the typographic design of a document, and the language used, is vital to the effectiveness of the communication.

Communication is considered to be in Plain Language when its structure, wording and design are clear enough for the intended receivers to find what they need effortlessly, comprehend what is found, and use the information for the intended goal (Schriver, 2017). Campbell, Amare, Kane, Manning and Naidoo (2017) researched the plain-style preferences of professionals in the United States. They found an overwhelming preference for Plain Language amongst native English speaking professionals. While the business language in South Africa is English (Mayer, Makhura, Akii, Dateling, Dineo, Ebrahim, Jordaan, Khoza, Mabanya and Mpatane, 2021), less than 10% of South Africans deem their home language to be English (Coetzee-Van Rooy, 2021).

The preference for Plain Language could therefore resonate with South Africans as well.

Cheung (2017) argues that using Plain Language decreases systemic inequity and is consequently vital for ethical purposes. Thus, Plain Language provides clear guidelines for effective messages in the form of documents. Interestingly, Xu *et al.* (2018) found that firms sometimes increase the complexity of financial reports to create confusion for ulterior motives.

2.1.3 Guidelines for adequate financial communication

Tong Suk Chong (2015) defines financial communication as, "*the set of actions in communication concerning all potential investors and their consultants.*" Certain guidelines exist for adequate financial communication. According to Rensburg and Botha (2014) and Laskin (2018), consistency within financial communication is key while inconsistent financial communication might mislead investors. Information presented must be true, accurate and fair. Financial communication requires various factors of trustworthiness: transparency, consistency, predictability, integrity and reliability.

The Society of Investment Professionals in Germany (DVFA) DVFA (2007) compiled a structure of "*principles for effective financial communication*". The three aspects for effective financial communication include transparency, target group orientation, and continuity. The Financial Planning Association (2014) suggests that standards are vital to an effective communication strategy. This is so it can be standardised and automated. Thus, it may be concluded that poor financial communication can be defined as inconsistent, inaccurate, confusing and misleading, which causes distrust by investors. Furthermore, an abundance of information should be avoided in financial communication as it only adds to the complexity and creates confusion: simplicity is key (Nell, Lentz and Pander Maat, 2018).

Orenstein (2014) also believes that the reason behind complexity in financial communication is the lack of a consistent framework.

The way in which financial information is transmitted does not only depend on the quantity or quality of the information, but also on the way one effectively communicates with all that it involves (Cristina and Ioana, 2013). Palmieri, Perrin and Whitehouse (2018) explored the pragmatics of financial communication. They found that previous knowledge, level of language skills, and text design play a role in comprehending financial documentation. In the context of the current study, the text design is an element of the 'message', and the level of knowledge and language skills are elements of the 'receiver'. They examined the extent to which the three contextual elements affected the capability to comprehend financial communication. They concluded that the skills required to successfully interpret financial documentation varies with the format of the text presentation. This means, the simpler the text format and design, the less skill is required to successfully interpret and use the information given. The 'message' is thus the element that can be manipulated in order to achieve higher efficiency and comprehensibility.

2.1.4 Standardisation of financial communication

Drawing from the accountancy discipline, an international body (The International Standard on Auditing 700) sets standards for financial reports. Fakhfakh (2015) analysed the structure and language usage of these reports and found that the consolidation of these financial reports improved the quality and efficiency thereof. Standardising thus forms a solid basis for effective communication. Furthermore, Almasi, Gomoi and Cuc (2015) explain that globalisation is causing an additional need for the standardisation of financial reports. The eXtensible Business Reporting Language (XBRL) and the International Financial Reporting Standards (IFRS) both recognised this need and are currently converting global financial reporting to follow global standards.

Both have been successful and have gathered widespread support and adoption globally (Markelevich, Riley and Shaw, 2015).

Day (2017) emphasised that construction is moving towards global alignment and standards in communication could increase global investments. However, the construction industry still lacks standardisation (Sullivan, 2017). Sullivan (2017) stressed that financial reporting in the construction industry should be conducted in a similar manner, while everyone completes the same steps in a regulated and more sophisticated way.

The IFRS Foundation (2016) went about improving and standardising financial reports in the following way, which proved to be successful:

- Identified issues
- Gathered feedback from key stakeholders to understand their perspectives and needs
- Identified possible solutions for the raised issues

The IFRS has enhanced the financial communication environment in accountancy by improving information quality, comparability (Horton, Serafeim and Serafeim, 2013; Xie, Hall, McCarthy, Skitmore and Shen, 2016), efficiency (Cotter, Tarca and Wee, 2012) and accuracy (Cotter *et al.*, 2012; Jiao, Koning, Mertens and Roosenboom, 2012). The need for standardised feasibility studies is thus driven by global alignment, foreign investments, competition, collaboration, accuracy and quality.

2.2 Financial Investment Decision-Making

Financial investment decision-making will be further discussed in this section. Financial investment decisions are not always based on rational thinking; they are in fact largely driven by emotions, which could result in irrational thinking (Forgas, 1995). The more complexity and uncertainty involved, the more emotions may influence the decision (Forgas, 1995).

In order to minimise the level of uncertainty, a deep understanding of the variables in question is required. This level of understanding is a direct consequence of the quality and quantity of the information regarding the variable at the given time (Virlics, 2013). Good quality information, in a sizeable quantity, increases the understanding of investment and the risks associated with it.

Virlics (2013) concludes that financial investment decision-making is influenced by an objective, prompt analysis of the investment with its possible outcomes and payoff, as well as the subjective perspective of the decision-maker (investor). The size of the risks vary, however, and investment decision-making involves emotional and psychological factors from the decision-maker. This causes uncertainty and risk to be perceived subjectively. Bias is thus a factor in investment decisions (Manuel and Mathew, 2017). Understanding the psychological and emotional effect on the decision-making could have an informative role in the decision-making process. In summary, financial investment decisions are influenced by:

- objective analysis of the investment
- subjective perspective of the investor
- prior knowledge of the investor
- quality and quantity of the information given on the suggested investment
- risk
- uncertainty.

As such, it is imperative that FSQS, which supports financial investment decision-making, is of good quality and comprises the correct information, mitigating the risk and uncertainty factors.

2.3 NATURE OF THE CONSTRUCTION INDUSTRY AND PROFESSIONAL PRACTICE

The construction industry has been identified as a complex adaptive system and is described as a non-linear, complex and dynamic phenomenon, which often exists on the edge of chaos (Bertelsen, 2003; Wood and Gidado, 2008). Various elements of complexity have been identified, which form part of construction. Among the complexities are technical, structural, directional, and temporal complexity. Technical complexity relates to the difficulty to understand and implement a project's design and technical requirements. Structural complexity occurs due to the interdependence and interrelation of the numerous aspects of a project. Directional complexity exists due to goals that are unclear or poorly defined, which is often the case at the start of projects. Lastly, temporal complexity arises due to the lack of knowledge regarding variations that could occur over time, due to internal or external environmental impacts (Remington and Polack, 2007). Consequently, non-linear behaviour is to be expected from complex projects, as well as a lack of predictability.

Additionally, other categorisations of complexities have been introduced with regards to construction projects:

- Organisational (Baccarini, 1996; Maylor, Vidgen and Carver, 2008; Bosch-Rekveldt, Jongkind, Mooi, Bakker and Verbraeck, 2011; Senescu, Aranda-Mena and Haymaker, 2012; He *et al.*, 2015; Lu *et al.*, 2015; Nguyen, Nguyen, Le-Hoai and Dang, 2015)
- Technological (Baccarini, 1996; Maylor *et al.*, 2008; Bosch-Rekveldt *et al.*, 2011; He *et al.*, 2015; Nguyen *et al.*, 2015)
- Environmental (Bosch-Rekveldt *et al.*, 2011; Nguyen *et al.*, 2015; He *et al.*, 2015)
- Resource (Maylor *et al.*, 2008)
- Complexity of fact, faith and interaction respectively (Geraldi, 2008)
- Task (Girmscheid and Brockmann, 2008; Lu *et al.*, 2015)

- Social, operative and cognitive complexity respectively (Girmscheid and Brockmann, 2008)
- Cultural (Girmscheid and Brockmann, 2008; He *et al.*, 2015)
- Product and process complexity respectively (Senescu *et al.*, 2012)
- Goal and information complexity respectively (He *et al.*, 2015)
- Socio-political, infrastructure and scope complexity respectively (Nguyen *et al.*, 2015)
- Detail and dynamic complexity respectively (Zhu and Mostafavi, 2017)
- Uncertainty (San Cristóbal, Carral, Diaz, Fraguela and Iglesias, 2018)

If one accepts construction projects as complex adaptive systems, there is a need to accept the context that the quantity surveyor and other stakeholders might not completely understand all factors/actants involved in the network, but alternatively focus on following the system's changes and adapt as the results become apparent. An environment that does not change (seldom in the case of complex projects), has no need for adaptation, and therefore will be less complex. In essence, for a project or any system to be accepted as a complex adaptive system, it needs to hold the following characteristics (Levin and Ward, 2011; Herszon, 2017):

- There are many elements that act in parallel and not in hierarchical sequence.
- These elements change constantly, consequently creating several levels of organisation and structure to support them.
- As per the second law of thermodynamics, the system exhibits entropy and will therefor wind down without additional energy entered into the system.
- Patterns can be recognised and used to foresee the future and allow adaptation to change.

Furthermore, another perspective identified the main features of a complex adaptive system as (Mullins and Rhodes, 2007; Crabtree, 2010):

- agents that may act independently, but are dependent on other agents in the system (to varying degrees)
- the environment in which the agents operate
- the objectives that agents are pursuing and their perceptions of how best to pursue these objectives
- the nature of the connections between agents (e.g., information exchange, resource dependencies, etc.)
- the initial conditions that were present at the ‘‘start’’ of the system
- the ‘outcomes’ of the system that create feedback, which influence agents’ subsequent actions

2.4 THE QS PROFESSION IN SOUTH AFRICA

The quantity-surveying profession in South Africa has been benefiting from a governing institution since 1908, when the Association of South African Quantity Surveyors (ASAQS) was established (The Association of South African Quantity Surveyors, 2017). A Quantity Surveyors’ act was published in 1970 and the South African Council for Quantity Surveyors was established. Hence, there were two bodies governing the profession: the Council and the Association (Maritz and Siglé, 2016).

In the year 2000, the Council for the Built Environment (CBE) was established as a statutory body and to provide governance over the six built professions: Architecture, Quantity Surveying, Engineering, Landscape Architecture, Property Valuers and Construction Management. A statutory body for each of the six professions was also established with ‘the Council for the Built Environment Act, 2000’, including, ‘The South African Council for the Quantity Surveying Profession (SACQSP) Act (No 49 of 2000)’ (Maritz and Siglé, 2016). Significantly, the Act (No 49 of 2000) introduced the principle of obligatory registration of persons who wish to practise as a ‘Professional Quantity Surveyor’ (PrQS).

Compliance of all prescribed registration requirements would permit a person to use the title 'Professional Quantity Surveyor' and without registration one is not allowed to open one's own firm or present one's self as a QS (Maritz and Siglé, 2016).

The QS is known to be the 'construction cost advisor' and provides the following services (Maritz and Siglé, 2016; The Association of South African Quantity Surveyors, 2020):

- **Advice on the cost of projects**
- Advice on tender procedures and contracts
- Collaborate with all professional team members
- Prepare cost estimates and budgets
- Prepare tender documentation
- Facilitate contract administration
- Implement cost control during the construction stage to ensure the project remains within budget
- Prepare provisional bills of quantities / bills of quantities / schedule of rates and other procurement documentation, such as the principal contract and subcontracts
- Prepare elemental estimates linked to design development and budget allocation
- Facilitate the tender process and tender valuation
- Monthly valuations and payment certificates
- Final account for the main contract and direct contractors
- Calculation of price fluctuations
- Estimation of value variations of current statements vs budget
- Advice on costs and cost control of specialised projects
- Negotiate rates and costs with contractors
- Manage the financial facets of cost-plus sum contracts

- Prepare bills of quantities for engineering works
- Conduct **financial feasibility studies** to forecast possible rates of return on commercial investment projects
- Acts as principal agent
- Prepare dilapidation reports and value buildings for insurance purposes
- Interpret construction contracts
- Serve as an expert witness as well as prepare statements during a litigation process
- Participate in the various methods of dispute resolution, such as conciliation, evaluation, mediation, and arbitration

In particular, as stated before, this study's focus is on the financial feasibility studies prepared by QSs to predict the possible rates of return on commercial investment projects. The preparation of estimates and budgets, as well as cost advice, is inherently part of this process.

2.5 COMMUNICATION IN CONSTRUCTION

Firstly, the occurrence and situation surrounding communication in construction as a whole is discussed. Then the focus is narrowed to the current practices and standards of feasibilities in the QS profession. Lastly, the status quo of communication standards of feasibilities within South Africa is considered.

2.5.1 Communication in overall construction practice

Moving towards communication and the construction industry, the construction industry is known for its complexity and misinterpretations. Misinterpretations are a result of poor communication. Gamil and Rahman (2018) did a literature study on the origins and effects of inadequate communication in the construction industry. They identified 57 studies that were done in the 25 years prior to 2018.

The graph in Figure 2.2 (Gamil and Rahman, 2018) illustrates the number and chronology of articles found.

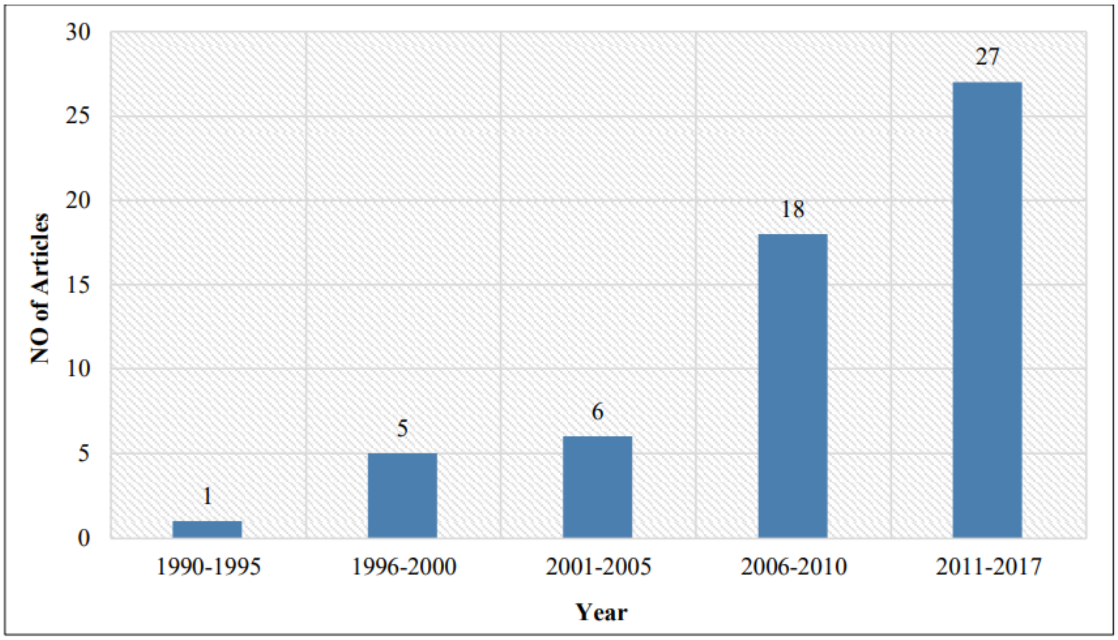

Figure 2.2: Published articles on the causes and effects of inadequate communication in the construction industry (Gamil and Rahman, 2018: 242)

In analysing these articles, Gamil and Rahman (2018) found 33 causative factors for inadequate communication in these articles, of which five relate to this study:

1. Absence of effective communication between construction parties (cited from 17 articles)
2. Non-effective communication systems and platforms (cited from 10 articles)
3. Poor communication skills (cited from 9 articles)
4. Reluctant support for new communication and information technologies (cited from 4 articles)
5. Lack of understanding among parties (cited from 1 article)

In addition, Gamil and Rahman (2018) found 21 effects of inadequate communication in the construction industry. Of the 21, six relate to this study:

1. Time overrun (cited from 19 articles)
2. Cost overrun (cited from 8 articles)

3. Failure of the project (cited from 5 articles)
4. Late response to disaster (cited from 4 articles)
5. Misunderstanding (cited from 3 articles)
6. Misinterpretation (cited from 3 articles)

In the process to combat inadequate communication, the construction industry has recognised Building Information Modelling (BIM) as a possible solution to more effective communication, as well as improved collaboration, among other technologies (Oesterreich and Teuteberg, 2016; Atazadeh, Rajabifard and Kalantari, 2017; Zou, Kiviniemi and Jones, 2017). The 3D modelling through BIM makes interpretation of designs easier for the team and the client, replacing two-dimensional paper-based drawings (Kensek, 2014).

BIM has been adopted internationally (Smith, 2014; Oesterreich and Teuteberg, 2016; Day, 2017). It is therefore clear that BIM's inclusion in future construction practice is inevitable, but could it enhance feasibilities? BIM has been recognised as being able to enhance financial communication, specifically in two ways. First, as a communication platform (Lin, 2019; Jin, 2018; Marzouk, 2019) and as a provider of accurate taking-off measures for cost estimates that could form part of the feasibility's content (Smith, 2014; Kim, Ma, Baryah, Zhang and Hui, 2016; Zainon *et al.*, 2018), under 5D of BIM. For the accuracy of the model, in 2008 the American Institute of Architects (AIA) proposed the level of detail (LOD), which standardises the level of detail of the model or the level of development of the model, into five different types, namely LOD100, LOD200, LOD300, LOD400 and LOD500. The higher the number, the more detail the development of the BIM model (and the greater the amount of available design information). BIM models with different developmental precisions are applied to different stages of the project. In the investment decision-making stage (stage 2: concept and viability), the BIM model has a low level of development which is LOD100, and corresponds with a conceptual design.

The researcher previously conducted a systematic literature review on the contribution of BIM towards financial feasibility studies in quantity surveying practice (Terblanche, Root and Vosloo, 2020), finding that the fifth dimension of BIM primarily contributes towards feasibility studies, by making automated quantity take-off possible on the design that has been done at the time of conducting the feasibility. These designs, however, provide minimal information that can contribute towards the cost estimation and are rarely trusted by QS practitioners. This also means that design information in BIM models do not contribute to the other sections of a feasibly study, such as project costs, revenue estimates and calculation of the return on investment (ROI). QSs will need to make use of both automatic features and personal knowledge and skills when developing a feasibility study while using 5D BIM. Therefore, currently, BIM practice contributes minimally towards feasibility studies and the efficiency and efficacy thereof. Additionally, the accuracy and usability of the data in the model is highly dependent on the expertise of the professionals.

Given the above, and the following issues recorded by Smith (2014) (with regards to BIM), it might not be the answer to improve the quality of feasibilities since:

- The quality of the BIM model is a major concern, since the data needs to be extracted from the model. An incorrect BIM model will lead to incorrect cost estimates.
- It is more difficult to check for errors and inconsistencies in the BIM model than on traditional 2D drawings.
- The lack of standards and terminology in BIM creates confusion.
- The full implementation of BIM means full transparency for the project team. Cost data is sensitive information and quantity surveyors are hesitant to share this data with the entire team as this is what gives quantity surveyors a competitive advantage. Transparency in this instance is not desirable because it levels the playing field.

- Concerns were raised about the younger cohort of quantity surveyors, who might be overly reliant on technology, resulting in a lack of fundamental quantity surveying skills and competencies.
- The cost of training staff, in order to use software programs effectively, is high.

2.5.2 Communication and standards in QS practice

Globalisation and liberalisation have a direct impact on quantity surveying firms, due to the competition it induces (Lynn and Hassan, 2016). As such, if quantity surveying firms want to survive, they need to practise in alignment with international standards (Day, 2017). However, there is a lack of standards in the quantity surveying profession, which creates confusion in practice (Zhou, Perera, Udeaja and Paul, 2012; Thomas, 2012; Smith, 2014). Complexity is an inevitable part of construction, which can hinder efficiency and success; therefore, standardised practices are imperative to simplify construction processes and to enhance success (Zainon *et al.*, 2018).

Given that standardisation is vital for efficient financial communication (as discussed in section 2.1.3), the attempts to standardise communication in QS practice are discussed hereunder. Some associations and councils worldwide are working together to create internationally-recognised standards: Africa Association of Quantity Surveyors and International Cost Engineering Council (2014) reached an agreement in 2014 to strive to work together to this very goal. This indicates that the associations and councils are still working towards the goal of internationally-recognised standards, but is trailing far behind other industries like IFRS (as discussed in section 2.1.4). The profession is moving towards international standards, for example, international property measurement standards (IPMSC, 2014) and international construction measurement standards (ICMSC, 2019); however, a number of areas have not be addressed, particularly feasibilities.

Regarding feasibilities, there are certain guidelines that are followed internationally. For example, the International Health Facility Guidelines (2015), published guidelines for feasibility studies for health facilities where they included the content that they require and providing a template they could use as a guide. The AAQS has issued an example of a feasibility report to guide quantity surveyors not yet familiar with such reports (Africa Association of Quantity Surveyors, 2020). The International Organization for Standardization (ISO) published standards for costing for the first time in 2017 (ISO, 2017). ISO aims to establish clear terminology and common methodologies internationally (ISO, 2017). While this is a step closer, feasibilities are not addressed specifically. Muse (2017) suggests that professional collaboration to standardise cost definitions and classifications are required globally. This could contribute to more accurate estimates and budgets.

Furthermore, Azhar, Khalfan and Maqsood (2012) argues that developers could benefit from a lower financial risk with reliable cost estimates and feasibility studies due to standardised systems. Architects, engineers, project managers and other stakeholders could benefit from better information flow (Volk, Stengel and Schultmann, 2014). Additionally, the adoption of a consistent table of contents ensures a comprehensive assessment, a study fit for purpose, consistent terminology and studies, which meets the needs of all stakeholders, where all contributors knows what is expected, and which minimises unnecessary duplication of work (Mackenzie and Cusworth, 2007). Furthermore (Hyari and Kandil, 2009; Kwaku Osei, 2016; Syed Alwee, Salehudin, Mohamed Sabli, Isnaini Janipha and Maisham, 2019) also argue that a unified scope and methodology for conducting feasibilities will lead to improved feasibilities, as well as effective tools (Kwaku Osei, 2016).

As presented by the literature, the need to standardise financial communication in quantity surveying practice to date has emerged through recognising the lack of standards and the benefits that standardisation can provide. Standards on feasibilities in quantity surveying practice are nevertheless, few and far in between.

2.5.3 Communication and standards in QS practice in South Africa

In South Africa, the Association of South African Quantity Surveyors (ASAQS) publishes standards and guidelines for various aspects in construction including:

- A model bill of quantities (ASAQS, 2005)
- Standard methods of measurement (ASAQS, 2017b)
- Guide to elemental estimating (ASAQS, 2016b)
- General preambles for trades (ASAQS, 2017a)
- Guide to Co-ordinated Economic Viability Studies For Commercial Property (ASAQS, 2016a)

However, Willemse (2019) found that comprehensive and thorough studies are not conducted in South Africa, and that control over procedures should be enforced if cost overruns are to be mitigated. By comparing theoretical best practices for feasibility studies and practical implementation, they determined where the industry is lacking and found that South Africa requires the development of tailored procedures/standards for feasibilities. In the South African context, standards and guidelines do exist for feasibilities, but there is a lack of evidence on the terms of the method followed to compile the guidelines for feasibilities. A proven successful method to compile effective and useful guidelines on financial reporting is to (IFRS Foundation, 2016):

- identify issues
- gather feedback from key stakeholders (to understand their perspectives and needs)
- identify possible solutions for the issues raised.

The standards and guidelines provided by ASAQS do not address the issue of globalisation and the need for internationalised standards. Furthermore, this study attempts to improve feasibility studies by following the method as set out above.

2.6 A Brief Depiction of Financial Feasibility Studies

There are various best-practice components of feasibilities that are defined. According to Stefánsdóttir (2015), the best practice components include: Project overview (objectives and requirements); Alternatives; All Costs and Benefits; Net Present Value; Sensitivity Analysis, and Recommendations. According to the South African Council for the Quantity Surveying Profession (SACQSP, 2000), the components should be: All Costs; Duration and Milestones; Net Income (all expenditure vs receipts); Cost of time; and Net Present Value.

The following components are discussed in more detail: project overview (Stefánsdóttir, 2015), duration and milestones (Willemse, 2019), total capital outlay, total project income (Stefánsdóttir, 2015; Karas, 2017; Lock, 2020), cash flow projection (Lock, 2020), profitability indicators (Cloete, 2006; Stefánsdóttir, 2015; Sudhana, 2016; Lock, 2020), sensitivity analysis (Stefánsdóttir, 2015; Karas, 2017), the life-cycle costing (Heralova, 2017) and recommendations (Stefánsdóttir, 2015).

2.6.1 Project overview, duration and milestones

All important dates, such as the project start date, pre-construction period, construction start date and period, handover date, and start date of the operational phase need to be provided (Willemse, 2019). The project objectives and requirements also need to be given (Stefánsdóttir, 2015).

2.6.2 Total capital outlay

The total capital outlay consists of land costs, escalated construction cost (Okereke, Ejekwu and Ohamma, 2020), professional fees, finance charges (Okereke *et al.*, 2020), marketing costs and other costs (Cloete, 2006). This is illustrated in Figure 2.3.

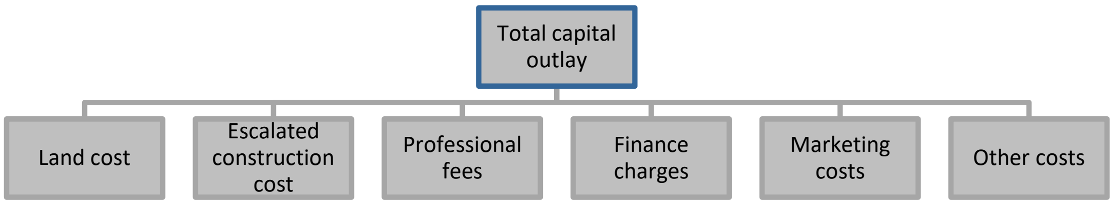

Figure 2.3: Components of the total capital outlay

2.6.2.1 Land costs

The land acquisition costs form a significant part of the total capital outlay and consists of (Cloete, 2006; Ciruelos Alonso, 2015; Willemse, 2019; Ibrahim, 2020):

- **Market value** of the land. Note, it is not the amount paid for the land, but the current market value that should be reflected in the feasibility (Farrell, 2010).
- **Transfer costs**: The calculations of the latest and applicable transfer costs can be found on the South African Revenue Services' (SARS) website for construction projects within South Africa. The attorney fees for registering the title deed should also be accounted for. Note that if the property is already in the name of the developer, then the transfer costs are irrelevant. Additionally, if value added tax (VAT) is payable, then transfer duty will not be payable (Cloete, 2006).
- **Geotechnical reports**: This is usually required to ascertain the soil composition in order to understand what type of foundations would be suitable for the purpose (Dandan *et al.*, 2019).
- **Bulk services**: If the site lacks services like electricity, water, storm water and/or sewer, then the services need to be extended to the site. This should

be carried out by municipalities and could be a major item of expenditure. This is often the case for greenfield developments (Costello and Preller, 2010).

- **Tax on land or improvements**: The requirements of the local authorities should be consulted (valuation and tax rates). Tax on the land should be allowed, from the time of purchase, and estimated until the time of opening. Tax increases each year, and this should be accounted for. Tax on improvements could also be applicable (Farrell, 2010).

2.6.2.2 Escalated building cost

Firstly, the current building cost comprises (Cloete, 2006):

- **Basic items** that will be executed by the main contractor, including concrete, formwork, reinforcement, masonry, plastering etc. (Cloete, 2006)
- **Provisional sums** for special items, such as shopfronts, hoists, ceilings, air conditioning, electrical works, etc (Mac-Barango, 2017).
- **External works** like roadwork, paving, landscaping, water reticulation, etc. (Cloete, 2006)
- **Preliminaries** (Mac-Barango, 2017)
- **Contingencies**, which are usually a percentage of the total current building cost (Lim, Nepal, Skitmore and Xiong, 2016; Karas, 2017).

The building cost can be calculated by different methods (Githaiga, 2006; Lim *et al.*, 2016):

- Unit method
- Approximate quantities
- Rate per square metre (R/m^2)
- Elemental estimate (according to the ASAQS guide to elemental cost estimating (Cloete, 2006))
- Bill of quantities according to the ASAQS standard method of measurement

The building cost should be presented as a rate per square metre (R/m²) and each element a percentage of the total building cost. In the case of shopping centres, the internal fit outs of shops should be given separately.

Secondly, escalation should be applied to the pre-tender duration and the post-tender duration. Therefor it is imperative to have a realistic estimated duration of the project (Lock, 2020):

- **Pre-tender escalation** should be allowed from the date of the feasibility report to the anticipated tender date. There are two calculation methods that can be used to calculate the escalation: (i) percentage compounded monthly, (ii) the tender price index method. The index and percentage should be obtained from a reliable source (Cloete, 2006).
- **Post-tender escalation** is applicable from the date of tender until construction is completed. Usually, the Contract Price Adjustment Provisions formula is applied using the work group indices published by the Statistical Services (Willemse, 2019).

2.6.2.3 Professional fees

Professional fees include the fees of the architect, quantity surveyor, applicable engineers (electrical, mechanical, structural, etc.), and any additional professions required, for example, a project manager, landscape architect, etc. (Willemse, 2019). Most of the professions have published fee scales that form part of the fee calculations. Disbursements should also be allowed for to account for travelling and printing expenses (Cloete, 2006).

2.6.2.4 Finance charges

Finance charges could comprise:

- **Mortgage registration cost**: If the project is funded by financiers, the attorneys that register the loan require a registration fee (Cloete, 2006; Huxham, 2010).

- **Mortgage raising fee**: If applicable (Cloete, 2006)
- **Cost of capital (interest)**: This allocation of cost is to account for the interest that accrued on the capital during the construction period. This could be in the form of debt and/or equity (Kimaru, 2018). The interest rate to be used is the rate the developer is required to pay for bridging finance. A thorough income and expenditure cash flow to the date of opening should be prepared and the interest should be applied to the aforementioned cash flow (Karas, 2017).

2.6.2.5 Marketing costs

Marketing costs could include any marketing that is required for the project and which should be considered, for example, brochures, billboard advertisements, etc. Additionally, the commission payable to leasing agencies for securing tenants can be a substantial amount and needs to be taken into account (Karas, 2017; Ibrahim, 2020).

2.6.2.6 Sundry costs

Any additional costs applicable to the project should be allowed for. This could include:

- Sundry legal fees for agreements if applicable (Willemse, 2019)
- Plan approval fees (Karas, 2017)
- Tenant co-ordination fee for consultants liaising with tenants with regards to their tenant fit out. This is usually applicable to shopping centre developments (Farrell, 2010).
- Tenant allowance for tenant requirements in order to attract tenants (Farrell, 2010).
- Project contingency: Allow less than 1% on the total capital outlay for unforeseen project circumstances (El Khawas and Aghaei, 2020).
- Interim income: if the building generates any income before the opening date, this amount should be deducted from the total capital outlay (Cloete, 2006).
- Allow for any other applicable expenses.

2.6.3 Total project income

The gross income and the net income should be calculated, as well as the interim income (discussed above) if applicable (Cloete, 2006; Huxham, 2010):

- **Gross income**: List the various rentable spaces and the expected rental income per space per month for the first year. From this, the gross monthly and annual incomes can be calculated. The rentable area is defined by the SAPOA Method of Measuring Floor Areas.
- **Net income**: The net income is calculated by deducting the estimated escalated annual operating expenses and applying a vacancy factor.

The operating expenses could include the following (Cloete, 2006; Huxham, 2010; Stefánsdóttir, 2015; Ciruelos Alonso, 2015; Ibrahim, 2020):

- **Rates and taxes**: land tax, water and electricity consumption, refuse removal, etc.
- **Management fees**: Administrative and management staff
- **Security fees**: Security staff
- **Auditors' fees**
- **Cleaning services**
- **Maintenance:** Building, garden, lifts, AC, etc.
- **Depreciation**
- **Assurances:** Fire, public liability, income loss
- **Any other applicable costs**

The total current annual cost should be calculated and then escalated annually by the expected inflation.

2.6.4 Cash flow projection

Cash flow projections should be done for the construction costs and the income and expenditure for the next 20 years after opening (Syed Alwee *et al.*, 2019).

- **Construction cash flow**: details of the construction cash flow should be provided. Formulas could be utilised like the S-curve or the De Leeuw formula (Cloete, 2006).
- **Income and expenditure cash flow**: present the cash flow for a 20-year period and account for the terminal value (Huxham, 2010).
- **Income tax cash flow**: if applicable, a five-year period of the expected income tax should be presented with the applicable deductions (Cloete, 2006).

2.6.5 Profitability indicators

Various profitability indicators can be calculated depending on the developer's objectives:

- **Initial return (IR)**: This is calculated by dividing the first year's net income by the total capital outlay. The IR is expressed as a percentage (Huxham, 2010):

Equation 1: Initial return

$$IR = \frac{NI_1}{TCO}\ x\ 100\%$$

Where:

NI_1 = First year's net income

TCO = Total capital outlay

- **Return on investment (ROI)**: This is the actual net income in each year, divided by the total capital outlay (Al-Hawsah, 2020). The calculated return is the average ROI over the expected life span of the investment, which is usually between 10 and 20 years (Huxham, 2010):

Equation 2: Return on investment

$$ROI = \frac{NI_T}{TCO}\ x\ 100\%$$

Where:

NI_T = Net income over the expected duration of the investment

TCO = Total capital outlay

- **Payback period (PP)**: This indicates the time it will take to get the investor's capital back. This is calculated by dividing the total capital outlay by the average net income of the expected investment period (Huxham, 2010):

Equation 3: Payback period

$$PP = \frac{TCO}{ANI_T}$$

Where:

TCO = Total capital outlay

ANI_T = Average net income over the expected duration of the investment

In the hospitality industry the project is deemed feasible if the PP is less than ten years (Sudhana, 2016).

- **Net present value (NPV)**: This is the net income discounted back at the required rate of return. If the NPV exceeds zero, then the project is deemed feasible (Sudhana, 2016). The formula is presented as follows (Pienaar, 2015):

Equation 4: Net present value

$$NPV = \sum_{t=0}^{T} \frac{C_t}{(1+i)^t}$$

Where:

C_t = net cash inflow during the period t

i = discounted interest rate

T = number of time periods

t = the time period (0 to T)

The net cash inflow at the start of the project (C_0) is typically the initial investment cost.

- **Internal rate of return (IRR)**: The IRR is the interest calculated that will make the NPV of the total net cash flow equal to zero. A project is usually deemed feasible if the IRR is higher than the interest rate provided by financiers (Sudhana, 2016). Therefore, the IRR can be calculated as follows (Karas, 2017):

Equation 5: Internal rate of return

$$NPV = 0 = \sum_{t=0}^{T} \frac{C_t}{(1 + IRR)^t}$$

- **Residual land value (RLV)**: This is the method of calculating the value of the land when it is unknown or to establish the land acquisition cost, pre-purchase, that will relate to a feasible project. The formula is as follows (Karas, 2017):

Equation 6: Residual land value

$$RLV = \frac{NI_1}{r} - TCO - P$$

Where:

NI_1 = First year's escalated net income

r = Capitalisation rate that is equal to the expected return

$\frac{NI_1}{r}$ = Value on completion

TCO = Total capital outlay (escalated)

P = Developer's profit

2.6.6 Sensitivity analysis

A sensitivity analysis is conducted to determine the change in profitability when a component in the feasibility report is altered. These components could include the total capital outlay (building cost, interest, land cost, professional fees), initial gross income, operating expenses, vacancy factors, and escalation in rental (Cloete, 2006). The components (after adjustment) that effect the return most are seen as the riskiest items and require careful management. The components should be altered to optimistic, most likely and pessimistic scenarios (Huxham, 2010).

2.6.7 Life cycle costing

Life cycle costing, in terms of building and construction assets, is defined by the International Organization for Standardisation (ISO) 15686 Part 1 – Service Life Planning as, *"a technique which enables comparative cost assessments to be made over a specified period of time, taking into account all relevant economic factors both in terms of initial costs and future operational costs."* The life cycle costing includes: the initial total capital outlay including the construction/purchase cost; all operating costs, including rental commission; and all maintenance costs over the lifespan of the building (usually 20 years), as well as any renewal costs during this time. All the aforementioned are estimated on the basis of the technical condition of the building. This is offset against the salvage value, which is an estimate of the expected market value at the termination of the investment, typically after 20 years (Heralova, 2017).

2.6.8 Alternatives and recommendation

As a final estimate of the financial feasibility study, the professional consultant (QS) should make a recommendation, in terms of proceeding/not or alternatives to the client, based on the findings of the feasibility (Stefánsdóttir, 2015).

2.7 THE CONCEPTUAL MODEL

The conceptual model is considered to include concepts produced by works of other researchers in the field; research assumptions made by the researcher within the relevant research field and the researcher's own experience and observations in practice (Leshem and Trafford, 2007). Furthermore, a conceptual model is a combination of theories, concepts, beliefs, assumptions, and expectations that support and inform the applicable research (Bickman and Rog, 2009), including the context of the researcher's particular expertise, experiences and motivation (Bryman, 2016). In addition, a model guides the process of implementation (Strifler, Cardoso, McGowan, Cogo, Nincic, Khan, Scott, Ghassemi, MacDonald and Lai, 2018).

A visual conceptual model is presented that consolidates these concepts, beliefs, and assumptions.

2.7.1 Current literature and theories

Current literature in the field of financial feasibility studies in QS practice contain findings of a number of issues (Shen *et al.*, 2010; Huxham, 2010; Stefánsdóttir, 2015; Kwaku Osei, 2016; Ramawela, 2017; Kgaka, 2018; Mohammed *et al.*, 2019), but these studies do not necessarily identify from where the issues stem. Methods to improve feasibilities are recognised by other scholars (Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Mukherjee and Roy, 2017; Syed Alwee *et al.*, 2019; Dandan *et al.*, 2019), but factors applicable in the feasibility compilation and communication process are not considered thoroughly researched or presented. A few studies interviewed a small sample of developers (Huxham, 2010; Ramawela, 2017; Kgaka, 2018; Al-Hawsah, 2020), and others did a document analysis on feasibilities (Githaiga, 2006; Abou-Zeid, Bushraa and Ezzat, 2007; Hyari and Kandil, 2009; Huxham, 2010; Shen *et al.*, 2010; Bettini, Longo, Alcoforado and Maia, 2016; Okoro, Musonda and Agumba, 2019).

Literature on document design and communication (Shaikh, 2007), found that the formatting and its perceived appropriateness for a document affect the overall tone of the document and the probability of the viewer to take action based on the document (message), and whether or not the viewer prefers the document. However, all the aforementioned studies did not address communication issues including document design/formatting, aside from Terblanche *et al.* (2019), who advocate for adequate document design and simplicity that should be applied to feasibilities.

Furthermore, none of the aforementioned studies offered in-depth engagement with both key stakeholders (QSs and developers) to gather insight on their perspectives regarding the compilation and communication process.

As per the literature found, it appears that the in-depth view of the QSs (those responsible for the compilation and communication of feasibilities) has not been obtained with regards to feasibilities. The research offers another approach, to place the QSs' and developers' opposing views and experience, along with a document analysis at the heart of the enquiry, while focusing on the entire compilation and communication process of feasibilities. The theoretical lens and analytical tool adopted to achieve this is the Actor-Network Theory.

2.7.2 Assumptions and reflection from experience

The author is a professional QS, with experience as a consulting QS on commercial projects for the private sector, as well as an academic. A practitioner and academic identifies an issue worth investigating from within a field practice, where traditionally a scholar undertaking a doctor of philosophy degree approaches a phenomenon from the outside looking in (Moore, 2020). This immersive view from within, facilitates more in-depth knowledge of the research topic and is the basis for this study's assumptions. Reflection from practising as a QS, the author perceived poor quality feasibilities in practice due to a lack of protocol and consistency, and developers or interpreters struggling to comprehend the information displayed in the document. Reflection in practice suggests that adequate document design as part of efficient communication, discussed within section 2.1.2, is lacking. Additionally, the lack of a protocol suggests the absence of standards and could be the cause of other issues within the compilation process of feasibilities. These observations fuelled a personal doubt in the quality of feasibilities in the QS profession and influenced the aim and objectives of this research project.

The author's view created the opportunity to investigate an issue in the professional practice and subsequently created the possibility to address this issue. With this inside view, the research is steered towards the problem. Additionally, the author's experience contributes to conclusions relevant to what is necessary in practice.

2.7.3 Visual display of the conceptual model

Drawn from work presented in this chapter, communication is a major concept of this study, while the industry at play is the construction industry. Communication is the overarching concept; however, this study will more narrowly focus on financial communication and document design. Where the applicable industry is the construction industry, the focus will be drawn to the QS profession in South Africa and more specifically concentrate on the feasibility studies developed by QSs as part of their services as a professional. These concepts, around which this study revolves, is modelled in Figure 2.4:

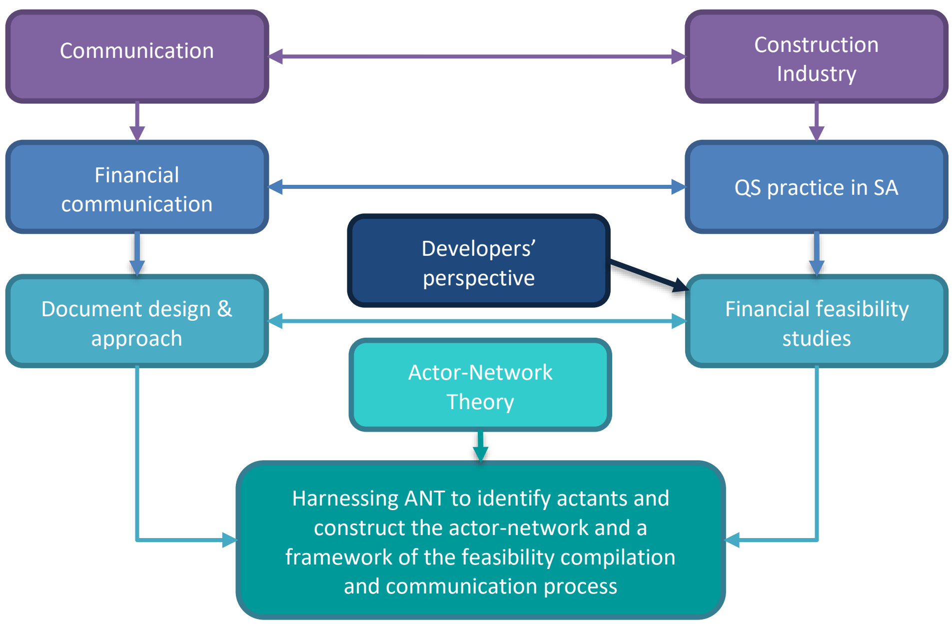

Figure 2.4: Conceptual Model

By combining the concepts, communication in the construction industry is addressed, financial communication in QS practice, and more narrowly, document design of feasibilities. Finally, the heart of this study is to identify actants and construct the actor-network of the feasibility compilation and communication process through the lens of the Actor-Network Theory (discussed in Chapter 4).

Through the ANT, further conclusions and recommendations can be drawn. These actants will be gathered from the QSs' and developers' perspective.

2.8 SUMMARY AND KEY FINDINGS OF THE CHAPTER

Communication is an integral part of financial decision-making, and therefore in the financial feasibility study network. Communication as a concept is defined, as well as financial communication. Guidelines for adequate communication, specifically in terms of financial communication and financial document design are discussed, along with communication in the construction industry and QS profession. Standardisation emerged as a key factor for effective and quality communication, and simultaneously as an element that lacks in communication in the QS profession. A brief depiction of financial feasibility studies is also given, while expanding on the best practice components based on current literature. These concepts form the basis of the conceptual model of this thesis. These are the following key findings, as per Figure 2.1 at the beginning of this chapter:

Communication: The communication process consists of seven elements: sender, channel, message, receiver, relationship between sender and receiver, context and effect. All of the elements need to be taken into consideration when optimising communication.

Document design: As part of optimum communication, adequate document design is required for documents in general. The principles and guidelines for Plain Language set out the requirements for adequate document design and require an audience analysis to be done, information to be organised in a logical way, easily readable formatting to be applied, consistency and standard terminology observed.

Financial communication: The relationship between the typographic design of a document, the language used, and the goal of the communication, is vital to the effectiveness of communication.

Previous knowledge, level of language skills, and text design, play a significant role in the understanding of financial documentation.

Standardisation: XBRL and IFRS are councils that are developing global standards in accountancy and are deemed successful. They increased the accuracy, quality and comparability of the financial reports. Standards increased international investments, and lessoned chaos, confusion and inconsistent terminology. There are thus two reasons why standardising financial communication in construction is valuable: first, it is driven by globalisation, and second, it is pulled from quality financial communication as illustrated in Figure 2.5.

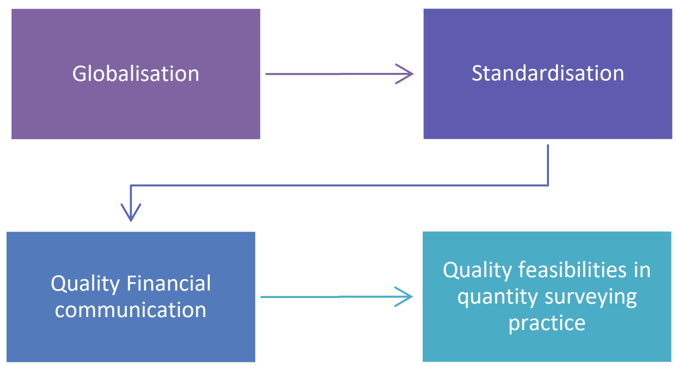

Figure 2.5: The value of standardisation

Arguably, QS practice can learn from the procedures and successful practices of financial communication in accountancy and apply them to financial communication in QS practice. Specifically, the IFRS went about improving and standardising financial reports the following way that proved to be successful through:

- identifying issues
- gathering feedback from key stakeholders to understand their perspectives and needs
- identifying possible solutions for the raised issues.

Financial investment decisions: In turn, the level of understanding by the interpreter (developer) influences the investment decision.

The skills required to successfully interpret financial documentation, however, varies with the format of the text presentation. In addition to adequate document design, quality financial communication requires simplicity, credibility, consistency, accuracy, transparency, reliability, comparability, and should target the correct audience, while promoting investor confidence and trust. Standardisation contributes to the aforementioned qualities.

Construction industry: Construction projects are becoming larger and more complex, while complexity of communication increases concurrently.

Communication in overall construction: Communication in construction remains poor. BIM has been associated with the improvement of collaboration and communication. However, BIM contributes minimally towards feasibility studies and the quality thereof. Furthermore, the effects of poor communication in construction includes time overrun, cost overrun, project failure, late response to disasters, misunderstanding and misinterpretation. Moreover, construction competes globally, and is driven by globalisation, standardisation and quality.

Communication in QS practice: Drawn from the above, the QS profession needs to provide quality and globally recognised services in order to be able to compete. Still, the QS profession lacks standards, resulting in systems being developed independently in firms.

Communication in QS practice in SA: There are guidelines available regarding feasibilities, internationally and in South Africa, although only recently (2016). Given that the adoption of a consistent table of contents ensures a comprehensive assessment, a study fit for purpose, consistent terminology and presentation, needs of all stakeholders addressed, and contributors knowing what is expected, it seems that these guidelines have not yet been adopted. Guidelines, however, are not sufficiently rigorous; standards are required.

It is unclear what protocol was taken when the guidelines for feasibilities were developed and assumingly did not take communication guidelines and the entire compilation process into account nor the perspectives of both key stakeholders. This study is taking the approach of IFRS to standardisation: to identify issues, engage with the key stakeholders to understand and draw from their perspectives, and to then identify solutions.

Feasibilities: The main components of a feasibility study are project overview, duration and milestones; total capital outlay; total project income; cash flow projection; profitability indicators; sensitivity analysis; the life cycle costing; and alternatives and recommendation. While the SACQSP does not include project overview, cash flow projection, life cycle costing, alternatives nor recommendation as best practice components, these are found to be valuable additions to best practice components. Studies on financial feasibilities are discussed in the next chapter.

CHAPTER 3: STUDIES ON FEASIBILITIES

This chapter describes how the systematic literature review was conducted and presents the studies found in the endeavour. Each of the 25 studies is then discussed in terms of the geographic location, the research methodology implemented, and the findings. These findings are then linked to themes and the objectives of this thesis. The structured mining of the current literature creates the opportunity to portray the gap in the literature.

3.1 THE PROTOCOL OF THE SYSTEMATIC REVIEW

A systematic literature review was conducted in search of the existing literature to establish the gap, what is currently known, and to create a basis for coding for next sections. The gap relates to the current nature and occurrence of feasibility studies conducted by quantity surveyors, as well as the actants influencing the quality and success thereof. A systematic literature review required that the process be strategic and comprehensive. The Kitchenham (2004) Systematic Literature Review (SLR) was methodically followed according to the eight steps:

Step 1: The problem and research question (1.3, 1.5)

Step 2: The search protocol (3.1.1)

Step 3: The literature search (3.1.2)

Step 4: The inclusion screening (3.1.3)

Step 5: The quality check and primary sources (3.1.4)

Step 6: Data extraction (3.2)

Step 7: Data analysis and synthesis (chapters 7 & 9)

Step 8: The findings (chapters 7 & 9)

3.1.1 The search protocol

The search protocol included the purpose, search strategy (terms and sifting method), database selection and the inclusion and exclusion criteria. The purpose of this scoping review was to map the entire domain as much as possible, which required an exhaustive and comprehensive search of literature. Therefore, grey literature, such as Master and PhD theses, and conference proceedings, were included in the search.

Three specific terms were identified to use in the methodical search to address the relevant research gap: ‘feasibility study’, ‘quantity surveyor’ and ‘investment decision’. The search was done by including all three search terms, as well as their appropriate synonyms and plurals. Table 3.1 presents the three terms that occurred in each search, as well as their synonyms and plurals. All possible combinations of the various formats were searched.

Table 3.1: The search strategy

	Term 1	**Term 2**	**Term 3**
Synonyms and plurals	‘feasibility study’ OR ‘feasibility studies’ OR ‘viability study’ OR ‘viability studies’	‘quantity surveyor’ OR ‘quantity surveyors’ OR ‘cost engineer’ OR ‘cost engineers’	‘Investment decision’ OR ‘Investment decisions’

The sifting method had three steps. First, the titles and/or the abstracts of all the studies found, using the search terms, were reviewed. Secondly, the abstracts and conclusions of the identified studied via the title review, were scrutinised and finally the remaining articles were carefully reviewed. The review was conducted in two main databases: Google Scholar and the e-Wits database, which is a portal to multiple databases, including Scopus, ScienceDirect, JSTOR, Emerald, EBSCOhost, Taylor & Francis Journals, Web of Science, etc. Therefore, the search was conducted within a significant number of recommended databases for the construction discipline.

The inclusion criteria were carefully constructed to focus the search to reach the most relevant studies. The selection criteria related to this study were articles:

- published in English
- relevant to the research problem and research question by including the combinations of the three search terms
- related to the construction industry
- original work.

Studies were excluded when it were out of scope, repeated work, or not an original study.

3.1.2 The literature search

The literature search consisted of three channels. An internet search and then a forward and a backward citation search on primary studies. Firstly, the Google Scholar database was searched by including the three terms and all their variations, creating all possible combinations of the terms in one search. The search yielded 362 articles/studies. A rudimentary review was conducted with each title. It was inclusion based, which means if there was any doubt, the study was included. A total of 115 articles were identified and recorded by saving the title and the author/s names on a Word document.

Likewise, the e-Wits database was searched. Due to a less-sophisticated search engine, each combination of the search terms had to be searched separately. Altogether there were 32 combinations that yielded a total of 268 articles. After the title and/or abstract review, 21 articles remained. Duplicates were excluded.

3.1.3 The inclusion screening

After the identification of 136 studies, their abstracts and conclusions were reviewed. Articles were identified based on the inclusion and exclusion criteria discussed earlier. If there was any doubt, the article was included. After inclusion, 33 articles remained.

3.1.4 The quality check and primary sources

The full texts of the remaining 33 articles were thoroughly reviewed. This phase acted as a fine sieve and the final stage in preparing the pool of studies for data extraction. This stage helped identify which articles truly adhere to the inclusion/exclusion criteria, as well as understanding the methodologies followed. The final stage of the search presented 14 primary studies prior to the implementation of the forward and backward channel search.

A backward and a forward citation search was conducted with the primary studies. In other words, the list of references of each article, as well as the articles that have since cited the primary studies were reviewed. First the titles were reviewed and from there the same steps were followed until more primary studies were identified. A reiterative process was followed until no further primary articles were identified.

Ultimately, this systematic literature review yielded a total of 25 studies. The oldest study found was published in 2006 with the latest study identified dated 2020. Figure 3.1 illustrates the annual distribution of these articles. It can be seen that 2019 yielded the greatest number of studies (6) and that the most studies were published within the last five years.

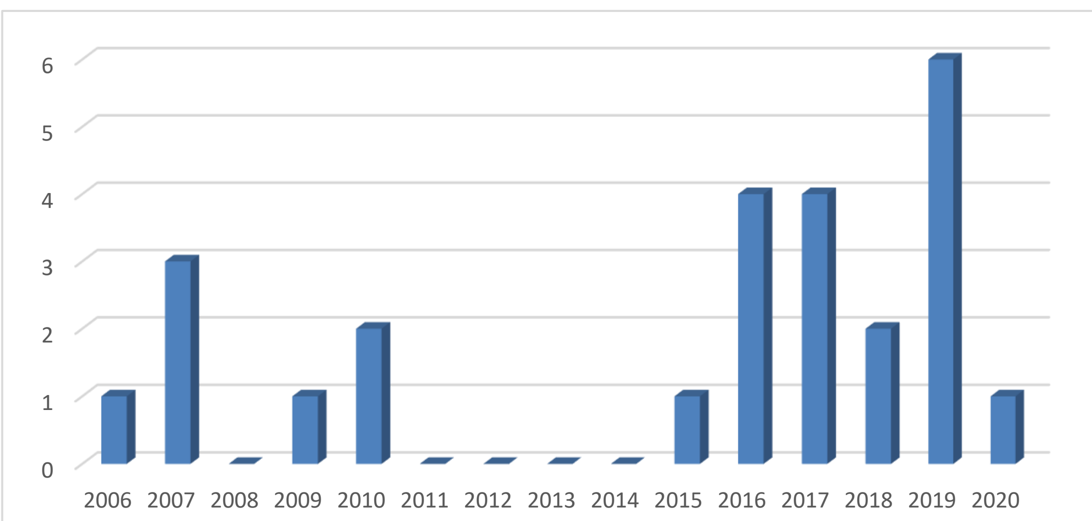

Figure 3.1: Annual distribution of sources

Furthermore, as indicated in Figure 3.2, the search brought forth eleven academic journal articles, ten theses and four conference papers.

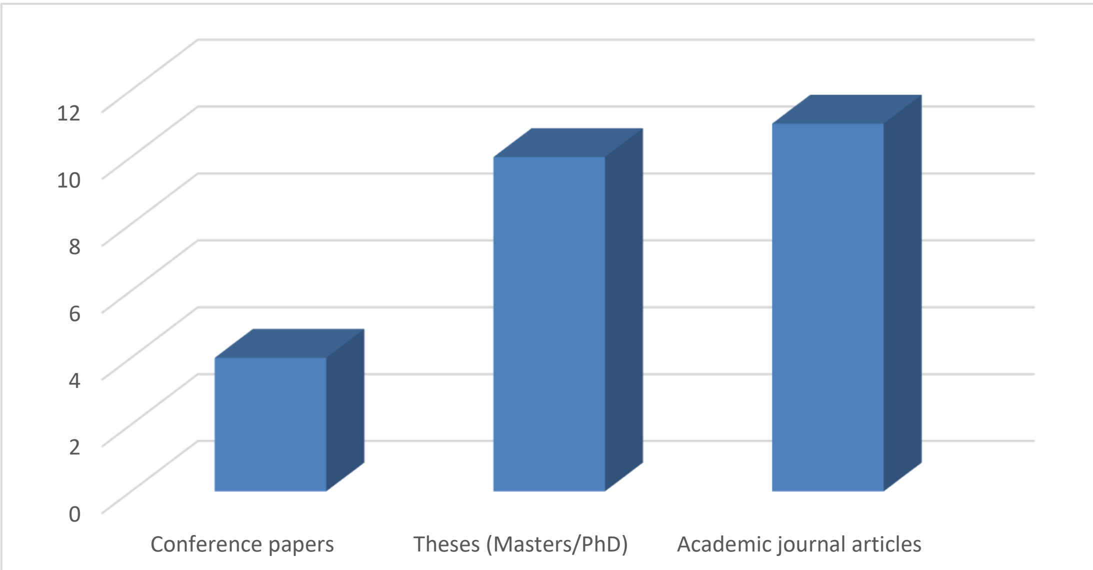

Figure 3.2: Type of sources

3.2 Discussing the Studies on Feasibilities

The data extracted from each study are the title, the author/s, the country in which it was conducted, the methodology used, and their findings. The link to the current study is then discussed. Each of the 25 studies is discussed individually. First, the 20 international studies are discussed in the order of the date published, followed by the five articles (studies 21–25) that were conducted in South Africa, also according to the date published.

Study 1: "An investigation into factors that affect the accuracy of cost estimates for buildings: case study of private residential and office projects in the city of Nairobi" (Githaiga, 2006)

This study, conducted in Kenya, found that predicting costs accurately is a problem in the construction industry, particularly at the pre-tender stage. They obtained 68 cost estimates of residential and office buildings from private quantity surveyors and conducted a questionnaire survey that consisted of 46 quantity surveyors. The estimation methods used, as well as the success of these methods, were analysed. The methods used to predict project building costs include the unit method, floor area method, approximate quantities, elemental analysis and pricing of bills of quantities before tender. Furthermore, they found that the cube method is not being used in the industry anymore and the unit method is seldom used. Importantly, they found that 43% of estimating errors were due to the chosen estimation method.

Linkage to the current study: Cost estimates form a significant part of a feasibility. Therefore, factors affecting the accuracy and quality of cost estimates directly affect the accuracy and quality of feasibilities. Furthermore, the findings of Githaiga (2006) relate to actants that influence the quality and success of feasibilities, the nature and occurrence of feasibilities and it helps build an understanding of possible improvements.

Study 2: "Overview of feasibility study procedures for public construction projects in Arab countries" (Abou-Zeid et al., 2007)

As found by this study conducted in Egypt, usually, standard procedures to carry out feasibility studies are lacking, particularly for public projects in various Arab countries. The paper gives a general idea of the procedures followed during the execution of feasibility studies in the public sector in varies Arab countries as well as their advantages, disadvantages, and elements of inconsistency.

They conducted a pilot study of 91 highway public projects. The feasibility studies were collected and analysed. They found the following inconsistencies in the procedures of feasibilities:

- Incomplete and/or inaccurate data
- Lack of organisation and management tools make it difficult to complete the extensive document required
- Outdated historical data

Linkage to the current study: the findings relate to infrastructure projects in the public sector, however, the issues experienced in the aforementioned sector are also applicable in the private commercial sector. The themes identified in this study are actants influencing the success of feasibilities, the nature and occurrence thereof, as well as methods of possible improvement.

Study 3: "BOT Viability Model for Large-Scale Infrastructure Projects" (Salman, Skibniewski and Basha, 2007)

This analysis, conducted worldwide, yielded noteworthy aspects that would have a definite influence on a feasibility. These aspects were classified into three relative categories creating the framework of a suggested project viability model. Data were collected by means of two questionnaire surveys with participants from the professional team/experts. The first questionnaire was compiled using literature and designed to rank critical success factors that affects the feasibility of build-operate-transfer (BOT) projects. This questionnaire comprised of 85 factors that were grouped together under the designation of the corresponding critical success factors and 15 completed questionnaires were gathered.

The data collected from responses to the first questionnaire was refined, compiled, and screened according to applicable statistics. Twenty-one decision factors were included in the second questionnaire.

They received 12 completed questionnaires. The important common factors that influence the viability of BOT projects included 21 decision factors. After the factor analysis, the following significant factors with an impact on feasibilities, were identified:

- High debt/equity ratio
- Professionals that are highly qualified
- Acceptable tariff level
- Low construction cost
- Short construction and concession period
- Reasonable return on investment

Linkage to the current study: The findings, even though derived from infrastructure projects, relate to actants that influence the success of feasibilities and the drivers behind the investment decision in commercial projects.

Study 4: "The Use and Abuse of Feasibility Studies" (Mackenzie and Cusworth, 2007)

This study, conducted in Australia, gives a framework for the conduct of 'feasibility studies' and offers guidance to minimum standards and best practice for the mining and engineering disciplines. Data was collected by means of a literature review, and a review of the framework developed by the Capital Investment System for a consistent approach and conduct of feasibilities in the mining discipline in Australia.

Due to the commonalities between commercial and mining projects, this study forms part of the review, especially since this is the view of the study: "A Feasibility Study assesses in detail the technical soundness and economic viability of a mining project and serves as the basis for the investment decision and as a bankable document for project financing." Commercial projects are not as dependent on technical solutions as the mining or other engineering disciplines, however, it is still dependent on economic viability and funding.

Their framework incorporates three feasibility phases: Scoping study, prefeasibility study and feasibility study. Scoping studies are to determine what the cost and profitability could be and are undertaken during project exploration. Along with a scoping study, there should be a recommendation to either proceed or not. Prefeasibility studies determine what the cost and profitability should be and should be accompanied with a recommendation to proceed or not. Feasibility studies determine the scope of the project and are undertaken following detailed data gathering. Similarly, the study includes a recommendation as to whether the project should proceed or not.

This framework accepts that the feasibility process is iterative, and importantly that at any iteration it could be recommended that the project should be abandoned, reassessed or shelved (regardless if it was initially approved). It is however difficult for the involved team to reach the aforementioned conclusion after spending significant time, effort and resources on the feasibility. Subsequently, studies often do not progress smoothly through the feasibility phases.

For instance, the Capital Investment System has developed a consistent approach to the scoping and execution of feasibilities in the mining industry. Although the standards and approach of mining projects are far removed from commercial projects, if the mining industry has demonstrated benefit from such standards, then it stands to reason that the commercial industry should too benefit from standards if it is specifically prepared for the applicable sector.

It is argued that without a set of standards and a standard table of contents, the potential for key elements being overlooked and ultimately forgotten is very likely. In addition, adopting a consistent table of contents for each feasibility phase ensures a all-inclusive assessment, a study fit for purpose, consistent terminology and studies, consideration of all stakeholder needs, defined expectations for all contributors, as well as minimising duplication of work.

Those who conducted the study also found that independent peer reviews are essential elements that contribute to the quality and credibility of a feasibility. Finally, the study recommend the use of a feasibility to demonstrate the economic viability and whether to proceed with the investment or not.

Link to the current study: The above study demonstrated particularly the possible ways to improve feasibilities, whether it be in the mining discipline or in commercial developments. Furthermore, actants were found to influence the quality and success of feasibilities.

Study 5: "Validity of Feasibility Studies for Infrastructure Construction Projects" (Hyari and Kandil, 2009)

A case study was conducted in Jordan, where an infrastructure project's feasibility study was compared to the actual costs on completion. The main objectives of this study were to observe the predictive accurateness of feasibilities for infrastructure projects and to identify weaknesses and potential causes of mistakes in the preparation of feasibilities. The study concluded with recommendations to improve feasibility studies.

First, they found that there are no efforts to assess feasibilities after construction, i.e., prediction versus actual. Second, they found that previous studies on the validity of feasibilities only existed in the mining discipline. Given that the current study is on commercial projects, neither mining nor infrastructure projects are relevant to the desired discipline. However, there exist commonalities across the disciplines, in that all the disciplines require sound financial decision-making, require large initial investment in capital, and an evaluation of viability. The case study indicated that the internal rate of return (IRR) reflected in the initial feasibility and the actual IRR differ by a variance of more than 8%. Ultimately, four main actions to improve feasibility studies were recommended.

1. Peer reviews of feasibilities: This includes asking the experts in the firm to review the study and to submit a report as an annexure to the study that comments on the appropriateness of the study, identification of weaknesses and recommendations for improvement.
2. Before-and-after feasibilities: Once the project is finished, the assumptions and estimates of the initial feasibility should be compared to the actual outcome. The deviations from the estimate to the actual should be analysed.
3. Multi-stage feasibility: Staging the economic feasibility study in three phases. The recommended stages are: (i) conceptual feasibility study; (ii) pre-feasibility study; and (iii) feasibility study. The conceptual study is a scoping study which provides an initial evaluation. Limited data and engineering work is available at this time, and therefore will rely more on previous experiences and an 'order of magnitude' estimate. This study should help to determine whether a project is worth pursuing further.

   The pre-feasibility study is the transitional step in the project evaluation. At this time, sufficient data and preliminary engineering design should be available to base the estimate on. The aim of this feasibility is to determine preliminary estimates in terms of costs and benefits. Aspects that require further research should also be identified in this stage.

   The feasibility study (third stage) is merely a refinement of the pre-feasibility study, which evolved from the conceptual study. The key components of a feasibility study includes a detailed cost and benefit estimate based on a detailed design, attention to environmental and socioeconomic concerns, as well as a financial model of the project. This final study provides the basis for the decision on whether to advance the project to the next project phases: design, tender and construction.

4. Unified scope and methodology for feasibilities: standardisation of what constitutes a satisfactory feasibility, and more critically, what constitutes an adequate measure of financial viability should be developed. In order to be able to compare feasibilities of different projects, a scope and methodology of the three different stages of feasibilities should be well-defined.

Linkage to the current study: The findings relate to the nature and occurrence of feasibilities in the mining and infrastructure disciplines, which offer a similar indication of the nature and occurrence of feasibilities in the commercial sector. Additionally, the above study made recommendations for ways to improve feasibilities, especially to compare feasibilities to the actual outcome.

Study 6: "Project Feasibility Study: The Key to Successful Implementation of Sustainable and Socially Responsible Construction Management Practice"* (Shen et al.*, 2010)

Shen *et al.* (2010) conducted a case study in China on the feasibility studies of 87 construction projects. In essence, they conclusively found major discrepancies among the feasibility reports. The elements considered as part of a feasibility study can be divided into three main categories, namely economic performance elements, environmental performance elements, and social performance elements. Focusing on the economic performance elements, this category is concerned with project financing, economic benefits of the project, etc., and is considered directly related to investment decision-making.

Some of the economic elements are project function and size, budget estimate, life cycle cost, internal rate of return, life cycle profit, net present value, return of investment and financial risk assessment. Table 3.2 is an extract of a table presented by Shen *et al.* (2010) and reflects the information discussed below. The study indicated that 79% included the budget estimate; 78% of the reports included the project function and size; 62% had life cycle cost; 54% presented the IRR.

They also found that 54% had life cycle profit; 52% indicated the net present value; 43% had the return on investment, and only 37% reflected a financial risk assessment.

Table 3.2: Frequency of economic performance elements in feasibility studies

Economic performance element	Percentage of feasibility studies that reflected the element
Budget estimate	79%
Project function and size	78%
Life cycle cost	62%
Internal rate of return	54%
Life cycle profit	54%
Net present value	52%
Return on investment	43%
Finance risk assessment	37%

From Shen *et al.* (2010) findings, it is clear that feasibility studies lack uniformity and key elements and is in need of standardised contents and methods.

Linkage to the current study: The study above presented the nature and occurrence of feasibilities in China in terms of the content in the feasibilities. This study compares the best practice elements of feasibilities as accepted in China to what they actually found in the feasibilities. If they found these discrepancies in China, then it is important to investigate whether that is the case in South Africa as well.

Study 7: "Feasibility studies in construction projects in Iceland" (Stefánsdóttir, 2015)

This focused on feasibilities in private construction projects built in Iceland. The literature review was used to determine which procedures can be categorised as "best practices" when conducting feasibilities at the start of projects. Eight interviews were conducted with randomly-selected private construction projects in Iceland, where current feasibility study practices are compared against theoretical "best practices".

First, this study presents six major activities for a feasibility:

- Project overview: project objectives; origin of the project; project background; and a requirements analysis
- Alternatives: develop at least two alternatives and at most six
- Income and expenses: expected income and total capital outlay
- Return/yield: calculate indicator (NPV, IRR, IR, PP)
- Sensitivity analysis: perform a sensitivity analysis
- Recommendations: recommend the best course of action

Based on the six major activities (divided into 17 sub-activities), it was found that in the private sector in Iceland, only 40% fully adhered to the best practice items; 24% partially adheres and 36% does not adhere at all. Even more concerning is that in the public sector, only 24% adheres to the activities fully, 24% only partially adheres, and 52% does not adhere at all. In spite of a better performance from the private sector, the results are nevertheless disappointing.

Linkage to the current study: Likewise, Study 7 mapped the nature and occurrence of feasibilities in Iceland. Study 6 and 7 both followed a similar approach in that they investigated how many of the best practice elements actually occur in published feasibilities. They did not necessarily use the same "list" of best practice items. Both these papers prove that there are issues in the quality of feasibilities in Iceland and in China. It is likely, that if such a study is done in various more countries, that similar issues would be identified.

Study 8: "Drivers of the Accuracy of Developers' Early Stage Cost Estimates in Residential Construction" (Lim* et al.*, 2016)

This Australian study collected data through a case study of two residential projects, in conjunction with 10 interviews conducted with professionals working on the aforementioned projects. They identified the following factors as influencers on the accuracy of the estimates:

- Certainty and all-inclusiveness of project-specific information

- The appropriateness of historical cost data
- Methods of estimating
- Contingency allowances
- The estimator's level of knowledge

Linkage to the current study: Cost estimation forms a significant part of the overall capital outlay, and the accuracy of the estimate has a direct influence on the accuracy of feasibilities. Therefore, the findings relate to the theme of actants influencing the success of feasibilities.

Study 9: "Method for Estimating of Construction Cost of a Building Based on Previous Experiences" (Bettini* et al.*, 2016)

Study 9 was conducted in Brazil by doing case studies on the feasibility studies of 25 commercial construction projects. Here the argument was that estimators, design teams, quantity surveyors, managers, planners and the construction team (in other words, everyone), need to work aligned and towards the same vision and operates as an integrated team, devoted to the same goals, pursuing the fulfilment of the project requirements, and respectful of the guidelines and assumptions set out within the feasibilities. They found that a 4% margin of error in a feasibility study was acceptable. Finally, they concluded that the traditional direct area comparison estimates used in feasibilities is unreliable and not worth the risk.

Linkage to the current study: The findings relate to factors that influence the success of a feasibility. In particular, direct area estimates are rather more erroneous than worth using in the industry. The approach that the QS take is thus vital to the success of these studies. The idea of a cost conscious team also arose.

Study 10: "An Evaluation of Project Cost Management in the Mining Industry: A Case Study of AngloGold Ashanti (Gh) Limited – Obuasi Mine" (Kwaku Osei, 2016)

This study, done in Ghana, found that that the mining sector does not perform well when it comes to finishing a project within the estimated financial budget. This causes cost overruns due to overly optimistic feasibilities and poor cost estimation. Data was collected by means of a literature review and a case study of the cost management, including the feasibility study of a mine. In the world review it was found that a survey of 18 mining projects, covering the period 1965 to 1981 exposed an average cost overrun of 33%, equated to their feasibility study estimates (Castle, 1985). A survey of 60 mining projects covering the period 1980 to 2001 indicated average cost overruns of 22% with virtually half the projects reporting overruns of an additional 20%. A review of 16 mining projects carried out in the 1990s indicated an average cost overrun of 25%, as a result of too overly optimistic feasibility studies with poor cost estimation.

The Ghanaian mine suffered the same fate. Kwaku Osei (2016) concluded that a standard approach and effective tools that can be utilised to compile more reliable feasibilities needs to be developed. Furthermore, more focus should be focused on value engineering rather than eliminating some scoped activities.

Linkage to the current study: Even though this study focuses on the mining industry, the basic procedures of a feasibility study and managing the budget are similar to commercial projects. Evidently, feasibility studies in the mining industry require enhancement, as the study mapped the nature and occurrence thereof. Furthermore, the findings relate to possible improvement of feasibilities.

Study 11: "Analysis of Investment Decision Making of a Budget Hotel: A Case Study" (Sudhana, 2016)

This study was conducted in Indonesia by means of a semi-systematic literature review and a case study of one hotel.

They found that investment decisions in real estate (not only in the hotel sector), are highly dependent on information provided by the feasibility study, including the profit and loss report, the cash flow report indicating the Net Present Value (NPV), the Payback Period (PP) and Internal Rate of Return (IRR), as well as the location. For a hotel development to be deemed feasible, the NPV needs to be larger than zero, the PP needs to be shorter than ten years, and the IRR needs to be more than interest provided by banks. It is also vital that the developer has experience in the industry. What is noteworthy is the feasibility study is the central point of investment decision-making.

Linkage to the current study: Study 11 identified some actants that influence the quality and success of feasibilities, as well as the role a feasibility plays from the developer's perspective. This links with the third objective of this thesis. The experience of developers are vital to the overall success of projects. While a feasibility could be accurate, the correct decisions still needs to be made.

Study 12: "Feasibility Studies and Important Aspect of Project Management" (Mukherjee and Roy, 2017)

This study, conducted in India, collected data by means of a literature review and discusses the different types of feasibility studies, including the economic feasibility study. Furthermore, elements of a good feasibility study are discussed. These elements include accurate information; utilisation of the latest financial records, and all-inclusiveness of the scope. Additionally, they claim that a feasibility provides clarity on the investment risk and assists with decision-making on the project.

Linkage to the current study: The above study presented actants that influence the quality and success of feasibilities, as well as possible ways to improve them. This contribute greatly to this thesis in order to create a comprehensive list of how to prepare an accurate and successful feasibility.

Study 13: "Life cycle costing as an important contribution to feasibility study in construction projects" (Heralova, 2017)

Heralova (2017) led a case study in the Czech Republic focusing on the importance of life cycle costing as part of feasibilities. The feasibility study of one office building was scrutinised. The calculation of life cycle costing was discussed, which includes the initial total capital outlay, the cost to rent out the building (commission), operating costs, maintenance costs, and renewal costs, which are estimated on the basis of the technical condition of the building. This is offset against the salvage value, which is an estimate of the expected market value at the end of the study period, typically after 20 years.

Furthermore, a decision-making tool for the investors, evaluating the entire life cycle cost, shifts the objective from decision-making based only on the construction costs, towards life cycle costs.

Linkage to the current study: Heralova (2017) found an important element that forms part of the indicators on which decisions are based by developers. This relates to the developers' perspective (objective three of this thesis). Most importantly, life cycle costing must be added to the list of best practice items that must feature in feasibilities.

Study 14: "Formulation and Analysis of Multiple Development Strategies for Project Horova" (Karas, 2017)

This study was formulated in the Czech Republic and deals with a feasibility study of a 20-year-old commercial/residential development project, which has been delayed for a number of reasons over this two-decade period. A sensitivity analysis was done, as well as alternative strategies, concluding with the recommendation of how to proceed with the project.

Importantly, this study includes the touch points of feasibility studies: real estate market conditions; project stakeholders; income; yields and return; land residual calculation; building cost; assumptions; financing; cash flow; sensitivity analysis, and recommendation of alternatives. Additionally, they found that a feasibility could forecast a rental income; however, if no tenants are signed it could make the whole project unfeasible.

Linkage to the current study: Karas (2017) stipulates the important touch points of comprehensive feasibility studies and therefore relates to the theme of factors that influence the success of feasibilities. Their findings contribute to create a comprehensive list of how to prepare an accurate and successful feasibility and to what is known.

Study 15: "Factors Affecting the Need for Feasibility Analysis (for Local Construction Projects)" (Anees* et al.*, 2018)

In Pakistan, most of the local construction projects are approved without a feasibility analysis, on the basis of previously calculated data and without investigating the current situation. For this study, a questionnaire survey was conducted with the three main stakeholders (client, consultant and contractor), aimed at identifying the need for feasibilities to encourage the use thereof, especially in Pakistan. They gathered 56 responses in total. The perspectives of the three main stakeholders (i.e., the client, consultant and contractor) were gathered. The most crucial factors that affect the need for feasibilities (as identified) are:

- Understanding the viability and the need of the project
- To produce an efficient budget and cash flow to avoid cost overruns
- To enable the application of value engineering
- For the incorporation of modern technology
- To assist in contractual agreements and negotiations
- To generate a procurement cycle

- To use for quality management
- To have a sound financial turnover mechanism

<u>Linkage to the current study:</u> Anees *et al.* (2018) presented the need or the uses of feasibilities, which relate to the theme, understanding the role of feasibilities. What is known, in terms of various usages of feasibilities, are highlighted here.

Study 16: "The Importance of Information in the Preparation of Feasibility Study for Construction Development" (Syed Alwee* et al.*, 2019)

According to this study conducted in Malaysia, design consultants, like engineers, architects, and quantity surveyors, must always be aware of the importance of information needed in the preparation of feasibilities. This paper examined the use of information in feasibilities, the information that is required, and how feasibilities can be improved. Data was collected by means of a questionnaire that was completed by quantity surveyors, architects and engineers. They received 52 responses.

They found that the use of information in the feasibility included the following:

- Determining which projects to undertake and how these should be implemented, as well as how to market and dispose of it
- To achieve maximum profit through the project
- To lessen construction cost according to the design criteria
- It helps to stimulate the business plant for the project implementation
- Analysing problematic areas and searching for a possible course of action
- Development is in demand
- There are indicated cash flows
- Summarising the life cycle cost
- To enhance the employment opportunities in future prospects
- To ensure most of the clients' requirements are fulfilled

- Guiding the facility manager during the functional period of the proposed project

Additionally, they found that the following information is required for the preparation of feasibilities:

- Site investigation report
- Design guidelines
- Client requirements
- Cost data
- In-house cost libraries
- Cash flow
- Market survey report

Furthermore, they found that reliable information is dependent on the accessibility and availability of data, as well as the regular update of in-house cost databases. Importantly, they requested recommendations from the professionals (quantity surveyors, architects and engineers) to improve the preparation of feasibility studies. They found the following recommendations:

- Input from mechanical and structural engineers at the beginning of a project should be sought after, as their input contributes to a more accurate feasibility.
- The entire consulting team should increase their involvement
- Gather as much information as possible, since the more information gathered, the more accurate the feasibility
- Those who conduct a feasibility should do more research on previous projects
- Those who conduct a feasibility must closely and constantly follow the available guideline.

- A comprehensive study should include a sensitivity analysis and the overall profitability of the proposed project, as well as informing clients of alternative options when confronted with unforeseen circumstances
- The entire professional team should work collaboratively to meet the requirements of the client
- All information available from government, local authorities, etc., and private organisations, must be stored on a database that is available to consultants
- Standard guidelines on requirements should be developed to prepare a comprehensive feasibility
- Clear guidelines for all types of projects should be available to the industry
- Site visit prior to the preparation of a feasibility should be compulsory
- Coordination among project team consultants should be improved
- Knowledge sharing should be promoted

There were specific suggestions to create a manual for comprehensive feasibility studies, which should include:

- Recordings of previous problems and solutions
- The format and type of information to be considered

It is important to note that the different professionals (QS, architects and engineers) deemed other aspects to be more important contrary to what the other professions deemed to be important. This is a good illustration of the different perspectives between the different professions, in spite of the necessity of them working in harmony.

Linkage to the current study: Study 16 relates to theme usages/role of feasibilities, actants influencing the quality and success of feasibilities, as well as methods to improve them. This study greatly contributes to what is known in terms of usages and what causes poor feasibility studies and ultimately, recommendations of how to improve it.

Study 17: "The impact of the feasibility study on the construction projects" (Mohammed* et al.*, 2019)

Study 17 was conducted in Iraq. The study collected data through a field study. First, interviews were conducted with managers, members of academia and ministries (quantity unclear). A questionnaire followed (quantity unclear). The findings indicate that feasibilities are neglected, leading to the abuse of feasibilities, for example, deliberate fraudulent usage. This leads to poor time, budget, cost, revenue and cash flow estimates. Therefore, a project is faced with cost and time overruns.

Linkage to the current study: The findings of study 17 indicate the nature and occurrence of feasibilities, specifically in Iraq. While the current thesis will be gathering empirical/primary data in South Africa only, studies that find problematic feasibilities in other countries indicate that the issue could be global.

Study 18: "Financial Communication in Quantity Surveying Practice" (Terblanche* et al.*, 2019)

This study is based on a worldwide systematic literature review, and found that feasibility studies can be too complex and require careful construction. A readability and legibility model was developed: this model has four main categories for optimisation of a document, each of which has elements that need perfecting in order to create transparent, efficient and effective financial communication like feasibilities. These categories are:

- Content: Audience analysis and goal of communication
- Style: Short paragraphs and sentences; common words; avoiding superfluous words, jargon, abstract words, hidden verbs and passive voice; common language; standardised terminology; consistency
- Organisation: Logical order; tables; headings; and sub-headings

- Format: Font type and size; white spaces and spacing; left margins justified, and right margins ragged; short lines; tables; contrast between text and background

The identified problems of feasibilities compiled by QSs create the need to further explore the current nature and occurrence thereof.

Linkage to the current study: Study 18 provides insight on the nature and occurrence of feasibilities and recommends improvements regarding the format of feasibilities. Therefore, what is known is that communication guidelines are essential in the document design of feasibilities and that these feasibilities need more investigation in terms of communication guidelines.

Study 19: "Factors affecting the accuracy of cost estimate during various design stages" (Dandan* et al.*, 2019)

This study was conducted in Jordan. Data was collected by means of an online survey that was completed by 138 respondents, all of whom work in construction consultancy firms in Jordan, including architects, project managers, and quantity surveyors (QSs). Descriptive statistics were used to analyse these responses. Confirmatory interviews as well as case study comparisons were used to confirm the results of the statistical analysis. They found the following factors affected estimate accuracy before and during the feasibility phase (conceptual):

- Utilisation of checklists to ensure completeness
- The clarity of the developer's brief
- Estimation method
- Type of project (commercial, residential, industrial, etc.)
- Developer's budget
- Minimal information on mechanical, electrical, plumbing and structural systems

- Accuracy, availability, applicability, and reliability of the database for similar projects
- The use of adequate and appropriate risk assessment tools
- Effective communication between the design team and the client
- The consultant’s workload during the preparation of the estimate as well as the time and time set aside for the estimation
- Project size and complexity
- Currency exchange fluctuation, unanticipated changes in labour prices and unexpected increases in the cost of material
- The developer’s level of experience
- The project team’s level of experience
- Type of project structure (concrete, steel, masonry, etc.)

The following factors were found to be non-significant:

- The involvement of specialists and specialist work
- Project team’s ability to control the project, since this is the project manager’s responsibility
- Site conditions

Importantly, they found that estimates done in the feasibility phase in Jordan are 21% inaccurate.

Linkage to the current study: Cost estimation forms a significant part of the overall capital outlay, and the accuracy of the estimate has a direct influence on the accuracy of feasibilities. Therefore, the findings relate to the theme, actants influencing the success of feasibilities and greatly contributes to what factors are known to contribute to the success/accuracy of feasibilities. The nature and occurrence of the errors were also addressed, contributing to a better understanding to the artefact.

Study 20: "The Impact of Project Sponsors' Decisions on the Success of Projects: An Action Research Study" (Al-Hawsah, 2020)

This study, done in Saudi Arabia, focuses more on the investment decision-making of construction projects, by means of action research on three specific projects. First, interviews were conducted with developers. The factors that influenced the developers' decisions were identified, after which a second round of interviews were conducted, gathering opinions on the factors that were identified, as well as possible improvements. This was followed by a third round of interviews with expert panel members in order to remove biases. Importantly, they found that there are three main reasons developers make poor decisions. This includes a lack of knowledge, organisational culture where one person's opinion can override recommendations, and personal but unreasonable objectives. These issues, emanating from the developer, could potentially occur in projects worldwide. Additionally, they found that a lack of communication from the developer to the team and unrealistic budget decisions were both negative factors creating the potential for mistakes to happen.

Linkage to the current study: Al-Hawsah (2020) found actants that influence the success of feasibilities. These actants relate to developers specifically and indicate how they can actually cause a project to fail, irrespective if the feasibility is accurate. This highlights the importance of the role of the developer in the feasibility process.

Study 21: "Property development: feasibility and impact parameters in the Vaal Triangle" (Huxham, 2010)

This study, conducted in South Africa, gathered data by means of interviews with 12 developers and document analysis. The secondary data consisted of 12 financial feasibility studies that were compared to the actual, final numbers following the completion of the construction project. They found that different valuation methods (IRR, NPV, DCF, and combinations thereof) are used by developers.

Of the developers interviewed, 75% used a combination of methods; 8.33% made use of the IRR only; 8.33% made use of the NPV only, and 8.33% made use of the DCF method only.

In their comparison of feasibility study versus actual, they found that the rent income was forecast unsuccessfully by 58%. As the capital cost is a much more predictable and stable component, 75% of all the developments forecasted the capital cost successfully. Only 50% of the developers forecasted the IRR successfully, and 58% of the NPV of development forecasts, were unsuccessful. With the payback periods, the developments were forecasted 50% successfully. Of all the developments, 58% were successfully forecasted and 42% of the developments were unsuccessful.

Linkage to the current study: The findings relate to the perspective of developers (objective three of this study), as well as the nature and occurrence of feasibilities in the South African context. Therefore, it is known that in South Africa feasibilities are often inaccurate. This demonstrates that feasibilities are in need of further investigation in order to increase the amount of successful feasibilities.

Study 22: "Attracting Black Investment into the South African Hotel Sector" (Ramawela, 2017)

In-depth interviews were held with 10 hotel developers/entrepreneurs in South Africa to unfold the challenges faced, especially during the feasibility stage, when investment decisions are typically made. Significantly, they found that there is often misleading advice from quantity surveyors, through the manipulation of expected income in order to make the project appear viable, convincing developers who lack industry knowledge. Ramawela (2017) also claimed that conducting feasibility studies is expensive.

Linkage to the current study: The findings of Ramawela (2017) relate to actants influencing the quality of feasibilities and the nature and occurrence of the same through the perspective of the developer.

This contributes to the third objective of this thesis. Thus, this contributes to what is known from the developer's perspective. At this point, it is clear that the QS perspective is lacking.

Study 23: "Challenges Faced by Small Real Estate Entrepreneurs in the Johannesburg Central Business District" (Kgaka, 2018)

This study collected data in South Africa, by means of interviews with six private developers/entrepreneurs in the commercial sector. The challenges found regarding feasibilities include inadequate municipalities that cause a significant delay (up to three years) during plan approval, rendering the feasibilities dated and of little relevance at the time when construction commences. This is due to market changes and rental prices that turned unfavourable. In essence, the forecast of the rentals in the feasibility were unrealistic.

Furthermore, Kgaka (2018) found that it is vital for developers to have a sufficient level of understanding regarding the financials of a development and argues that this field of expertise is of the most important skills for an emerging property developer to possess before embarking on a development. Importantly, they found that in property development, there is a distinct difference between perfecting the feasibility study and having the practical skills to guide a project to finish within close proximity of the feasibility. This study also made it clear that developers are in essence entrepreneurs. Finally, they claim that feasibilities in South Africa often has overestimated income due to applying the same escalation to forecasted expenses and income.

Linkage to the current study: This study identified some actants that influence the success of feasibilities, as well as the nature and occurrence of errors in the South African context, through the perspective of developers (relating to objective 3).

Study 24: "A Factor Analysis of Transportation Infrastructure Feasibility Study Factors: A Study among Built Environment Professionals in South Africa"* (Okoro et al.*, 2019)

This study, conducted in South Africa, examined the critical factors that should be incorporated in a comprehensive feasibility study. This forms a basis for reliable investment decisions, which will in turn affect later performance. Data was collected using mixed methods. First, a pilot-tested field questionnaire was used to collect data on feasibilities relating to transportation infrastructure. A total of 132 questionnaires, completed by building professionals, were analysed using SPSS for factor analysis. Second, feasibility studies on infrastructure projects were collected for analysis, as well as an interview held with the custodian of each report. They found that the following factors should be incorporated to achieve comprehensive feasibilities:

- Methods of appraisal: scope and design requirements, a best scenario outcome, location characteristics, costs vs benefits, traffic growth analysis, and multi-criteria analysis
- Availability of finance: financing alternatives, financial contribution from private investors, existing financial and tender records, financial self-sustenance of the system, and possible sources that can provide financing
- User needs: user convenience, comfort of users during travel, user safety, and travel time
- Local environment: existing businesses in the area, the condition of existing infrastructure as well as the structural capacity to upgrade buildings.
- Available data: Existing designs and structural reports of the property

<u>*Linkage to the current study:*</u> The findings relate to elements that are required for a comprehensive feasibility and therefore contributes to the theme: actants influencing the quality and success of feasibilities. They contribute to the knowledge of what constitute a success feasibility.

Study 25: "An assessment of the relevance of feasibility studies in public projects in South Africa" (Willemse, 2019)

Data was collected through a survey completed by quantity surveyors, engineers and project managers and three interviews held with two quantity surveyors and a project manager. This study, conducted in South Africa, found that complete and thorough studies are not conducted in South Africa, neither in the public nor the private sector, and that governance over procedures should be enforced if cost overruns are to be mitigated. By comparing theoretical best practices for feasibility studies and practical execution, they determined where the industry is lacking and found that South Africa requires the development of tailored procedures/standards for feasibilities.

In addition, they found that the SA Council for the Quantity Surveying Profession (SACQSP) process to develop a feasibility study includes:

- Assessment of the costs associated with developing the site
- Determination of the duration and milestones of the project
- Calculating the total expenditure and receipts
- Accounting for the effect of time
- Determination of the return/yield

Furthermore, they found that of the 16 theoretical feasibility practices presented, only four are practised in South Africa, indicating that an abundance of factors is neglected. In addition, they found that there is no/limited knowledge around feasibility studies and clients are too eager to start projects, which are challenges imposed on the practices. Importantly, they found that the usage of feasibilities includes the projected budget, a guide to serve as governance of the project, and timing of the project.

Linkage to the current study: Willemse (2019) studied the nature and occurrence of feasibilities in the South African context and found additional usages of feasibilities.

They followed the Iceland study (study 7 discussed earlier), and concluded that the South African feasibilities lack most of the best practice items. This study ultimately proves that feasibilities are in need of better understanding and enhancement.

Through the systematic literature review, an additional 13 sources were identified with applicable data towards this study. However, the entire study did not revolve around feasibilities per se, and were therefor excluded from the primary studies. Therefore, the studies were excluded from the primary studies. These additional studies contributed to the following findings:

Findings on the underlying meaning of feasibilities:

- Incorrect decisions cause a loss of substantial funds, which has a crippling effect on the capabilities of investors (Alao, Jagboro, Opawole and Kadiri, 2019).
- Feasibilities usually constitute the beginning of projects (Lock, 2020)

Identified usages of feasibilities:

- As a core cost-management service (Perera et al., 2016)
- Macro-strategies (Kimaru, 2018)
- Sets the budget (Kimaru, 2018)
- Basis for negotiations (Kimaru, 2018)
- To acquire finance by means of debt or equity (Kimaru, 2018)
- Directs decision-making by the developer throughout the project (Kimaru, 2018; Dagne, 2019)
- Decision to proceed or not (Lock, 2020)
- Decision on how to proceed (Lock, 2020)

Additional actants influencing the quality and success of feasibilities:

- It is an iterative process (Costello and Preller, 2010)
- Location (Costello and Preller, 2010)

- Value engineering (Schmidt, 2017)
- A cost-saving culture within a project team (Schmidt, 2017)
- In South Africa, there is a need for a defined 'front-end' process. It is in this process where feasibilities are compiled. There is no common understanding of the design and construction process among consulting professionals in South Africa, beyond the six stages articulated by the professional councils. Likewise, there is no uniform and consistent application aside from for the purpose of determining fees. Details within the stages are not the same across the disciplines and inconsistent terminologies are used (Simango, 2017).
- The feasibility can take multiple years to be developed to a point where a final investment decision can be made (reiteration) (Lock, 2020).
- The reputation of contractors who might be involved (Lock, 2020)
- Cost management and control (Okereke et al., 2020)
- Market risk: this is the risk that market condition can cause to the value of an investment to decline (volatility of the market) (Okereke et al., 2020)
- Interest rate risk: this is occasioned by changes in the interest rate (Okereke et al., 2020)
- Inflation risk: this is the risk that return on investment will not out-pace inflation (Okereke et al., 2020)
- Exchange rate risk: this is the risk that the exchange rate will have an adverse effect on investment returns (volatility of the exchange rate) (Okereke et al., 2020)
- Political risk: this is the risk of uncertainty in a country as the result of leadership decisions (Okereke et al., 2020)
- Decision-making factors:
    - Risks involved (Zakaria, Brewer and Gajendran, 2015)
    - Profit margins (Zakaria *et al.*, 2015)
    - Benefit cost ratio (Yun and Caldas, 2009)

The nature and occurrence of errors in feasibilities:

- Inconsistency in terminologies used in South Africa (Simango, 2017)
- Hinder the success of housing projects as recorded in Tanzania (Kavishe, Jefferson and Chileshe, 2018)
- Inadequate feasibilities is the main cause of time overruns (Oso Sunday, 2020)

3.3 UNEXPLORED TERRITORY IN THE LITERATURE

The aforementioned studies contributed significantly to understanding feasibilities better, the nature and occurrence of errors in feasibilities, the quality thereof, the role of the feasibility, as well as methods on improving it. However, none considered the importance of adequate communication guidelines (including financial communication) for the feasibility document and process, nor do they address the detailed perspectives of both key stakeholders. Furthermore, by consolidating the findings of these studies, an in-depth and comprehensive understanding of feasibilities can be produced in support of the objectives of this thesis. This study will further use ANT as an analytical tool to contribute to the originality of this report.

3.4 SUMMARY OF THE CHAPTER

The chapter provided an in-depth account of the primary literature identified, directly related to the research questions and objectives. These findings are summarised in Table 3.3.

Table 3.3: Summary of primary literature found

Study	Reference	Location	Methods	Population & sampling	Findings
1	(Githaiga, 2006)	Kenya	Document analysis & questionnaire	68 feasibilities & 46 QSs	43% of estimating errors is due to the estimation method
2	(Abou-Zeid *et al.*, 2007)	Egypt	Document analysis	91 feasibilities	Certain errors in feasibilities

3	(Salman *et al.*, 2007)	Worldwide	Two sequential questionnaires	Professional team members. 15 then 12	Identifies significant factors the influence the feasibility of projects
4	(Mackenzie and Cusworth, 2007)	Australia	Literature review	N/A	Methods to improve feasibilities
5	(Hyari and Kandil, 2009)	Jordan	Document analysis/Case study	1 Feasibility	IRR estimates off by 8%. Methods to improve feasibilities
6	(Shen *et al.*, 2010)	China	Document analysis	87 Feasibilities	Major discrepancies and inconsistencies in feasibilities
7	(Stefánsdóttir, 2015)	Iceland	Interviews	8 with construction professionals	Feasibilities often lacks best practices
8	(Lim *et al.*, 2016)	Australia	Case study	Two residential projects and 10 interviews	Found factors that influence the accuracy of feasibilities
9	(Bettini *et al.*, 2016)	Brazil	Document analysis	25 feasibilities	Direct area comparison estimates used in feasibilities is unreliable and not worth the risk
10	(Kwaku Osei, 2016)	Ghana	Literature review and Case study	One mine	Found an average cost overrun of 25% and methods to improve feasibilities
11	(Sudhana, 2016)	Indonesia	Semi-systematic literature review and case study	One hotel	What constitutes a feasible hotel scheme? Factors that influence the quality of feasibilities as well as the role a feasibility plays from the developer's perspective
12	(Mukherjee and Roy, 2017)	India/ worldwide	Literature review	N/A	Factors that influence the success of feasibilities and methods to improve feasibilities
13	(Heralova, 2017)	Czech Republic	Case study	One office building	Life cycle costing is a best practice that should form part of a feasibility as it adds to the investment decision
14	(Karas, 2017)	Czech Republic	Case study	One 20yo commercial and residential building	Factors that influence the success of feasibilities
15	(Anees *et al.*, 2018)	Pakistan	Questionnaire	Client, consultants and contractor: 56 responses	Factors that affect the need for feasibilities/the role of feasibilities

16	(Syed Alwee *et al.*, 2019)	Malaysia	Questionnaire	QSs, architects and engineers: 52 responses	Usages/roles of feasibilities, factors influencing the success of feasibilities and methods to improve feasibilities
17	(Mohammed *et al.*, 2019)	Iraq	Interviews then questionnaire	Interviews with managers, academia and ministries	Feasibilities are neglected, leading to cost overruns and the abuse of feasibilities, for example deliberate fraudulent usage
18	(Terblanche *et al.*, 2019)	Worldwide	Literature review	N/A	Feasibility studies could be too complex and require careful constructing
19	(Dandan *et al.*, 2019)	Jordan	Questionnaire	Design consultancy firms: 138 responses	Estimates are inaccurate by 21%. Factors that affect estimate accuracy
20	(Al-Hawsah, 2020)	Saudi Arabia	Action research: Three sets of interviews	Three construction projects. Two rounds of interviews with developers and third round with experts	There are three main causes of poor decisions made by developers
21	(Huxham, 2010)	South Africa	Document analysis & Interviews	12 feasibilities and 12 interviews with developers	Rent income was 58% forecasted unsuccessfully. Capital cost 75% forecasted successfully. Only 50% of the developers forecasted the IRR successfully. Perspective of the developer
22	(Ramawela, 2017)	South Africa	Interviews	10 hotel developers	QSs manipulate income of feasibility. Developer’s level of knowledge influences the success
23	(Kgaka, 2018)	South Africa	Interviews	6 developers in commercial sector	Feasibilities in South Africa are prone to overestimate the forecasted income. Factors influencing the success of feasibilities
24	(Okoro *et al.*, 2019)	South Africa	Questionnaire, document analysis and interviews	Building professionals: 132 responses, feasibilities and interviews with their custodians	Factors that should be incorporated to achieve comprehensive feasibilities

25	(Willemse, 2019)	South Africa	Questionnaire and interviews	QS, engineers and project managers responded with questionnaires. Three interviews: 2 QS and 1 project manager	Complete and thorough studies are not conducted in South Africa. South Africa requires the development of tailored procedures/standards for feasibilities. Feasibilities do not follow best practices. Reported on usages of feasibilities

As seen in Table 3.3, of the 25 studies, 12 included a document analysis (some as part of a case study). These studies focused on the following: the estimation method used and errors due to this method; variance in actual cost versus estimated cost; data input; presence of best-practice components, and factors that should be incorporated to achieve comprehensive feasibilities. None of these studies, however, studied the communication aspect of the document, nor presented a holistic view of the feasibility compilation and communication process. Nevertheless, these studies did create a basis for the next phase of this thesis.

Eight studies made use of a questionnaire. While a questionnaire tests existing theories, it does not contribute to new theories, nor does it create the opportunity to explore and gather rich data. Some of the aforementioned studies are not based entirely on questionnaires, however, and include an interview component.

Nine studies made use of interviews. These studies focused on factors that influence the accuracy of the estimates; the impact of feasibilities on construction projects; investment decision-making; variance in actual cost versus estimated cost; the developers' perspective in terms of challenges with investments; factors that should be incorporated to achieve comprehensive feasibilities, and the presence of best-practice components. While the studies that made use of interviews collected rich data, the populations of the studies were construction professionals (not specifically QSs), managers, academia, ministries, and developers.

Considering the chosen populations, none of the studies had questions that focused on the expertise of the QS specifically.

In terms of the data collected through the interviews, the studies did not focus on understanding feasibility studies better, nor did they present a holistic view of the process. The 25 studies did contribute to the themes: the role/usages of feasibilities; elements that influence the quality and success of feasibilities; the nature and occurrence of errors currently found in feasibilities; methods of improving feasibilities, and certain perspectives from developers. These findings indicate what seems to be known in the current body of knowledge.

The goal was to map the entire domain as much as possible, hence an exhaustive and comprehensive search was implemented. As per the first objective of this thesis, this chapter identified what is known and unknown in terms of the financial feasibility process in QS practice. Importantly, these findings provide a basis for coding for the next phase of this study.

To focus on the gap presented by these findings, rich data drawing from the expertise field of the QS is missing. Additionally, to bridge the gap on the holistic view of the feasibility process, rich data from both key stakeholders (QSs and developers) is required. Furthermore, taking the trend of document analysis into consideration, it would be necessary to investigate the feasibility study document and focus on the communication aspect of the process. The detailed research methods and methodology of this thesis is discussed in the next chapter.

CHAPTER 4: RESEARCH PARADIGM

This chapter discusses the philosophical stance that serve as a guide to the research approach, design, strategy, technique and instruments. The philosophy to the approach of the data analysis is guided by the research aim. Justification of the methodical choices are also stated, as well as a brief explanation of the various choices available. In summary, this chapter explains the research methodology adopted for this thesis and offers a justification for the adoption thereof. It ends with the explanation of the execution plan and data collection protocol, validity and reliably approaches, limitations, as well ethical concerns and mitigation strategies.

4.1 POSITIONING THIS STUDY IN THE THEORIES OF 'SOCIAL SCIENCE'

Theories have become an integral part of human lives as they aid in organising the vast amount of information and perceptions that impose on our daily existence (Runeson and Skitmore, 2008). These theories assist in classifying, defining and recognising things and events, as well as to make predictions (Runeson and Skitmore, 2008). Two overarching fields have emerged: natural sciences and social sciences (Moore, 2020). While the natural sciences are concerned with physical entities and natural events, where independent and dependant variables are at play (Ledoux, 2002), social sciences refer to fields that deal with people-centric issues and interactions (Ledoux, 2002; Runeson and Skitmore, 2008). Theories in the natural sciences involve physical aspects such as electrons, electric charges, natural elements and the like, which react with other variables (independent and dependent) in an exact cause-and-effect pattern (Runeson and Skitmore, 2008).

Construction management is predominantly about people interacting with other people (Runeson and Skitmore, 2008). Therefore, studies in the construction management discipline are positioned within the social sciences (Runeson and Skitmore, 2008; Moore, 2020), including this thesis.

This research project aims to improve understanding around the feasibility process and communication from the perspectives of the key stakeholders, which include individuals interacting and collaborating.

4.2 Philosophical Approach and Assumptions

The philosophical approach and methodology of a research study is dependent on the nature of the study, the research questions, and the aim and objectives to be achieved. Furthermore, the nature of the research questions leads the researcher towards the data required and thus also the options available to collect this desired data. Each type of data can be analysed in a particular methodological way. In turn, each methodological choice has philosophical considerations supporting its practice. In addition, the philosophical assumptions applied in these particular methods are underpinned by both epistemological and ontological assumptions (Crowther, 2018). These philosophical underpinnings of ontology and epistemology, and the methodology with the corresponding methods, sources and instrumentation, constitute the research paradigm (Grix, 2014; Rubin and Babbie, 2016).

Consequently, it is imperative that the researcher understands the points given above, as well as the limitations of the chosen approach, as this becomes the basis of the research and the type of conclusions that can be drawn. There are multiple methodological paradigms available in the social science division. In particular, in the business, economics and management division, five major paradigms are recognised as useful: positivism, critical realism, interpretivism, postmodernism and pragmatism (Saunders, Lewis and Thornhill, 2016). Whilst a detailed discussion on each of these paradigms, in association with their advantages and disadvantages, is beyond the scope of this research project, it is crucial to demonstrate where this study is positioned and why. A sound research strategy needs to be developed.

More broadly, and before the chosen method is discussed in depth with the justification, it is necessary to outline the paradigmatic continuum briefly. Firstly, research philosophies are guided by three types of assumptions: epistemology, ontology and axiology. **Epistemology** is concerned with what constitutes acceptable knowledge: observable phenomena versus people's opinions and experiences. **Ontology** refers to the assumptions and questions regarding the nature of reality (Merriam and Tisdell, 2016). There are two main perspectives on the nature of reality, that there exists one reality only (as objectively observed), and that there exists multiple realities depending on human cognition (Saunders *et al.*, 2016). Therefore, the epistemological view influences and informs the ontological orientation and vice versa. **Axiological** orientation refers to the roles and values of the researcher. In other words, where the researcher is placed in terms of the study: detached; part of what is being researched, or the researcher's beliefs and assumptions that initiate and drive the study (Saunders *et al.*, 2016).

Secondly, a research philosophy is a combination of beliefs and assumptions concerning the expansion of knowledge (Saunders *et al.*, 2016; Creswell and Poth, 2018). As described in literature, the positivist and interpretivist stances are on the extreme ends of the paradigmatic continuum (Schworm, 2019), and pragmatism (among others) is somewhere in between (Sakız, 2018; Saunders *et al.*, 2016). As presented in Table 4.1 (the paradigmatic continuum), typically, quantitative methods to research are grounded in a **positivist** view, which lends itself to theory testing. The starting point is usually to form a hypothesis, and then to design and conduct an experiment to test the hypothesis. The narrow and focussed premises of the hypothesis assure the conclusion (Moore, 2020). The researcher remains neutral, detached and objective from their data and research to avoid influencing their findings (Saunders *et al.*, 2016). In essence, positivists take the view of the natural scientist.

It requires studies based on visible social reality to generate law-like generalisations. The ontological orientation is that there is a single reality and that which is observed is an accurate portrayal of reality.

Table 4.1: Paradigmatic Continuum (Adapted and consolidated from Saunders et al. *(2016) and Schworm (2019))*

	Extreme end	**Somewhere in between**	**Other extreme end**
Epistemological orientation:	Positivism	Pragmatism	Interpretivism
Ontological orientation:	Realism (single reality)	Practical (multiple realities)	Constructivism (multiple realities)
Axiological orientation:	Value-free	Value-driven	Value-bound
Role of theory:	Deductive (theory testing)	Abductive (iterates between theory testing and theory generating)	Inductive (theory-generating)
Research methods:	Quantitative	Multiple methods or mixed methods	Qualitative
	Objective		Subjective

In contrast, **interpretivists** believe that the individual shapes society. Interpretivism is the belief that humans differ and generate their own meanings from subjective experiences. The reality for the interpretivists is thus constructed or interpreted through the interactions of human beings and their environment. Typically, interpretivism is an approach to qualitative research and subjectivity is the norm (Creswell and Creswell, 2017). In harmony with the interpretivist epistemological and the constructivist ontological orientations, stands the inductive approach that is central to theory-generating.

The positivism versus interpretivism debate has lasted for centuries. However, there are philosophies that are more recent, which fall between the two extremes, such as pragmatism (Kivunja and Kuyini, 2017). **Pragmatists** are concerned about practices and how problems can be solved (Creswell and Creswell, 2017).

Solving the problem takes preference, therefore pragmatists use all the approaches that are available in order to solve the problem. It therefore often forms the foundation for mixed method research (Saunders *et al.*, 2016; Kivunja and Kuyini, 2017). Pragmatism focuses on practical and applied research, where various viewpoints can help in solving the matter (Sekaran and Bougie, 2016) and follows a non-singular reality ontology (Kivunja and Kuyini, 2017). Individuals are inclined towards either interpretivism or positivism, but not necessarily in its extremist form. This is where pragmatism is more lenient, as it incorporates both views and does away with extremism, while avoiding the respective weaknesses. Ultimately, a pragmatist's beliefs and assumptions initiate and drive the study (Saunders *et al.*, 2016).

4.2.1 View of this study

This study is driven by solving a problem that manifests in the QS profession: the financial feasibility studies compiled and communicated by quantity surveyors are sub-standard, problematic, neglected, and inconsistent, causing distrust, inadequate professional advice and poor investment decisions. The aim of the study is to better understand the phenomenon to form a basis to solving this problem and informing future practice. To solve this problem, the various perspectives of the key stakeholders are required to gather a deeper understanding of the various approaches and expectations. In the context of this study, the QS (compiler and communicator) and the developer (decision-maker) are the key stakeholders. Additionally, it is necessary to do an in-depth analysis of the document (financial feasibility study report) as it occurs in practice, to gain an understanding of the actual nature an occurrence thereof. Prior to the empirical part of the study however, a systematic literature review of the current literature on the topic, could provide a comprehensive basis of what is currently known, to assist in approaching the problem as effective as possible. Hence the reason for the systematic literature review in Chapter 3.

The philosophical view of this research project is grounded in pragmatism. A problem needs solving and whatever data is required to solve this problem is employed. The nature of this study calls on the subjective views of the key stakeholders, meaning peoples' subjective perceptions will be interpreted. However, when collecting and analysing this data the researcher's approach is to remain as objective and unbiased as possible. Furthermore, the problem being addressed calls for a document analysis. The content of the documents is to be interpreted by the researcher; still the researcher's method is to follow certain criteria (discussed later in this chapter) to avoid biases and subjectivity as much as possible. The view of this study therefore lies within pragmatism, leaning towards interpretivism as illustrated in Figure 4.1.

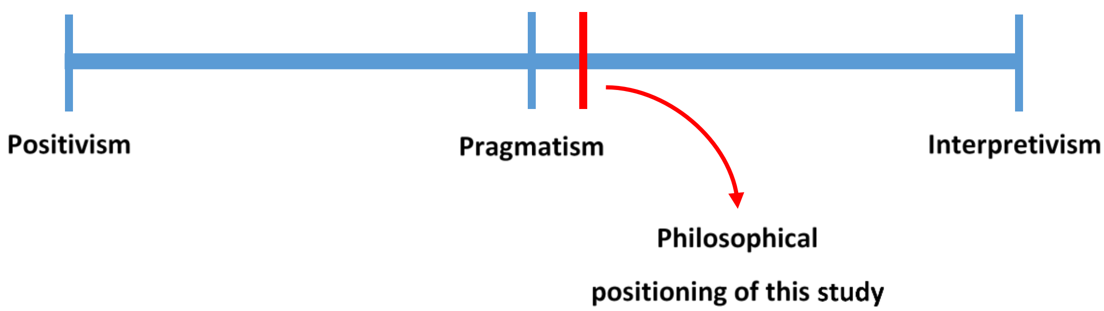

Figure 4.1: Philosophical positioning of this study

4.3 Role of Theory in this Study

The research approach deals with how the theory is used in the research. There are three basic approaches of logical reasoning: deduction, induction and abduction. Each of these approaches is defined and discussed hereunder to gain a deeper understanding and then to link the appropriate method to this research project.

Inductive reasoning is the process where a specific occurrence is detected, followed by general conclusions drawn from this observation (Sekaran and Bougie, 2016). Therefore, a theory is developed (Bryman and Bell, 2015). Consequently, an interpretivist view is inclined to follow this approach (Saunders *et al.*, 2016).

It is believed, however, that inductive research is unlikely to build an influential theory based on empirical data, without acknowledging existing theories (Green, Kao and Larsen, 2010).

Deductive reasoning is contrary to the aforementioned approach. The majority of construction management research tends to follow the deductive approach, where theories and hypotheses are tested through empirical research (Green *et al.*, 2010), however, Table 4.2 indicates that this has recently not been the case. Deductive reasoning is the transition from general perceptions to specific perceptions (Saunders *et al.*, 2016). This approach, however, is criticised due to the researcher being disengaged from the research subject (Green *et al.*, 2010), especially if the study is grounded in the 'Social Science' (Moore, 2020). As seen in the construction management discipline, engagement usually occurs from a distance and takes place through the medium of surveys (Green *et al.*, 2010; Agbaxode, Dlamini and Saghatforoush, 2021). Given the above, a positivist view is prone to follow this approach (Saunders *et al.*, 2016). Inductive and deductive reasoning are, however, not necessarily mutually exclusive (Gray, 2014).

When neither of the abovementioned approaches can fulfil the aim of a study, abductive reasoning is suggested to bridge the gap (Rahmani and Leifels, 2018). It addresses weaknesses associated with deductive and inductive approaches. This link between inductive and deductive analysis is discussed in the literature for qualitative methodology using that particular interview technique (Rahmani and Leifels, 2018; Ruge, 2019; Palsola, Renko, Kostamo, Lorencatto and Hankonen, 2020). Moreover, abductive reasoning works towards the cultivation of surprises in qualitative data and generates novel theoretical insights (Tavory and Timmermans, 2019). Ultimately, this approach lies in the iterative dialogue between data and a mixture of new and existing conceptualisations or theories, iterating between inductive and deductive reasoning (Rahmani and Leifels, 2018).

Reflecting on the nature of the construction industry and the professions: The construction industry has been recognised as a complex adaptive system (Bertelsen, 2003; Wood and Gidado, 2008), with construction projects becoming increasingly complicated; thus the industry needs consistent and systematic approaches to address any underlying factors that could hinder the success of projects (Rickaby, 2020). The professions in this industry need to account for these complexities and an ever-changing environment. In general terms, 'profession' is defined by Abadi, Ayentimi and Coetzer (2020) as: "*a specialised, knowledge-based and legally self-regulating occupation that renders its services to the public and society through a complex, reciprocal relationship based on competence, recognition and trust.*" Quantity surveying is firmly positioned as a 'profession'. Subsequently, it is seen that studies on the professions and education often make use of the abductive approach, since it creates the opportunity to extend knowledge on a phenomenon by comparing empirical data with existing theories, and by uncovering surprising facts (Paarup Michelsen, 2020; Blomquist and Jonasson, 2020; Islind and Norström, 2020).

Furthermore, 44% of the identified studies in the systematic literature review discussed in Chapter 3, made use of the abductive approach. Table 4.2 indicates the reasoning approach (deductive/inductive/abductive), of each of the 25 studies. Seven studies (28%) made use of the inductive approach, and the remaining 28% made use of the deductive approach. The trend clearly points towards abductive reasoning.

Table 4.2: Reasoning approaches of the identified studies in the systematic literature review

Reasoning approach	Primary Literature Studies no:	%
Deductive	1, 3, 6, 9, 15, 16,1 9	28%
Inductive	4, 5, 12, 13, 18, 22, 23	28%
Abductive	2, 7, 8, 10, 11, 14, 17, 20, 21, 24, 25	44%

While professions have an ever-evolving nature (Moore, 2020), a pure inductive or deductive approach seems risky and could lack an holistic view of the phenomena (Blomquist and Jonasson, 2020).

Therefore, given the field of study and trend of previous studies, abduction is perhaps best suited for studying professional outputs.

By studying past research of communication and feasibilities in quantity surveying practice, a deeper understanding has been acquired of these concepts. The outcome of the systematic literature review resulted in a framework for the coding of the empirical data collected in phase 1 (discussed later in this chapter). This understanding and framework were essential in order to identify the actants influencing the success of these feasibilities in the empirical data, as well as methods of possible improvements. In turn, the outcome of phase 1 resulted in a framework that guided phase 2 (discussed later in this chapter). The second framework was essential in guiding phase 2 in identifying the current nature and occurrence of the feasibilities. These empirical findings, while compared to existing theories, expanded on the findings in the current literature found, which means the knowledge has been extended regarding the actants influencing the feasibility.

This prominent iteration between theory testing and theory building, deductive and inductive reasoning, positions this research project in the abductive approach. This is demonstrated in this thesis by the gathering and understanding data based on theory, then comparing the data to reality, followed by reflecting to theory and ultimately expand on the existing knowledge regarding actants influencing feasibilities.

Multiple previous studies regarding ‘the professions’ made use of a qualitative study grounded in the pragmatist view and abductive inquiry, arguing that this methodology enables them to explore rich texture and nuances, and to contribute to a more holistic understanding of the phenomenon (Cross and Swart, 2020; Ahuja, Nikolova and Clegg, 2020; Löwstedt and Sandberg, 2020; Spolander, 2021). Drnevich, Mahoney and Schendel (2020) explicitly recommends that the best approach to achieve strategic management research that discovers real-world problems for refining and developing theory that is practically relevant, is pragmatism with abductive reasoning and by gaining insights drawn from key stakeholders. Given the above, the chosen research paradigm would best contribute to the achievability of the aim of this thesis.

4.4 PURPOSE OF RESEARCH DESIGN

The purpose of the research refers to the ultimate aim of the methodology. A research purpose could fall into one of four categories, or a combination of them: exploratory, descriptive, explanatory and evaluative (Saunders *et al.*, 2016). Drawing from the research aim, it is exploratory and descriptive in nature. The emphasis of this thesis is to study the problem, in this case feasibility studies in quantity surveying practice, and to seek to better understand the phenomenon to form a basis to solving this problem and inform future practice. An exploratory study is particularly useful to understand a phenomenon (Saunders *et al.*, 2016).

The theoretical framework and analytical tool, ANT, (discussed in detail in section 4.5.7) seeks to write descriptions of *how* rather than create interpretations of *why,* and is generally descriptive research (Wright, 2015). However, Kéfi and Pallud (2011) among others, did an exploratory study through the lens of ANT. ANT is thus recognised in exploratory and descriptive research. To achieve the aim, this thesis is making use of a combination of the exploratory and descriptive approach.

4.5 RESEARCH METHODOLOGY, METHOD AND TECHNIQUES

Research methods and research methodology are commonly mistaken as the same thing. However, each has its respective function (Kamba, 2009). The research methodology is an approach that guides the researcher to the suitable methods as well as shaping the use of the chosen method. It is the perspective in which the researcher will be addressing the research questions (Kamba, 2009). The research method on the other hand is the strategy adopted to gather the empirical data (Kamba, 2009). In short, methodology explains why the research method is chosen, and the research method explains how the researcher will engage on the empirical investigation. The research technique is a systematic way of collecting and analysing the empirical data (Kamba, 2009).

4.5.1 Research methodology

A methodical choice is informed by and derived from the philosophical view. With this thesis' pragmatist view, a multi-method qualitative or mixed method approach takes preference. In summary, mixed-method research is when both quantitative and qualitative methodologies are applied in the same study (Tashakkori and Creswell, 2007; Creswell and Creswell, 2017). Quantitative research focuses on objectivity and quantitative measurements with numerical, statistical and mathematical analyses (Creswell and Creswell, 2017). Qualitative research is an approach that typically draws on opinions and perspectives of people (Bryman, 2016). Furthermore, qualitative research is a suitable method for exploring and understanding problems related to humans (Creswell and Creswell, 2017).

Each research methodology, however, has limits and by combining the approaches (mixing the methods), some of these limitations of a single method could be eliminated (Teddlie and Tashakkori, 2003). In line with the philosophical positioning of this thesis, the methodical approach to data and analysis is constructed mainly from a qualitative approach. However, a quantitative analysis also emerged. There is thus a combination of approaches. Although this thesis is predominantly qualitative, it is grounded in the mixed-method approach.

There are a few reasons why using the mixed-method research approach is beneficial (Creswell and Clark, 2018; Leedy and Ormrod, 2019), and which this study will draw from:

- It can create completeness. The research problem can only be completely addressed by collecting and analysing qualitative and quantitative information.
- It is complementary. Qualitative aspects can compensate for the shortcomings of quantitative research and vice versa.
- Developing appropriate research strategies and tools. One type of research method can produce data that will be useful for the collection of another research method.
- Triangulation. A more convincing argument can be made if quantitative and qualitative data have similar conclusions.

4.5.2 Research method, techniques and design

A research method/strategy is guided by the problem statement, aim and objectives of a study. Saunders *et al.* (2016) list and explain the prominent research methods in this field and by applying the objective to understand the feasibility process from the key stakeholders' point of view, as well as analysing the document itself, it prompts the following observations: experiment, survey and archival research are not appropriate; the ethnographic approach is impractical for the researcher; the research concept does not support grounded theory, action research or narrative inquiry, and case study was considered to be too narrow. Therefore, as appropriate for the pragmatist's view, a combination of research techniques was chosen, which can yield the required information that would contribute to solving the problem, namely interviews with key stakeholders and document analysis of the artefact itself.

The following studies have aspects that are similar to this study, and which supports the methodical choice. The essence of the studies is presented, as well as the techniques used to gather the appropriate data. Almaşi, Gomoi and Cuc (2015) conducted a study in financial communication in accounting, with the aim of making suggestions for improved communication.

The research technique used was **document analysis**. Cotter *et al.* (2012) investigated the adoption of standardised communication in finance and utilised the **document analysis** research technique. Fakhfakh (2015) evaluated the understandability of audit reports and conducted the research by analysing the reports, known as **document analysis**. Johnson, Wu and Varnon (2017) examined the impact of standardisation on accounting rules by conducting a **document analysis**. Sahi, Arora and Dhameja (2013) studied psychological biases in financial investment behaviour through **semi-structured interviews**. Olatunji and Sher (2014) gathered the perspectives of construction professionals on modelling BIM-supported estimation practices by means of **semi-structured interviews**. Moore (2020) gathered the perspectives of professional QSs through **semi-structured interviews**, to establish the shortcomings in the professional education. Therefore, the most appropriate techniques to employ for this study are interviews and document analysis.

The **interview** technique is a purposeful conversation between two or more people. The interviewer is required to establish relationships and to ask short but clear questions. The distinction of objective versus subjective are applied by the way of interviewing. Provided the interviewee remains independent from the interviewer, and the interviewer uses the interview to collect data from witnesses of reality. Furthermore, there are various types of interviews including structured, semi-structured and unstructured. Structured interviews are questionnaire-based and comprise predetermined questions with close-ended answers. Semi-structured interviews consist of key focused questions with open-ended questions. Unstructured interviews are completely informal without predetermined questions, and only a general concept (Saunders *et al.*, 2016).

During the data collection phase of this thesis, semi-structured interviews were conducted where the researcher asked short, but clear unbiased questions. In other words, predetermined open-ended questions were asked of the interviewees.

This interview method requires a list of topics and main questions that need to be discussed, although each interview may vary on a case-by-case basis (Leedy and Ormrod, 2019). These semi-structured interviews presented the opportunity to gather the individual perspectives, preferences and experiences of the key stakeholders.

The second research technique of importance to this thesis is **document analysis**. In the context of this thesis, the financial feasibility study report is the document to be analysed and is also deemed the 'artefact' in question. Importantly, since the actual artefact is being analysed, the data collected is deemed to be qualitative data. The analysis of documents, however, can either be qualitative or quantitative in nature (Rose, Spinks and Canhoto, 2015). Both these analyses will be conducted in this thesis (which is explained later in this chapter).

Now that all the pieces of the puzzle have been identified, each piece needs to fit into place. The design involves the sequence of techniques and actions implemented, how it is executed (in terms of the populations), sampling and the instruments used, as well as the time horizon. Firstly, there are numerous research designs for mixed-method research. Leech and Onwuegbuzie (2009) consolidated the various mixed-research designs into a typology (Figure 4.2). Mixed methods can either be partially or fully mixed. It can occur concurrently or sequentially, and the methods can carry equal status or emphasis can be put on one of the methods, as presented in Figure 4.2.

A fully mixed method design is employed, where both quantitative and qualitative methods are used within at least one of the following occurrences: (i) the purpose of the research (e.g., both exploration and prediction), (ii) the type of data, (iii) the type of analysis, and (iv) the type of inference. In essence, the difference between fully- and partially-mixed methods is that in partially-mixed methods the quantitative and qualitative elements are conducted in their entirety before they are mixed at the data interpretation stage; fully-mixed methods involve mixing methods within at least one of the stages or across stages (Leech and Onwuegbuzie, 2009).

The time dimension refers to whether the quantitative and qualitative elements occurred concurrently (at approximately the same time), or sequentially (one after the other). The emphasis dimension relates to whether the study leans more towards one of the methods or if both methods carry equal weight (Leech and Onwuegbuzie, 2009). The mixed-method design of this thesis follows the fully mixed, sequential, dominant status design. This path is highlighted in red in Figure 4.2

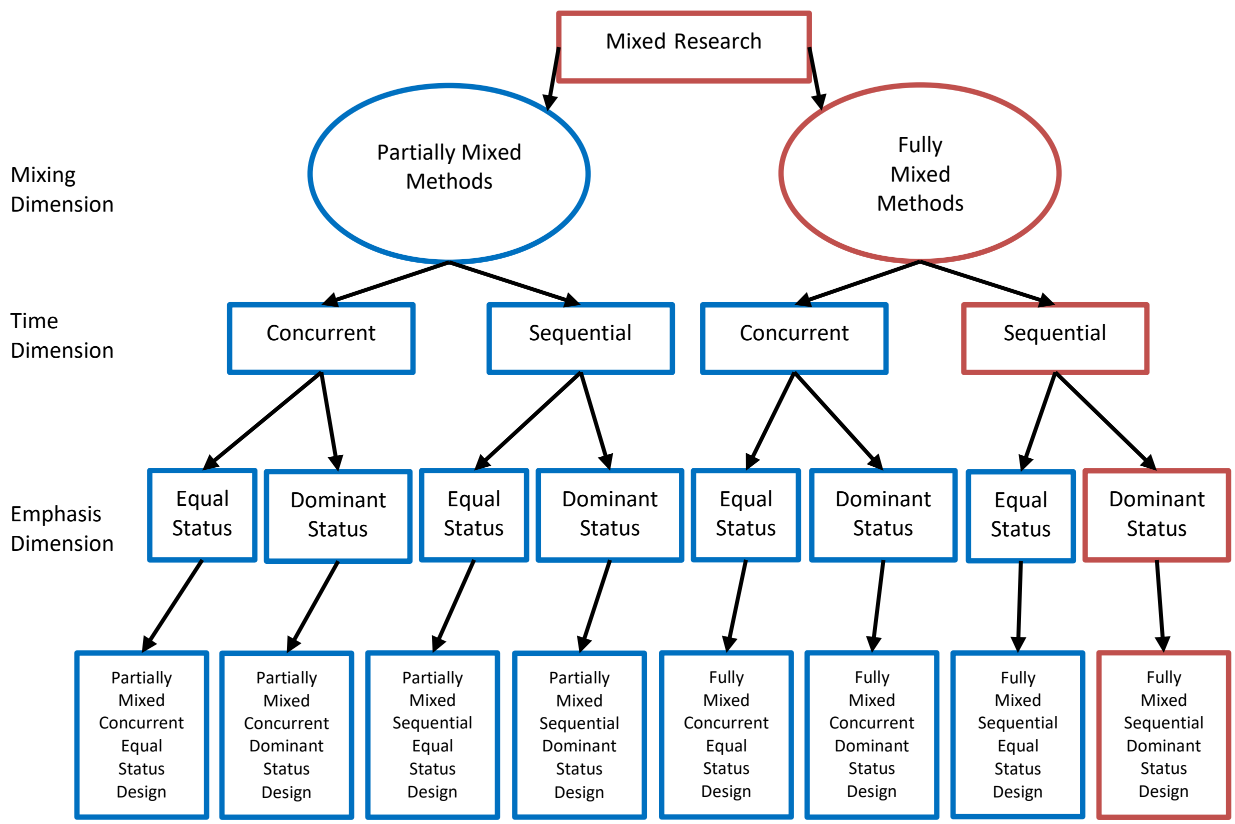

Figure 4.2: Typology of mixed research (adapted from Leech and Onwuegbuzie, 2009)

Figure 4.3 depicts the research design. This thesis consists of two phases of empirical data collection. Prior to the data collection, however, a systematic literature review was conducted. The systematic literature review shed light on the current literature, what is known, what is not known, and served as a basis for the coding of phase one's data. Phase one consisted of the interview technique, where both key stakeholders were interviewed, creating qualitative data, followed by a qualitative analysis. The systematic literature review and data from the interviews were then synthesised. The qualitative data analysis and findings from the interviews also served as a guide to inform the instrument partially (dotted line) of the data collection and analysis of phase two. Once phase one was done, the document analysis technique was employed, situating this study in the sequential type.

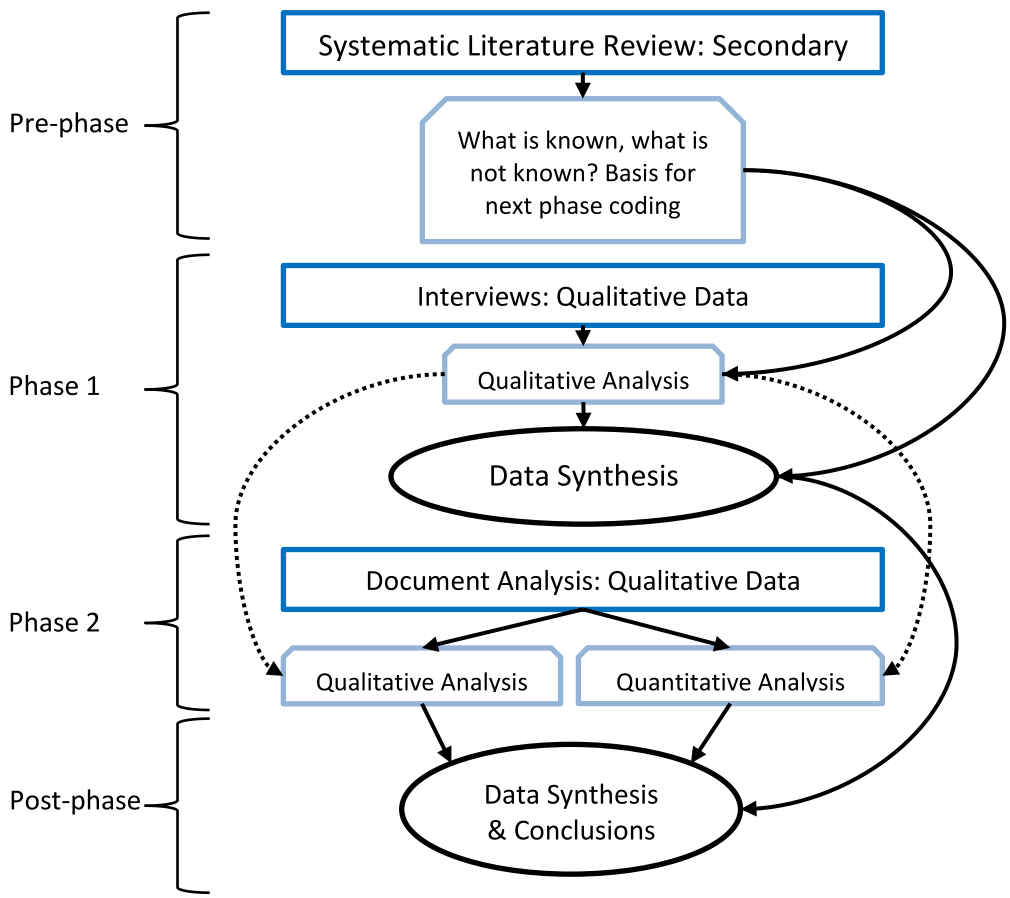

Figure 4.3: Research design

In phase two, feasibility reports (the artefact) were gathered and analysed. The qualitative data of the artefact was analysed using both methods of analysis: qualitative and quantitative.

The inference from phase one, together with the usage of both types of analysis within phase two, positions this study within the fully mixed method option. Additionally, it is clear that qualitative data and analysis is dominant over quantitative methods, hence this study utilises the fully mixed sequential dominant status design, consisting of two phases. Although the research design is sequential, the time horizon for this thesis will be cross-sectional, which is a snapshot in time (Saunders *et al.*, 2016). The cross-sectional time horizon is deemed appropriate for this study since the aim is to determine the current perspectives, nature, occurrence and status of the compilations and communication of the feasibility process.

Table 4.3 sets out the sequence of the data collection aligned with the objectives of this thesis and outcomes per phase.

Table 4.3: Phases aligned with objectives and outcomes

Phases	Action	Phase aligned with objectives	Outcomes
Pre-phase	Systematic literature review	Determine what is known and unknown in terms of the financial feasibility process in QS practice	Gap identification of actants in the network. Basis for coding of analysis in phase 1
Phase 1	Two sets of semi-structured interviews (developers and quantity surveyors) and data synthesis of literature and interviews	Determine the perspective of both key stakeholders in terms of the feasibility process. Determine the differences between the perspectives of the QSs and Developers	Differences in perspectives and expectations. Validation of findings in interviews with literature and identification of new findings. Identification of actants in the network. Guide to instrument development and data collection of phase 2
Phase 2	Document analysis	Determine the current nature and occurrence of the feasibility document in QS practice in terms of communication guidelines	Evaluation tool. Identification of actants in the network
Post phase	Overall data synthesis and integration of findings. Overall conclusions	Modelling the actor-network and compilation of the framework	Actor-network modelled, framework, conclusions, contributions, and recommendations

Furthermore, a design where the qualitative element comes before the quantitative element aligns with the exploratory aim of the research design (Plano Clark, Huddleston-Casas, Churchill, O'Neil Green and Garrett, 2008; Saunders et al., 2016; Leedy and Ormrod, 2019). Additionally, each phase is linked to certain objectives to be achieved as well as produced outcomes.

4.5.3 Population and sampling

There are three target populations applicable to this study: QSs, developers and feasibilities.

4.5.3.1 Interviews with QSs

The target population for the QS-interviews was professional quantity surveyors registered at the SACQSP who work in the private commercial sector as professional consultants. Saunders *et al.* (2016) suggested an adequate sample size for a semi-structured interview, of between five and 25 respondents. Given the sample size and population criteria, the non-probability purposive sampling method will be appropriate and should be successful for this research technique. Purposive sampling means that the participants are chosen and not left to chance (Leedy and Ormrod, 2019). The snowballing sampling method was also employed as necessary, when the minimum number of participants were not yet interviewed. Since the focus was to obtain in-depth data, homogeneous cases were gathered. A homogeneous case in this context meant all professional consultant quantity surveyors that work on private commercial developments. For the purpose of this study, the aim was to interview a minimum of 20 QSs.

The non-probability purposeful sampling started with contacting QSs with whom the researcher is acquainted, and who match to the selection criteria. Then, additional potential participants were found by searching the web for QS companies that specialise in private commercial developments as well as sourcing contact details of the QSs working for these companies.

Lastly, once the QSs (found by the two aforementioned approaches) agreed to be interviewed, they were asked to recommend other QSs who meet the selection criteria and were willing to be interviewed. Therefore, non-probability purposeful sampling and snowballing was employed.

4.5.3.2 Interviews with developers

The target population for the developer-interviews were developers with more than five years of experience in South Africa, specialising in commercial private developments. There is no sampling frame available, and the appropriate number of participants was difficult to find, which meant for homogeneous cases to gather in-depth data, the non-probability purposeful sampling method, as well as snowballing, were more appropriate for this research technique. Homogeneous in this context means private developers that have worked with quantity surveyors and made decisions based on the feasibility studies produced by the latter.

The aim was to interview a minimum of 20 developers. The rationale for this was twofold. First, literature suggests that it is an adequate number, with Saunders *et al.* (2016) recommending between five and 25, and Marshall, Cardon, Poddar and Fontenot (2013) recommending a sample size between 15 and 30. Second, it is a reasonable number based on the allocated time for this study. The non-probability purposeful sampling for this population commenced with contacting developers with whom the researcher is acquainted and who meet the population criteria. Second, QSs previously interviewed were contacted and asked to recommend developers that fit the population criteria and would be willing to be interviewed. Additionally, other potential participants were found by searching the web for developer companies that specialise in private commercial developments, as well as sourcing the contact details of developers working for these companies. Lastly, once developers agreed to be interviewed, they were asked to recommend other developers who meet the population criteria and would be willing to be interviewed. Therefore, non-probability purposeful sampling and snowballing was utilised.

4.5.3.3 Documents: Feasibilities

The population for the document analysis is feasibilities generated by professional quantity surveyors registered with the South African Council for the Quantity Surveying Profession (SACQSP) for commercial projects in the private sector. Additionally, the heterogeneous population criteria was informed by the first phase of this thesis, as certain themes emerged concerning complexity of the documents. These themes are the usage/type, the method of income and other complexities, such as green elements and phased projects. For a heterogeneous population, a minimum sample size should be between 12 and 30 (Saunders *et al.*, 2016). For successful data collection, non-probability purposive sampling took preference, owing to the sensitivity of the data.

A matrix was developed to include the various usages of buildings in the rows and complexities in the columns. The aim was to gather 20 feasibilities and to have representation of all the themes. Table 4.4 indicates the selection criteria that has emerged, along with the expected feasibilities to be collected. Note that other complexities (green and phased) will be concurrent with a method of income and is not a separate feasibility.

Table 4.4: Selection criteria for feasibility studies

	Method of income			**Other complexities**	
Type	***Sales***	***Rental***	***Hybrid***	***Green***	***Phased***
Retail	x	xx			x
Residential	x	xx	x	x	
Commercial	x	xx	x	x	
Industrial	x	xx	x		
Mixed use	x	x	x		x
Specialist	x	x			

4.5.4 Research instruments

Some argue that the interviewer is the prime research instrument when it comes to interviews (McGrath, Palmgren and Liljedahl, 2019) and document analysis (Chenail, 2011).

4.5.4.1 Semi-structured interviews

In the quest to remain as objective and unbiased as possible during the interviews, short, clear and neutral questions were developed. It is indeed advised that interviewers should talk less and listen more, to avoid driving the conversation in a biased direction (McGrath *et al.*, 2019). The objectives aligned with phase one, the interviews, are aimed at acquiring in-depth data to: understand the role of feasibilities from both perspectives of key stakeholders; identify actants in the entire compilation and communication process of feasibilities as experienced in practice, and to determine the nature and occurrence based on their key perspectives. Hence, study-specific open-ended questions were created.

Both sets of key stakeholders being interviewed required a slightly different approach from each other, since the QS compiles and communicates the feasibilities, and the developer interprets and makes decisions based on the communication. The interview questions were divided into two parts. Part one consisted of verification questions that confirmed whether the participant adheres to the population criteria. Part two consisted of the in-depth questions. The following questions were posed to the QSs.

Part 1: Verification questions

- Tell me about your QS career.
- On what kind of projects have you mainly worked?
- Are you a professionally registered QS?
- What has your role been in the firm?

Sample sufficiency is required for valid research and therefore necessary to confirm that the interviewees are indeed experts in the required field (Morse *et al.*, 2002), hence the above questions were asked first.

Part 2: Open-ended questions

The following questions asked in the interviews are linked to the literature as follows:

- What do you understand a feasibility study to be?

Simple definitions of a financial feasibility study in QS practice are given in literature (Costello and Preller, 2010; Mukherjee and Roy, 2017; Willemse, 2019). However, the question above was asked to gain a view of what they understand a feasibility study to be, and with these views, develop a comprehensive definition applicable to practice.

- What do you consider a successful feasibility study to be?

While a few studies elaborated on different factors that influence the success of feasibilities (Salman *et al.*, 2007; Mukherjee and Roy, 2017; Karas, 2017; Syed Alwee *et al.*, 2019), it was unclear what constitutes a successful feasibility, hence the above question was asked.

- What role does the feasibility study play in the QS firm?

Three studies (Anees *et al.*, 2018; Syed Alwee *et al.*, 2019; Willemse, 2019) reported on the usages/roles of feasibilities. These three studies, however, made use of surveys, limiting the respondents to what was given in the questionnaire. The above open-ended question created the opportunity for gaining new knowledge on the subject.

- How does a feasibility study influence professional relationships (with the team and the developer)?

In construction processes, the team needs to collaborate well and maintain good relationships (Ejohwomu *et al.*, 2017).

- What sort of impact do feasibility studies have on investment decision?

Literature stated that feasibilities are a basis for investment decisions (Mackenzie and Cusworth, 2007; Sudhana, 2016).

- Tell me about your approach when you work with a feasibility study. What is the first thing you do when you start preparing a feasibility study, and what is the last task you perform?

In order to understand what is in the whole feasibility process/network, the above question was asked. Literature does not discuss the entire process around feasibilities. However, ANT, the theoretical lens of this study (discussed in detail in section 4.5.7), requires an understanding of the whole process/network (Latour, 2005). Since the question required a long answer, there were some probing questions prepared should the interviewee omit discussing the subject:

- Do you work on a template?

In South Africa the ASAQS does have a guide to feasibilities (ASAQS, 2016a).

- How do you present feasibility studies to the developer?

The communication from the QS to the developer forms part of the overall feasibility process. Communication forms a vital part of a QS's service (Dada and Jagboro, 2012), and the feasibility document forms a central part of the communication process (McQuail and Windahl, 1993).

- What is the risk of not presenting it face-to-face?

Financial reports are prone to create confusion (Xu *et al.*, 2018).

- What requirements do you follow specifically to make communicating the content easier?

Plain Language guidelines in terms of format and text should be used when preparing financial reports/documents (Bonsall *et al.*, 2017; Matveeva *et al.*, 2017).

- Are there any standards and regulations that you follow?

The ASAQS prepares standards within the profession (The Association of South African Quantity Surveyors, 2017), while in accountancy the eXtensible Business Reporting Language (XBRL) and the International Financial Reporting Standards (IFRS) have created global financial reporting standards (Markelevich *et al.*, 2015).

- Any in-house guidelines that you follow in terms of presentation?

Plain Language guidelines in terms of format and text should be used when preparing financial reports/documents (Bonsall *et al.*, 2017; Matveeva *et al.*, 2017).

- How do you approach a feasibility study if the project is more complex than what you are accustomed to?

According to Herszon (2017), most feasibility studies are generated using traditional criteria that does not account for complexity.

- How did your approach around feasibility studies evolve over time? If you compare your first feasibility study with your last one, how did they differ from one another?

Since the industry has evolved (Perera *et al.*, 2016), feasibilities could also evolve. Additionally, approaches would have changed due to lessons learnt; knowledge sharing has also been identified as a factor that can improve feasibilities (Syed Alwee *et al.*, 2019).

- Ultimately, how did you learn to carry out a feasibility study?

According to Salman *et al.* (2007), only highly qualified professionals should execute feasibilities and the level of the estimator's experience is vital to the success thereof (Lim *et al.*, 2016).

Consultancy firms are lately being appointed for the sole purpose of conducting feasibilities for construction projects (Seghezzi, 2018), and arguably, feasibilities have become an expert field within the QS profession.

The following questions were posed to the developers:

Part 1: Verification questions

- Tell me about your career as a developer.
- What is your role in the company?
- What type of projects do you prefer to develop?
- From where do your projects originate?

Sample sufficiency is required for valid research and therefore necessary to confirm that the interviewees are indeed experts in the required field (Morse, Barrett, Mayan, Olson and Spiers, 2002).

Part 2: Open-ended questions

- What does a feasibility study mean to your developments?
- What do you use a feasibility study for?

Three studies (Anees *et al.*, 2018; Syed Alwee *et al.*, 2019; Willemse, 2019) reported on the usages/roles of feasibilities. These three studies, however, made use of questionnaires, limiting the respondents to what to answer, based on what was given in the questionnaire. Both the above questions probed this.

- What do you expect from a feasibility study? / What do you want to see in a feasibility?
- What is the first section you page to?

The principles and guidelines for Plain Language required an audience analysis to be done (Matveeva *et al.*, 2017). Both the above questions attempted to understand what the audience wanted to see/read.

- In your opinion, what separates a good feasibility study from a bad one?

While a few studies elaborated on different factors that influence the success of feasibilities (Salman *et al.*, 2007; Mukherjee and Roy, 2017; Karas, 2017; Syed Alwee *et al.*, 2019), it was unclear what constitutes a successful feasibility.

- How and when does a feasibility study influence your investment decision?

Literature stated that feasibilities are a basis for investment decisions (Mackenzie and Cusworth, 2007; Sudhana, 2016).

- When it comes to the preparation and interpretation of your feasibility studies, who is typically involved?
    - What is your involvement?
    - What role does the QS play?
    - Which other professionals are involved?

In order to understand what sits within the entire feasibility process/network, the above questions were asked. Literature does not discuss the entire process around feasibilities. However, ANT, the theoretical lens of this study (discussed in detail in section 4.5.7), requires an understanding of the whole process/network (Latour, 2005), and the developer's perspective is also required to achieve a holistic view.

- How do you prefer to receive a feasibility study?

The communication from the QS to the developer forms part of the overall feasibility process. Communication forms a vital part of a QS's service (Dada and Jagboro, 2012), and the feasibility document forms a central part of the communication process (McQuail and Windahl, 1993).

    - What about formatting?

Plain Language guidelines in terms of format and text should be used when preparing financial reports/documents (Bonsall *et al.*, 2017; Matveeva *et al.*, 2017).

- Do you prefer working with the same QS?
- How does the feasibility shape your relationship with the QS?

In construction processes, the team needs to collaborate well and maintain good relationships with one another (Ejohwomu *et al.*, 2017).

- How has your understanding of feasibility studies changed over time?

The developer's level of knowledge influences the success of a feasibility (Ramawela, 2017) and this question forms part of the audience analysis that is required (Matveeva *et al.*, 2017).

- Have there been any discrepancies between the feasibility estimate and the actual outcome? If so, why?

Several studies concluded that the actual outcome of the cost versus the estimated amount in the feasibility differs more than is acceptable (Hyari and Kandil, 2009; Huxham, 2010; Kwaku Osei, 2016; Dandan *et al.*, 2019).

The questions listed above were the guideline. However, a participant was occasionally comprehensive in their response and answered more questions during the process, which means certain questions were no longer required. On the other hand, some participants needed more prompting to achieve a comprehensive response.

4.5.4.2 Document analysis

Phase two of the research design (document analysis) focuses on identifying actants drawn from the artefact, and to determine the nature and occurrence of the actual artefact. Therefore, the nature and occurrence of document communication guidelines in terms of: features and organisation; format; style (terminology and consistency), as well as audience analysis, were analysed. As such, textual and non-textual content is of importance. The audience analysis was guided by the analysis in phase one of the developer interviews, since the developers are the key audience of the feasibilities. Finally, the complexities that manifest in the reports were analysed as guided by inference of phase one.

Readability is affected by four main categories: features of organisation, format, style, content (DuBay, 2004). Thus, the following questions were posed as the instrument for the document analysis:

- How do the features of organisation occur in the reports, in terms of:
    - headings and logical order
    - tables
    - graphs?

Features of an organisation include headings and logical order, tables, and graphs (DuBay, 2004; Matveeva *et al.*, 2017).

- How does formatting occur in terms of:
    - font size
    - font type
    - capitals
    - white space and spacing
    - colouring and contrast?

Formatting includes font type and size, white spaces and spacing, margin justification, length of lines, and contrast between text and background (DuBay, 2004; Matveeva *et al.*, 2017).

- What inconsistencies are there in terms of the terminology used?

Style refers to terminology and consistency (DuBay, 2004; Loughran and McDonald, 2014).

- Which elements appear in the reports that the audience/developers expect to see?

- How many of the reports included the expected elements?

The ‘content’ is the fourth category that affects the readability of documents, which includes an audience analysis and goal of communication (Matveeva *et al.*, 2017). The elements that the audience (developers) wants to see has been confirmed in the interviews with the developers and is discussed in Chapter 6.

- How do the complexities manifest in the reports, in terms of:
    - usage of the building
    - green rated buildings
    - type of income stream
    - phased construction?

According to Herszon (2017), most feasibility studies are generated using traditional criteria that does not account for complexity. The complexity factors applicable in feasibilities were confirmed in the interviews with the QSs and are discussed in Chapter 5.

4.5.5 Data collection protocol

4.5.5.1 Interviews

The protocol for the interviews was executed as follows:

- Gained ethical clearance from Wits University.
- Contacted possible participants who fit the population criteria by means of a phone call or email (with information sheet and consent form attached), where phone details were not obtained.
- Briefly explained the reason for approaching them and informed them of the information sheet, which gave more detail about the study.
- Asked for their consent to participate.
- When an email address was the only contact information available and when there was no response, a follow-up email was sent twice following the initial

contact, in two-week intervals. If there was still no response, the person was deemed unwilling to participate.

- Asked for email address if not yet obtained when contact was first made by phone call.
- If the initial approach was by phone call and the person agreed to receive the information sheet and consent form, the researcher emailed the information sheet and consent form.
- Once the person expressed their willingness to participate, further communication commenced via email.
- Via email, the participant was then asked which day, time and online platform would be convenient for them to participate. (All interviews were done online, either on Microsoft Teams or Zoom.)
- Scheduled a meeting on the day, time and online platform (as per the request of the participant).
- Reminded the participant via email of the consent form, if not yet received, and obtained the signed consent form prior to the interview.
- The participants gave consent to:
  - participate in an interview with regards to feasibility studies conducted by the researcher
  - Remain anonymous in the report, while the researcher treats their personal information as confidential
  - Quote them anonymously in the report
  - record audio of the interview.
- At the meeting, permission to record the meeting was requested once more, prior to it commencing.

- With permission obtained, the recording was started, and the interview commenced. (Both online meeting platforms have an embedded recording function and recordings were done using this function.)
- After the meeting, the participants were asked if they knew another professional who fit the population criteria who the researcher could approach for a possible interview (hence snowball sampling).
- If new contact details were obtained, the process started again, until an adequate number of professionals were interviewed (which is 23 of each population).
- The audio recordings were kept on a password-protected computer and deleted once they were transcribed.
- The transcriptions excluded all personal details.
- The transcriptions were verbatim transcriptions and repetition, stutters and false starts were included, as accuracy was crucial (Manns, Cramp, Lewis, Clark and Palmer, 2018).

4.5.5.2 Document analysis (financial feasibility study reports)

The protocol for collecting the artefact (financial feasibility study reports) were as follows:

- Gained ethical clearance from Wits University.
- Contacted QSs that had feasibilities that fit the population criteria by means of email (with information sheet and consent form attached), as these QSs were already approached for interviews and agreed to being interviewed.
- Asked for their consent to share the document.
- When an email address was the only contact information available and when there was no response, a follow-up email was sent twice following the initial contact, in two-week intervals. If there was still no response, the person was deemed unwilling to share the document.

- It was requested that the consent form be signed and returned with the feasibility.
- The documents were kept on a password-protected computer and deleted once fully utilised.

4.5.6 Data analysis

The two different techniques employed in this thesis called for different analytical methods.

4.5.6.1 Phase 1: Semi-structured interviews and qualitative analysis

The first step of the analysis, for data obtained for the interviews, was to transcribe the audio recordings. The interviews were transcribed verbatim using Otter.ai software to aid the process. Subsequently Nvivo software was used for coding and organising the data, allowing easy access to quotes with similar codes. A reflexive thematic analysis was done. Therefore, considerable interpretative work was done by the researcher, and themes from the codes were developed at a later stage (Braun and Clarke, 2021). Furthermore, coding in the reflexive thematic analysis approach is recognised as an inherently subjective process that requires a reflexive researcher (Braun and Clarke, 2021).

As expected from a reflexive thematic analysis, the coding process was unstructured. Therefore, no codebook or code framework was followed. The transcripts were coded from beginning to end, while each was systematically and thoroughly read. As each new element arose, a new code was created. As new information emerged, some existing codes were changed and adapted. Themes were only developed after the coding was done.

4.5.6.2 Phase 2: Document analysis with qualitative and quantitative analysis

Qualitative data can be analysed quantitatively through a conceptual content analysis, which determines the existence and/or frequency of identified concepts.

These frequencies can then be statistically analysed. The quantitative analysis should be done systematically and objectively, therefore a codebook is necessary (Bjorklund and Audunson, 2021). The previously identified concepts were coded with the following definitions set out in Table 4.5, first to determine the existence and second to identify the frequency of the concepts across the artefacts:

Table 4.5: Codebook for quantitative analysis of the document analysis

Coding	Definition
Concept: Tabulation	
All	The entire document is tabulated
Mostly	Most of the document is tabulated, but not the entire document
Some	Only some of the document is tabulated
Minimally	A maximum of one page is tabulated
Horizontal lines	The table exists of horizontal lines only
Vertical lines	The table exists of vertical lines only
Concept: Graphs	
Graphs	Appearance of any graph: line graph, bar graph, pie chart, etc.
Concept: Font Size	
Too small	Where the font is less than 10 points anywhere in the document
Adequate	Where the font is 10 points or more in the entire document
Concept: Font Type	
Difficult to read	Where font that is difficult to read occurs anywhere in the document
Easy to read	When the entire document consists of a font that is easy to read
Concept: Capitals	
All	All writing in the document consists of capital letters
Main and sub-headings	Main and sub-headings are all capitals
Main headings	Main headings only are all capitals
Minimally	There are minimal words in the entire document that are all capitals
Concept: White space and spacing	
Strategic	White space and spacing is strategically used in the entire document to ensure easy reading
Partially strategic	White space and spacing is strategically used in some part of the document to ensure easy reading; however, other parts of the document are more densely populated with text and more difficult to read
Moderately dense	The entire document is moderately dense with text and is slightly more difficult to read
High density	The entire document is densely populated with text and difficult to read
Concept: Text colour	
Black	All text in the document is black
Mostly black	Some text is a colour other than black
Concept: Background colour	

White	The background of the whole document is white
Mostly white	Most of the background is white, with some areas highlighted with colour
Coloured	Most of the background is highlighted with a colour
Concept: Contrast	
Efficient	All text is contrasting to the background and easy to read
Moderate	All text is less contrasting to the background and slightly harder to read
Some efficient	Some text is contrasting and easy to read, some is less contrasting
Concept: Items to be present in the executive summary as per audience analysis	Note: The section does not explicitly have to read ‘executive summary’; it can be summary or similar. If the item occurred elsewhere in the document and not in the executive summary (or similar), this should be noted as such
Spatial allocation	The total areas allocated to certain types of space should appear in the executive summary
GBA vs GLA	The gross building area to gross lettable area should appear in the executive summary
GBA vs GLA ratio	The gross building area to gross lettable area ratio should appear in the executive summary
Construction cost	The total construction cost should appear in the executive summary
Construction cost/m²	The total construction cost per square metre should appear in the executive summary
Preliminaries	The preliminaries of the main contractor should appear in the executive summary
Contingency	The contingency for the construction work should appear in the executive summary
Escalation	The amount allowed for the escalation of the construction cost should appear in the executive summary
Professional fees	The amount allowed for the professional fees should appear in the executive summary
Professional fees (%)	The percentage used for the professional fees’ calculation should appear in the executive summary
Land cost	The amount allowed for the land cost should appear in the executive summary
Interest	The amount allowed for the capitalised interest for the project costs should appear in the executive summary
Total capital outlay	The total capital outlay should appear in the executive summary
Percentages	Percentage allocation of the entire total capital outlay per element should appear in the executive summary
Cost per unit	Total cost per unit (i.e., cost per office/cost per flat) should appear in the executive summary
Total income	The total expected amount for income should appear in the executive summary
Op cost	The total operational costs (per annum) should appear in the executive summary (Not applicable to pure sales schemes.)
Op cost/m²	The total operational costs per square metre should appear in the executive summary (Not applicable to pure sales schemes.)

Performance indicator	The performance indicator (yield) should appear in the executive summary
Concept: Items to be present somewhere in the document as per audience analysis	
Sub-contractors	The totals allowed for each sub-contractor should appear somewhere in the document
TI	The allowances of the tenant installations should appear somewhere in the document
Assumptions	Clarity on the assumptions should be provided somewhere in the document
Time and programme	The time allocation and programme should appear somewhere in the document
Cash flow	The estimated cash flow should appear somewhere in the document
Sensitivity analysis	A sensitivity analysis should appear somewhere in the document
Value engineering	Value engineering suggestions should appear somewhere in the document

To identify inconsistencies in the terminology used across the feasibilities, the existence was recorded. A codebook for this analysis was, however, impractical. Inconsistencies were identified by first reading through the first document, then reading the next document, and if any of the terminology used was different, it was recorded as such. The next document was then read through, identifying any discrepancies in terminology used in all the previously read documents. A term was only coded once a discrepancy was found in the terminology. Once a discrepancy was found, the previous document/s were reread to identify the first version of the term, in order to portray all versions of the same term across all the documents.

A codebook to determine the logical order and headings used in the documents would also be impractical. Instead, all sections, headings and sub-headings were extracted as raw data and kept in the order they appear in the documents (refer to Annexure A). Furthermore, the aim of this exercise is to determine if inconsistency occurs across the documents in terms of the overall organisation, for example: sections used, headings used and logical order. The occurrence is of importance and not the frequencies.

The analysis seeks to identify the following:

- Is there inconsistency in terms of sections used?
- Is there inconsistency in terms of the order of the sections given?
- Is there inconsistency in terms of the order of the items in sections?
- Is the information within a section similar to the information presented under the same section in another feasibility?
- Are items categorised and grouped similarly?

The final aspect to determine, is how complexities manifest in the reports. First, the manifestation of the complexities was identified in the interviews: Usage of the building, green-rated buildings, types of income stream and phased construction. Additionally, the benchmark for a ‘simple’ commercially centred feasibility study, is deemed a bulk residential project as a sales scheme in a single phase. The manifestation of complexities within the feasibility reports are determined by comparing other schemes with the single-phase residential sales scheme and reporting on the additional required items and calculations.

4.5.7 Theoretical and analytical framework

4.5.7.1 Actor-network theory (ANT)

Essentially, ANT is an analytical framework that is utilised to examine networks consisting of humans and non-human aspects to be able to expand on knowledge. These networks are relationships between people, their ideas, technology and abstract concepts (Callon, 1984; Law, 1984; Latour, 2005). Michael Callon, Bruno Latour and John Law were scholars in science and technology, who developed the Actor-Network Theory (ANT) concept between the late 1970s and early 1980s (O'Connell, Ciccotosto and De Lange, 2011). Initially, ANT focused on explaining the origins and inner workings of technological and scientific breakthroughs.

Consequently, ANT has developed into a considerably wider framework (Law, 2009), which has been used in different contexts, while grounded in empirical case studies/qualitative data (Law, 2009). There is no unified body for ANT and, given the variety of authors who have contributed to this field, there consist a variety of emphases and interpretations (Pollack, Costello and Sankaran, 2013). While ANT is based on a great number of concepts (Sidorova and Sarker, 2000), only the subset of the concepts that are pertinent to the analysis of this thesis will be discussed. These unique concepts are: Actor; Actant; Focal Actant; Actor-Network; Translation; Problematisation; Interessement; Enrolment; Mobilisation; Black Box; Betrayal; and Graphical Syntax.

Actor

In ANT, both human and non-human actors are ascribed agency (Callon, 1984), and ANT creates an analytical space to study the non-human actors as significant in a network (Nicolini, 2012). An actor can have either agency as "*something that acts or to which activity is granted by others … An actant can literally be anything provided it is granted to be the source of an action*," (Latour, 1999). Non-human actors can therefore be inanimate objects, concepts, processes (Latour, 2005), objectives, challenges and the like (Silvis and Alexander, 2014).

Actant

Actors are often referred to as actants within ANT, since an actant is that which either accomplishes or undergoes an act (have agency) (Latour, 1996). Actants have their qualities and agency due to their associations with other actants in that network (Wong, 2016). By using the word 'actant', the focus is shifted slightly towards the actions of the entity rather than the source of this action. Therefore, the term 'actant' is deemed more appropriate, and will be referred to as such in the following discussions.

Focal Actant

The actant that is central to an actor-network and that initiates the structuring of this network is known as the focal actant (Onsrud, 2007). The focal actant is responsible for defining the interests and identities of the other actants in the same network. This concept is also closely related to the process of translation, as the focal actant also initiates this process. Callon (1984) gives an example of this. The example is based on an empirical study done on the domestication of scallops. Callon (1984) explains that all actants undergo translation. He makes use of that example to explain how the process of translation is an instrument of how the social and natural world gradually takes form. In that study, the researchers were deemed as the focal actant since they initiated the entire process and thus defined the identities of the additional actants.

Actor-Network

The concept of a heterogeneous network is the heart of ANT, where both human and non-human actants have aligned interests (Law, 1992). The word network should not be confused with the technical use of the word in engineering contexts, for example a telephone or train network. Actually, the actor-network may lack all the characteristics of a technical network. Furthermore, ANT has very little connection with the study of social networks (Latour, 1996).

ANT is a way to explain the differences in how something is and how it is perceived (Law, 2009) and assigns agency to both human and non-human actants (Callon and Blackwell, 2007).

Translation

Translation is the concept that explains the gap between the heterogeneous actants that form part of the same network and is the mechanism by which the network takes form (Callon, 1984), it is therefore the creation and alignment of actants that form the network. Callon (1984) further explains that there are four stages to translation, termed ‘problematisation’, ‘interessement’, ‘enrolment’, and ‘mobilisation’.

These four stages are interwoven and overlap, and are not isolated events that occur sequentially. Translation examines the connection between actants, rather than examining actants individually. The translation process to achieve mobilisation is illustrated in Figure 4.4.

Gherardi and Nicolini (2000) gives an appropriate example regarding translation. They examined a case study on safety knowledge in construction, and used ANT to describe

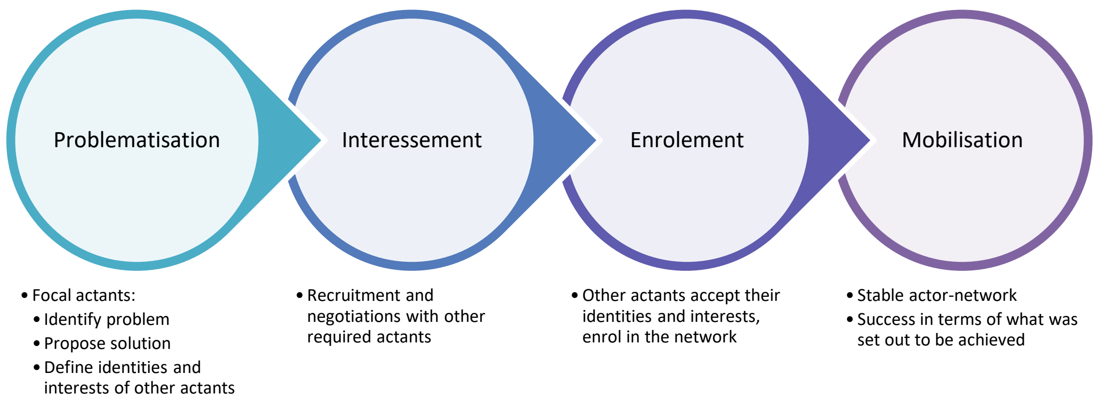

Figure 4.4: Graphical display of the translation process in ANT

how this safety knowledge was circulated on a construction site. The process of translation was used to map the actor-network involving communities, individuals, organisations and institutions. ANT helped them to demonstrate how non-human actants also have an influence on the circulation of knowledge creation as well as the circulation of safety knowledge.

Problematisation

Problematisation (the first process of translation) occurs when initiating actants, also known as focal actants, identifying an issue and proposing a solution. Here the identities of other actants are defined, which are aligned with the interests of the focal actant. Subsequently, in this stage, the initial actants are determined (Pak, Alwi and Ismail, 2020).

Interessement

In the second stage, interessement, additional actants are recruited as part of this solution. This includes getting the actants interested in and negotiating the roles and terms of their involvement, and ultimately trying to convince the actants to accept their interests as defined by the focal actant (Callon, 1984).

Enrolment

Enrolment takes place when the recruitment was successful and actants accept their defined interests (Callon, 1984).

Mobilisation

Finally, mobilisation is in play when the network is stable, although temporarily, and the solution is widely accepted. Furthermore, complete translation does not necessarily have to occur – it could fail or cease at any stage (Callon, 1984).

Black Box

Black boxes are used in ANT as a means to simplify the actor-network by condensing parts of the network into a single actant. In these black boxes, it is assumed that the network within is stable (Silvis and Alexander, 2014). Simultaneously, it is recognised that the black box can be 'opened' at any time to reveal a complex network. Venturini (2012) emphasised the significance of the black box concept, "*The basic tenet of ANT is that every actor can be decomposed into a network and that every network can be connected tightly enough to become a single actor.*"

Betrayal

A situation when actants do no abide by the agreements made during the enrolment phase (Callon, 1984).

Graphical Syntax

In addition to ANT, Silvis and Alexander (2014) created a graphical syntax for ANT to provide a mechanism for visualising the actor-network. This graphical syntax is useful to identify actants and translations within the actor-network.

There are three different roles that actants can take during the translation process (Silvis and Alexander, 2014):

(i) A source actant: an actant that is being translated (abbreviated as source).

(ii) A target actant: an actant that is being translated for another actant (abbreviated as target).

(iii) A translating actant: the actant that translates the source actant for the target actant (abbreviated as translator).

The graphical syntax is illustrated in Figure 4.5.

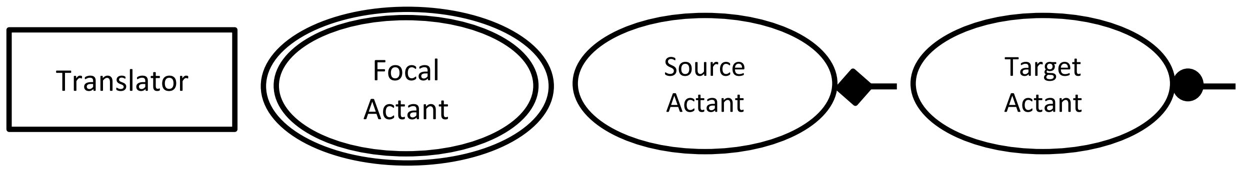

Figure 4.5: Graphical syntax of an actor-network

ANT allows aspects of the feasibility process to be explored through the examination of how the network of connections is built between actants to govern the feasibility process, where objectives of giving and receiving correct advice in terms of financial feasibility of a proposed construction project are met. If the various enrolled actants remain in position, creating a stable network, the goal to deliver and receive correct advice in terms of financial feasibility of a proposed construction project can be achieved. Furthermore, by investigating the translation process and actor-network of the feasibility process, the shortcomings (in terms of unidentified actants and actants that betray their roles causing mobilisation of the actor-network to fail), can be identified. The rationale of using ANT as an analytical tool is twofold. First, to understand the network revolving around the feasibility process, and second, to identify issues in the network that destabilise the network.

The analysis is conducted through the ANT framework and the graphical syntax is used to interpret and demonstrate the actor-network. The syntax uses symbols to present an actant's state as well as the relationships within the network. This allows for the descriptions of relationships within the network, while graphically depicted.

The first study in financial communication in accounting that made use of ANT was done by Robson (1991); after this, various financial communication studies made use of ANT, such as Kelmendi and Gicic (2020), to guide their enquiry (O'Connell *et al.*, 2011). ANT is used to explain how networks of actants are built to support claims to specific knowledge by those who use accounting reports in an effort to persuade influence (Mouritsen, Larsen and Bukh, 2001). The construction industry first made use of the ANT in 2001 (Rohracher, 2001) and thereafter started making use of ANT in the literature. Some of the latest studies that were done, which are similar to this study, and which made use of the ANT are:

- "*Visualising accounting: an interdisciplinary review and synthesis*", which deals with the design of financial documents using ANT (Davison, 2015).
- "*The struggle to fabricate accounting narrative obfuscation*", which entails readability and the actor's interests (Rutherford, 2016).
- "*Beyond Numbers: How investment managers accommodate societal issues in financial decisions*", which revolves around financial communication and investment decisions (Arjaliès and Bansal, 2018).

In light of the similar studies that made use of the ANT, it is argued that ANT is an acceptable analysis method to underpin this study.

4.5.8 Trustworthiness, validity and reliability

Qualitative methods have a slightly different approach to validity and reliability than quantitative methods, and lean more towards trustworthiness (Rose and Johnson, 2020).

All approaches to achieve validity are not necessarily applicable to all qualitative studies, and where the study lies on the paradigmatic continuum will influence what constitutes a quality or trustworthy study (Rose and Johnson, 2020). The following methods were deemed necessary to achieve validity for this study and were therefore implemented: rich, thick description; peer debriefing; audit trail (Rose and Johnson, 2020); reflection (Saunders *et al.*, 2016), and sampling sufficiency (Morse *et al.*, 2002).

A rich, thick description of the data and analysis was done by means of comprehensive participant quotes in Chapters 5 and 6, and a detailed description of the analysis method was provided earlier in this chapter. A peer debriefing was obtained by the feedback received from the supervisors of this study and incorporated. An audit trail was created by including the questions prepared for the interviews in section 4.5.4, the transcripts accompanying this thesis, and a detailed explanation of the research techniques undertaken. Reflection was practised by discussing ideas, findings and theme development with a person independent of the study.

Furthermore, validly was obtained by means of sampling sufficiency and saturation (Morse *et al.*, 2002). First, the sample size of both target populations was 23, where Saunders *et al.* (2016) recommend between five and 25 and Marshall *et al.* (2013) recommend the sample size to be between 15 and 30. Second, the interviewees were experts and knowledgeable in the field, as confirmed in the verification questions, and illustrated in sections 5.1 and 6.1. This supported the collection of optimal quality data. Lastly, saturation was achieved.

Saturation is reached when nothing new is added (Marshall *et al.*, 2013); in other words, no new codes emerged from the transcriptions. The saturation is illustrated through bar graphs for both interview samples. Figure 4.6 depicts the saturation of the codes of the QS interviews. Only 18 of the 23 QS interviews yielded new codes.

Figure 4.7 portrays the saturation of the developer interviews and indicates that 20 of the 23 developer interviews yielded new codes, while the last few interviews did not yield any new information. Hence, saturation was achieved for both sample sizes.

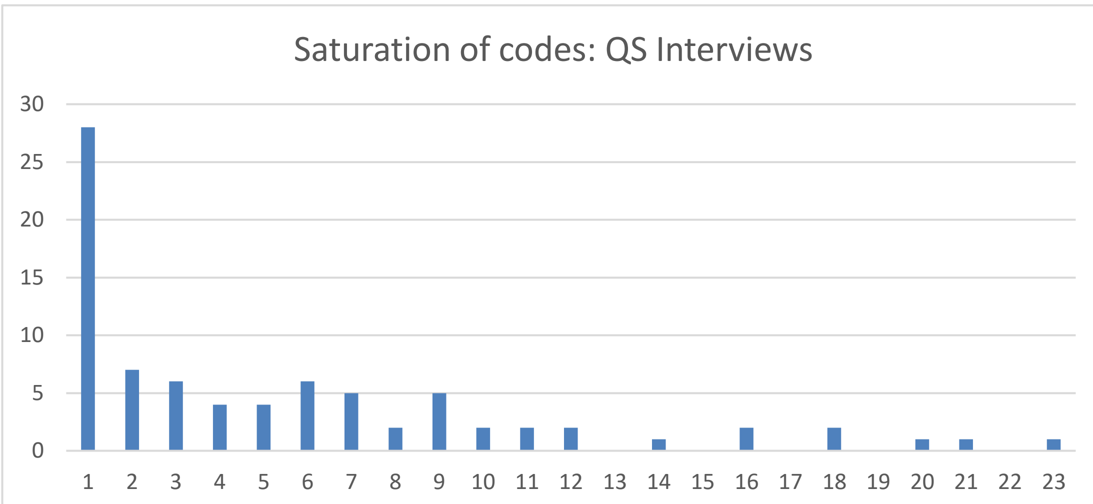

Figure 4.6: Saturation of codes: QS Interviews

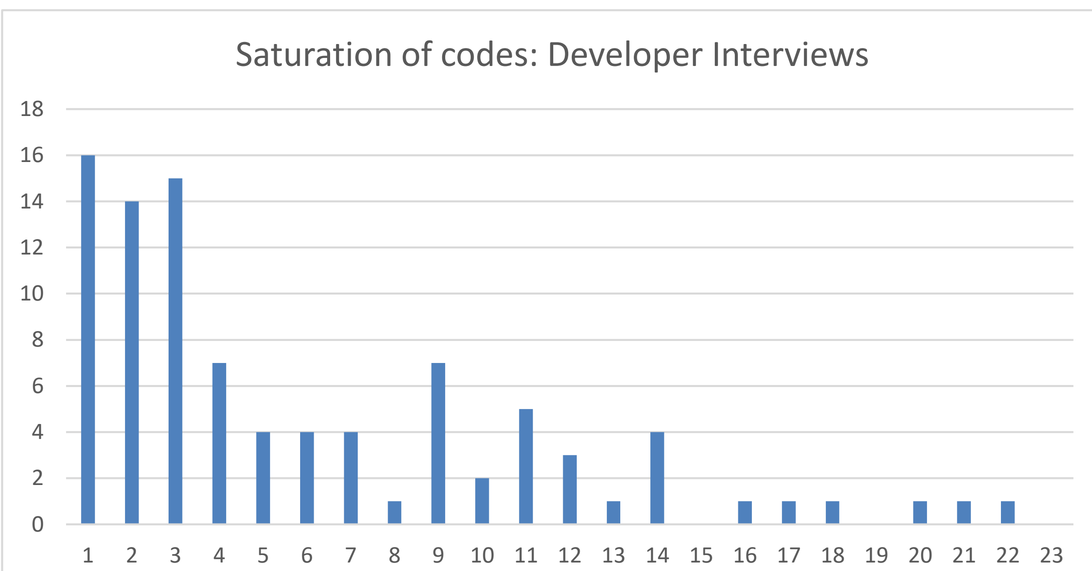

Figure 4.7: Saturation of codes: Developer Interviews

Member checking is often reported to enhance the credibility and validity of qualitative research; however, Thomas (2017) found no evidence that member checks improve research quality, where the purpose of the research is to develop theory. Furthermore, Thomas (2017) found that member checking is prone to issues such as lack of response from members, intruding further on participants, and little or no substantive changes in the research findings, deeming the member checking irrelevant. Hence, this study did not make use of member checking.

Reliability deals with the ability to repeat similar results when applied to a similar situation, and is threatened by participant bias, researcher bias and error (Saunders *et al.*, 2016). Rose and Johnson (2020), however, explicitly expressed that subjectivity and reflexivity are vital to qualitative research. Additionally, they stated that while subjectivity and reflexivity mean that duplicability or repeatability is unlikely, it is in fact a strength of qualitative research. Different researchers providing a different analysis may provide different insight, which is necessary to understand a particular phenomenon better (Rose and Johnson, 2020). In agreement with the above, the qualitative analysis of the interview data followed a reflexive thematic analysis, where the coding process was unstructured. Therefore, no codebook or code framework was followed, as discussed under section 4.5.6.1. The subjectivity and reflexivity of the researcher during the analysis of the interview data unavoidably contribute to researcher bias; however, researcher bias during data collection (interviews), participant bias and errors, were purposefully avoided.

Interviewer/researcher bias during the interviews was avoided by asking short, clear and neutral questions. The interviewer talked as little as possible and listened attentively to avoid driving the conversation in a biased direction. Participant bias was avoided by ensuring participant anonymity; utilising non-obtrusive approaches in the data collection; formulating clear semi-structured questions that were consistently posed to all participants (as consistency is key to reliability); allowing the participant to choose a convenient time for the interview to avoid rushing the answers, and by providing a clear account on the analysis procedures (all as recommended by Saunders *et al.* (2016)).

Additionally, a pilot study was done where the prepared interview questions were asked with the main goal to receive feedback on the clarity of the questions and to compare the answers to the intended feedback. Any ambiguity was addressed, questions were improved to be clearer and more concise, and to address the intended feedback. This ensured that the interviewees understood the questions well and as intended, while avoiding misunderstandings and errors during the interviews. Errors during transcriptions were minimised by using the Otter.ai software program. The software first transcribed it, then the researcher went through the entire transcription to address any mistakes.

The document analysis was predominantly a quantitative analysis of qualitative data: a quantitative content analysis. To counter the issue of biases of the analyser/researcher, a codebook (Table 4.5) was developed to make replicability possible and the data preparation and analysis are explained in detail in section 4.5.6.2. The codebook includes the code, a long definition, as well as when to use the code. Since this is a thesis, the coding was done by the researcher only. To ensure clarity of the definitions, the researcher did the same analysis twice, but six months apart. If any discrepancies arose during the second time of the analysis, the definition was revisited and improved to increase clarity and replicability. Discrepancies only occurred at five of the 53 codes. By using the percentage agreement formula, the reliability can be tested (Rose *et al.*, 2015):

Equation 7: Percentage agreement formula

$$PA = \frac{A}{n} x\ 100$$

Where PA = percentage agreement

A = number of agreements

n = number of segments coded

Equation 8: Percentage agreement calculation

$$PA = \frac{48}{53} x\ 100 = 90.57\%$$

According to Rose *et al.* (2015), it is unclear what constitutes an acceptable level of agreement. However, Neuendorf (2002), cited in Rose *et al.* (2015), suggests that a score above 80% would be acceptable. The score calculated in Equation 8 is 90.57%, and therefore the inter-rater reliability of the codebook tabulated in Table 4.5 is deemed reliable.

4.5.9 Ethical risks and mitigation strategies

Various ethical issues arise when interviewing professionals in the field. These issues include voluntary participation and informed consent, autonomy of participants, confidentiality, anonymity, research transparency and trust, and potential harms (Zapata-Barrero and Yalaz, 2020). Voluntary participation and informed consent were addressed, first by compiling an information sheet that explained the essence of the study, what was expected from participants, and how the data would be used and stored. Additionally, a consent form was created to obtain written consent from willing participants. Both these forms were submitted to the University's Ethics Committee and gained approval. Second, potential participants were approached and informed about the study and its procedures, by means of the information sheet. They were then asked if they were willing to participate, while being reminded that participation was voluntary and choosing not to participate would hold no risk for them. This approach ensured voluntary participation with informed consent.

The information given to the participants regarding the study, and for what the data would be used, was truthful and checked by the supervisors and Ethics Committee. The participants were also given the opportunity to ask any questions they had regarding the study, creating a transparent environment.

Autonomy of participants was practised by making sure they participated voluntarily and receiving written consent from them before the interview. Then, the date, time and platform of the interview were determined by the interviewee. Additionally, participants were made aware that they could opt out at time they chose, at no risk to them. Lastly, participants could refuse to answer any question they preferred not to answer.

Confidentiality was obtained by not disclosing the identities of the participants and not disseminating specific data that would help identify the participants, while the collected data (recordings) was stored on a password-protected laptop used only by the researcher. Anonymity of the participants was practised by assigning pseudonyms, for example Q1, Q2–Q23 and D1, D2–D23. During the verbatim transcription of the interviews (done by the researcher alone), any identifying information that was mentioned by the interviewee was transcribed by using placeholders, for example ‘xxx’. The transcribed files were given the pseudonym as the file name. Hence, the transcriptions have no identifying information about the participants. The verbatim transcriptions of the recordings allowed for the recordings to be deleted permanently. The target populations of both quantity surveyors and developers are large enough that the information provided by the small sample size in terms of their experience in the industry, will not disclose their identities unintentionally.

An additional risk to interviews is the potential harm that questions can inflict on participants. Due to the nature of this study, professionals were interviewed regarding their professional experience in the construction industry. The questions asked were thus not personal in nature nor related to any traumatic past events. The questions were asked respectfully and remained strictly related to their professional experience and opinions, avoiding any questions that could harm them in any way.

The collection of the documents required a slightly different approach. Due to the sensitivity of the documents and inherent information accompanying it, the custodians first received an information sheet, followed by a consent form. The information sheet informed the custodian that the feasibility document to be collected did not require any company logos, building names, client names, or any other identifying information to be included. Additionally, the document could be in PDF format, as no background calculations are necessary for this study. These aspects were communicated clearly to increase the willingness of custodians to share their feasibility documents for analysis. The received documents were all soft copies and kept on a password-protected laptop used only by the researcher. While some of the received copies did contain identifying information as well as background calculations, these were ignored to adhere to the ethical procedures. Furthermore, it was promised that the actual feasibility or snapshots of the feasibility would not appear in the report. To adhere to this, the sections, main headings and sub-headings of each feasibility were extracted and listed in the order they appeared, and included as Annexure A. This became the raw data and basis for coding.

4.5.10 Limitations and mitigation strategies

Each study is bound by limitations. Literature on feasibilities in quantity surveying practice, specifically, is limited. Therefore, a systematic literature review was conducted (including grey literature), to gather as many studies as possible. The geographical limitation for the empirical part of this thesis is South Africa; however, the systematic literature review includes international studies to ensure an international perspective. Additionally, the small sample sizes of qualitative data (23 QS interviews, 23 developer interviews and 18 feasibilities) infringes on generalisability of this study. In light of this, the QS-sample represents QSs across all major metropolitan areas of South Africa (presented in Figure 5.3) and the developer-sample represents developers from company with various sizes (presented in Figure 6.2) to increase generalisability.

4.6 SUMMARY OF THE CHAPTER

This chapter has explained the methodology adopted for this research project. It has established the philosophical stance and the research paradigm that supports this quest for new knowledge regarding financial feasibility studies. A pragmatic view and abductive approach was employed with a fully mixed sequential dominant status design. The research instruments include semi-structured interviews with two distinct samples as well as a document analysis. The analytical and theoretical framework is the Actor-Network Theory. The validity, reliability, ethical risks and limitations are also covered. The next chapter discusses the interviews from the QS sample.

CHAPTER 5: ANALYSIS AND DISCUSSION OF THE QS INTERVIEWS

Using the ANT as an analytical framework, this chapter presents an account of actants that form part of the feasibility study process. The quantity surveyors' perspectives are discussed in this section. For phase one of the research design, a qualitative approach was taken. Participants were interviewed individually by means of semi-structured interviews. The chapter begins with the demographic analysis of the participants in the QS profession.

5.1 DEMOGRAPHIC ANALYSIS: INTERVIEWS WITH QUANTITY SURVEYORS

After 43 suitable quantity surveyors were approached, a total of 23 agreed to be interviewed, giving a 53.49% success rate. The demographic details of this sample group are illustrated in Figure 5.1. The male versus female distribution is on the left, and the professional registered quantity surveyors versus the unregistered quantity surveyors are on the right.

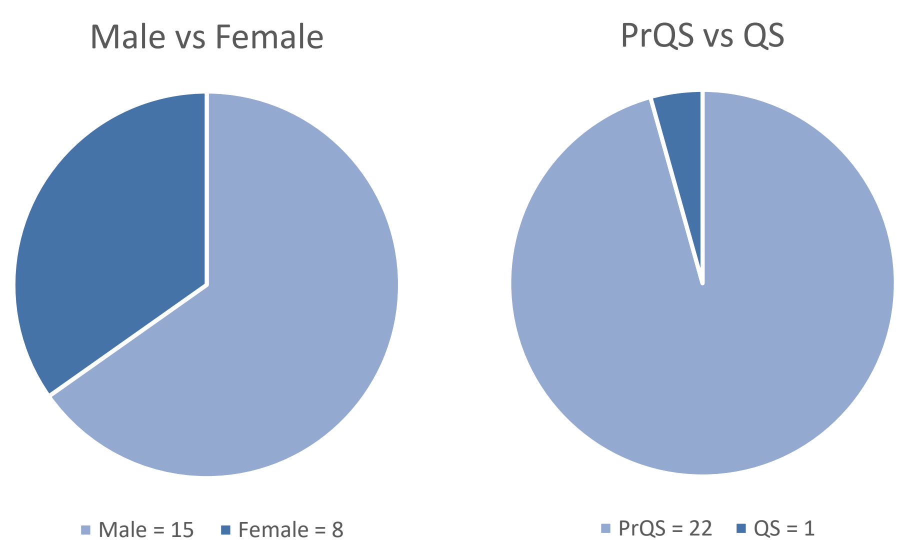

Figure 5.1: QS Interviews – Pie charts indicating the male vs female distribution and PrQS vs QS distribution

A total of 15 males and eight female quantity surveyors formed part of this study, while only one of the participants did not hold professional quantity surveyor status. This particular quantity surveyor, however, specialises in retail feasibility studies and is therefore deemed appropriate for this study. Figure 5.2 designates a participant's roles at the company for which they work on the left, and the pie chart on the right indicates the amount of experience each participant has. Nine of the participants are either the founder of the company and/or the sole owner; four participants are in an upper-management position, three are associates of a company, six are senior quantity surveyors (which includes the role of mentor), and only one participant's role is limited to a junior quantity surveying role.

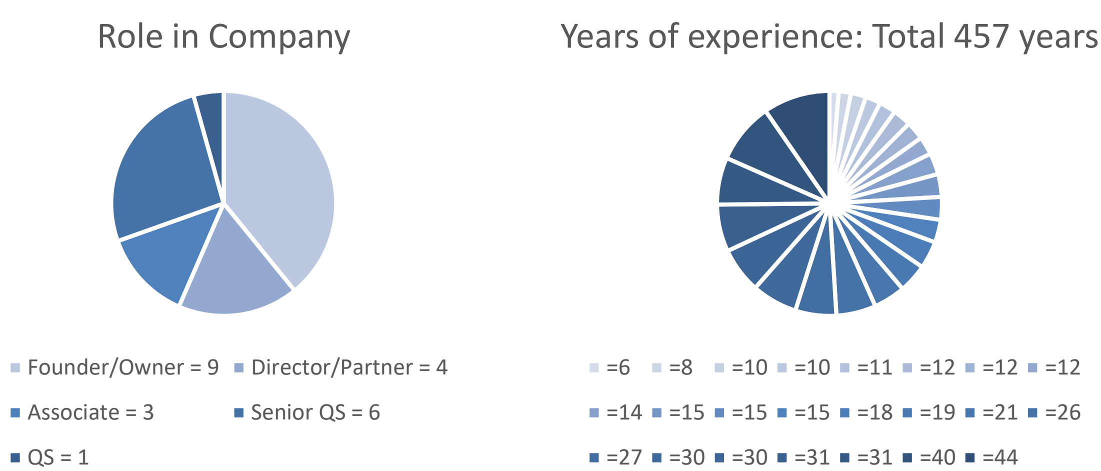

Figure 5.2: QS Interviews – Pie charts indicating the participants' roles in the company and their years of experience

The junior quantity surveyor, however, has six years of experience as a quantity surveyor, and eight of the participants have more than 25 years' experience in the industry. The total amount of experience among the participants is 457 years.

Figure 5.4 is a pie chart indicating the geographical distribution of the participants.

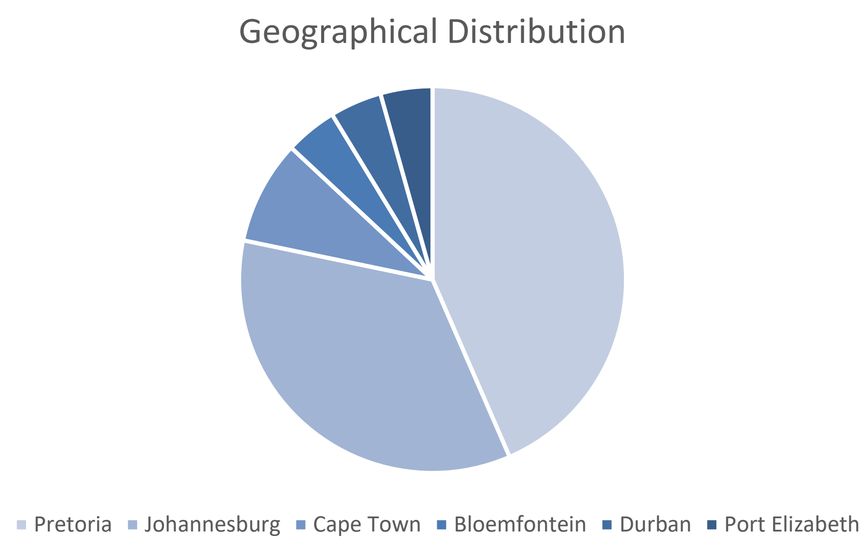

Figure 5.4: QS Interviews – Geographical distribution

The participants represent all the major metropolitans in South Africa, including Pretoria, Johannesburg, Cape Town, Bloemfontein, Durban and Port Elizabeth. Figure 5.3 is a map of South Africa displaying the six metropolitan areas represented by the participants. As seen in Figure 5.3, the sample of quantity surveyors adequately represents South Africa. Generalising the findings nationally is thus acceptable.

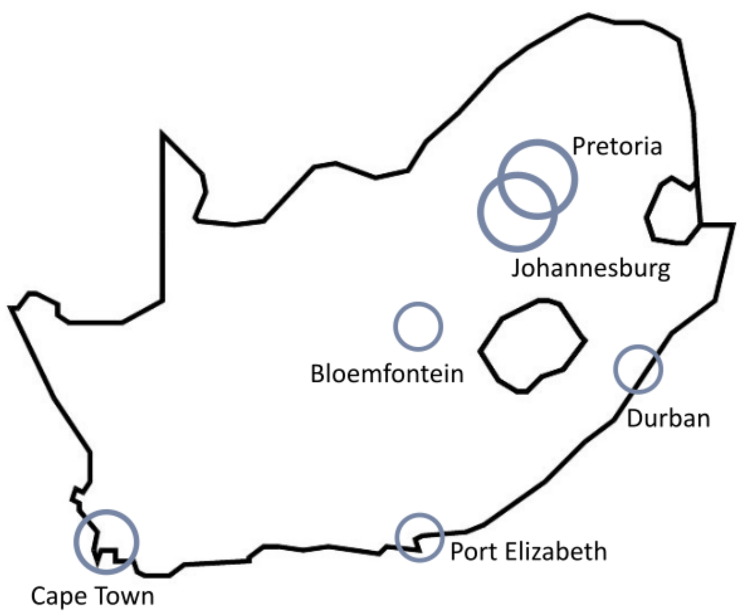

Figure 5.3: QS Interviews: Map of South Africa indicating the major metropolitan areas represented by the participants

5.2 Introducing the Sections

The interviews with the quantity surveyors are divided into three main sections. Figure 5.5 indicates section one of the qualitative component; Figure 5.6 shows section two, and Figure 5.7 indicates section three of the quantity surveying interviews. These sections are categorised according to the overarching themes.

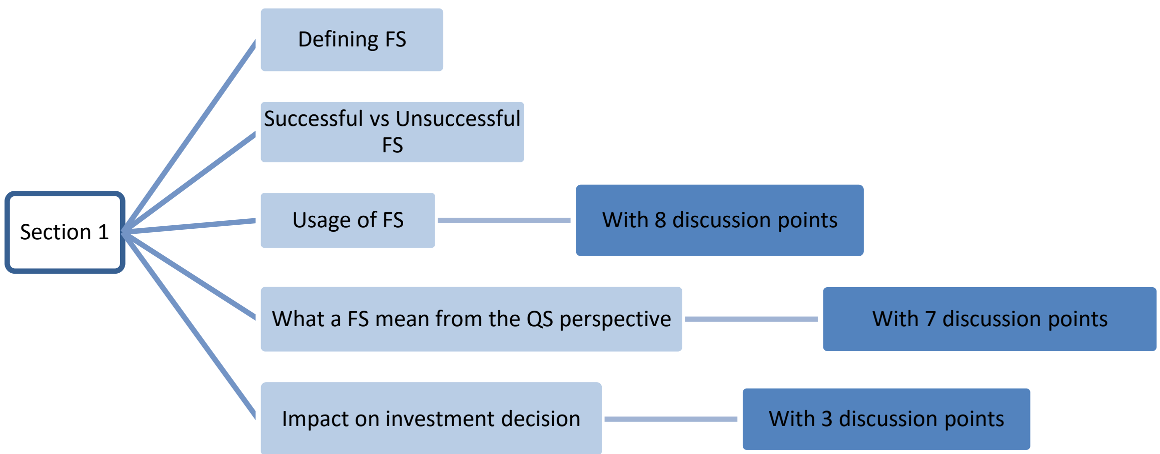

Figure 5.5: Depiction of section one's selected concepts

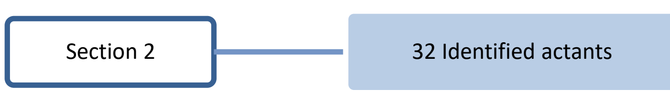

Figure 5.6: Depiction of section two's selected concepts

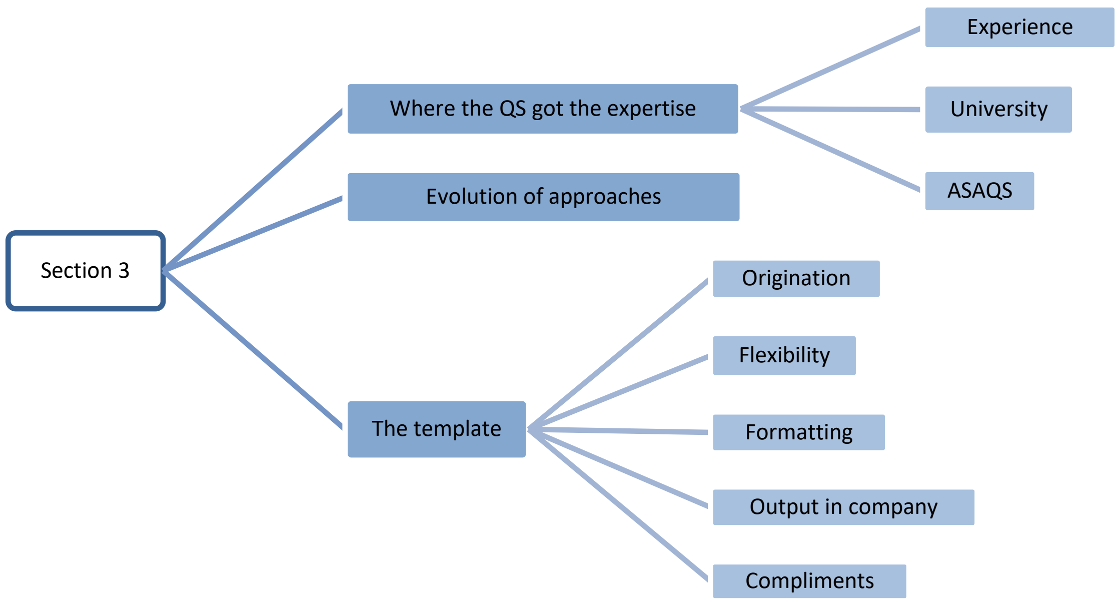

Figure 5.7: Depiction of section three's selected concepts

5.3 Section 1: The Role of the Feasibility Study from the QS's Perspective

Section one dealt with the role of the feasibility study from the quantity surveyor's perspective and the underlying meaning thereof. The aim of section one is to address the QS perspective of the sub-question: What role does a feasibility study play as an artefact from various perspectives? Five considerations arose from the thematic analysis. The findings of Section one are set out as follows:

- Defining a financial feasibility study as per quantity surveyors (5.3.1)
- Successful versus unsuccessful feasibility studies (5.3.2)
- Usage of feasibility studies (5.3.3)
- The underlying meaning of feasibility studies to quantity surveyors (5.3.4)
- The impact on investment decisions (5.3.5)

The transcripts are labelled per QS participant using the following labels: Q01, Q02, up to Q23 for the 23 transcripts/participants. These references used in the following sections refer to the transcripts and therefore a specific participant.

5.3.1 Defining a financial feasibility study as per quantity surveyors

While various definitions of feasibility studies exist (Basak, 2006; Banda, 2017), ample input from quantity surveyors themselves could contribute to an all-encompassing definition. The participants emphasised that a feasibility study ultimately determines if the project is feasible, profitable and worth the investment. It is further explained thus:

> *"Is the sizing of the development correct for burying all of the costs and what return is he looking at from a financial investment point of view, is it worth his while? Should he proceed with this project or should he just can it?" (Q01)*
>
> *"A feasibility study is the financial aspect of expenditure versus income that a client would utilize as a benchmark or as a tool to determine whether a project is worth pursuing or not." (Q02)*
>
> *"It is a tool that defines the project. That document, which is a tool for a client or a banking institution to use to understand the feasibility of a project in terms of return, cost, rentals and that sort of stuff." (Q07)*
>
> *"It's one of the first steps in any construction development. My opinion, the most important step, determining whether a project is feasible, whether to pursue that project going further with it, drilling into it in more detail." (Q10)*
>
> *"It's just a set of numbers that show whether the project that you're looking at will make sense for the client, will it make him money in the short term, in the long term and over the complete lifecycle of the project." (Q13)*
>
> *"It is to tell your client, whether the project he's embarking on is going to be feasible." (Q14)*
>
> *"So your feasibility would ... it tells you how feasible your investment is." (Q17)*
>
> *"In a nutshell, it's to understand whether this project is going to be profitable or not." (Q19)*

"It's a kind of a tool to assess the goals of the client's investment." (Q20)

Participants indicated that a feasibility study is there to provide clarity on the profitability by means of calculating the expected return on investment. The feasibility study comprises all the expenses incurred to obtain the land, construct the building, the potential income, and the expected operating costs. With all the applicable information, the return on investment in terms of the yield or IRR is calculated:

> *"It's to work out initially the cost to build the building because that's where we are the experts as QSs from drawings. And then you then do the other side of the equation, which is the money in so the cost is the money out. And then you also do the buildings and then you do the land if you sometimes you get involved in land cost, to buy the land or to buy the existing building and then you also get involved in the interest during construction and the bank charges and other general costs that might apply not just the building cost and professional fees. ...when the building is finished, you start either selling it on so it could be a sell on situation and you get a return. Or it could be a rental situation, where you get a monthly rental and then you have an overall rate of return, the first year or you have the internal rate of return, you know, so you do the actual return that's that makes the project viable." (Q05)*
>
> *"So a feasibility study is the income stream divided by the development cost." (Q09)*
>
> *"Feasibility study is normally you always compare like IRR or payback period or net present value or return on investment. And always the first year return, this is only five major method. But if you purchase property is they normally it's just the Compare very simple like to compare the net income minus capital cost and see what that percentage is. But is a few times is when they if they want to rent out you need to really look at is what the payback period, net present value, IRR all that things." (Q22)*

Participants Q03, Q04, Q08, Q14, and Q17 shared the above sentiment. Additionally, a participant explicitly stated that a feasibility study is not just about the yield:

> *"It's not just about that yield. It's about the cash flow. How long before you break even? What happens if you're going to sell, what is the buyer looking at? All the equity, cash flow, all of the funding and the gearing, How is it being geared?" (Q12)*

A participant mentioned that the feasibility study firstly provides guidance with regards to the price worth paying for the land (Q01):

> *"Is the price for the land sufficient?" (Q01)*

The interviews indicated that emphasis is placed on different aspects of the function of a feasibility study, and an all-encompassing definition could be beneficial.

5.3.2 Successful versus unsuccessful feasibility studies

Drawn from the literature, a feasibility study is a critical element for the success of a project and projects can fail due to incorrect facts or assumptions (Mukherjee and Roy, 2017). According to Bettini *et al.* (2016), a 4% margin of error is acceptable. For a hotel development to be deemed feasible, the NPV needs to be larger than zero, the PP needs to be less than 10 years, and the IRR needs to be more than the interest provided by banks (Sudhana, 2016). The participants commented on what they deem a successful or an unsuccessful feasibility study to be. Many participants emphasised that the parameters of a successful feasibility study change with each client, depending on what return they expect:

> *"A successful feasible feasibility study depends on what the client wants at the end of the day, if it is a short-term investment. It depends on what return he would want to see within that short term. And would he want to be able to sell it within the first five years at a certain rate or cap rate, then yes, then that feasibility in that sense would make would be sufficient for him and successful*

for him. But if you are, for example, a pension fund, then your returns would look completely different. You don't want to sell it off. So, in that sense, it would be completely different tick boxes that they would look at. And they would rather look at what how is this thing growing over the expense of 10 to 15 years, is that sufficient or no? It's not working. So, it completely in my view, depends on what the client wants. What's successful for the one is completely you know unacceptable for the next." (Q01)

"…understanding the minimum return requirements from the client." (Q02)

"I think that my answer would differ depending on the client. So, the client, and some is searching for a specific rate of return. And some doesn't necessarily look at the first year of return but looking at maybe selling the asset in a few years that we don't necessarily deal with a lot. But a successful feasibility is where that rate of return exceeds what the client would have invested in something else." (Q04)

The above quotes resonated with what Q08, Q10, Q14, Q15, Q18 said. A few participants indicated that a feasibility is only deemed successful once the project is finished and done, so within the constraints of the study or with a better yield:

"I feel ... a feasibility study is only proven successful at the end of the project because it's all about the cost anyway. If the yield is at the end of the project less than initially anticipated, then it was definitely not as successful feasibilities study, because it was wrong at the end" (Q02)

"I would say from a QS point of view, if you set the estimated capital cost and you've find that after two years when the project's finished and it is handed over, and you analyse the costs, and you find that you are within 10%, I would say, you know, 5%, up and down." (Q05)

"I would say on your yield, obviously, anything better than what you've estimated is good." (Q10)

Participants Q18 and Q19 gave the same view as the QSs in the aforementioned quotes. Other participants stressed that the success of the study is related to the yield, where the return needs to be better than inflation, cost of money and other investment opportunities:

"The Return needs to be more than inflation obviously, but it also needs to be better than other investments, otherwise the client can just take his money and invest it in another place." (Q03)

"Currently, if you can show a return of 9% plus." (Q21)

These opinions were shared by Q06, Q09 and Q17. Additionally, some participants mentioned that the success of a study is dependent on accuracy, honesty, and the portrayal of realistic numbers:

"We need to be pretty accurate in terms of our feasibility studies. And it's all good and well making a feasibility work from a financial point of view. But it's got to be realistic." (Q06)

"An accurate feasibility study." (Q09)

"An honest one." (Q11)

"Successful study is one that gives the correct answers. The study must be truthful." (Q13)

The comprehensiveness of a feasibility is directly related to the accuracy:

"A feasibility study it got to encompass many things. So, it's got to, it's got a work for us, it's got to work for the client, it's got to work for the team. So, you're going to bring all assets in together because it can't just be one sided.

So, it's got to be something that's based on a product that the client is happy with." (Q07)

"A successful feasibility study, I think it's something that's comprehensive, shows all the income expenditures, covers all the costs, and shows exactly what you can expect when, when the project's done." (Q23)

It was also mentioned that a feasibility study that gets a project off the ground is a successful one:

"It's successful when we get to a point that we can turn a paper exercise into a real project." (Q12)

Furthermore, a feasibility's success is dependent on the tenants paying rent as well as securing interest at the estimated rate:

"Once you finish that project, and that end result and that final account talks to that feasibility, and the clients got his tenant getting his income, and the funds were secured at that interest rate, then that's a win for everybody." (Q07)

From the feedback received, it is clear that quantity surveyors have different perspectives when it comes to what constitutes a successful or unsuccessful feasibility study.

5.3.3 Usage of feasibility studies

The literature indicated that feasibility studies have various other important uses, which include setting up a budget and cash flow predictions in order to carry out effective cost control; apply value engineering; assist in the incorporation of modern technology in construction projects; preparing and negotiating contracts; setting procurement dates; have a quality management system in place, and to develop a sound financial turnover mechanism (Anees *et al.*, 2018). In the interviews, eight factors that affect the need for feasibility studies appeared:

- Secure income (5.3.3.1)
- Tool to advise and make decisions on (5.3.3.2)
- Value engineering (5.3.3.3)
- For negotiation of professional fees (5.3.3.4)
- Sensitivity analysis (5.3.3.5)
- Acquiring financing (5.3.3.6)
- Budget (5.3.3.7)
- Management tool (5.3.3.8)

5.3.3.1 Secure income

The first identified usage of feasibility studies in the interviews relates to how quantity surveyors are dependent on feasibility studies to, first and foremost, secure income as a quantity surveyor:

> *"Obviously, you want it to work, because that will give you the work." (Q03)*

> *"…and generally when it comes to securing income." (Q06)*

5.3.3.2 Tool to advise and make decisions on

The second usage that appeared in the interviews refers to using it as a tool from which to give advice and which serves as basis to make decisions from:

> *"So that's basically it's a decision-making tool at the end of the day for an investor property development developer or a property investor." (Q01)*

> *"So, for a QS, the feasibility study would be the ultimate tool, to be able to advise the client and the team, because the team also invest a lot of effort into the project." (Q02)*

Participants Q06 and Q22 shared the same opinions as per above.

5.3.3.3 Value engineering

A feasibility forms the basis for value engineering (Anees *et al.*, 2018). A participant advocated for the same view:

"And the tool with the feasibility study is that afterwards you can suggest changes to the design to make it either more profitable or more cost effective, which will increase rates of return and profit." (Q18)

5.3.3.4 Negotiation of professional fees

Moreover, the negotiations of the fees of the professional team could stem from the feasibility study, as supported by Q10 and Q18:

"You will also do a fee split in a feasibility study, determining who gets what percentage of the fee package on the scheme…" (Q10)

5.3.3.5 Sensitivity analysis

Additionally, a feasibility study forms the basis of a sensitivity analysis:

"Another thing that you can develop from a feasibility is what-if situations and sensitivity analysis." (Q05)

5.3.3.6 Acquiring financing

To acquire financing (Kimaru, 2018). A few participants emphasised how important a feasibility study is in the acquisition of financing:

"…which becomes a very important document. Firstly, to ensure profitability, the profitability, and then it also use it as a marketing tool when you're looking for finance." (Q19)

Participant Q07, Q09 and Q10 emphasised this usage as well.

5.3.3.7 Budget

A crucial factor that affects the need for a feasibility is the need to produce an efficient budget (Anees *et al.*, 2018; Kimaru, 2018; Willemse, 2019). Participants Q10, Q13, Q14 and Q15 also indicated that the feasibility study is important as it becomes the set budget for the construction project:

> *"The feasibility would be your baseline budget and you'd always report against that going forward, and the success of the project is also measured against your base budget, base approved feasibility." (Q10)*

5.3.3.8 Management tool

The feasibility serves as governance and timing tool for projects (Willemse, 2019), and is a core cost-management tool (Perera *et al.*, 2016). The eighth and final usage identified during the analysis is a valued cost management tool:

> *"But my private clients mostly wants a return and it's the most important management tool." (Q21)*

5.3.4 The underlying meaning of feasibility studies to quantity surveyors

The literature depicted that a feasibility study is a tool that supports risky investment decisions, especially the decision whether to invest in a construction project or not (Halil, Nasir, Hassan and Shukur, 2016). The risk in this instance lies with the developer (Azhar *et al.*, 2012). However, this discussion point aims to understand the underlying meaning of feasibility studies to quantity surveyors. This could contribute to understanding the risks that the quantity surveyors face with the same feasibility study. The analysis presented seven underlying meanings to quantity surveyors:

- Earlier involvement (5.3.4.1)
- Getting projects off the ground to earn an income (5.3.4.2)
- A quantity surveyor's output (5.3.4.3)
- High reward (5.3.4.4)
- Success of QS firms (5.3.4.5)
- Reputation (5.3.4.6)
- Creation of a specialist field (5.3.4.7)

5.3.4.1 Earlier involvement

The interviewees mentioned that quantity surveyors are becoming involved much earlier in projects, due to the facilitation of feasibility studies:

> *"I am finding over the years, it's become more and more powerful tool and more and more important, and QSs are being called in at earlier stages in the projects." (Q05)*

This is in contrast to traditional practice, when quantity surveyors would join the team after the architects or even be referred by an architect (Q08).

5.3.4.2 Getting projects off the ground to earn an income

Literature indicates that one of the main aims of feasibilities is to get a project started (Lock, 2020), but also because it enhances future employment opportunities for QSs (Syed Alwee *et al.*, 2019). A significant amount of emphasis was set on getting projects off the ground (Q01, Q03, Q04, Q12, Q13, Q14, Q15, Q23), since an income stream for quantity surveyors is only generated once construction commences (Q08, Q09, Q17, Q18, Q20, Q21, Q23):

> *"It means new work." (Q08)*

> *"So that's a big part of how we would get projects off the road." (Q12)*

> *"A big door into potential new clients or getting projects off the ground that you can eventually earn fees on." (Q23)*

Participants, however, warned against creating jobs at the expense of honest advice:

> *"…and we've got to give the right advice, not to make a nice job for ourselves. We might lose a job or giving them the wrong advice, but we'll save somebody's livelihood and hopefully there'll be another opportunity to deal with them" (Q06)*

5.3.4.3 A quantity surveyor's output

A feasibility study and cost reports are among the few visible outputs that a quantity surveyor has, since they do not have a designing role:

> *"The other thing about a QS, the only thing you really have to show to a developer is a feasibility study and a cost report. That's the only thing they'll ever see from you beside your face in a meeting. So, you want to keep it very, very professional. There's no room for mistakes." (Q10)*

5.3.4.4 High reward

A noteworthy underlying meaning identified is the high reward that quantity surveyors feel when executing feasibility studies:

> *"It's damn hard. But it's rewarding because it's a document that's highly regarded by the client and financial institutions." (Q07)*

> *"I think we love doing them as QSs because ultimately, you feel that you have a sense of accomplishment. It's quite awesome to be doing them. But they are hard, really hard." (Q08)*

> *"The feasibility is actually... that's actually the only thing I enjoy out of quantity surveying. So, we will take the architects imagination, and we will make it work." (Q14)*

5.3.4.5 Success of QS firms

In the interviews, the feasibility study is often referred to as "the be all and end all" of projects. Hence, the success of a quantity surveying firm is heavily reliant on it:

> *"So it's a Bible that we got to refer back to from the start to the end." (Q07)*

> *"…you can't really do a project without it." (Q13)*

> *"So that's the be all and end all of a project." (Q17)*

"So feasibility in the QS firm is 90% of your company's success. It is critical." (Q17)

"It's the most important part of that entire ...of the firm. The feasibility study is the crux of everything." (Q21)

The participants made it clear that a feasibility is critical to both projects as well as QS firms.

5.3.4.6 Reputation

Furthermore, the success of a quantity surveying firm is subject to their reputation (Q02, Q03, Q05, Q09, Q16, and Q18). The feasibility study, seems to be the centre point of the same:

"The feasibility study is also linked to the reputation of the QS." (Q02)

Ultimately, a good feasibility means more projects (Q03, Q05, Q9, and Q18) and a faulty feasibility could be the end of your business relationship with a client, as well as a threat to possible future jobs (Q03, Q05 and Q16).

5.3.4.7 Creation of a specialist field

Lastly, the feasibility study and the expertise around it create a specialist field for quantity surveyors, as well as the opportunity to rise in the field of QS. Not all quantity surveyors are equipped to compile feasibility studies:

"On the commercial side as a company we don't do many feasibilities at all." (Q11)

"I don't think feasibilities is a typical QS function. I think feasibilities is always a very specialised field." (Q16)

From the interviews, it became clear that not all QSs have experience in doing feasibilities and it is regarded as rather a specialist field.

5.3.5 The impact on investment decisions

As found in the literature, the feasibility study ultimately supports the decision to proceed or not with a project idea (Banda, 2017). The qualitative component explores the full impact that feasibility studies have on the investment decision. The findings relate to three aspects:

- The decision to proceed (5.3.5.1)
- Clarity on the type of project (5.3.5.2)
- In support of emotional or prior decisions/beliefs (5.3.5.3)

5.3.5.1 The decision to proceed

A feasibility is used to demonstrate the financial viability and to recommend whether to proceed with an investment or not (Mackenzie and Cusworth, 2007; Heralova, 2017; Lock, 2020). In support of the literature, multiple participants underlined that the main role of the feasibility study is to support the decision whether to proceed with the project idea or not (Q02, Q04, Q05, Q07, Q08, Q18, and Q21):

> *"So it's things that the client uses to make his decision on new developments. Without that, you can't decide whether to go ahead or not." (Q07)*

5.3.5.2 Clarity on the type of project

Furthermore, the analysis brought forth that the feasibility study also guides the decision on how to proceed (Lock, 2020) with the development regarding the type of building to erect:

> *"It's also what type of investments they look at." (Q08)*

> *"So our role is not to tell a client, it's not going to work, it is to tell the client, how it's going to work. You can say the design is not going to work, but you make it work, you must do X, Y and Z. That's our job." (Q14)*

5.3.5.3 In support of emotional or prior decisions/beliefs

Moreover, the feasibility study sometimes becomes a confirmation exercise, rather than guiding decisions (Q03, Q13, and Q18):

> *"It should have a significant impact. Unfortunately, sometimes clients build with their hearts, if you like, they take emotional decisions." (Q13)*

> *"A lot of times, clients will know that this project is potentially a slam dunk. And the feasibility study just confirms it." (Q18)*

5.4 SECTION 2: IDENTIFYING ACTANTS

Using the Actor-Network Theory as an analytical framework, this section reports on the identified actants in the feasibility study process. The participants were not explicitly asked to elaborate on actants, but rather to explain how they go about preparing a feasibility study. The detailed content analysis of the interviews presented 32 actants:

5.4.1 QSs area of expertise

Highly qualified professionals have a significant impact on feasibilities (Salman *et al.*, 2007; Lim *et al.*, 2016). The first identified actant relates to the choice the client/developer makes to approach the QS, based on their area of expertise (Q04, Q08, and Q15).

> *"...so the industry knows you can come to us with hotels, retail and offices. But I think it would be from a client's side always best to use... to get an accurate feasibility, to use someone that has experience in the field." (Q04)*

5.4.2 The feel

An interesting actant that emerged is *the feel* that participants referred to, which has an impact on how they approach feasibility studies:

"...you want to get a feel for the feasibility." (Q07)

"Feasibility studies, for me that is the easy part. If you cannot estimate and you don't know and you haven't got a feel for the project." (Q09)

"The first thing I will do is I'll take a feasibility study and I'll just do a very high level order of magnitude, just to see what is my gut feeling." (Q15)

This 'feel' for a feasibility has been recognised in literature as a high level of experience (Kahneman, 2011).

5.4.3 Delayed exposure to feasibility studies

New quantity surveyors entering the profession often do not receive exposure to feasibility studies and there are often reserved for quantity surveyors with more experience. Those that do gain exposure at an early stage of their career, deem themselves to be quite lucky:

"I have been very lucky in a sense that I have been exposed to that from an early at this firm as well." (Q01)

"The client can't do without it. So it's a very important factor. That's why we

"Specifically the younger QSs don't get exposed to it." (Q16)

This was also stated by participants Q02, Q05, Q07, Q15, and Q22.

5.4.4 The quantity surveyor's approach

The methods used to predict the building cost have an impact of the accuracy of the feasibility (Lim *et al.*, 2016; Dandan *et al.*, 2019) and could contribute to 43% of errors in estimating (Githaiga, 2006). The direct area comparison method is unreliable (Bettini *et al.*, 2016). Therefore, the approach of the QS is essential, and each participant explained their approach in compiling a feasibility study. In summary, their approaches are as follows:

Participant Q01:

- Get the brief from the client
- Make assumptions on what the client does not know
- Start with the estimate (high level if information is limited but make the information as detailed as possible, even a full BOQ)
- Slot the quantities into the feasibility study template
- The income is then calculated (either from team input or own research)
- Prepare a cash flow to assist in the accuracy of the calculated interest

Participant Q02:

- First try and understand the class of finishes required (low/middle/upper)
- Choose applicable feasibility study template
- Get input from team
- With a good understanding of the scope, look and feel, and the template (rental/sales), a feasibility study can be compiled

Participant Q03:

- Get brief from the client
- Get information from the team (if there is one)
- Do an elemental estimate (if time and information are limited, do a rate-per-square estimate)
- Determine the operational costs
- Do proper research, go the site, do market research
- Get tenants aboard
- Compile feasibility study and do calculations

Participant Q04:

- First assist with the rights of a property (if needed)
- Get brief from the client

- Gather information from the team (what you are able to) as well as from the client
- Do an elemental estimate and calculate the income
- Calculate the operational costs with help from the client

Participant Q05:

- Tap into database with historical data
- Get information from the team (as much as possible)
- Calculate the building cost. You are more in control of the building cost
- Estimate the general cost. This is based on less scientific data and has more risk attached to it

Participant Q06:

- First give general advice with regards to the property
- Approach real estate agents and get adequate information on the market conditions
- Go to town planner if the property rights need adjustment
- Get information from the team
- Do an elemental estimate (not a per square estimate)
- Have a look at the contingency (less than 5%) and the escalation
- Get land and related costs from the client, as well as the perceived method of financing
- Calculate interest
- The hard part – calculate the operational costs
- Prepare a cash flow
- Calculate the monthly payments and breakeven point/year

Participant Q07:

- Get brief from the client

- Get information from the team
- Get land and related costs from the client
- Do an elemental estimate
- Calculate preliminaries based on historical data
- Get expected income from client
- Compile the feasibility study and do the calculations

"So it is getting the client what he wants, giving the architect what he wants, and having a return at the same time." (Q07)

Participant Q08:

- First check the parking bay rations because the architect does not spend enough time on it
- Check other efficiencies and inefficiencies on the architect's design
- Do rate-per-square estimate and the sundry costs are based on percentages
- Get land cost form the client
- Input the information into the feasibility study template
- Do a sensitivity analysis

Participant Q09:

- Give input on the cost of the property
- Get information from the architect (usually minimal)
- Get information from engineers
- Rely on your skill to do an accurate costing
- Contingency is between 2–2.5%
- In the event of limited time and information, an estimate can be done in half a day with no input from the team. This creates a platform for tenant negotiations.

"And once the deal is sort of settled, the details are and then the real work starts. So then you need fight so that you stay within the perimeters in which the feasibility allowed for."

"The fundamental thing is estimating, you need to be able to do that accurately." (Q09)

Participant Q10:

- Get information from the team (as much as possible)
- Use knowledge of past experiences with clients
- Do an elemental estimate that is linked to a BOQ
- Get income from the leasing team

"The way I do it, I usually never go in at a desired yield. I always go in a bit higher at a lower return, because I want to push my income as high as I possibly can. So I put pressure on my leasing agents to achieve the highest possible rental out of them. That way you can build in a bit of fat, not a bit of fat but cover unknowns. I mean, especially with retail, one day you've got 70% let scheme, the next day 30% of them has pulled out. Them you are unknown and at the end of the day, you might find you have an empty scheme because it's not the best area, but you end up having available cash in your budget to buy tenants to come in. The last thing you want is to have a vacancy factor exceeding your allowable.

Another thing, include a vacancy factor in your scheme. And then yeah, so I always go in a little bit under than what they want. Obviously, if a scheme doesn't work, it doesn't work. If you've got a 5% return pull the plug. The nice thing about retail feasibilities is you've got your income component managing the return on investment triangle, either by being short on your capex, increasing your rentals, adding a bit of saving, allowing you to do larger TI is *spending more capex to balance out the scales, getting your desired return on investment.”*

Participant Q11:

- Get land and related costs from the client
- Identify other consultants to use
- Do costing, escalation and fees

Participant Q12:

- Get information from the team and focus on getting areas correct (rentable, parking, etc.)
- Rate-per-square costing and, as information increases, move to an elemental estimate
- Get income and operational information from the client (charge extra for doing the income side themselves)
- Qualify assumptions
- Compile and do calculations
- Do tax
- Prepare the cash flow

Participant Q13:

“Depending on what state you're in, if it's a one page, high level document, we will just thumb suck it, to be honest.”

“Depending on when we get involved, if it's early days …so on in like a say in a one pager so that we have an order of magnitude answer at the bottom, so that we can guide the client and architect as to what could potentially work.”

“Until we take the next step for sketch drawings. We revisit the feasibility again, we'll revisit the costs as well, that stage we will be relying on elemental

estimates, engineers' inputs, and so forth and start putting the cost into a cash flow so that we can calculate cost of capital a little bit better."

- Get information from team
- Tap into the database
- Brief architect

Participant 14:

"Well, the thing is, how much information we've got, but let's say let's say we do have drawings, because I mean we can do feasibility studies with no information."

- First call up an applicable feasibility study template
- Do an area schedule
- Do an elemental estimate, external works and P&Gs
- Escalation
- Fees
- Contingency
- Land and related costs
- Capitalised interest
- Do income calculations
- Qualify everything that has been excluded

Participant 15:

"The first thing I will do is I'll take a feasibility study and I'll just do a very high-level order of magnitude, just to see what is my gut feeling, you know, because often you'll find that it's not going to work whatsoever."

- Do costing
- Land and related costs
- Escalation cost

- Finance costs
- Contingency: "Two contingencies in your feasibility study. One is in the building costs. And the other one is the development contingency."
- Information on the income is either self-obtained or there is input from the leasing team

  "I've got assumptions, exclusions, high value items. And then you address all your concerns, then where you've maybe over allowed."

Participant Q16:

- Get briefing from client
- Get information from team
- Do elemental estimate
- Add land and related costs
- Escalation
- Fees
- Calculate income, vacancy factors
- Sensitivity analysis

Participant Q17:

"With my experience from being on site and I'm blessed with… Luckily, I can take a letting plan and do a feasibility of a letting plan."

- Do a costing
- Do the professional fees
- Land and related costs (get from client)
- Financial costs
- Do rent role to be able to tell the leasing agent what the minimum rent per square metre can be
- Add operational costs

"I have no contingency. Zero."

Participant Q18:

- Find a similar historical project as a basis
- Hold a briefing with the architect
- Do an area schedule
- Hold a general discussion on finishes
- Do detailed costing
- Finance charges
- Get land and related costs from the client
- Calculate income

Participant Q20:

- Get a brief from the architect and the client
- Make allowance for all costs
- Use a template in the office

Participant Q21:

- Study the drawings and then do an area schedule using SAPOA
- Get information from team
- Do elemental estimate
- Contingency
- P&Gs
- Escalation
- Timeline
- Financing costs
- Fees
- Land and related costs
- Calculate income

- Calculate operating expenses
- Get a net income and then calculate the return
- Information on the income side is either obtained by themselves of input from the leasing team
- Group different areas to do rate-per-square check
- Check the percentage of the cost of the project it holds.

Participant Q22:

> *"Say, if the client, if I heard this thing from the client or architect or whatever, firstly you need to do the... find out what the site location, what size of the project and what type of the project, what quality level the clients need, and then is what the purpose this building is built for, for rent or for sale for development whatever and then you may need to do the site visit and based on all this this information is already good enough to let you do the feasibility study like high level is rate or whatever, in rate per square meter.*
>
> *Of course you also need to look at, is the what is rates at the moment and you know, rental investigate from developer, property developer. In feasibility's studies stage normally you have nobody, you either only have a QS or you have architects and the QS. So, you have to base it on your previous experience say so, maybe 10% is for the you calculation based on the like, current market and the previous job and say like electrical maybe thousand 200 per square meter, electronic is maybe 600 per square meter, you need air con and blah, blah. So, normally in that moment, you have no background.*
>
> *There's also usable document you always can use for support is the South Africa property owner, Association, whatever, they always publish, what the rental, what operational cost, the current market, the percentage. And you can use that and then like if the legal fee and that you will know is like 8% for the*

scrutiny fee and if they have any once of investigation, so investigation or something that is all based on your previous experience, is quite difficult."

Participant Q23:

- Measure the big items, elementally
- Give standard allowance for the rest
- Allow general development costs
- Get expected rental from leasing team
- Get info from fire, electrical, and mechanical engineer if they have been appointed

5.4.5 Competition in the QS profession

More quantity surveyors are entering the profession, increasing competition in the industry:

"You're going to lose a client if it doesn't work. So that is why it's so important that your feasibility study needs to be accurate and correct." (Q03)

"There's a lot of QSs registering. So that just tells you, there is a lot of competition for people coming into the industry." (Q09)

More competition could cause QSs to adapt their approach to feasibilities, cut time and produce poor quality studies. Additionally, QSs can lose clients more easily.

5.4.6 Intellectual property

Knowledge sharing could form the basis of successful feasibilities (Syed Alwee *et al.*, 2019); however, feasibility studies are seen as intellectual property by quantity surveyors and therefore they remain reluctant:

"So preferably we won't allow the client to change it and we won't allow the client to share it to someone else because we are a bit jealous about our work." (Q03)

“I'm not sure if another QS firm would share their intellectual property.” (Q04)

“…you don't want another company to know what you've done.” (Q08)

There seems to be a general reluctance to share knowledge QS practice.

5.4.7 Approach by the client

The approach by the developer has an effect on the success of feasibilities, especially when personal but unreasonable objectives are set with unrealistic budget decisions (Al-Hawsah, 2020). Furthermore, developers use different profitability indicators (valuation methods), which can give different profitability advice and therefore influence the success of projects (Huxham, 2010). Profit margins (Zakaria *et al.*, 2015) and benefit cost ratio (Yun and Caldas, 2009) are decision factors depending on the developer’s approach. The client’s approach also dictates how a feasibility study looks and how it is presented:

“And we have different clients that that would want to specifically see… they are very cash flow orientated. So they would want to see a lot of permutations on how they would get the equity back.” (Q01)

“Some clients take the cost first approach, others take the Design first approach.” (Q02)

“That usually looks different depending on the client.” (Q04)

“Some people like to have things shown in certain ways, others not.” (Q06)

“And you might also find that your documentation can vary between different clients. Some people only want black and white, the other guy prefer a nice colourful, nicely covered sturdy page documents, other people want a one pager.” (Q10)

"My experience with feasibility studies is actually very limited because I find that developers and clients and building... owners who wants to build will do The feasibility... will do their own feasibility." (Q16)

"One developer said to me now, I don't want to see all this, roll it up, roll it up. I want to see how much it costs. And the other developers said.... where did you say that whether to show that. So they want to see, the one developer, he wants to see with the nitty gritty." (Q17)

Participants Q07, Q14, Q20, Q21, and Q23 mentioned a similar experience. It seems that some clients have specific items they focus on, for example the cash flow; other clients simply want to see a summary page, and some want to know the details. Simplicity, however, remains key, or the developers will struggle to understand it (Q20).

5.4.8 Client knowledge

The developer's experience level affects the accuracy of feasibilities (Sudhana, 2016; Dandan *et al.*, 2019; Al-Hawsah, 2020). There is no or limited knowledge about feasibility studies and clients are too eager to start projects (Willemse, 2019). Furthermore, Kgaka (2018) found that it is vital for developers to have a sufficient level of understanding regarding the financials of a development and argues that this field of expertise is of the most important skills for an emerging property developer to possess before embarking on a development. The level of knowledge that the clients/developers possess dictates what and how information is presented in feasibility studies:

"The clients are not always financially inclined or don't necessarily understand all the calculations, and it just confuses them." (Q01)

"All of the clients aren't educated in the built environment. So that is why you actually have to lecture them through your feasibility study." (Q03)

In addition to the aforementioned quotes from participants Q01 and Q03, more participants confirmed that the lack of a client's knowledge will impact how they would present the feasibility and advice (Q02, Q04, Q06, Q11, and Q13).

5.4.9 Client expectation

Pre-imposed expectations by the client could guide the outcome of a feasibility study:

> *"I have a client who's got an expectation, an unrealistic expectation. And I can see this is not going to end well, because they want to see this fantastic profit at the end of the day. And it is not there. But they don't want to know that." (Q12)*

These unrealistic expectations could lead to inevitably doomed projects.

5.4.10 Relationship with the client

The relationship between the client (developer) and the quantity surveyor has been an integral part of the communication process. Effective communication between the client and the team is essential (Dandan *et al.*, 2019; Al-Hawsah, 2020). The cultivation and elements of the required relationship was stated by the participants. Honesty (Q06), reliance (Q12) and trustworthiness (Q01, Q03, Q05, Q12, Q15, Q19) were key elements:

> *"First you got to be very honest with him." (Q06)*

> *"So you kind of entrench yourself in terms of a service more than just a traditional QSing service. You've got to build that trust and that relationship." (Q12)*

The relationship needs to be cultivated to begin with, by protecting the developer from his own mistakes (Q15), and then exercising methods of engagement (Q03, Q14) and doing quality work (Q09, Q21).

"And we personally do the presentations to clients, because that is where you build your relationship." (Q14)

"So you are in a much more a much stronger negotiating position and more valuable, I think to your client, then just quantity surveyor to manage building costs." (Q12)

"If the client and the architect see the value and they work according to the guidelines, or the guidance that the QS then brings, it often results in good relationships with clients and team." (Q13)

Furthermore, the duration of the relationship also has an impact (Q02, Q07, and Q12):

"It's a process and obviously as you get to work with your client, the first and the second, and the third, they trust you more. And they trust your expertise and that what you're telling them is real." (Q12)

As a result, the QS becomes a valuable member of the team and is often being included in confidential meetings without the other team members (Q05, Q08, and Q15):

"And in some cases, once you've developed a relationship with the developers, the QS is actually more important. Or he's included in all the confidential meetings, whereas the architects and engineers tend to be considered just for the design side. So you are right there next to the developer, so it's become more and more important now." (Q05)

"You are the financial custodian for the client." (Q15)

It seems that the closer the developer and QS become, the more there is a divide between the QS and the team. This divide between the QS and the team could have a negative impact on the overall relationship between them.

5.4.11 Financiers

Acquiring bank financing is a major part of construction projects, and by the nature of the project, the financiers have a substantial influence on the feasibility studies. They first require that a feasibility study be compiled by a registered QS (Q07) and that they then have certain requirements pertaining to the document (Q01, Q05, Q07, Q10, and Q21). Third, banks prefer consistencies in feasibilities (Q12). Lastly, it influences the quantity surveyors' strategies to maximise chances of funding (Q15, Q18):

> *"So they (financiers) want to know you are registered." (Q07)*
>
> *"We've had a couple of specifications or criteria from financiers, how they want to see it, they would want to see specific calculations for financing purposes as well on the capex." (Q01)*
>
> *"What the banks were liking is that they were now getting consistency in what they were reading." (Q12)*
>
> *"You need to involve your clients. Are they putting in the land for free? Or how much are we going to put the land in in the feasibility? Sometimes what happens is the client buys the land for 5 million, but it's valued at 12. And the reason that's done is because it looks to the bank like he's put in more money." (Q18)*

While the financiers dictate certain aspects, such as only accepting feasibilities from registered QSs and dictating what they want to see in feasibilities, QSs still give the advice in terms of strategy.

5.4.12 Investors and joint ventures

Investors and joint venture partners also help shape the feasibility study and strategy (Q01, Q05, and Q19):

"Does he plan to get partners involved, because that all kind of stipulates how you would present this feasibility. If it's only for the client and you present it in a certain way. If it's for partners, you would need to look at it to kind of hide his sensitive information as well, but keeping it enticing for the investor." (Q01)

5.4.13 Tenants

Occasionally tenants are approached before the compilation of the feasibility study, and in this case, the study can revolve around their requirements. A feasibility may forecast certain rental income; however, a lack of tenants makes the entire project unviable (Karas, 2017). The percentage let greatly contributes to the success of a feasibility study:

"So you have to, I think at that early stage, try to get some tenants already on board who might be interested in renting out parts of the building." (Q03)

"Especially with retail, one day you've got 70% let scheme, the next day 30% of them is pulled out." (Q10)

5.4.14 Information available

Drawing from the literature, the certainty and completeness of project-specific information, at the time of the feasibility, influence the accuracy of estimates (Lim *et al.*, 2016), for example low information on mechanical, electrical, plumbing and structural systems (Dandan *et al.*, 2019). The information available at the time of compilation has a significant impact on the approach of a feasibility study, the number of assumptions and the level of expected accuracy (Q04, Q05, Q09, Q10, Q14, Q18, Q20, and Q23):

"Where we don't have information or he doesn't know. We would make assumptions and just, you know, qualify that going forward, then we'll start building the feasibility in terms of, you know, allocating the cost that we've

gathered doing a building cost estimate, depending on if we've got information or not, if you don't have information we would do a high level costing." (Q01)

"In the end the feasibility is only as accurate as the information that you get." (Q04)

In addition to this, the amount of information available also influences what the QS allows for the contingency (Q06).

5.4.15 Input from the team

The main input from the team, with regards to the building cost, is usually related to the conceptual designs from the architect, if they are available. Later in the process, engineers (structural and civil) are approached to do mark-ups on the architect's work. However, advice given by the mechanical and structural engineers at the start of a project can improve the accuracy of the feasibility (Syed Alwee *et al.*, 2019). This also applies to the engineers designing the services (electrical/mechanical/fire/traffic) and the wet services consultant.

Increased involvement from the entire team will enhance feasibilities – the more information is gathered, the more accurate the feasibility (Syed Alwee *et al.*, 2019). Furthermore, the design team should carry out more research on previous projects when conducting a feasibility (Syed Alwee *et al.*, 2019). The client provides the information concerning the land and related costs.

To calculate the income side of the project, property brokers and real-estate agents give their input. Most participants elaborated on the input from the architect, engineers and other consultants:

"Definitely, it depends on, on where we are with a project. So with a lot of feasibility that we do, it's only the architects being approached and he has given a layout. …we take information from the consultants in into consideration definitely. We will provide them with information so they can do

their own investigation work and get back to us with regards to budgets and mark ups and just report on that, which we would then accommodate within the feasibility." (Q01)

"Right at the beginning we will rely on all of the professionals on a high level." (Q13)

Participants Q03, Q04, Q06, Q07, Q11, Q15, Q17, Q18, Q21 and Q23 also mentioned the input from the architects and engineers and/or other consultants, with regards to the building cost. These inputs are linked to the costing part of the feasibility. The income part of the feasibility is dependent on property brokers or real-estate agents:

"On the other side of things, you would have your income and getting leasing, letting agents involved." (Q10)

Likewise, participants Q06, Q09, Q15, Q21 and Q23 stated the involvement of the property brokers or real-estate agents, related to the income calculation.

"We require client information, particularly with regards to land and related items." (Q07)

Over and above this, participants Q17, Q18, Q21 and Q23 also specified the contribution of the client pertaining to the land and related costs.

5.4.16 Cost conscious team

A cost-conscious team is advantageous towards the success of feasibilities (Bettini *et al.*, 2016; Schmidt, 2017) and the whole team needs to work together to meet the cost concept (Syed Alwee *et al.*, 2019). The quantity surveyor operates as part of the team; therefore, the cost consciousness of the team members is important to the success of a feasibility study (Q04, Q14, Q17, and Q18).

"My boss likes getting involved at these early stages, so that also assisting with getting the right professional team in place. Because that also makes a huge

impact, you have consultants that is cost conscious, and you have ones that really doesn't care." (Q04)

"The architects... good architects, in my opinion are very good at design, but also have a sense of, of cost." (Q18)

5.4.17 Relationship with the team

The team must work aligned and towards the same vision and command as an integrated team, committed to the same goals, pursuing the fulfilment of the project requirements (Bettini *et al.*, 2016). Improved co-ordination among team members could greatly benefit feasibilities (Syed Alwee *et al.*, 2019). Given that the QS is dependent on input from the team for the feasibility study, the relation between them is fundamental. Firstly, the architect often recommends the QS to their client, giving the QS more work:

"You'll find that usually architects are the ones that would recommend you to clients." (Q08)

"The relationship with the architect is very important because they need to bring you the next project." (Q13)

Secondly, the QS is often responsible for the negotiations of the fees with the rest of the team:

"You can use the feasibility study, that's your base. So, when I've got a base that says we're doing this residential project, and we're making 20% profit, that sort of sets the tone with the other professionals, because now we know what the fee pot is." (Q18)

The QS needs to communicate with the design team in order to implement value-engineered designs, which is a necessity to make a feasibility study work, causing a change in the design that the architect or engineer had in mind (Q02, Q03, Q04, Q05, Q08, Q14, Q16, Q17, Q20):

"I think everyone then sort of understands one another, a bit better because of the feasibility. Because if you can prove to a designer that look, the norm is that you're part of the design for this type of structure, for this type of development in this part of South Africa should be roughly about 20% of the total cost. And at the moment, it's about 30%. So I think having everything on black and white for decision making and not just relying on gut feeling in terms of aesthetics." (Q02)

"Then we would. So if we do it, if we do a feasibility based on nothing. We would then inform the architect of our assumptions, and he has to design according to our assumptions. That happens often." (Q14)

"They just want to design palaces. But you have to calm down the architects." (Q17)

From the interviews, it became apparent that while the feasibility could appear as the cause of downscaling on the designs, it in turn serves as proof for the necessity of the change in design. It might be a tool for value engineering, but it is also proof for the need thereof. The QS, however, is often seen as separate from the team or at a higher level:

"Sometimes the client doesn't want the rest of the team to know all this information. So that then stipulates your relationship with the rest of the team." (Q01)

"QS is not always friends with the rest of the okes because he fights very hard to get the budget back." (Q09)

"I would say you need to you need to, obviously be the watchdog of the other consultants." (Q15)

Participant Q12 shared the same experience. Consequently, tension exists between the QS and team (Q01, Q02, Q09, Q13, Q14, Q15, Q17, Q18, Q21, and Q23):

“I've seen countless, countless projects where architects are unhappy with the QS for interfering.” (Q02)

“Sometimes, it's not helping the relationship because often enough, the study shows that the numbers aren't working. And the numbers normally don't work because of inefficient design or costly design. But architects don't like to do a cost based design and that's why we often find ourselves getting involved too late. The architects know very well, that they should try and avoid the QS for as long as Possible, sell the dream to the client.” (Q13)

“Not great, obviously, because they always go for the most outrageous things.” (Q20)

Ten of the interviewees had emphasised the tension that exists between the QS and the architect due to value engineering. Participant Q21 highlighted that the way the QS handles this ‘news’ is critical for a positive reaction from the architect.

5.4.18 Risk work

According to a study conducted in South Africa, conducting feasibilities is expensive (Ramawela, 2017). Contrary to this claim, participants stressed how feasibilities are done as risk work, in other words they do not get paid to do the feasibility if the project does not realise. In South Africa, the first three stages of the six construction stages are usually done on risk (without compensation) by the professional team members. Thus, the team members, including the quantity surveyors, are not compensated for their work before the project moves to stage four, or if the project is terminated prior stage four. This creates the possibility of team members doing work in the first three stages, which includes the feasibility study, and never receiving compensation for the work (Q02, Q03, Q04, Q09, Q17, and Q18).

“Especially in South Africa, a lot of private sector, commercial projects are done on a risk basis. Up until financial closure, which actually means that the budget

and the design and everything is now approved to go ahead and that only happens at the end of stage two. So a large portion of work gets done on a risk basis. I mean, some projects can take over two years before it reaches the end of stage two, and then you would have done all that work for nothing." (Q02)

"The sad thing is people in South Africa work on risk and not getting paid. You work on risk for seven to 10 years before you start a project." (Q10)

Subsequently, the designers as well as the QSs do a rush job (Q03).

5.4.19 False perceptions created by technology

Moreover, certain technological advancements produced to ease the compilation of feasibility studies (among others) have the opposite affect:

"And I got this massive model and everything and I started with the 3D take offs and it's just a mess. Even with a project that far advanced, the top of the range architects and engineers in the country. It's actually more work and you're not getting paid for it. So yes, I want to click a button and say Okay, that's my amount of brickwork. But then the responsibility sits on the one who draws the model, not the QS, so now there's an error. What do I say okay, no shit it was the architect? So who takes responsibility? What does your PI cover? There are just too many things not lining up in this. I mean, the fact that it creates perceptions and then we need to deal with it.

All this BIM nonsense, there is nothing behind, that thing is incomplete there is nothing in it, but the clients got the perception that you've got a full set of drawings. So it's just this 3D model thing that's killing me, because everybody create these perceptions in the field and in the market that listen, all this information is there, why I actually need to pay you less now, because you got all this information which you didn't have" (Q09)

> *"So I see BIM has more for those packages that are going into detailed estimating you need. At feasibility level, not so much." (Q12)*

It seems that BIM technology creates the illusion that it could contribute to easier take-off and estimation, making the QS's job easier. However, the designs are incomplete and faulty, creating more work for QSs to do the take-off correctly.

5.4.20 Geotechnical conditions

The underground conditions have a major impact on the building cost, therefore influencing the feasibility:

> *"The land conditions, because things like pilling or you know, taking land away or water tables can have a major effect on the costs." (Q06)*

Participants Q10, Q13, Q15, Q17 and Q18 discussed this risk as well.

5.4.21 The volatility of exchange rate

Currency exchange fluctuation has a significant impact on the success of feasibilities (Dandan *et al.*, 2019; Okereke *et al.*, 2020). A significant amount of the construction materials for projects in South Africa is imported. The volatility of the rand value greatly impacts feasibility studies:

> *"You need to actually have a look, is the project mechanically intensive, are there lots of lifts are there lots of imported air conditioning equipment or whatever that might affect your, the Rand-Dollar that might affect your escalation." (Q06)*

> *"60% of the building is reliant on import duties, and an exchange rate." (Q07)*

It is important to be aware of the project's specific items and how much of the cost is linked to the exchange rate.

5.4.22 Operational costs

The operational cost is used in calculating the net income. However, the uncertainties and changes with regards to operational costs are impacting feasibilities (Q03, Q06, Q16, and Q21). The location of the site does not only influence the value of the property, but also the operating costs (Q07):

> *"And then the hard part comes, is operational costs." (Q06)*
>
> *"We often overlook things like operating expenses and if we don't look at them properly, and then neglected and sometimes people just use an average industry norm and that's not the case, because certain operating expenses are quite specific depending on the area and location." (Q07)*

5.4.23 Municipalities: Plan approval and rates and taxes

The literature indicates that municipalities in South Africa are inadequate and cause significant delays during plan approval, rendering feasibilities outdated (Kgaka, 2018). Furthermore, the uncertainty of the expected rates and taxes in South Africa can influence the feasibility of a project:

> *"There is things like increases in rates can have a major effect on the feasibility, when the council ups his rates by 100% for no real reason." (Q06)*

5.4.24 Published Information

All information available from government, local authorities as well as private organisations should be made available to the firm and industry and stored on their database (Syed Alwee *et al.*, 2019). Published information like the BER is often used when compiling feasibility studies; however, using it indiscriminately can cause inaccuracies in the compilation thereof:

> *"It's not just a matter of looking at a table and saying well the BER says this or the statistical department, you need to actually have a look, is the project mechanically intensive." (Q06)*

Other published guidelines (for instance from SAPOA) are followed to calculate the lettable areas (among others) in a uniform manner (Q21), since this has an impact on the income calculation:

> *"So you've got all your gross building and lettable areas correct your outbuildings vs your SAPOA internal buildings." (Q21)*

> *"And then there's also usable document you always can use for support is the South Africa Property Owner Association (SAPOA), whatever, they always publish, what the rental, what operational cost, the current market, the percentage." (Q22)*

It seems that published information, BER and SAPOA, can be used in the calculations of feasibilities; however, one should proceed with caution and not simply follow it blindly.

5.4.25 Regulations and legislation

All information available from government, local authorities as well as private organisations should be made available to the firm and industry and stored on their database (Syed Alwee *et al.*, 2019). First and foremost, the SACQSP or the ASAQS do not stipulate regulations around the compilation and presentation of feasibility studies in the quantity surveying profession. They do, however, provide some guidance:

> *"They do give guidelines, but it's not a mandatory regulation that you as QS need to adhere to." (Q01)*

Other regulations do have an influence on the input of feasibility studies, for example, the NHBRC in the case of residential developments, and municipality specific regulations:

> *"You would consider especially in Johannesburg. There is regulations... just something interesting not all municipalities or metros actually have it as far as I know but Johannesburg is an interesting one with their storm water control. Also, things like the heritage council if you're, if you're renovating an old historical buildings to definitely make sure you allow for the, the historical aspect of it as well in the heritage Council and, and preservation and, and all of that." (Q02)*

> *"It's residential, and you need NHBRC fees." (Q13)*

The above statement by Q13 is also enforced by participants Q06, Q15 and Q21.

5.4.26 Complexities

Complexities of projects have a direct influence on feasibility studies in terms of the compilation and presentation. It is noted that the amount of specialist work and specialist involvement does not influence the accuracy or complexity of projects (Dandan *et al.*, 2019). The complexities presented by the analysis includes cross-border projects, phased projects and the type of project and sector:

- Cross-border projects (Q02, Q13, and Q22):

  "Maybe it's an international project or project across the border, you're going to have to consider that country's legislation." (Q02)

- Phased projects (Q14):

  "If it is phased, it is more complicated." (Q14)

- Type of project and sector (Dandan et al., 2019): The participants indicated that the overall feasibility study is minimally impacted by various complexities and the major elements with an impact is the type of income stream to be expected and the purpose of the building. The complexity of the building itself has a minor implication, since quantifying the building costs are always based on the same standards and procedures. The only minor impact is if there are specialist items involved (green ratings, server rooms, fuel stations, etc.), a specialist in that field would be approached for input with regards to the building cost. Furthermore, the identified purposes of buildings that have their own complexities are offices, retail, industrial, hospitality, residential, hospitals and mixed use. Therefore, quantity surveyors become specialists in buildings serving the same purpose:

"Maybe to understand the technicalities of a specific project in terms of industrial or mechanical plant, that might be different. But that's just one component, the building costs that would differ, the rest of it might still be the same." (Q01)

"So the industry knows you can come to us with hotels, retail, and offices... hospitals... No" (Q04)

"We had a hotel that we did, it was going from an 11 bed to a 40 bed hotel, and then they wanted more than a feasibility. They wanted the whole financial analysis over 20 years. So the income side of the feasibility became much more important." (Q05)

"Residential is a different story because if you are selling the residential, it's a totally different kind of feasibility to shopping centre or an office block or industrial development. And unless you of course are letting out the residence. A hotel feasibility is a complicated piece of paperwork, because you got to work on rates for rooms, costs of sales, cost of food and beverage, and a hotel feasibility is... they won't look at a first-year return." (Q06)

> *"If it is a two-storey garage or a single lane garage, we approach that the same as a multibillion-dollar developer, so the core principles are the same. Well, the feasibility study always has an income stream against it. So, I mean, most of the stuff from a feasibility and viability point of view, principles are the same. The only thing that is sort of unknown in certain areas is where you deal with something where the income stream is uncertain, like a stadium." (Q09)*

> *"The most complicated we find out are these mixed use. A combination of sale and rental." (Q12)*

The building cost section of the feasibility is not what influences the complexity of a feasibility (Q09, Q14, Q15, Q17, and Q22); rather the complexity lies with the type of income stream (Q05, Q06, Q09, Q12, Q14, Q19, and Q20).

In summary, the cause of the complexity/simplicity of the standard proposes of buildings are as follows:

- Offices: Complexity due to high rise or multiple tenants
- Retail: Complexity due to cost calculations in terms of requirements by tenants and multiple tenants
- Industrial: Complexity due to cost calculations in terms of high spanning distances and simplicity due to limited amount of tenants
- Hospitality: Complexity due to income calculations
- Residential: Complexity due to income calculations
- Hospitals: Complexity due to income calculations
- Mixed use: Complexity due to income calculations

The participants claimed that they would approach complex and unfamiliar projects the following ways:

- Do research (Q01, Q02, Q07, Q10, Q12, Q14, Q16, Q20, and Q21).

- Approach colleagues with experience in that area (Q01, Q02, Q08, Q11, Q18, and Q19).
- Approach other professionals (engineers) in the industry (Q01, Q10, Q13, Q14, and Q15).

  "We do get information from other consultants, not our competitors." (Q14)

- Approach the ASAQS (Q04 and Q16).
- Approach other QSs in the industry (Q16, Q18, and Q21).
- Take professional advice that is paid for:

  "There is only one way you can approach it and that is take professional advice from the right people." (Q06)

- Open line of communication with the client (Q07 and Q23):

  "If I've never done a casino before, which is one thing we did, we spent a lot of time with the client and understood he's his business model." (Q07)

- Specialist contractors/experts in the field (Q15, Q16, and Q17).
- Database compiled with historical data (Q08, Q15, Q16, and Q18).
- Baseline feasibility study (Q16 and Q20):

  "I would most definitely use my feasibility as a base. And I would think about where the differences are between my first base and what the project requirements is." (Q16)

- Leeway in the contingency (Q23).

5.4.27 Lowered professional fees

The tariff level of professional fees is one of the important items to a developer, which impacts feasibilities and their decisions (Salman *et al.*, 2007). Lowered professional fees due to additional professions joining the team, puts more strain on members and increases competition even further:

> *"We normally do the professional fees, and that's just getting less and less every year." (Q11)*

> *"And I honestly believe that is the biggest problem in our industry at the moment is project managers. Their fees are so inflated because they created their own fee scales. It puts pressure on the other consultants, because you need to accommodate another consultant now who is not adding value." (Q15)*

5.4.28 Time available

The volume of a consultant's workload during the time of estimation and the time available for carrying out the estimate, affect the accuracy of feasibilities (Dandan *et al.*, 2019). In spite of the feasibility study being such a crucial document, the time given to prepare it is frequently less than desirable:

> *"We would go into as much detail as we've got time available." (Q01)*

> *"That depends on the time you have available." (Q23)*

The time available directly influences the approach to take, as well as the accuracy of the feasibility (Q05, Q09, and Q10).

5.4.29 Reiterations

The feasibility process is a reiterative process (Mackenzie and Cusworth, 2007; Costello and Preller, 2010) that can take multiple years (Lock, 2020). This finding is confirmed by interviewees Q04, Q05, Q08, Q10, and Q12.

> *"As QSs we find ourselves doing viabilities for years and years on the same project. It goes up to as many as six years." (Q08)*

> *"Most of the time, we would do many, many iterations in order to get the scheme to work, because the first one doesn't work." (Q12)*

5.4.30 Value engineering

Value engineering is an integral and unavoidable process that forms part of the success of feasibility studies (Kwaku Osei, 2016; Schmidt, 2017) and (Q04, Q07, Q10, Q11, Q12, Q13, Q14, Q16, Q17, Q18, Q20, Q21, Q22):

> *"But if you're looking for a 9% return, and you're at 8.8. You're in the ballpark, you can get to the 9 by way of Value Engineering." (Q07)*

> *"We need to add value and we need to value engineer, that's all part of feasibilities adding value here." (Q14)*

5.4.31 Applying cost management to remain within the constraints of the feasibility study

A feasibility study becomes the benchmark of the project and to remain within the estimated feasibility, thorough cost management needs to be applied (Okereke *et al.*, 2020). There is a distinct difference between perfecting the feasibility study and actually possessing the adequate technical trade skills to finish a successful construction development in close proximity with the initial study (Kgaka, 2018). The participants shared this view (Q02, Q06, Q08, Q09, Q10, Q12, Q17):

> *"Updating the feasibility study as you go along during all the different phases of construction." (Q02)*

> *"You got to keep on updating that feasibility so that they are aware of where they stand." (Q06)*

> *"And then it's the monitoring exercise all the way through to completion. So we manage it and update literally right the way through to completion." (Q12)*

5.4.32 Presentation

The presentation is an essential part of the communication process, and the participants explained how the presentation process is carried out. Email is the only option, when the client is far away and a face-to-face discussion is out of the question (Q11), or when there have already been multiple reiterations of the same feasibility study (Q23). The participants explained that they prefer to email the feasibility study prior to the face-to-face meeting, with the goal to allow the client to familiarise themselves with it in preparation for the meeting (Q01, Q05, Q10, Q12, and Q15). Some participants, however, are against emailing the feasibility study altogether and favour face-to-face discussion only (Q16).

> *"We send it through and then we'll have a meeting afterwards to discuss and then go through." (Q05)*

Furthermore, the participants emphasised the risk that pure written communication can yield. These risks include: the developer does not read the qualifications (Q01); the QS is not there to advocate for a potentially viable project, even though the numbers currently indicate otherwise (Q06); incorrect interpretations (Q07, Q15, Q19, and Q23); misunderstandings (Q08 and Q21)); a lack of understanding (Q12, Q14, and Q17), and making one's own assumptions (Q14):

> *"So we don't just send it to them because they don't understand it." (Q12)*
>
> *"They make their own assumptions, they do not understand the document." (Q14)*

Contradictory to the above statements, one participant's view is that a feasibility study should be self-explanatory:

> *"The document should be explanatory enough." (Q16).*

5.5 SECTION 3: THE NATURE AND OCCURRENCE OF FEASIBILITY STUDIES

Section three reports on the nature and occurrence of feasibility studies in the industry, addressing OB3. The data is allocated to three main sections:

- Where the QS got the expertise (5.5.1)

- Evolution of approaches (5.5.2)
- The template (5.5.3)

5.5.1 Where the QS got the expertise

The three identified methods of acquiring expertise are:

- Experience (5.5.1.1)
- University (5.5.1.2)
- ASAQS (5.5.1.3)

5.5.1.1 Experience

Most participants expressed that the valuable knowledge that they gained surrounding feasibility studies is through experience (Q01, Q02, Q07, Q08, Q10, Q11, Q12, Q14, Q16, Q17, Q18, Q19, Q20, Q21, Q22 and Q23):

> *"100% by experience, got a bit of information from varsity, but I must be honest, it's so completely different in the firm that I'm working in. So I would say 99% of the ability to do a feasibility, I learned from my mentor or superior at the firm, you know, in terms of guidance, and how to do that." (Q01)*
>
> *"Trial and error, by myself." (Q17)*

Sixteen participants shared this view, which is an overwhelming number of participants, given that they all received professional tertiary education prior to entering practice. In summary, their experience is gained either by a mentor in the workplace, by running a project from start to finish, or by trial and error. A seminar could also contribute to some extent (Q20).

5.5.1.2 University

Some knowledge is gained through university:

"I think like all Universities, we had a very good base. I am still using some of the information that we learned at university in some of my feasibility studies." (Q15)

"So what they teach you at varsity just goes over your head. But the feasibility study is the crux of everything and that is what is weird for me, at varsity you do not do an intense study on feasibilities. So that goes to show, the lecturers are not necessarily in practice, to realise that it is very important." (Q21)

The views on acquiring the skills via university is contradictory. Only one participant felt the university adequately contributed to their skills, with regards to feasibility studies (Q15). The other participants, however, contradicted that statement and emphasised the lack of contribution by universities (Q01, Q02, Q19, and Q21).

5.5.1.3 ASAQS

Interestingly, only one participant referred to the association as a means of gathering some knowledge:

"So the feasibility, was ... I've developed it myself based on the published feasibility from the association." (Q16)

5.5.2 Evolution of approaches

Since experience is highly valued, the participants were asked how their approached changed over time. Their responses included: asking many questions at first, but not anymore (Q01); building their own historical data base (Q02); the feasibilities became more and more visually attractive over time (Q03); change on emphasis like focusing on the big cost items (Q04, Q13); changed from manually to electronically (Q05, Q07, Q09, Q12); more focus on the operational costs (Q06); doing the feasibilities more quickly and accurately (Q07, Q18, Q22); initially blindly copying from previous projects (Q08); making the feasibilities more understandable (Q10); adding elements like sensitivity analysis (Q12); more gut feel (Q14); more detail (Q17); more involved in terms of advice (Q21); more knowledgeable (Q23).

> *"After 30 years of experience, I've got a very good gut feel of what things should cost. So I don't have to really analyse and go through every line item, because I can just by looking at it, know where there is a problem." (Q14)*

> *"A lot. When I first started, I didn't really know much about what I was doing. I was just doing what I thought. And as you go along, you realize what all the different items actually are. And you better understand what can and can't happen, once you've done a few projects, so you know better what to think about or how to think about it." (Q23)*

5.5.3 The template

First, companies do make use of feasibility study templates, usually in Excel (Q01, Q02, Q04, Q10, Q15, Q18, and Q19); however, there are software programs also available (Q12, Q15):

> *"We basically slot this into our feasibility model that we have in Excel." (Q01)*

> *"So if you're using a standardized product, you kind of have comfort in the numbers that you see, that you know, how it's being calculated, and what is the basis of the calculation. If it's a homegrown Excel, then there may often be mistakes that come through and we pick up that, if we are presented with the feasibility and we will plug it in into our model, high level and the numbers don't tie up." (Q12)*

> *"Normally the guys with the packages don't have all of that info in their feasibility studies. Although it looks good, you know, it's very nice on the eye, they haven't got all the technical rope in there. So it's a bit of a... I like to use my own template. What makes a package that you buy very nice is that you've got certain things that you need to go and do. And that thing has been checked*

and been locked in. It's very difficult to make a mistake. So now obviously when you work on your an Excel spreadsheets, it's easier that you make a mistake." (Q15)

Interestingly, both Excel and a software package have been criticised as being inadequate for feasibilities. Furthermore, the findings regarding the template are divided into five aspects:

- The origination of the template (5.5.3.1)
- The need for flexibility (5.5.3.2)
- Formatting (5.5.3.3)
- Output in a company (5.5.3.4)
- Compliments received (5.5.3.5)

5.5.3.1 The origination of the template

The templates used in companies originated in various manners. Some built the template themselves over years (Q01, Q02, Q03, Q05, Q06, Q07, Q09, Q12, Q15, Q17, and Q22); some are not sure where the template came from (Q04 and Q23); in some cases the developer provides the template (Q08); others used the ASAQS guideline (Q10, Q16), or varsity guidelines (Q13), or copy what they have learnt from their mentors (Q14), or a combination of the aforementioned (Q21).

"I have absolutely no idea what the ASAQS guidelines are. That's something that we've developed ourselves." (Q06)

"I work with this specific developer, do a lot for them, and they actually do have a specific template that they give to you, and then you end up inputting into that." (Q08)

"It's a combination of what we got While we were studying, what you get from the council, what you've seen at firms you've worked with, and then you create your own template for yourself that works and that you can manage." (Q21)

In summary, most templates are created within companies by incorporating what employees have learnt from their superiors in the workplace, at university, or by the ASAQS's guidance. The ASAQS's guide, however, has been published in recent years and some participants believe that the council could have used their template as a guide. However, the one section of the feasibility study, namely the calculation of the building cost, is meticulously followed by the association's guide to elemental estimating.

5.5.3.2 The need for flexibility

Participants stated why flexibility needs to be an integral part of the template:

> *"…but it's not that rigid that you can't change it because every project is different. … with Excel luckily, you can be flexible." (Q05)*

> *"…and it's been tweaked and..., but every client is quite different. So that document is flexible in that way." (Q07)*

> *"…that Excel document you need to tailor." (Q15)*

> *"We do have a template in the office, but I won't say it's cast in stone, you know, it changes with the type of project that it is." (Q20)*

5.5.3.3 Formatting

The participants were asked about the communication guidelines and formatting that they implement in their feasibility studies. The participant's feedback is given in a summary:

> *"We would, for example, not necessarily show all of the calculations, but primarily just show the results. We want around 10 pages Max. The look and feel is quite modern. Like to keep it clean, not overcrowded with information" (Q01)*

> *"The document needs to be professional and visually attractive. So I always put in some nice graphs and pie graphs and show the progress and charts and*

tables. I always include a little research document just to show what I've done and where the information is coming from." (Q03)

"Just a cover page, an executive summary. And then it's kind of the, I want to say bottom line numbers on the first page, and then going back the breakdown of those values.' (Q04)

"A letter head and it's a professional presentation. We stay away from graphics and artwork and stuff like that, because that's not our field of expertise, we tend to report it like an accountant does. But still nicely presented that it's easy to read. It has a summary page on the first page. So the first page carries the high level figures, the summary figures. And then it's a series of annexures, so annexure A is the building costs and then professional fees and contingency and escalation. An annexure C is the general costs and interest during construction." (Q05)

"We used to do graphs and pie charts and everything else. I think ultimately, those are nice to haves." (Q06)

"So you tend to hide those things just to show sort of one liners so that they can follow things in groups. So use colours to highlight what you want to draw the attention to." (Q08)

"A feasibility study to me it's a four page document. You can sum up the entire development on one page. And then you have four pages of backup." (Q09)

"…draw specific attention to the big ticket items. The developer would look at three items, which is capex, income and return on investment. Have those items stand out, put it on your front cover. Just keeping it simple. Not too much colours. Keep it simple, keep it basic. You're not an architect. We're not selling pretty things. You are, you're selling a money making tool, make it real nice. Obviously keep it professional, company details." (Q10)

"Keep it as simple as possible." (Q11)

"Reporting has become much richer with graphs and much more visual. Compared to our early versions." (Q12)

"That really depends on who your client is because some of them like the nitty gritty all black and white and all the facts on the table and others want a one pager with a bit of colour and some, some bold and some comparison with previous projects." (Q13)

"We try and I believe in less is more, keep it simple… easy to read. So that's why I like the dashboard approach. Present the dashboard and then I ask, anything else would you like to go through the details or not? And then we can go through the details. So I start executive summary." (Q14)

"We presented the three options in a table." (Q16)

"I've made mine very easy, easily readable to the developer." (Q17)

"You just got to be consistent. Fonts got to be the same, it's just excel editing." (Q18)

"So we try as much as possible when presenting our documents that it's user friendly, and it's easy to understand. But I need to be able that anybody could read it and make it visually appealing." (Q19)

"We kind of structure it in a way that it's like, easy to read on one page, you can see this is the cost, this is the return. It's nice to have kind of the one page as a summary upfront, with then all the backup at the back, if they want to go into all that detail. I always like to kind of colour code my documents, I feel that it's easier to read. Table format, always works well." (Q20)

"Mine would be like a bank document, it's got the same bank document, look and feel with the columns, that adds up to the top, and it's got the debit and the credit numbers and the bottom line. So I think I have tried to simplify it to

a bank type of document that it looks like those bank statements you get, because everyone gets them anyone understands them." (Q21)

"Ours is actually quite dull, and there's not a lot of colour or graphs or anything in it. It's normally about four pages. Of which one is a cover letter." (Q23)

From the feedback received, it is clear that QS practitioners do not follow set communication guidelines.

5.5.3.4 Output in a company

Irrespective of the differences in the industry, the output in terms of look and feel per company is generally the similar (Q01, Q03, Q04, Q05, Q06, Q12, Q14, Q18, Q20, and Q23):

"It does look the same in the company." (Q06)

"There are 5 directors there and each of them has got their own version of the templates, which makes it a bit difficult." (Q10)

However, two participants mentioned that the various directors in the company prefer their own template, creating inconsistency within the company (Q08 and Q10).

5.5.3.5 Compliments received

It is noted that a few participants received compliments from their clients with regards to the formatting of their feasibility study (Q05, Q09, and Q17).

"And we've had compliments back from developers. And also, we find unsophisticated developers also like it as well." (Q05)

5.5.4 Errors in feasibilities

Drawn from the literature, QSs make mistakes when preparing feasibilities, such as inconsistencies in the procedures or approaches in terms of incomplete and/or inaccurate data, a lack of organisation and management tools to complete the required document, and overlooking and forgetting key elements (Mackenzie and

Cusworth, 2007). Some mistakes made by quantity surveyors were highlighted. These mistakes include:

- According to the literature, there are no attempts to evaluate feasibilities after construction is done (Hyari and Kandil, 2009). Likewise, this study found that QSs do not check the final outcome of the project against the initial estimated feasibility.

  “I've never done a feasibility and then kind of afterwards went back to the client to see if that was the return that we kind of predicted.” (Q20)

- Faulty estimates (Abou-Zeid et al., 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Mukherjee and Roy, 2017).

  “And my boss at the time took over and smelled something fishy. So she redid the whole feasibility study again and found that the budget was light by a couple hundred million Rand. So the bank immediately pulled the funding…” (Q18)

- Focusing on one part of a feasibility study in lieu of taking a holistic approach (Q01).
- Lack of cost control during the construction stage (Q09).
- Over allowance on contingencies (Lim et al., 2016) and (Q06, Q12, Q14 and Q15).

  “Some QSs are very conservative and the costs have got contingencies built in there that you can never make the project work.” (Q12)

- The rate per square estimate (Bettini et al., 2016).

  “I don't do rate per squares, I do not do that, it is too risky.” (Q09)

- Relying too heavily on historical data (Abou-Zeid et al., 2007; Lim et al., 2016; Mukherjee and Roy, 2017).

"Don't just leave something like it was in the previous feasibility study that you've used. That happens quite often. So where you just leave costs." (Q23)

- Misleading clients to benefit from the job (Ramawela, 2017; Kgaka, 2018) and (Q06 and Q11).

  "And I think it's one of the biggest problems in the market generally, is that we as QSs are trying to, try and convince our clients that they must do this development. Every scheme is a good scheme, and it's not always the case." (Q06)

5.6 SUMMARY OF THE CHAPTER

This chapter conveyed the findings of the QSs' perspective regarding feasibilities. These findings are integrated with relevant literature. The data is organised into three sections. Section one focused on the role of the feasibility from the QS's perspective. Section two highlighted additional actants, and section three focused on the nature and occurrence of feasibilities in the industry and the errors thereof. This chapter revisited rich data gathered from interviews, which includes comments made by practitioners surrounding the research argument. The next chapter is a discussion on the interviews with the second sample group, the developers.

CHAPTER 6: ANALYSIS AND DISCUSSION OF THE DEVELOPER INTERVIEWS

Similar to Chapter 5, this chapter presents an account of actants that form part of the feasibility study process using the ANT as an analytical framework. The developers' perspectives are discussed in this chapter. For phase one of the research design, a qualitative approach was taken. Participants were interviewed individually by means of semi-structured interviews. The chapter starts off with the demographic analysis of the participants in the property development profession.

6.1 DEMOGRAPHIC ANALYSIS: INTERVIEWS WITH DEVELOPERS

A total of 46 developers were contacted, where 23 were interviewed as part of this study, ending with a success rate of 50%. The developer side of the industry is dominated by males, as only one female formed part of this sample group. As indicated in Figure 6.1, most of the developers interviewed were originally quantity surveyors or construction managers.

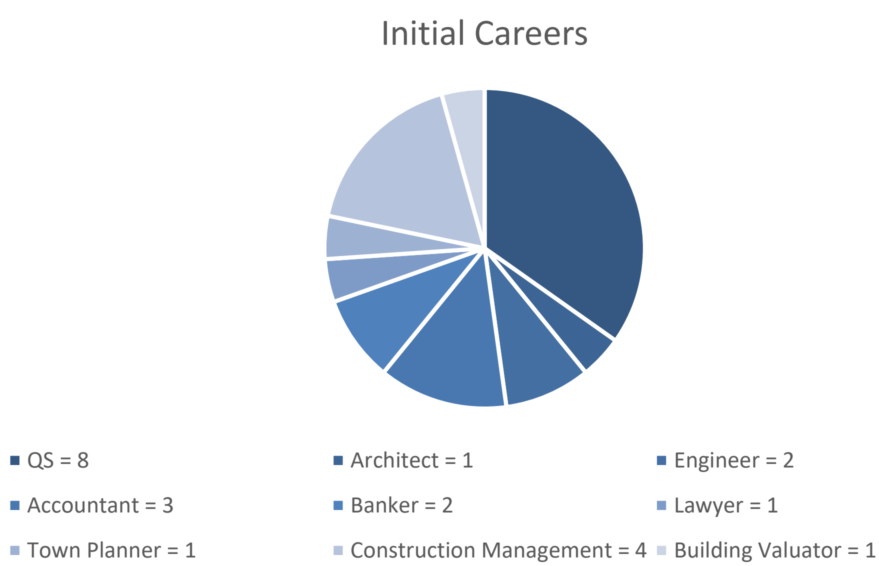

Figure 6.1: Developer Interviews – Initial careers of the participants

The developer profession is fed by other professions, as it is more an entrepreneurial role (Ramawela, 2017; Kgaka, 2018). The initial profession of the other participants includes accountants, bankers, engineers, architect, town planner, lawyer and a building inspector and valuator. It is noteworthy to mention that none of the participants started their careers by studying property development.

Each of the participants represents a company, given that the experience of the interviewee is dependent on the experience of the company. Four small companies, eight medium-sized companies, five large companies and six Johannesburg Stock Exchange (JSE) listed companies are represented. As shown in Figure 6.2, each category is adequately represented.

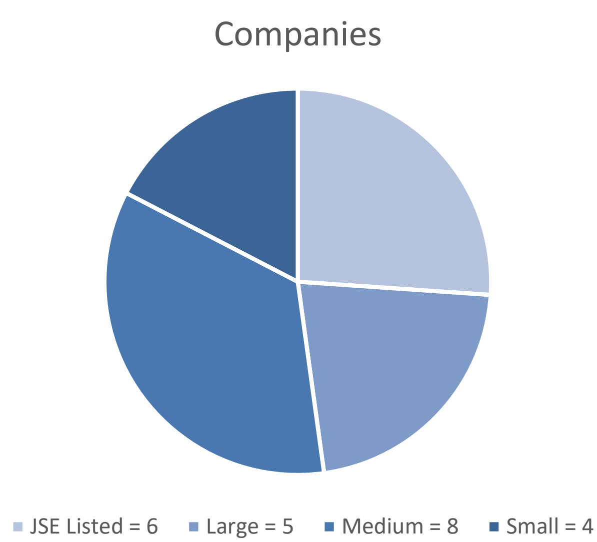

Figure 6.2: Developer Interviews – Distribution of the size of property development companies represented

The size of the companies depicts the type of roles that the employees fulfil, although they are still similar to a developer. Larger companies have job titles like commercial managers, development managers and project managers all fulfil a part of the development role and form part of the developer's perspective.

Most of the participants (nine) are either the sole owner or founder and CEO of a property development company. Four of the participants are in upper management, six are development managers, and there is one commercial manager, one project manager, and two participants who fulfilled a partial QS role from the developer's perspective. The distribution thereof is displayed in the pie chart in Figure 6.3.

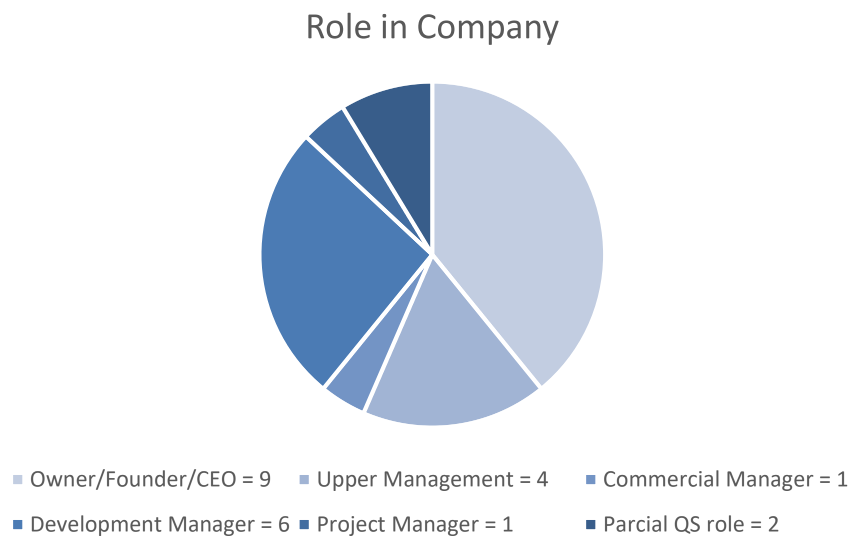

Figure 6.3: Developer Interviews – The participants' roles in the companies

6.2 INTRODUCING THE SECTIONS

Likewise, the interviews with the developers are divided into three main sections.

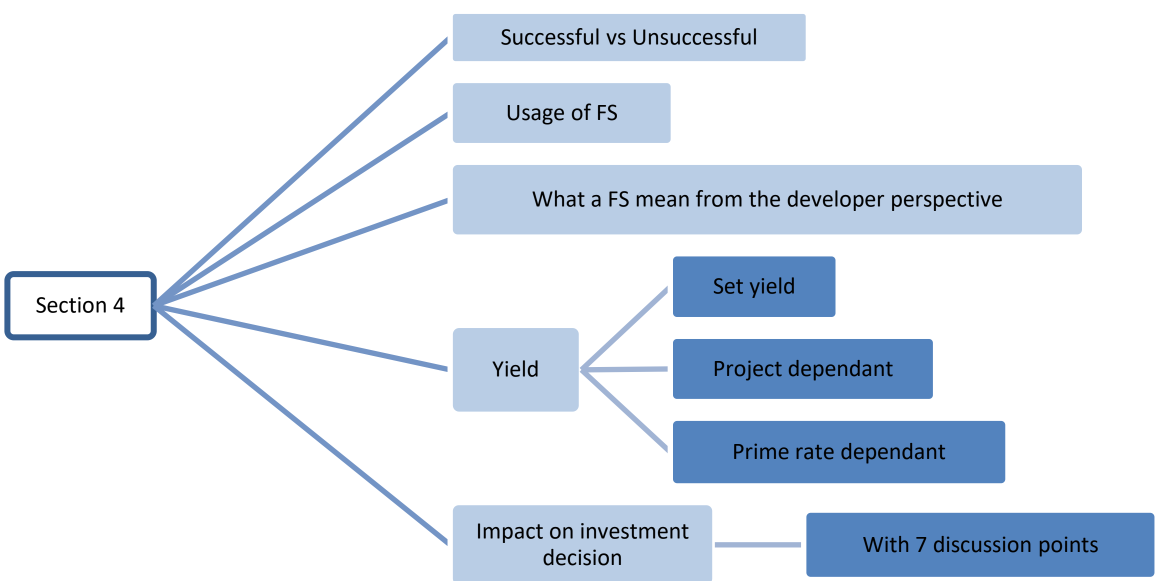

Figure 6.4: Depiction of section four's concepts

Figure 6.4 indicates section four of the interview; Figure 6.5 shows the depiction of section five, and lastly Figure 6.6 illustrates the final section of the qualitative data (section 6).

Figure 6.5: Depiction of section five's concepts

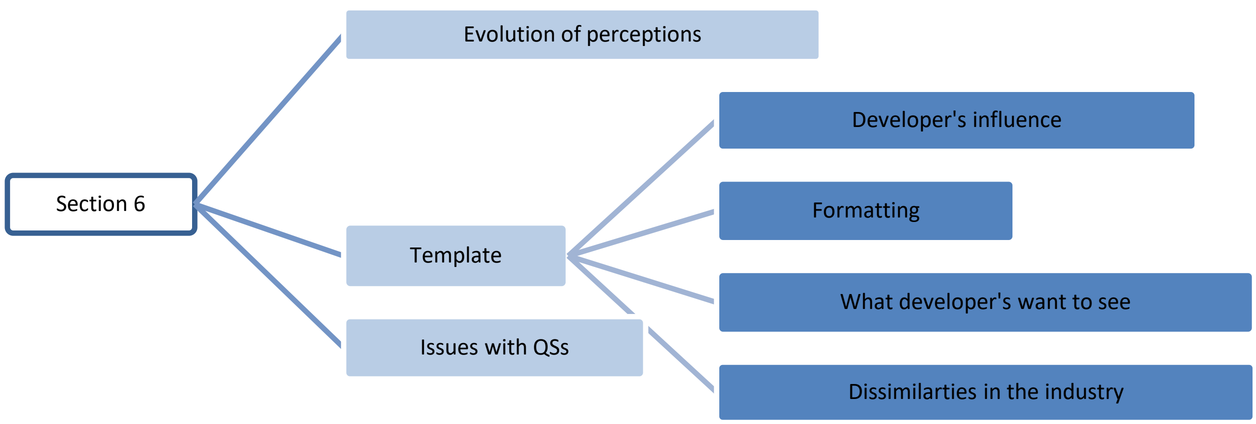

Figure 6.6: Depiction of section six's concepts

The transcripts are labelled per developer participant using the following labels: D01, D02, up to D23 for the 23 transcripts/participants. These references used in the following sections refer to the transcripts and therefore a specific participant.

6.3 Section 4: The Role of the Feasibility Study from the Developer Perspective

Section four dealt with the role of the feasibility study from the developer's perspective and the underlying meaning thereof. The aim of section one is to address the developer perspective of the sub-question: What role does a feasibility study play as an artefact from various perspectives? Five considerations arose from the thematic analysis. The findings of section four are set out as follows:

- Successful versus unsuccessful feasibility studies (6.3.1)
- Usage of feasibility studies (6.3.2)
- The underlying meaning of feasibility studies to developers (6.3.3)
- Yield (6.3.4)
- The impact on investment decisions (6.3.5)

6.3.1 Successful versus unsuccessful feasibility studies

Decision factors include a high debt/equity ratio, low construction cost, short construction period and a reasonable return on investment (Salman *et al.*, 2007). According to Bettini *et al.* (2016), a 4% margin of error is acceptable. For a hotel development to be deemed feasible, the NPV needs to be larger than zero, the PP needs to be shorter than ten years, and the IRR needs to be more than interest provided by banks (Sudhana, 2016). A participant, however, mentioned that provided there is some return on investment, it is deemed to be successful:

> *"You've got your money back, and plus a little bit of interest on your own capital that you've put in plus a … plus a bit of a return, then you're definitely successful." (D03)*

Furthermore, participants specified that a successful feasibility study is named as such when the estimated budget and yield are achieved by the end of the project (D11, D13, D15, and D20) and does not have a big saving (D04, D13, and D17):

> *"So, the promised budget, or capital expenditure on promised income should be achieved at the end." (D11)*

Additionally, participants stated that a successful feasibility study requires to be all inclusive (D01, D11, and D17):

> *"So, it's all encompassing, you've included everything." (D11)*

The most emphasis, however, was put on correct, realistic an accurate feasibility studies (D04, D10, D14, D16, D18, D19, D20, D22, and D23):

> *"Accuracy, that's first and foremost. If it is inaccurate, it's not really worth much given that it is the thing on which so much so many vital decisions are made on." (D16)*

Some participants relate the success of a feasibility study with the amount of detail it accompanies (D03, D11, D13, D16, and D19):

> *"If it's detailed, based on a detailed concept design, that's a good feasibility." (D11)*

The data needs to relate to the current market conditions (D01, D12, D14, D15, and D22):

> *"It should be market related in cost and income and returns." (D18)*

The application of logic during the compilation of a feasibility study is connected to the success thereof (D02 and D03):

> *"My biggest requirement is to have a logical clear layout." (D03)*

Furthermore, a participant mentioned that negotiated fees should be included in the feasibility study:

> *"That the fees and stuff that they included is accurate and was negotiated with all the professional team and they agreed to those fees." (D01)*

Moreover, value engineering should have taken place:

> *"I would like to, to know that they did a bit of value engineering with the architect to see if they can't save on expenses." (D01)*

Lastly, clarity is critical to the success of a feasibility study (D05, D09, and D15):

> *"They just got to be very clear." (D15)*

There are many different views of what constitute a successful feasibility according to the developers. However, consolidating these views give a clear picture of how a feasibility should be overall, rather than seeing these as contradicting views.

6.3.2 Usage of feasibility studies

From the developer's point of view, multiple usage factors were identified:

A basis for decision-making (D10, D15, and D16):

> *"It goes to the core of whether we proceed with work or not. It is sort of the founding document and that on which decisions are made." (D16)*

To acquire financing, either through the bank or investors (Kimaru, 2018) (D02, D09, and D15):

> *"It's probably quite important for bank reasons." (D15)*

Determine how much debt would be acceptable:

> *"…how much debt could one put into that system?" (D12)*

A basis for negotiation (Anees *et al.*, 2018; Kimaru, 2018) (D10 and D20):

> *"So, I know the areas where I can negotiate." (D20)*

Facilitate deals with potential tenants (D09, D17, D18, and D20):

> *"Sometimes we have a deal with a tenant that's on a yield-based deal. They will say. If this is the cost, that's the yield, they will pay for it." (D17)*
>
> *"It guides me on the revenue side of my development. So once I know my costs and I know what margin I want, it guides me from a revenue perspective, so I know where to pitch the development and whether that's possible or not." (D20)*

It becomes the budget (Anees *et al.*, 2018) (D09, D11, D12, D15, D16, D17, D19, and D20):

“That feasibility becomes your budget.” (D09)

“And so we then start measuring costs against that our pre sales, our rentals etc. against that, literally on a monthly basis, so it becomes my budget.” (D20)

Determine the risk in terms of the total capital outlay (D12, D20, and D21):

“It’s critical in terms of just understanding your cost structure, the amount of funding you need to raise the equity you've got to put in the development.” (D20)

It becomes the basis for value engineering (Anees *et al.*, 2018) (D20):

“And it's very important from a value engineering perspective.” (D20)

To acquire and service land (D09, D10, and D11):

“We start off with a feasibility study on how to service a piece of land.” (D09)

“It's in pursuit of acquiring land.” (D10)

It is a basis of cost reporting:

“It’s also the basis of your monthly cost reports that you need to present.” (D01)

It is a basis for cost control (D02, D03, D08, D10, D14, D19, and D22):

“And then from there, we'll manage the feasibility Study through our QS reports on a monthly basis.” (D22)

It is a basis of progress measurement:

“We'll use it as a sort of a budget to measure our progress.” (D05)

It links to financial statements:

“…this is what we plan to spend and our statements that reflect that is what we've actually done.” (D03)

It becomes a basis for performance measurement:

> *"That becomes the baseline for our performance measurement as well." D19*

It is an encompassing tool:

> *"It's a tool, but it's not only a tool. There's more to it." (D04)*

It is a basis for the as-built feasibility study:

> *"And at the end of the job on my side, I then have to finalise what we call an as built feasibility to say, this is the job started. And this is where we hand it over to our facilities guys. And give back to the finance guys the as built feasibility." (D17)*

Lastly, feasibilities serve as a guide for managing risks (Zakaria *et al.*, 2015) (D07):

> *"A feasibility tends to probably guide you on certain risks." (D07)*

From the findings it is clear that feasibilities do not have only one purpose, but multiple usages that is integrated with all six project stages.

6.3.3 The underlying meaning of feasibility studies to developers

This discussion point aims to understand the underlying meaning of feasibility studies to developers. This could contribute to understanding the expectations of developers regarding the same feasibility study. The analysis presented six underlying meanings to developers:

Assurance of a return:

> *"A feasibility study for me is to make sure that you get your ... the proposed your return on the investment that you're making." (D01)*

The overall success of projects (D01, D10, D14, D18, D20 and D22):

> *"So the feasibility is to the end all and be all, I think, in my opinion, to the start of a project to the success of a project, being as the decision is made on your feasibility to go ahead or not for the project." (D01)*

It becomes a business plan:

> *"Well for us it's almost like a business plan." (D03)*

It gives credibility to a project:

> *"They give credibility to your project." (D04)*

It is the starting point of a project/investment and it gets projects off the ground to start an investment (Lock, 2020) and D05, D11, D14, D15, D22, and D23):

> *"The feasibility study is basically, I would say that the finger on the trigger." (D05)*

> *"That's always our starting point." (D23)*

It solves problems:

> *"We focus on the commercial solution in trying to really deeply and fundamentally understand what is the commercial problem you're trying to solve?" (D06)*

6.3.4 Yield

Since the return is the deciding factor, three main concepts surrounding the yield emerged:

- Set yield (6.3.4.1)
- Prime rate dependent (6.3.4.2)
- Project dependent (6.3.4.3)

6.3.4.1 Set minimum yield

Participants stated that the tipping point for the investment decision rests on a minimum yield (D02, D05, D09, D12, and D23):

> *"I am very bullish. I would say from 12% up." (D02)*

> *"I'm looking at returns north to 25%." (D12)*

> *"We look at a minimum return that we want." (D23)*

6.3.4.2 Prime rate dependent

Some participants stressed that the target yield changes along with the set prime rate (D13 and D20):

> *"It does change depending on your cost of funding." (D20)*

6.3.4.3 Project dependent

Most participants said that the yield, however, is dependent on each project and the underlying risks that accompanies the specific project (D03, D06, D8, D10, D11, D14, D15, D16, D17, D19, D21, and D22):

> *"If it is a development where you see that this asset will be... it is such a landmark piece of land and the development that you will do on that land is of such a landmark value, then you might sacrifice yield for long term benefit." (D10)*

> *"It's all about the expected return and that expected return is very dependent on the perceived risk of opportunity." (D11)*

> *"The expected yield depends on a couple of things. So it's firstly the nature of the project, the long term view of the project and the location of the project." (D19)*

6.3.5 The impact on investment decisions

As found in the literature, the feasibility study ultimately supports the decision to either proceed or not to proceed with a project idea (Banda, 2017). The qualitative component explores the full impact that feasibility studies have on the investment decision from the developer's perspective. The findings relate to seven aspects:

- The decision to proceed (6.3.5.1)
- When to proceed (6.3.5.2)
- Clarity on the type of project (6.3.5.3)
- The tenants to include (6.3.5.4)
- Continuous decision-making (6.3.5.5)
- In support of prior decisions/beliefs (6.3.5.6)

6.3.5.1 The decision to proceed

First and foremost, the feasibility study impacts the initial investment decision to proceed (Mackenzie and Cusworth, 2007; Heralova, 2017; Lock, 2020) and (D01, D03, D05, D08, D11, and D21):

> *"The feasibility study is the basis for making the decision to go ahead with the project." (D11)*

6.3.5.2 When to proceed

Furthermore, the feasibility study helps answer the question 'when to proceed?':

> *"The question is, should we do it then or should we wait?" (D07)*

6.3.5.3 Clarity on the type of project

Clarity on how to proceed with the project is provided by the feasibility (Lock, 2020). The participants voiced their opinions on this (D12, D13, and D20):

> *"Once I'm invested in the land, I'm going to go forward with the project, but it's how it's done. It's the how my developments going to be done." (D20)*

6.3.5.4 What tenants to include

Moreover, the feasibility assists with the decision on the tenants:

> *"The other crucial ones are the signup of major tenants …it's the anchor tenants, the feasibility study and the market study, if those are aligned and show the potential then that you move forward and spend money." (D18)*

6.3.5.5 Continuous decision-making

The feasibility study forms the basis of continuous decision-making throughout the project (Mukherjee and Roy, 2017; Kimaru, 2018; Dagne, 2019) and (D03 and D11):

> *"It's basically what you base your decisions on. I refer to it probably for all the big decisions that we make on a development." (D03)*

6.3.5.6 In support of prior decisions/beliefs

On occasion however, the feasibility study serves as a confirmation tool rather than a decision-making tool (D04, D07, and D15):

> *"But there has been in certain cases, that said, it was more for banks or financial institutions to confirm our belief... is basically ... the feasibility was more to confirm what we believe that we try and do." (D04)*

> *"And the feasibility is just a confirmation really, at the end of the day." (D15)*

6.4 SECTION 5: IDENTIFYING ACTANTS

As in section 2, this section aims to identify actants that influence the feasibility study drawn from the developer interviews. Twenty-six actants emerged:

6.4.1 Approach by developer

The approach by the developer has an effect on the success of feasibilities, especially when personal but unreasonable objectives are set with unrealistic budget decisions (Al-Hawsah, 2020). Furthermore, developers use different profitability indicators (valuation methods), which can give different profitability advice and therefore influence the success of projects (Huxham, 2010). Profit margins (Zakaria *et al.*, 2015) and benefit cost ratio (Yun and Caldas, 2009) are decision factors depending on the developer's approach. The participants elaborated on their approaches:

D01:

- In-house system: own feasibilities and contractor – appoint other consultants
- QS input is limited to construction cost and fees calculation

  "General costs, rezoning, legal fees things like that we also have in-house we also have our own in-house lawyer. So, we do the rezoning all in house. So, the professional team has no input on that."

D02:

  "First of all you need to have a vision of what you want to do. You target the area. You got to find your location you believe in. And then you look for stuff where I can add value."

- Work with a 'one-man-show' QS
- JVs on different projects

  "I generally like distressed properties. I don't want to go into new buildings, because then it's too expensive. I like looking for distressed properties."

- Communication to QS: upmarket or low market and special features, but QS does the entire development cost.

D03:

- Develop to sell but do have some rental schemes.
- Look for opportunities

  "We have limited capital available and normally we can do one or two, three max, probably developments at a time at various stages of development. So,

it's driven by the availability of capital and then going out and looking for opportunities."

- Do feasibility oneself, unless a JV is involved, then there is an external QS doing the feasibility.

  "We direct the architect or to limit him in on what is allowed to do."

- Get input form marketing agents and utilise the deed search platform.

  "It's also a situation where sometimes you run out of work, and you don't have enough and you have to generate something. So let's build something. Instead of having the market determined what is the demand for buildings."

D04:

- Number one, acquiring projects is a combination of contacts built up over many years; number two is a feeling for the market.

  "Traffic impact studies is quite important in the sense that it influences our town planning information. And that's a major cost to us."

  "We double our profit margin so I can do the development half the size then let's say a listed or establish role-player, because I cut out a lot of those professionals and I cut out the feasibility. I cut out the Qs."

  "Then we oversee project management Qs, sales all of that and in a sense, the ... we've got two divisions. The one creates rent ... the one create stock to sell and there we increase our profit margin."

  "The big challenge is to get a banking partner that's willing to accept that those liabilities or guarantees of that professional team is not involved."

- Use Property24.com to check rental market.

  "... I drive past the stand. I do quick research and I take a decision within an hour's time. Whereas if I request a report I get in in two months' time."

"Actually I've got an unfair advantage and I've got a better business that build and sell properties. And that is my income. And that pays for all overheads. And actually, that business subsidize the purely rental business."

"So the cost is not purely a figure. It's the way that we do it. So that it's not just identifying the land but the way that we buy it. We've got cases where I would drop the amount of units slightly, but it would mean that I don't have to put in a traffic light or a robot at the intersection.

So each council determines bulk contributions in a different way. And to really understand, so it's not I'm just going to build this building, what is the bulk contributions? I say, How do you calculate the bulk contributions, then I tell my architect, create the unit 74 square meters with the availability to split them afterwards.

I really believe in phasing of units. Bank finance is also easier."

D05:

- To acquire land, people will approach them, or they have a dedicated person in the office to find land/development opportunity.

  "We like sticking to the same team."

- Developer input: land and related. Engineers' input on bulk contributions.

  "He can do his first feasibility without the costing from the consultants, the various engineers. The closer we get to the start date and the more we start drilling down on the return number, the better, it is to have your costing from the engineers as well."

- Internal leasing team, legal advisor, and town planner.
- Speaking to the various tenants long before developments start.

D06:

- Development opportunities are driven by an unfulfilled need in the market.

  “We are businesspeople who see an opportunity in power. So we will package the project. We are commercial people who will package the project and then team up with international experts to come and run the power plant or do the EPC construction of the power plant.”

D07:

“You must go and look for development. Because the ingredients of putting it up together depends on your broader knowledge of how the industry functions.”

“I don't work with a lot of QSs, I work with strictly with one.”

“It will be ourselves that give information to the QS.”

“So I'll give it to a development manager who then reports to me, but in my own right, am I development manager.”

D08:

“I don't have a quantity surveyor. I do my own quantities.”

“I like to have a chat with the local agents that's working in the area, and then determine what the market, on the selling side as well as on the renting side.

D09:

- Find land on their own or are approached.

  “We’ll sit on it until we find either an offtake agreement with the residential partner or we've got a leasing department, which we'll then go out and physically look for tenants. And once a big anchor tenant on the retail portion has been acquired, then the development can start.”

"We sit on them for quite a while and obviously my job in this case is to find out what is the land costing us by just sitting on it and not developing it."

"For each top structure project, there will be a QS company involved. I think we currently working with five to six QS companies."

- Development manager and project manager in-house.
- Input from developer: land and related costs

D10:

- Have development criteria and stick to what you know.

"You investigate and you do your thorough homework. And then until such a point where you either ... where you where you start to develop where you appoint, your professional team."

"We are more successful with the things that we pursue and identify."

"We have a final closeout document that's presented and signed off where it will say this was the actual cost all the parameters."

"From experience that a yield will improve during the development. So you might say yes to a yield of 8.8. Where your benchmark is actually nine."

D11:

"So at the beginning when we initiate projects we obviously first initially do what I like to do our due diligence, the background checks, do we have the zoning rights, do have this and do we have... is there a market? You then go to your shareholders and you sell that and you get it approved."

"We have what we call our closeout reports that we will do a year or two after development is finished."

"I've got a project manager who will have put together the programme and the method statement on how we're going to build this thing. So those are assumptions that need to be factored in by the QS."

- The developer gives land value and interest rates to the QS.
- Make use of a lot of different quantity surveyors.
- Property brokers give input.

D12:

"You can either choose to sell the land, hold the land, or choose to develop the land."

"We spend an enormous amount of time finding land. So what I'll do is I actually do a, I run a lot of scenarios, even before feasibility."

"I then go to a contractor. And I say, give me a turnkey contract to build for 680. Whatever you save is yours."

D13:

- As a financial institution they get involved in projects that they fund:

"…there is a good opportunity and when distressed projects and distressed properties that had been bought to develop and people didn't either have the know all or the way with all or the ability to develop it and so we could get in."

"Very clever actuaries and guys who knew nothing about construction that would come in and question the numbers and question the feasibilities."

"We give the detailed specification and the list of criteria that are required in order for that specification to be met. Along with the expectations of the yields."

"The income side came from either an external letting agent or from an internal letting team that drove the... so your legal department drives all the

leases and then only once the heads of terms is signed by the tenant, and the board resolution as approved the signing of the lease, that's the board from the company itself."

D14:

"We generally find the opportunities that come across our desk of just being sort of a major developing company and quite well known in the industry." JV

"We do our own feasibilities. Where our QS play a role is they purely just work on the construction estimates for us."

"The development managers are the guys who set it up. They have to understand the model intimately, and what inputs are going in."

"We'll rather invest in 10 different developments and take 10% in each of those, which means we as an operational business has 10 developments that they can then actually develop and generate money out of instead of taking 100% from one development because that's the equity available."

"We appoint the professional team, we appoint the contractors, we perform a development function for a group of investors where we sit as well on that side and we report back to these investors. We also do all the leasing for the investors."

"But we pay that price so the investors are then shielded from a cost overrun. We take that risk."

"A tenant that wants a building upfront straightforward, you negotiate everything up front, everything's fixed, done and signed the lease, then you build."

"We've got asset management teams that take over."

"We often have a scenario where we have three, three four shareholders, but that each have a different feasibility, then we will prepare... your yield is this your yield, your yield is this. And that can make it quite tricky as well."

- Carry out fee negotiations themselves.

"We have leasing, leasing and marketing teams in-house and they are dealing with tenants."

D15:

"Our speciality is sectional title offices, which we are sort of business models to sell half keep half. We are very green and we build five and six star rated green buildings."

"I give all the income, and it's gut feel."

"The general development costs a QS will always put in so that's always in their feasibility. So things like your zoning costs. And all the let's call it marketing costs, etc. that must all come into the feasibility. So that's a QSs responsibility and if it is not in he is not a good QS."

- QS compiles full FS and needs to gather the relevant data.

D16:

"We are the owners of the assets. We seek opportunities to develop assets in order to increase our asset base."

- QS does feasibility, client provides income side and land and related.

D17:

"CEO generally finalize those deals, finalise leases and stuff and then hand it over to our on the us on the development side."

"Extensively hunt for the projects."

“We generally do our own feasibilities. We will get PQs to do our estimates based on the concept planning that we do. And then we do our own feasibilities.”

“On some projects where we are joint ventures, and some of our partners work differently, and they let the PQs do the feasibility.”

D18:

“I drive around and investigate possibilities, and then do a first myself a desktop study. And then after that, I, I get a market researcher to investigate more. And then I start negotiating with the landowner.”

“Later on when you sit... you have control over the land, and you start with approaching the key tenants, then you do a full market research. What you present and then present it to the tenants for the interest.”

“The first thing for me is to get the income, the cost you can control... is... for me the starting point is the income stream.”

“Normally it's I do it myself. Firstly, based on the income. I do the income side because I've got a lot of experience on leasing. I compile the income side and the financial side, and then the QS do the cost side of it.”

“There are market researchers that provide you with those info, you just go online and you pay a fee of two or R3000. And then you can say what you think is the market area. And they will they will do the calc they will provide you with a desktop.”

D19:

“Generally what happens is how our company is structured, you've got asset managers who look after specific key sectors, and their job is the strategic growth of the company.”

"The professional team we appoint, we then come up with a workable scheme, hopefully for approval."

"So it's basically if you look at our internal processes, it would be us as a development manager, and then the income sections would come from our asset management guys who sort of owns it. So between us we give all the info to the QS and externally, I think although the Qs is the main driver, underneath that, you've got the architect, the PM and all of them feeding the information into the QS for the drafting of the document."

D20:

"So the first thing I'll do is I'll try and identify land."

"We really get involved in in the profitability of the development and the QS plays a vital role in that regard."

"So the QSs get involved in the costs costing of the building per se... professional fees and all the rest of it."

"I work with property brokers all the time."

D21:

"We are very fortunate in the sense that we create our own work within the estate."

"We don't make use of external professional quantity surveyors."

"We work quite closely with the contractors, we are on site. It's almost a more time consuming process going from a contractor to a QS back to us back to the QS back to the contractor. We sort of eliminated that process and we do still have a QS function and a feasibility function."

We actually put the estimate and the feasibility aside. You know, we don't really work with a budget process like most professionals would where you *constantly comparing where the project is to budget and you know how many variations are going up or down we have it in the back of our minds but we actually manage the cost with the contractor."*

- Do income themselves.

D22:

"We basically then have the land just lying there and we then will either wait for a tenant, specifically commercial office tenants to come to us and wanting to situate themselves inside the precinct."

"If you look at the work stages of the QS normally we would go through iterations of the feasibility study right through from stage one to probably stage 4.1, maybe even stage 4.2. At the start of construction, where we will still make some adjustments to the feasibility study."

"Then from there, we'll manage the feasibility Study through our QS reports on a monthly basis."

"We pretty much leave it up to the QS but we also get input from a developer's point of view, what we think the escalation should be, and what we think the interest rates should be, how the cash flow factor needs to be worked out, and what the S-curve will be throughout the duration of the project."

"We've got an in-house brokerage as well brokerage division."

D23:

"We've got a property broker that works for us and then they go out to look for clients. We've got open pieces of land that zone for light industrial, industrial, residential, commercial. So we go on to the market and get guys that want specific buildings."

"Sometimes we do a JV."

"Everything is internal" (FS).

"We've got internal property brokers."

6.4.2 Developer knowledge

The level of understanding of the developer influences their thinking with regards to feasibility studies and impacts the success of feasibilities (Sudhana, 2016; Dandan *et al.*, 2019; Willemse, 2019; Al-Hawsah, 2020). Furthermore, Kgaka (2018) found that it is vital for developers to have a sufficient level of understanding regarding the financials of a development and argues that this field of expertise is of the most important skills for an emerging property developer to possess before embarking on a development. This became a clear opinion of a participant:

> *"But other developers I think are quite often um, have a much... they have a much worse understanding, that they don't know the proper understanding really of what the document is about." (D03)*

6.4.3 The feel

Similarly, as mentioned by quantity surveyors, 'the feel' plays an intricate role in decision-making (D04, D05, D08, D12, D15, D20, and D21):

> *"Number two is a feeling for the market." (D04)*

> *"We've got an internal leasing department as well. So they, depending on the area, so obviously, they've got a feel for the areas as well."*

> *"You've got a good feeling, anyway of where things are…" (D20)*

6.4.4 Financiers

Financiers have specific requirements regarding feasibility studies (D02, D03, D04, D07, D08, D10, D18, D20, D22, and D23) and therefore has a direct influence on the outcome thereof. Often developers are dependent on banks:

"It's also got to meet the bank's requirements" (D20)

From the quantity surveyor's side, they need to be aware of the applicable interest rates:

> *"Is the rate, the interest rate that they put in there, does it relate to your prime interest rate at the moment? The QSs must also go and investigate and ask the developer and ask the client, where are you going to get the money to build this building?" (D09)*

Undivided share structure:

> *"So we generally structure the developments in undivided share where each owner has his own effective title dead on the development. So each owner can do his own funding... which gives it flexibility." (D14)*

6.4.5 Investors and joint ventures

Financing can also be dependent on investors or joint venture partners (D02, D03, D04, D06, D09, D11, D14, D17, D22, and D23). In the event, the same would have an influence on the requirements of the feasibility study:

> *"On some projects where we are joint ventures, and some of our partners work differently, and they let the PQs work like that. And then we say that's fine. Do the whole thing on your side as well." (D17)*

6.4.6 Tenants

A feasibility may forecast certain rental income; however, lack of tenants make the entire project unviable (Karas, 2017). The involvement of tenants form part of investment decision-making (D02, D03, D08, D09, D13, D14, D16, D17, D18, D21, and D22):

> *"Then you need to find tenants or developers that will buy into the vision." (D02)*

"The bank also has a certain requirement for pre sales or pre rentals and so you know, the easier we can we can get it um, successful in that sense by selling it um, the better." (D03)

"As soon as you find tenants then we will go to an investment committee to start the process and to say okay, we've got potential tenants that wants to build a new building on this piece of land." (D09)

6.4.7 Volatility of the market

The volatility of the market ensures that the feasibility study is only for a point in time (Kgaka, 2018) and market risk is the possibility that the market value can decline (Okereke *et al.*, 2020) and (D04, D12, and D22):

"No quantity surveyors going to convince me that a feasibility is through the cycle. It's a point in time estimate. You prepare the costings, based on what you've got at a point in time. You don't know how the markets going to play out. No one foresaw the virus, no one." (D12)

6.4.8 Contractor

The appointed contractor can also influence the success; therefore the reputation of contractors who might be involved is essential (Lock, 2020) and D01:

"They appointed a contractor who didn't, did not perform. It's also key not to just only look at the feasibility but also to appoint a contractor that can do the job." (D01)

6.4.9 QSs' areas of expertise

Highly-qualified professionals are vital to feasibility studies (Salman *et al.*, 2007; Lim *et al.*, 2016). The interviewees recognised this factor as being important as well (D11, D14, D16, D19, D20, and D22):

"We are very specific in using people who have experience in whatever it is that you're trying to do. We're not going to consider using a QS whose experience is just doing industrial buildings." (D11)

"We work with guys that have become reasonably specialised focused in retail." (D16)

"Just some QSs are better than others at different areas. So you get QSs that might be really good on a hotel, where other QSs haven't get that exposure. Some are really good on industrial, not so good on Office development." (D20)

6.4.10 QS motivation

The motivation behind the QS to make the feasibility work is fees. This motivation could infringe on the objectives of the project.

"Also, if the project works, then the QS gets fees. There's a good motivation for him to make it work with someone else's money again." (D03)

6.4.11 Relationship between the QS and Team

Lack of communication from the developer to the team is an issue and impacts the success of feasibilities negatively (Dandan *et al.*, 2019; Al-Hawsah, 2020). The expected relationship elements with the QS as described by the developers were as follows:

- Ethicality:

  "I work strictly with one QS. He is not driven by how much percentage is going to charge, he driven by how much is going to save you. Which I find to be extremely ethical." (D07)

- Loyalty and commitment:

"They've shown loyalty, they've shown commitment, they've shown hard work. They've stood with us for ... through the good and the bad. And we've formed relationships with them." (D10)

- Partnership:

  "It's important to grow in partnership with whoever's doing your feasibility studies." (D04)

- Familiarity was mentioned or implied by participants D02, D05, D06, D07, D10, D12, D14, D15, D16, D19, D20, and D22):

  "And basically I've been working with the 'one-man-QS' with 30 years. Familiarity." (D02)

  "Typically once you build up a relationship with people you understand how they work." (D06)

  "It's familiar faces, they are like family now." (D10)

  "We work on a repeat basis with the QSs so you actually, they understand your system." (D19)

They referred to familiarity in terms of the developer understanding the QS, as well as the QS being familiar with the type of designs that can be expected. This familiarity also contributes to more efficient services from the QS and team.

- Reliability and trust (D01, D03, D06, D07, D09, D10, D14, D17, D20, and D22):

  "It's a very important basis for the relationship. The QS basically builds trust by having an accurate feasibility." (D03)

  "And we use a very specific QS to do our feasibility studies and we've been working together with them since the beginning. Almost on all our projects we've been working exclusively with him. So I think it's a very the relationship that the developer has with his QS and with the party that prepares the

feasibility studies is very important. And it's quite a trust based kind of relationship." (D22)

Participants stated that they prefer to work with the same team as a whole, not just with the QS (D05, D07, D10, D12, D14, D15, and D21). Furthermore, a participant recognised the tension that exists between the QS and the architect:

"So there's a lovely tension between the architect and the feasibility and it's a very productive process." (D15)

Additionally, participants deemed the relationship among team members to be important:

"Once you've found one or two that really work well with you. Work well with your professional team, have a track record, you stick to those guys." (D20)

"I think can be defined as a QS that has good relationships with industry players." (D22)

The QS having a good relationship with the rest of the team, as well as the contractor, adds value in terms of efficiency and less tension.

6.4.12 Risk work

Contradictory to what the participants stated, Ramawela (2017) claimed that developers pay for feasibilities:

"Sometimes you got to take that hard line and it gets you the results. And they all work on risk until ... we don't pay until, until the construction starts." (D14)

6.4.13 Geotechnical conditions

Geotechnical conditions can cause cost overruns if a geotechnical study is not done (D08 and D20):

"I spent about 80,000 just on moving ground which I had to get rid of ground and the rocks that we took out to do the raft, and we never budgeted for that." (D08)

6.4.14 Location

The location of a project remains a centre point of the success thereof (Costello and Preller, 2010; Sudhana, 2016) and (D02, D03, and D06):

"It is high risk and you got to choose your location quite well." (D02)

6.4.15 Brownfield versus Greenfield

Brownfields versus greenfields emerged when it became clear there is a difference in what is required to get the land ready for the envisaged development:

"Brownfields is always exceptionally difficult. Greenfield stuff is a lot easier because you can ... your visibility is clear." (D06)

"If it is necessary so greenfields development that might need bulk services cost, infrastructure costs and then the legal conveyancing, that sort of thing." (D16)

"So our key focus generally is Brownfield assets, assets we already own and the regeneration of it." (D19)

"It's actually quite unique because we are developing a brownfield development. So it comprised around about 16, hectares, and it had 107 houses situated on that site. So the developers initially demolished all those houses and then they started with land assembly." (D22)

Interestingly, some developers have a distinct preference for either brownfield or greenfield. Their preferences also differ from one another.

6.4.16 Green developments

Some developers aim to develop green-rated buildings (D11, D12, D15, D20, and D22), which have an impact on the approach to the feasibility:

> *"Sustainability is a big part of what we do here. I've got our sustainability consultant on board who sit and tell me how the design and the current provisions, sort of from a green star perspective where we stand." (D11)*

> *"If you do a 4 green star rated building it property adds about 10% your cost of development. So what you try and do is built that into your rental." (D20)*

> *"So we try to keep the green element separate as far as possible, just so that we can see what the impact is. And through the years, I mean, initially, you looked at a premium of, let's say, between 11 and 14%. And now you are looking at maybe two or 3%, which is quite interesting." (D22)*

6.4.17 Operational costs

Operational costs need to be strategic to have a minimal impact on the net income (D04, D07, D12, and D13):

> *"So there's a lot of things that we think beforehand. How am I going to reduce the maintenance costs for the next 50 years, rather than to just getting up and going." (D04)*

> *"I'm always fighting with the bank, because the banks are used to 18 rand, 17 rand, 16 rand and I said to them, I'm doing it at 12, then they say how?" (D07)*

> *"A lot of the time on the income side of it where it's very difficult to know is what your operating costs are going to be. That was always an area that was highly scrutinised, what were the operating costs in the feasibility, because they varied... from... it was just absolutely no consistency in operating costs at all." (D13)*

6.4.18 Municipalities: Plan approval and rates and taxes

The literature indicates that municipalities in South Africa are inadequate and cause significant delays during plan approval, rendering feasibilities outdated (Kgaka, 2018). The inefficiency and incompetence of the councils with regards to rights, bulk services, plan approval, and rates and taxes, cause issues in the feasibility process (D03, D04, D08, and D20):

> *"I think they're the one thing that makes the building industry suffering the most is the incompetence of the municipality." (D08)*

> *"The one project, there was no electricity. There was no water. There was no sewerage. There was no storm water and we had massive debates and what have you with a council about what they wanted to charge us. We eventually put the last, the last connection because they didn't have money to do it. So you end up having to do it yourself. So that impacts on a feasibility as well." (D13)*

> *"So I identify land as a starting point, and then I'll go through the planning process... town planning process which is a long and frustrating process." (D20)*

6.4.19 Regulations

All information available from government, local authorities as well as private organisations should be made available to the firm and industry and stored on their database (Syed Alwee *et al.*, 2019). The developers mentioned a few NHBRC regulations that they need to wrangle in residential developments (D03, D08, and D21):

> *"In the residential side where you've got lots of rules and regulations and structural stuff that you have to comply with." (D08)*

6.4.20 Complexities

Various complexities were identified by the developers:

- Green buildings:

  "We try to keep the green element separate as far as possible, just so that we can see what the impact is, especially initially when it was still very much unknown what the cost impact is off green." (D22)

- Historic sites:

  "After 60 years the building becomes a historic building. Which is much more complicated because then you've got heritage issues and stuff like that." (D02)

- Phased projects:

  "So especially we have things with funny phases or funny deliveries, then it becomes quite a mission, sorting it out." (D02)

- Regulatory difficulties:

  "These products are not technological, they are regulatory difficult because you are stepping into regulatory space. So there's a big legal component." (D06)

- Specialised work according to Dandan et al. (2019) does not affect the complexity; however, the participants' opinions contradicted the aforementioned (D02, D06, and D22):

  "So some stuff that we have done was that is highly specialised. The one building used to be a bakery building, and we changed it to television studios. We had to know seek acoustic engineers and mechanical engineers and stuff that give us specific information on specific things." (D02)

- Various partners:

"So often we'll have developments where we have various banks that are funding and because of that… So now you start getting three different feasibilities on one development." (D14)

- Type of developments (D11, D14, and D20):

  "But another thing there is depending on what the development is there are consultants who are better at certain types of developments than others." (D14)

6.4.21 Time available

The volume of a consultant's workload during estimation and time allowed for estimation affect the accuracy of feasibilities (Dandan *et al.*, 2019). In contrast, a participant regarded the management of the budget by referring back to the feasibility study as a waste of time:

> *"But I do think one of the reasons we why we don't work so strictly with budgets and with cost reports and all these things is, is to be more efficient. You know, it takes time to do those things, and we would rather have the, call it the project manager or the QS, you know, doing his work then reporting on stuff that happened a month ago, that's old news a month later, you know, so sort of, you know, I think it was almost sort of enforced by time constraints. If you would agree, and just working on the current project and what's happening now and the future instead of looking back and cost reporting and almost, not wasting time but putting effort into those items." (D21)*

6.4.22 Reiterations

The feasibility process is a reiterative process (Mackenzie and Cusworth, 2007; Costello and Preller, 2010) that can extend over multiple years (Lock, 2020). Participants D02, D05, D14, D15, D19, D20, D22, and D23) shared the same view:

> *"It's this back and forth, because you have to sort of tweak it and pull it." (D19)*
>
> *"We'll work through various iterations of the feasibility in the planning phase." (D20)*

6.4.23 Value engineering

Value engineering is an intricate part of the success of a feasibility study (Kwaku Osei, 2016; Schmidt, 2017)

> *"So that makes it a bit more difficult for us to get jobs off the ground saying that the directors and the top management expects a return of 15% on our projects then we have to go back to the drawing board and do a bit of value engineering and redesigns to make sure that we that we get to our desired return that we need." (D01)*

Participants D02, D05, D06, D09, D10, D14, D15, D20, D22, and D23 too emphasised the intricacy of value engineering within the feasibility study process.

6.4.24 Cost management

Similar to the QS interviews, the developers emphasised the importance of cost management after the approval of the feasibility (D03, D17, D21, and D22):

> *"So generally, if a project goes well, the feasibilities are fine, it's when something goes wrong on a project, so it's not a feasibility that's a problem. It's something that will happen in the execution of the project." (D17)*
>
> *"And once we've received that tender, we evaluate that in the document. And then we use that we actually manage costs throughout the project." (21)*

6.4.25 Construction mafia

Surprisingly, two developers (D01 and D05) mentioned a construction mafia that impedes on the feasibility of projects:

"A new thing they had to incorporate into feasibilities which is unfortunate is the impact that the construction mafia has on a project. So that you know about the construction mafia. The guys that pitch up at the site and demand employment and the favours." (D01)

6.4.26 Expectation of the presentation

Some participants mentioned that they prefer to receive the communication via email:

"I think meetings is a time waster to sit around the table and they print out the feasibility and they can literally just send their first draft of the feasibility." (D09)

"No, just want an email." (D15)

Other participants prefer to first receive it via email, followed by a face-to-face meeting (D01, D07, D10, D16, D18, D20, and D22):

"You first get the thing in the format that circulated prior to a meeting so that you can prepare you can scrutinize a document and see where you want to ask difficult questions or where you are not happy with or where we need to up our game." (D10)

"I prefer the right up front for the QS to send me the study. I will then review it and then we'll sit down." (D20)

Additionally,, some participants prefer a face-to-face presentation (D03, D04, D06, D11, D12, and D19):

"It's good if a QS can run you through it, you know, just to give them... just to give you an understanding of how they approach it. But I think the crux of it lies in me sitting down and putting my thoughts next to it and comparing, what I what I envisage." (D03)

"It needs to be a document that's discussed." (D04)

"His got to come and sit with me and show me." (D11)

6.5 Section 6: The Nature and Occurrence of Feasibility Studies

Section six reports on the nature and occurrence of feasibility studies in the industry, addressing OB3. The data is allocated to three main sections:

- Evolution of perceptions (6.5.1)
- The template (6.5.2)
- Issues with quantity surveyors (6.5.3)

6.5.1 Evolution of perceptions

Like the quantity surveyors, the developer's expertise with regards to feasibility studies increase with experience, allowing their perceptions to evolve.

The participants stated that over time they received increasing respect, while realising it is not only a basis for decision-making, but for many other aspects too (D01). Expectations have increased (D03, D13) as well as scepticism, leading to more comprehensive and conservative studies (D03). More value has been added to feasibility studies over time (D04, D10, and D17). Understanding has improved greatly (D07, D15, D17, and D19), with the added ability to ask questions and participate, rather than to be schooled (D07). Experience adds a more holistic view and one can apply one's mind more (D09). The ability to manipulate a feasibility also comes with more experience (D15). Better understanding too allows one to see where the study is flexible and where negotiations are possible (D20). Furthermore, involvement increases with better understanding (D22).

6.5.2 The template

From the developers' perspective, it is important to understand what their requirements are in terms of the formatting of a feasibility study, as well as how they currently perceive it. The findings regarding the template are divided into four aspects:

- The developers' influence (6.5.2.1)
- Preferred formatting (6.5.2.2)
- The most important touch points (6.5.2.3)
- Dissimilarities in feasibilities (6.5.2.4)

6.5.2.1 The developers' influence

Some developers guide the QS in terms of what they want to see in a feasibility (D05, D10, D11) or change it accordingly (D09, D11, D19). A participant stressed that the feasibility is complex and that it should rather be in an open platform where people can learn the basics to improve understanding. A feasibility should be presented in such a manner, that everyone can understand it, not just the experts (D07).

> *"We have our own template. So because we do a lot of developments. It is important for us to compare apples with apples. Whilst all the QSs have their own formats and all of that. From a presentation, we insist they do it in our format." (D11)*

6.5.2.2 Preferred formatting

The preferred formatting as stipulated by the developers are:

- Simple 4–5 pages (D02)
- Spreadsheet and tables (D02, D12, D14, D15, D23)
- Broken down in the components (land, fees, development cost, construction cost, vat calculations) (D03)
- Chronological sequence (D05, D16, D17)

- First 4–5 pages with all the necessary info, and then detailed backing (D05, D11, D13, D15, D16, D17, D18, D20, D22)
- Column indication the rate per square metre (D09)
- Graphs (D09, D12, D14) and pie charts to give one a sense of how the money is being divided (D11, D22)
- Easy-to-read black and white paper with the highlighted lines or total columns to show the numbers you want to see (D09)
- Detailed analysis and breakdown of cost and income (D10)
- “It's got to look nice. It's got to have all the bells and whistles and it's got to have all the information that allows you to get a decision.” (D11)
- Sensitivity analysis (D11)
- Summary page (D12, D16, D19, D22) and nothing more than the one pager (D19).
- Cash flow graph (D12, D17, D19, D20, D22)

6.5.2.3 The most important touch points

The participants were asked to elaborate on their most important touch points in the feasibilities and what the first items are that they would look at, when presented to them:

- Total construction cost (D03, D19, D20)
- Total rate per square metre on the construction cost (D05, D08, D14, D19, D20) including (D14, D19) and excluding land (D08, D20, D20)
- Total capital outlay (D01, D08, D13)
- Total expected income (D01, D08, D13, D14)
- Builders’ work and totals for sub-contractors (D16)
- Cash flow (D12, D20, D22)
- Clarity on assumptions (D04, D11)
- Contingency (D03, D22)

- Escalation allowance (D03, D22)
- Professional fees (D09) total and percentage (D22)
- GBA to GLA ratio (D05)
- Capitalised interest (D07, D09, D20, D22)
- Land cost (D09, D11)
- Land cost versus the total development cost (D03)
- Operational costs per square metre (D07)
- Preliminaries allowance (D05, D16, D22)
- Total income versus capital required (D03)
- Sensitivity analysis (D20)
- Spatial allocation (parking, rental, communal) (D03)
- Value engineering suggestions (D04, D07)
- Tenant installation allowances (D05)
- Time allocation and programme (D20)
- Two units of measure (cost per unit and per square) (D12)
- Return (yield), (D01, D05, D07, D10, D12, D13, D14, D15, D16, D18, D19, D20, D23) IRR (D18) and breakeven point (D23)

6.5.2.4 Dissimilarities in feasibilities

The participants have noticed dissimilarities in the formatting of feasibilities as presented by developers (D05, D07, D09, D10, and D16). These result in developers needing to re-familiarise themselves when they work with the next QS (D07). However, the feasibility, in spite of the difference in formatting, still reports on the same information (D10, D17).

> *"The format of a feasibility is, is similar across the board in terms of the inputs. It's a question of where you place the input." (D11)*

> *"The feasibility model is always similar but not always the same. It might not be a bad idea if it we're harmonised." (D16)*

An interviewee recognised that harmonised feasibilities would be beneficial to the industry.

6.5.3 Errors in feasibilities

The literature indicates that feasibility studies are inconsistent, lack key elements (Shen *et al.*, 2010), are too complex (Terblanche *et al.*, 2019), and mostly do not follow best practices (Stefánsdóttir, 2015). Furthermore, findings indicate that feasibilities are neglected, leading to the abuse of feasibilities, for example deliberate fraudulent usage. This leads to poor time, budget, cost, revenue and cash-flow estimates (Mohammed *et al.*, 2019). QSs give misleading advice by manipulating expected income to make the project seem viable (Ramawela, 2017) or forecasting unrealistic rentals (Kgaka, 2018). The participants stressed the issues that they have observed while working with QSs:

- Over allowance of a contingency (D09) (Lim et al., 2016)
- Too conservative with the estimate (D14, D16)
- Dissimilarities in the industry can cause frustrations (D16)
- Faulty formulas within the spreadsheet (D14, D17)
- Incorrect estimation and lacks accuracy and backing (D03, D10, D11, D15, D16) (Abou-Zeid et al., 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Mukherjee and Roy, 2017)
- Lacks information and detail (D09, D16) (Shen et al., 2010)
- Lacks focus on providing savings (D07)
- Lack of proper value engineering (D09) (Kwaku Osei, 2016)
- Lacks proper research and rather makes use of historical and irrelevant data (D03, D07, D09, D14, D23) (Abou-Zeid et al., 2007; Lim et al., 2016; Mukherjee and Roy, 2017)
- Lacks holistic view (D06, D07, D13)

- Not often involved at the end and seeing the actual versus the expected (D03, D17) (Hyari and Kandil, 2009)

  "Sometimes feasibility studies tend to be ...that aren't connected to anything. They make sense on their own but the connecting points haven't been considered." (D06)

6.6 SUMMARY OF THE CHAPTER

This chapter transferred the findings of the developers' perspective regarding feasibilities. These findings are integrated with relevant literature. The data is organised into the same three sections as the previous chapter. Section one focused on the role of the feasibility from the developer's perspective. Section two highlighted additional actants, and section three focused on the nature and occurrence of feasibilities and the errors thereof in the industry. This chapter revisited rich data gathered from interviews, which includes comments made by developers surrounding the research argument. The next chapter integrates the findings of the two perspectives and the systematic literature review.

CHAPTER 7: DATA SYNTHESIS PART 1

The goal of this chapter is threefold: To synthesise and integrate the data of three sources; to expand on the current literature and illustrate where it occurs, and to highlight the differences in perspectives that occur within the two key stakeholders. The data is synthesised and integrated by presenting the findings from a total of three sources: systematic literature review, interviews with developers, and interviews with QSs. The interviews of both QSs and developers occurred concurrently and independently, while these two samples are deemed to present opposing views: compiler of feasibilities versus interpreter of feasibilities. Hence, these interviews are two separate sources. In addition, the systematic literature review occurred prior to interviewing; however, it did not influence the interviews, and is the third source for triangulation. This contributes to the validity of this study. Each finding that does not have a literature reference, constitutes the original contribution to this study. The findings are presented according to the themes identified in Chapter 5 & 6, and then finally the differences in the two key perspectives are analysed:

- The role of financial feasibility studies (7.1)
- Additional actants (7.2)
- Nature and occurrence of errors in feasibilities (7.3)
- Possible ways of improvements (7.4)
- Differences in perspectives (7.5)

7.1 THE ROLE OF FINANCIAL FEASIBILITY STUDIES

The role of feasibility studies is divided into five categories: Elements of successful feasibilities, the usages of feasibilities, the underlying meaning of feasibilities, decision-making factors, and the impact on investment decisions. Each category is presented in a table format that stipulates the findings supported by the applicable source or sources, drawn from the previous chapters.

Table 7.1: Elements of successful feasibilities

Findings	Literature	Dev	QS	Total
Acceptable margin of error 4–5%	(Bettini *et al.*, 2016)	x	x	3
NPV larger than zero	(Sudhana, 2016)			1
For hospitality PP should be less than 10y	(Sudhana, 2016)			1
Return is more than bank interest or other investment opportunities	(Sudhana, 2016)		x	2
Client dependent	(Huxham, 2010)		x	2
Reasonable yield (8–12.5%)	(Salman *et al.*, 2007)	x	x	3
When a project finished within the parameters of the feasibility		x	x	2
Accurate, honest and realistic study		x	x	2
A comprehensive study where all components are included		x	x	2
When the project realises			x	1
Funds are secured at anticipated interest rate			x	1
Client receives anticipated income		x	x	2
Not a big saving		x		1
Detailed behind the estimate		x		1
Market related		x		1
Logical approach and layout		x		1
Clear communication of components in study		x		1
Negotiated professional fees		x		1
Value engineering already applied		x		1

As reflected in Table 7.1, literature briefly touches on what a successful feasibility is, and is referenced with six of the 13 codes. The remaining elements are new perspectives found in the interviews. A clear divide emerged between what the QS and the developer consider a successful feasibility. These misaligned perspectives are an additional element that contributes to the feasibility process and its associated issues.

Table 7.2 presents a significant number of usages of feasibilities compiled from literature, QSs and developers, which indicates the importance of the document. The developers contributed noticeably to the usages, which reflects their role in the feasibility process. Importantly, if the QSs do not recognise these usages from the 'owner' of the feasibility, an adequate feasibility for the usage will unlikely be presented.

Table 7.2: Usages of feasibilities

Findings	Literature	Dev	QS	Total
Setting up a budget	(Anees *et al.*, 2018; Kimaru, 2018; Willemse, 2019)	x	x	3
Setting up a cash flow	(Anees *et al.*, 2018; Syed Alwee *et al.*, 2019)			1
A tool for effective cost control/management	(Perera *et al.*, 2016; Anees *et al.*, 2018; Kgaka, 2018; Willemse, 2019; Okereke *et al.*, 2020)	x	x	3
Basis for value engineering	(Kwaku Osei, 2016; Schmidt, 2017; Anees *et al.*, 2018; Syed Alwee *et al.*, 2019)	x	x	3
Basis for negotiations and contracts (consultants and contractors)	(Anees *et al.*, 2018; Kimaru, 2018)	x	x	3
Basis for key dates	(Anees *et al.*, 2018)			1
Quality management system	(Anees *et al.*, 2018)			1
A sound financial turnover mechanism	(Anees *et al.*, 2018)			1
For the QS to secure income			x	1
Tool to advise on investment			x	1
Tool to make investment decisions on		x	x	2
Acquire financing	(Kimaru, 2018)	x	x	3
To initiate a sensitivity analysis			x	1
Determine how much debt would be acceptable		x		1
Negotiations on land costs		x		1
Facilitates deals with tenants		x		1
Basis for progress measurement		x		1
Basis for as built feasibility		x		1
Determine risk in terms of total capital outlay		x		1
Provides clarity on the investment risk	(Mukherjee and Roy, 2017)			1
Achieve maximum profit	(Syed Alwee *et al.*, 2019)			1
Analyse problem areas and the solutions	(Syed Alwee *et al.*, 2019)			1
Summarise the life cycle costs	(Syed Alwee *et al.*, 2019)			1
Ensure most of the client's requirements are fulfilled	(Syed Alwee *et al.*, 2019)			1
Guide the facility manager during the functional period of the proposed project	(Syed Alwee *et al.*, 2019)			1
Guiding risks	(Zakaria *et al.*, 2015)	x		2

Underlying meanings of feasibilities emerged and are depicted in Table 7.3. Not only do feasibilities have multiple usages, but they also have various underlying meanings. These underlying meanings are hardly seen in the literature and the only underlying meaning that emerged from both QSs and developers is that it is the mechanism to get projects off the ground. The remainder of these meanings are situated firmly in only one of the perspectives. This leads one to believe that the misaligned underlying meanings that drive the perspective of feasibilities could also enact the success of feasibilities. Interestingly, the literature provided one unique perspective: a feasibility could mean a possibility to suffer a substantial loss of funds due to incorrect decisions.

Table 7.3: The underlying meaning of feasibilities

Findings	**Literature**	**Dev**	**QS**	**Total**
The possibility to suffer a substantial loss of funds due to incorrect decisions	(Alao *et al.*, 2019)			1
To get projects off the ground	(Lock, 2020)	x	x	3
Opportunity for QSs for earlier involvement			x	1
Make projects possible to earn an income	(Syed Alwee *et al.*, 2019)		x	2
The QS's output/work of art			x	1
Gives the opportunity for a sense of accomplishment/rewarding work			x	1
Determine the success of QS firms			x	1
Creates the opportunity for a specialist field			x	1
The assurance of a return		x		1
Determine the success of projects		x		1
Roadmap for a project		x		1
Serves as a business plan	(Syed Alwee *et al.*, 2019)	x		2
Gives credibility to projects		x		1
Assists in problem-solving within projects		x		1

Table 7.4 stipulates the impact the feasibility has on investment decisions. It does not only relate to the decision to proceed, but to various other decisions. Literature provided most of the elements in this table, which is confirmed by both other sources, except for one: the decision on which project to proceed when multiple projects are in play. The literature did not present the option for supporting prior beliefs; however, both interview sources brought this into discussion.

Arguably, if feasibilities are used to support prior beliefs or emotional decisions, this can be a root cause of manipulation of feasibilities, causing inaccurate feasibilities.

Table 7.4: A feasibility's impact on investment decisions

Findings	**Literature**	**Dev**	**QS**	**Total**
Decision to proceed	(Mackenzie and Cusworth, 2007; Heralova, 2017; Lock, 2020)	x	x	3
Decision on how to proceed	(Syed Alwee *et al.*, 2019; Lock, 2020)	x	x	3
Supports emotional or prior decisions/beliefs		x	x	2
Decision on when to proceed		x		1
Decision on which project should proceed	(Syed Alwee *et al.*, 2019)			1
Decisions on what tenants to include		x		1
Supports continues decision-making	(Mukherjee and Roy, 2017; Kimaru, 2018; Dagne, 2019)	x		2

7.2 ADDITIONAL ACTANTS

In addition to the previously identified actants, this section provides an overview of all identified actants. These actants are divided into ten categories: QS related; developer related; relationships and the team; dependencies; the process; external uncertainties; building related; complexities; communication, and non-significant actants. Each category is presented in a table format that stipulates the findings supported by the applicable source or sources, drawn from the previous chapters.

The QS-related actants (as presented in Table 7.5), refer to the activities or actions that directly relate to the QS that has an impact on the execution of feasibilities. The literature did not present any unique findings. The fact that the feasibility study is done as risk work emerged from both interview sources; however, Ramawela (2017) contradicts this and claims that feasibilities are expensive to conduct. The QS perspective offered significant insight under this category. Furthermore, the QSs' approach varies considerably from QS to QS, indicating a lack of a standardised approach when conducting feasibilities, creating room for errors.

Table 7.5: QS-related actants

Findings	Literature	Dev	QS	Total
QS area of expertise	(Salman *et al.*, 2007; Lim *et al.*, 2016)	x	x	3
The feel		x	x	2
Delayed exposure to feasibilities			x	1
The quantity surveyor's approach	(Lim *et al.*, 2016; Bettini *et al.*, 2016; Dandan *et al.*, 2019; Githaiga, 2006)		x	2
Competition in the QS profession			x	1
Feasibilities being intellectual property			x	1
QS motivation		x		1
Lowered professional fees	(Salman *et al.*, 2007)		x	2
Risk work	(Ramawela, 2017) contradicts	x	x	3
Time available	(Dandan *et al.*, 2019)	x	x	3

Table 7.6 offers the activities surrounding the developer.

Table 7.6: Developer related actants

Findings	Literature	Dev	QS	Total
The developer's approach	(Huxham, 2010; Zakaria *et al.*, 2015; Al-Hawsah, 2020)	x	x	3
Developer level of knowledge	(Sudhana, 2016; Kgaka, 2018; Dandan *et al.*, 2019; Willemse, 2019; Al-Hawsah, 2020)	x	x	3
The developer's influence on the template		x	x	
False perceptions created by technologies			x	1
Clarity of the developer's brief	(Dandan *et al.*, 2019)			1
The developer's budget	(Dandan *et al.*, 2019)			1
Organisational culture	(Al-Hawsah, 2020)			1
Unreasonable objectives /expectations/budget decisions	(Al-Hawsah, 2020)		x	2
Expectation of profit		x		1
Perception of decision-making factors:				
Risks involved	(Zakaria *et al.*, 2015)			1
Profit margins and profitability indicators	(Huxham, 2010; Zakaria *et al.*, 2015)	x		2
Benefit to cost ratio	(Yun and Caldas, 2009)			1
Profit margins: Based on a minimum return		x		1
Profit margins: Return relative to prime rate		x		1
Profit margins: Return based on project goal		x		1

The literature presented a thorough amount of the elements in this category. Many of the literature review studies focused on the developer's perspective, while the QS perspective lacked. The QS perspective in this study did yield one unique perspective, in that new technologies create the false perception that the QS has less work. This false perception manifests within the developer, creating more stress for the QS during the execution of the feasibility. Another key element, not found in the literature, but confirmed by both interview sources, is the developer's influence on the template or formatting. From the developer interviews it seems that the QS, who should cater for the specific audience, did not necessarily do an audience analysis.

Table 7.7 presents the team relationships. The QS-developer relationship as well as the QS-team relationships are essential, since the entire team contributes to the input required when compiling feasibilities. The items under this category have been well established in literature. However, the lack of developer perspective indicates the lack of knowledge regarding the inputs required.

Table 7.7: Relationships and input to gather

Findings	**Literature**	**Dev**	**QS**	**Total**
QS-developer relationship	(Dandan *et al.*, 2019; Al-Hawsah, 2020)	x	x	3
QS-team relationship	(Bettini *et al.*, 2016; Syed Alwee *et al.*, 2019)	x	x	3
Cost-conscious team	(Bettini *et al.*, 2016; Schmidt, 2017; Syed Alwee *et al.*, 2019)		x	2
Information available	(Lim *et al.*, 2016; Dandan *et al.*, 2019)		x	2
Input from the team	(Syed Alwee *et al.*, 2019)	x	x	3
Input from elsewhere:				
Published information (BER, ASAQS, SAPOA, etc.)	(Syed Alwee *et al.*, 2019)		x	2
Regulations (country/municipality specific, NHBRC, environmental, etc.)	(Syed Alwee *et al.*, 2019)	x	x	3

The feasibility process and feasibility success is directly dependent on certain aspects, as listed in Table 7.8.

Table 7.8: Dependencies

Findings	Literature	Dev	QS	Total
Financiers' requirements		x	x	2
Financiers' changes in interest rate	(Okereke *et al.*, 2020)			1
Investors and joint ventures		x	x	2
Tenants	(Karas, 2017)	x	x	3
Contractors	(Lock, 2020)	x		2
Municipalities: delay in plan approval	(Kgaka, 2018)	x		2
Municipalities: Inconsistencies in rates and taxes			x	1
Municipalities: delay in bulk services		x		1

The value engineering and reiterations cause a cyclical process, which in turn influences the efficiency of the feasibility process. Arguably, if a QS expects multiple reiterations and multiple opportunities to get the feasibility right, the motivation to get it right the first time is lacking. The reiterations and value-engineering process are confirmed by all three sources (Table 7.9).

Table 7.9: The process

Findings	Literature	Dev	QS	Total
Reiterations	(Mackenzie and Cusworth, 2007; Costello and Preller, 2010; Lock, 2020)	x	x	3
Value engineering	(Kwaku Osei, 2016; Schmidt, 2017)	x	x	3

Table 7.10: External uncertainties

Findings	Literature	Dev	QS	Total
The volatility of exchange rates	(Dandan *et al.*, 2019; Okereke *et al.*, 2020)		x	2
Volatility of the market	(Kgaka, 2018; Okereke *et al.*, 2020)	x		2
Construction mafia		x		1
Unpredictability of inflation	(Dandan *et al.*, 2019; Okereke *et al.*, 2020)			1
Political risks (leadership decisions)	(Okereke *et al.*, 2020)			1

The success of feasibilities can significantly be influenced by external uncertainties. Table 7.10 depicts these uncertainties. Most of the aspects have been known previously. However, the developers brought one new external uncertainty to light: the construction mafia that is present in South Africa, which could bring the entire construction to a halt until an agreement has been reached between the mafia and the developer. These hold-ups and increased costs impact the feasibility of a project.

Table 7.11: Building-related actants

Findings	**Literature**	**Dev**	**QS**	**Total**
Location	(Costello and Preller, 2010; Sudhana, 2016)	x		2
Geotechnical conditions	(Dandan *et al.*, 2019) contradicted	x	x	3
Brownfield vs greenfield		x		1
Complexities (discussed in detail below)	(Dandan *et al.*, 2019)	x	x	3
Operational costs	(Stefánsdóttir, 2015)	x	x	3

Table 7.11 indicates the project-specific aspects. As for all projects, project-specific conditions need to be taken into consideration, such as elements like the geotechnical reports. Dandan *et al.* (2019), however, specifically states that certain aspects, such as obtaining a geotechnical report and planning accordingly, are standard procedures and should not cause unexpected costs.

Certain complexities manifest in feasibilities. These complexities are indicated in Table 7.12.

Table 7.12: Complexities

Findings	**Literature**	**Dev**	**QS**	**Total**
Project size	(Dandan *et al.*, 2019)		x con	2
Type of project structure (concrete, steel, masonry, etc.)	(Dandan *et al.*, 2019)		x con	1
Specialist work	(Dandan *et al.*, 2019) Contradicted	x	x	3
Cross-border projects			x	1
Project executed in phases		x	x	2
Purpose of the building/sector	(Dandan *et al.*, 2019)	x	x	3
Type of income stream			x	1
Historic sites		x		1
Regulatory difficulties		x		1
'Green' buildings		x		1
Joint ventures		x		1

There have been a few contradictions regarding which complexities actually influence the feasibility. While Dandan *et al.* (2019) advocate for the size of project and type of structure influencing the complexity. The QS perspective contradicts this, with the perspective that any building is equally quantifiable. The QSs on the other hand states that specialist buildings causes a complexity, while Dandan *et al.* (2019) contradict this. Other complexities, however, did emerge.

Table 7.13: Communication

Findings	Literature	Dev	QS	Total
Communicating the study			x	1
Expectation of the communication		x		1
Adequate document layout	(DuBay, 2004; Terblanche *et al.*, 2019)	x	x	3

Table 7.13 tabulates the role communication plays in the process. Interestingly, all three sources advocate for adequate document layout. However, the particulars are not known within current literature.

Table 7.14: Post-feasibility approval

Findings	Literature	Dev	QS	Total
Applying cost management	(Kgaka, 2018; Okereke *et al.*, 2020)	x	x	3
Comparing approved feasibility with actual outcome post project	(Hyari and Kandil, 2009)	x	x	3

Table 7.14 tabulates the post-feasibility approval actants. When the feasibility phase has passed, the success of the feasibility in some respects has not yet been achieved. All three sources confirmed the importance of applying cost management during construction, and finally compare the approved feasibility to the actual outcome of the project. Both these actions contribute to the overall success of feasibilities.

The elements that were deemed non-significant by either of the sources are tabulated in Table 7.15. In addition, these elements listed are deemed non-significant by this study due to the standard procedures that should be followed when conducting the feasibility.

Table 7.15: Non-significant actants

Findings	Literature	Dev	QS	Total
Site conditions including geotechnical conditions	(Dandan *et al.*, 2019)			1
Specialist work	(Dandan *et al.*, 2019)		x	2
Project size			x	1
Type of project structure (concrete, steel, masonry, etc.)			x	1
Brownfield vs greenfield		x		1

7.3 Nature and Occurrence of Errors in Feasibilities

The nature and occurrence of errors in feasibilities are divided into three categories. The first relates to errors in the process (Table 7.16).

Table 7.16: Errors relating to the feasibility process

Findings	Literature	Dev	QS	Total
Lack key components and information	(Mackenzie and Cusworth, 2007; Shen *et al.*, 2010; Stefánsdóttir, 2015; Willemse, 2019)	x		2
Do not compare end/actual results with initial study	(Hyari and Kandil, 2009)	x	x	3
Under estimating	(Abou-Zeid *et al.*, 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Mukherjee and Roy, 2017)	x	x	3
Lack holistic approach		x	x	2
Lack cost control			x	1
Inflated contingency	(Lim *et al.*, 2016)	x	x	3
Using the rate per square estimate method	(Bettini *et al.*, 2016)		x	2
Using outdated historical data	(Abou-Zeid *et al.*, 2007; Lim *et al.*, 2016; Mukherjee and Roy, 2017)	x	x	3
Misleading clients to benefit from the job (Inflated income)	(Ramawela, 2017; Kgaka, 2018)		x	2
Over estimating		x		1
Dissimilarities throughout the industry	(Shen *et al.*, 2010)	x		2
Lacks focus on providing savings		x		1
Lack of proper value engineering	(Kwaku Osei, 2016)	x		2
Lacks proper research		x		1
Too complex	(Terblanche *et al.*, 2019)			1
Do not follow best practices	(Stefánsdóttir, 2015)			1
Neglected	(Mohammed *et al.*, 2019)			1
Inconsistent terminology	(Simango, 2017)			1

The errors that occur during the feasibility process has been well researched in previous studies. However, six new elements emerged from the interviews. Most of the new elements emanated from the developer's perspective, leading to the belief that QSs might be oblivious to some of the errors that occur. Table 7.17 indicates the variances that occur between estimated feasibilities and the actual outcome according to previous research. Four studies specifically compared accepted feasibilities to the actual outcome and all four studies concluded that most projects finish outside the set perimeters of the feasibility.

Table 7.17: Variances between estimated feasibilities and actual outcome according to literature

Estimated feasibility vs actual	References and location of study
Differs more than 8%	(Hyari and Kandil, 2009) Jordan
Cost overrun of 20–33%	(Kwaku Osei, 2016) Ghana
Inaccurate by 21%	(Dandan *et al.*, 2019) Jordan
42% of the forecasts were unsuccessful	(Huxham, 2010) South Africa

Table 7.18 summarises the errors relating to the document itself. The systematic literature review did not yield any findings on the document itself in terms of the template, formatting, etc.

Table 7.18: Errors relating to the document report

Findings	Literature	Dev	QS	Total
Faulty formulas within the spreadsheet		x	x	2
Lack of flexibility			x	1
Inconsistent formatting in the industry		x	x	2
Three QSs received compliments on their well formatted/presented feasibilities			x	1

The developers did state two issues regarding the report: that there have been faulty formulas in the spreadsheets and that inconsistent formatting in the industry causes confusion. These inconsistencies could be caused by the various originations of templates in the profession. Three QSs felt the need to express the compliments they have received regarding their layout and formatting of their feasibilities.

This leads to the belief that the developers that gave the compliments have worked with less desirable formatted feasibilities before.

7.4 Suggested Improvements to Practice

This section stipulates the factors that contribute to the success of feasibilities. Each factor is presented in Table 7.19, supported by the applicable source or sources, drawn from previous chapters in this study.

Table 7.19: Factors that contribute to the successfulness of feasibilities

Findings	Literature	Dev	QS	Total
Incorporate three feasibility phases: Scoping study, pre-feasibility study and the feasibility study	(Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009)			1
Develop a consistent approach to the scoping and conduct of feasibilities	(Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Syed Alwee *et al.*, 2019)			1
Implement independent peer reviews	(Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009)			1
Before-and-after feasibilities	(Hyari and Kandil, 2009)			1
Using effective tools	(Kwaku Osei, 2016) (Dandan *et al.*, 2019)			1
Site visit prior to the preparation of a feasibility should be compulsory	(Syed Alwee *et al.*, 2019)			1
Create a database, made accessible to all relevant parties consisting of clear-cut guidelines for all projects	(Syed Alwee *et al.*, 2019) (Dandan *et al.*, 2019)			1
Closely and constantly follow the available guideline	(Syed Alwee *et al.*, 2019)			1
Professional advice given by structural and mechanical engineers at the start of a project can enhance the efficiency of the proposed feasibility	(Syed Alwee *et al.*, 2019; Dandan *et al.*, 2019)			1
Increase involvement of the entire design team	(Syed Alwee *et al.*, 2019)			1
The more information gathered the more accurate the feasibility	(Syed Alwee *et al.*, 2019)			1
Carry out more research on previous projects	(Syed Alwee *et al.*, 2019)			1
All members must work as a team to meet the design and cost requirements	(Syed Alwee *et al.*, 2019)			1

All information available from government, local authorities and others, as well as private organisations must be made available and stored on a database	(Syed Alwee *et al.*, 2019)		1
Improve team coordination	(Syed Alwee *et al.*, 2019)		1
Promote knowledge sharing	(Syed Alwee *et al.*, 2019)		1
The manual for comprehensive feasibilities should include recordings of previous problems and solutions	(Syed Alwee *et al.*, 2019)		1
The manual for comprehensive feasibilities should include the format and type of information to be considered	(Syed Alwee *et al.*, 2019)		1
Utilisation of checklists to ensure completeness	(Dandan *et al.*, 2019)		1
Effective communication between client and design team	(Dandan *et al.*, 2019)		1
Doing an audience analysis	(DuBay, 2004)		1
Standardise terminology	(DuBay, 2004; Cintron, 2019)		1
Use reliable methods of estimating	(Lim *et al.*, 2016; Bettini *et al.*, 2016; Dandan *et al.*, 2019)	x	2

One of the objectives of the systematic literature review is to find possible ways of improving feasibilities. Table 7.19 summarises the finding of the literature review and presents a holistic view of how feasibilities can be improved, by providing 23 actions that should be followed.

7.5 Differences in Perspectives

This section provides Venn diagrams illustrating the overlap between the QS perceptions and developer perceptions (in the categories presented earlier in this chapter). More importantly, these illustrations highlight the differences in their perceptions. These differences could in turn provide insight on the miscommunication, errors and misaligned objectives with regards to feasibilities. Figure 7.1 presents the different perspectives in what constitutes a successful feasibility.

As seen in Figure 7.1, QSs are focused on a return that should exceed the cost of money to be considered successful. This perception could cause the QS to give incorrect advice compared to what the developer is looking for. Additionally, some QSs link the success of a feasibility to a project that realises and could be the root cause for poor advice given. This observation is made based on the neglect of other success factors that should be considered, for example, first and foremost, the feasibility should be accurate and honest. If a QS loses sight of this and only focuses on getting a project realised, then it could become a risk to manipulate feasibilities.

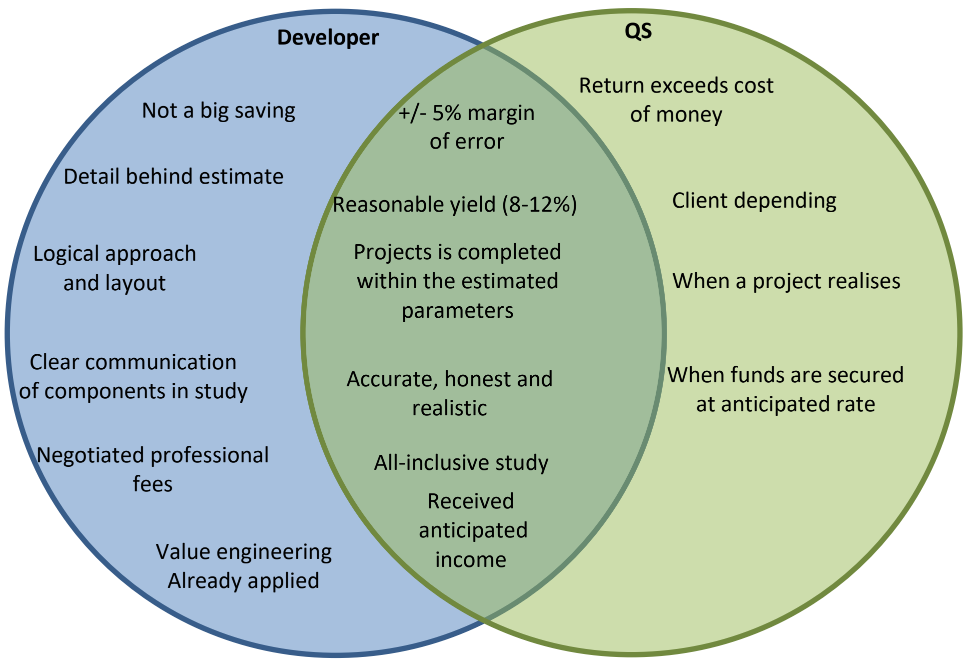

Figure 7.1: Perceptions of a successful feasibility

Current literature does indicate that manipulations occur in the industry, locally and internationally, while some QS participants recognised that this happens in the industry. Furthermore, developers emphasised that they do not want a significant saving, while some QSs state that the feasibility is a success provided there *is* a saving. Interestingly, a developer specifically stated, "*not a big saving*", and it seems all QSs do not share this view. Ultimately, there are quite a few views of a successful feasibility in the developer's perspective that do not occur in the QS perspective.

This misalignment should be eradicated to avoid misunderstandings. While the QS is the professional that should provide a service based on what the client (developer) wants, it is the QS's responsibility to understand what the developer constitutes as successful.

Figure 7.2 illustrates the usages of feasibilities of both perspectives. A prominent QS usage secures income. Therefore, the feasibility is not just applicable to the success of construction projects, but also to the success of QS firms.

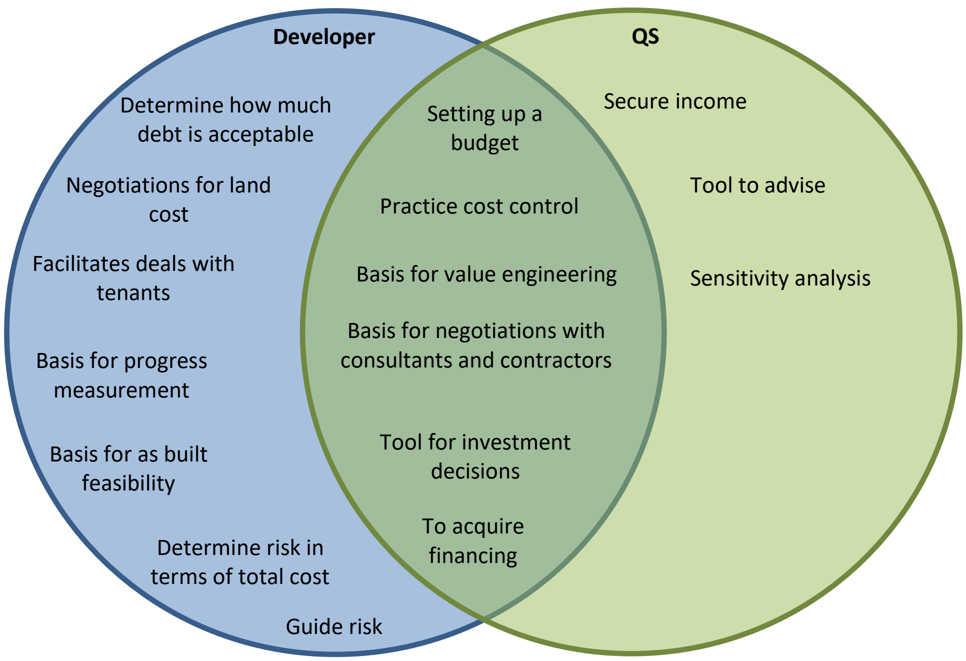

Figure 7.2: Usages of feasibilities

The developers seem to use the feasibility for many more aspects than the QS. Importantly, since the QS is the consultant and the one compiling the feasibility, the intended usages of the feasibility by the developer should be known to the QS to ensure compatibility. Again, it is the QS's responsibility to ensure the views are aligned, although it seems that the QSs do not engage with this.

The underlying meaning that emerged from both perspectives is presented in Figure 7.3.

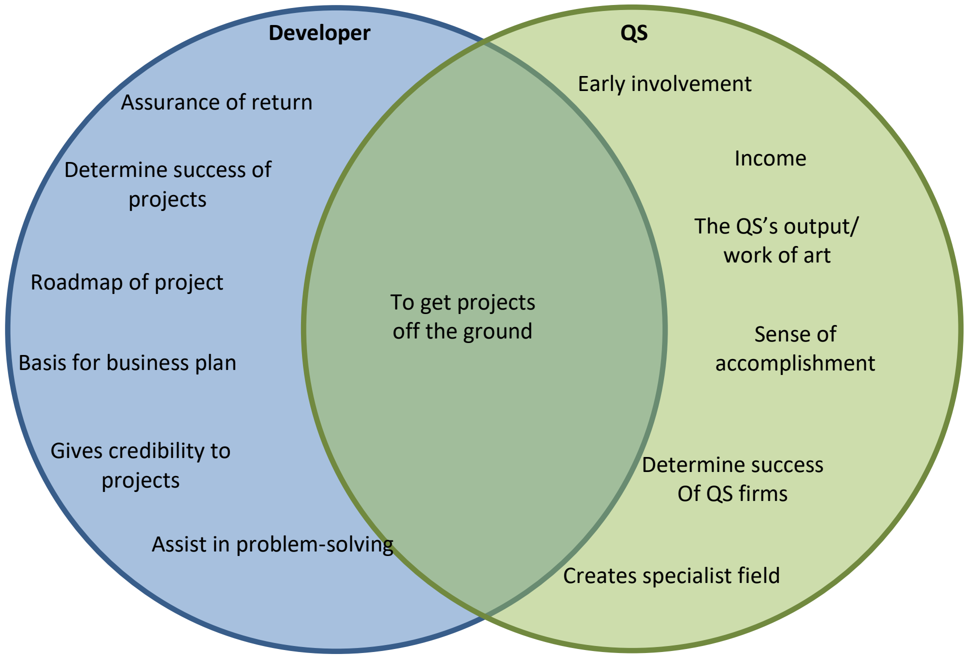

Figure 7.3: Underlying meaning

Notably, the underlying meanings that emerged from the QS's perspective is with regards to the success of the QS or the firm and is not project related. For the developer, however, the underlying meaning is linked to the construction project in question, while consensus is to get projects off the ground. It is thus imperative that the QS does not lose sight of what the client wants.

Figure 7.4 displays the impact of feasibilities on decisions. While both perspectives admit that a feasibility sometimes support prior beliefs or emotional decisions, this reinforces the possibility to manipulate the feasibility to show them what they want to see and does not necessarily provide the correct advice. It also seems that the QS is not always aware of which decisions the feasibility support. This misalignment is the QSs' responsibility to avoid, to ensure they are working towards the goal.

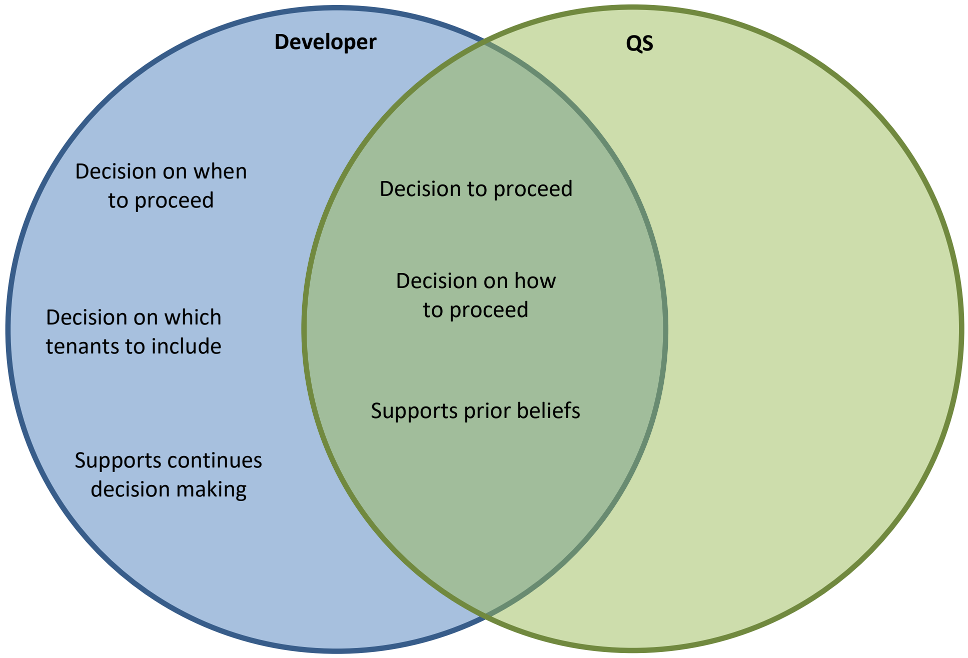

Figure 7.4: Impact on decisions

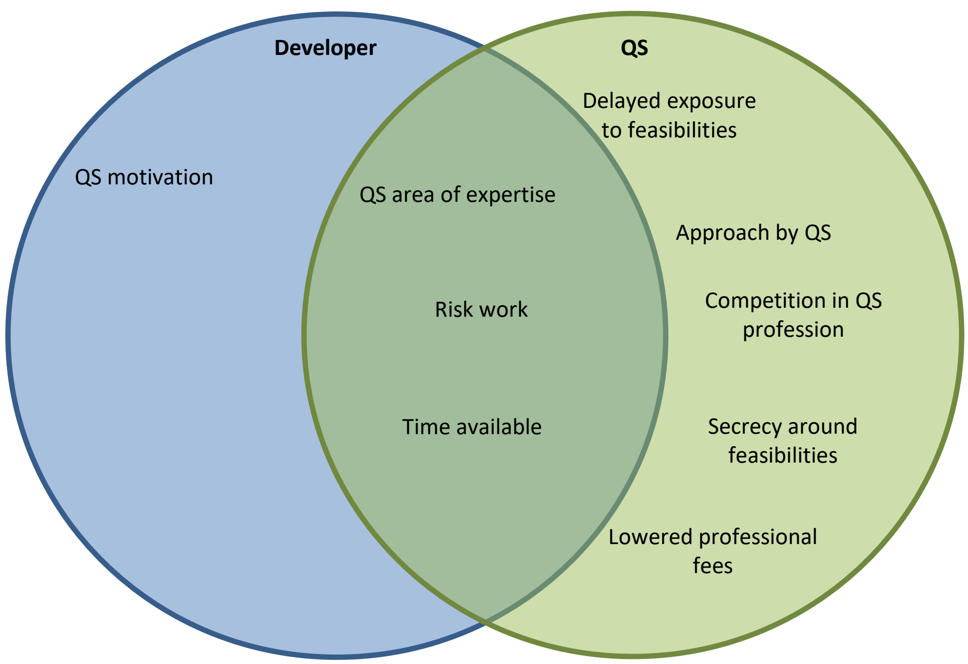

Figure 7.5: QS-related actants

Figure 7.5 provides the QS-related actants from both perspectives. While it is understandable that most of the elements emerged from the QS interviews, the lack of elements in the developers' perspective suggest that the developer is unaware of the elements that cause issues in terms of the success of feasibilities. Especially the lowered professional fees directly influenced by the developer. The other elements in the QS circle are professional-specific and should be addressed by the profession.

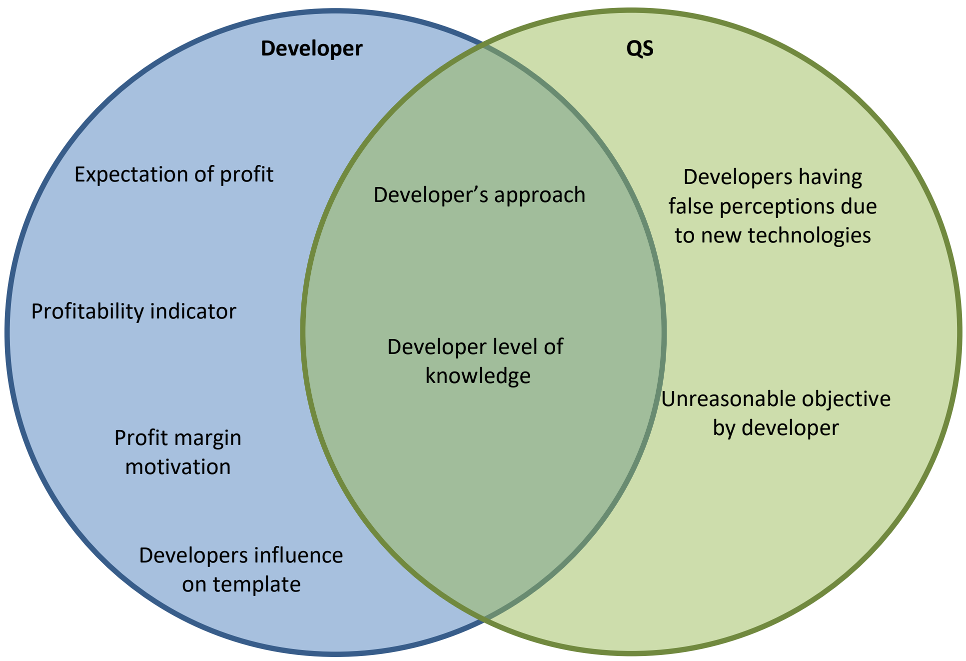

Figure 7.6: Developer-related actants

The developer-related actants, displayed in Figure 7.6, reveal that developers can set unreasonable objectives; however, they might be oblivious to this. These unreasonable objectives could be linked to the lack of knowledge developers have when it comes to developments. Reflecting on the initial careers of the developer participants of this study, indicated in Figure 6.1, not a single participant started their career as a property developer. These developers are entrepreneurs by nature, and the level of knowledge regarding developing, financing and estimating should be taken into consideration by the QS, when preparing and presenting a feasibility.

The QS should understand their audience. The QS should be aware of the profit expectation and motivations of the developer.

In Figure 7.7, the relationships and input required are given. An interesting element that has arisen from the QS's perspective is that a cost-conscious team is valuable to the overall success of projects.

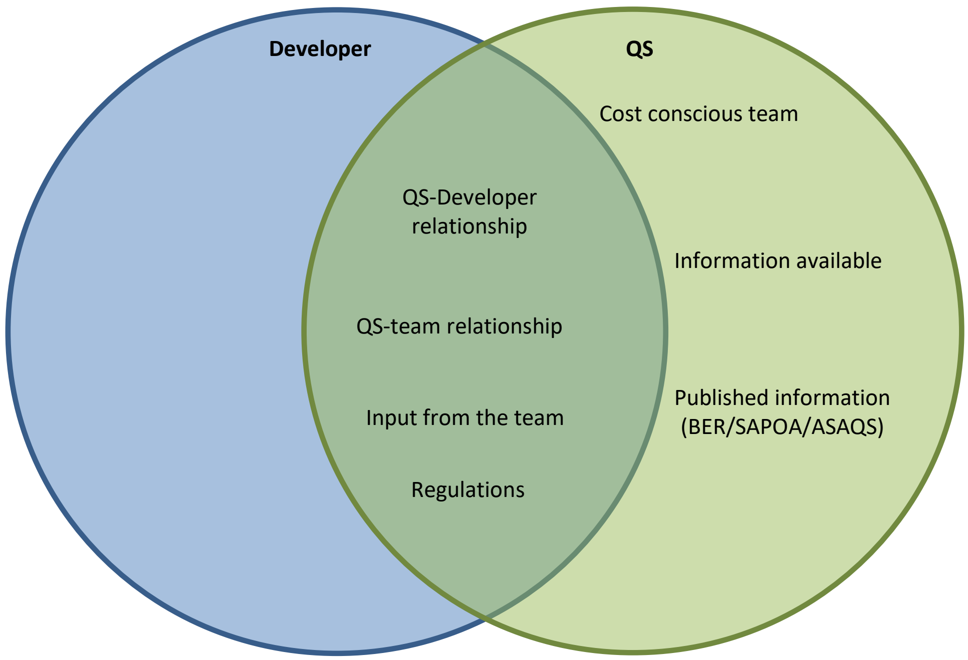

Figure 7.7: Relationships and input

Since the QS is relatively dependent on receiving certain information from team members, the amount and quality of the information are imperative to the overall success. A cost-conscious team inevitably smoothens the feasibility process and limits friction between the money guards (QSs) and designers. However, it does not seem that the developer takes this into consideration when appointing the team. The QS is often not the first professional to be appointed, and therefore not in a position to advise on who to appoint. Hence, this lies with the developer, and the perception that the QS is the only professional who should be cost conscious, should be dismissed to ensure a cost-conscious team.

Figure 7.8 indicates the external dependencies. It is clear that the QS does not pay attention to delays that occur during the plan approval or provision of bulk services by the municipalities. However, these delays could render the feasibilities outdated and are important to take cognisance of. The bulk services delay could contribute to the delay of the opening date, which in turn delays the first income of the project.

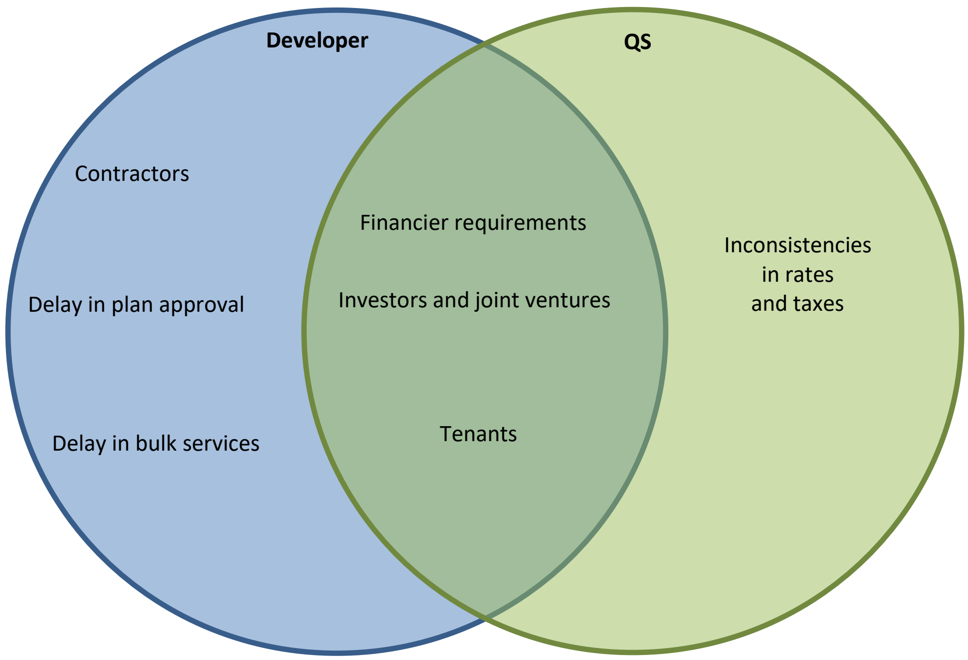

Figure 7.8: Dependencies

The value engineering and reiterations are well known by both perspectives (Figure 7.9). Notably, the expected vacillating *(“Most of the time, we would do many, many iterations in order to get the scheme to work, because the first one doesn't work” (Q12)*) could place the QS in a position of complacence, less motivated to get it right as quickly as possible. This could contribute to dragging out the concept and viability phase for several years, rendering the feasibility dated.

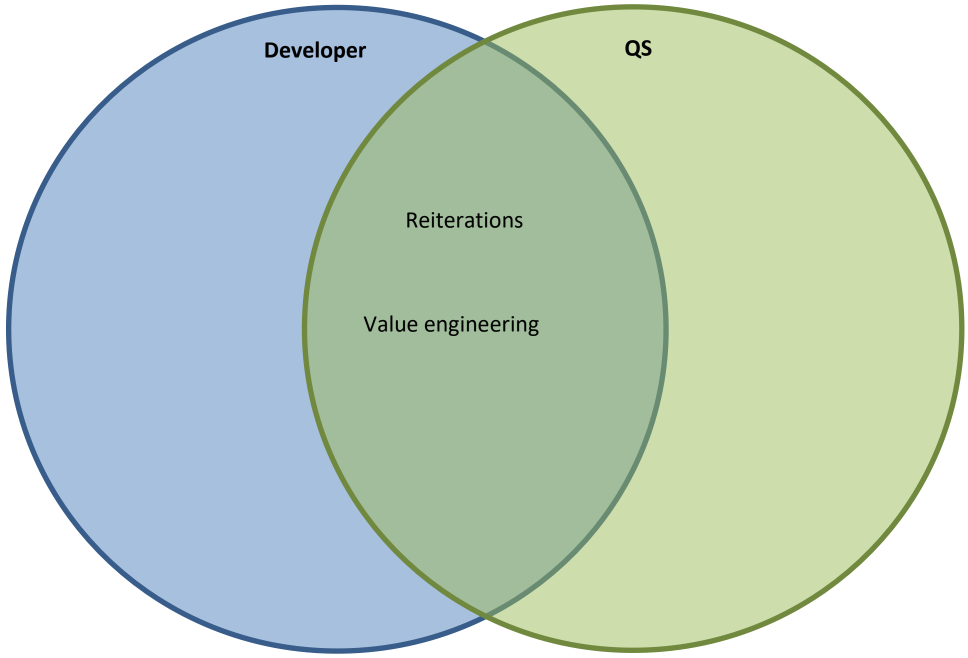

Figure 7.9: The process

Figure 7.10 depicts the external uncertainties. The misaligned perspectives indicate the divergent focus of the two respective views. The QS often deals directly with the changes in the exchange rate, as many assumptions are made based on the exchange rates when conducting the estimate. However, the volatility of the market should also be taken into consideration by the QS, since this greatly influence the possible income. To achieve the anticipated income is deemed one of the methods to determine whether a feasibility is successful or not. The final element, the construction mafia, is a phenomenon that occurs in South Africa, and is something that the QSs should be aware of.

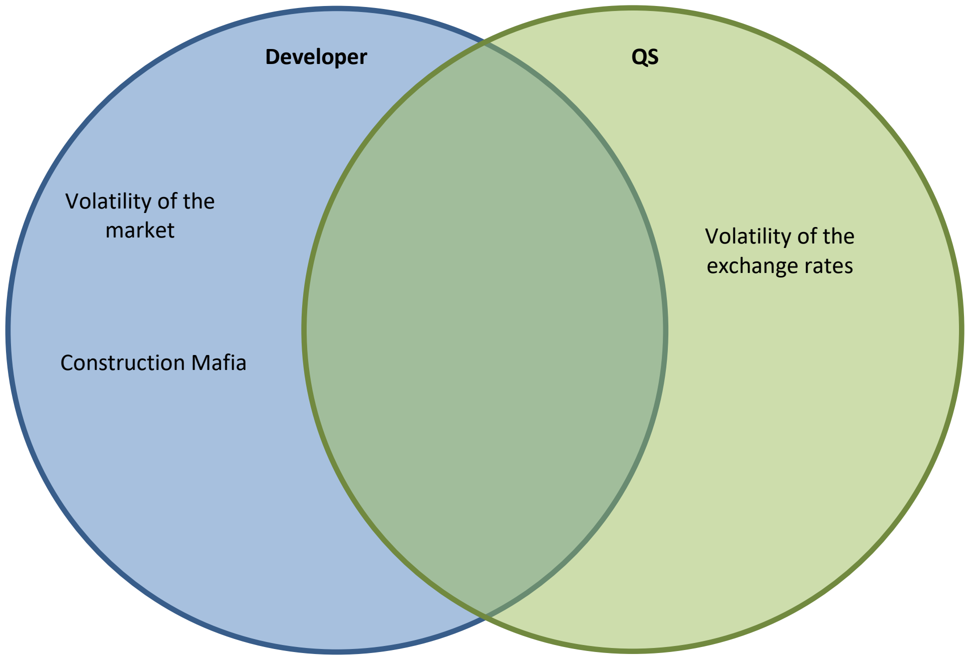

Figure 7.10: External uncertainties

The project-specific actants are illustrated in Figure 7.11. While most of the project-specific items have been rendered standard to the estimation process, some elements are still of concern.

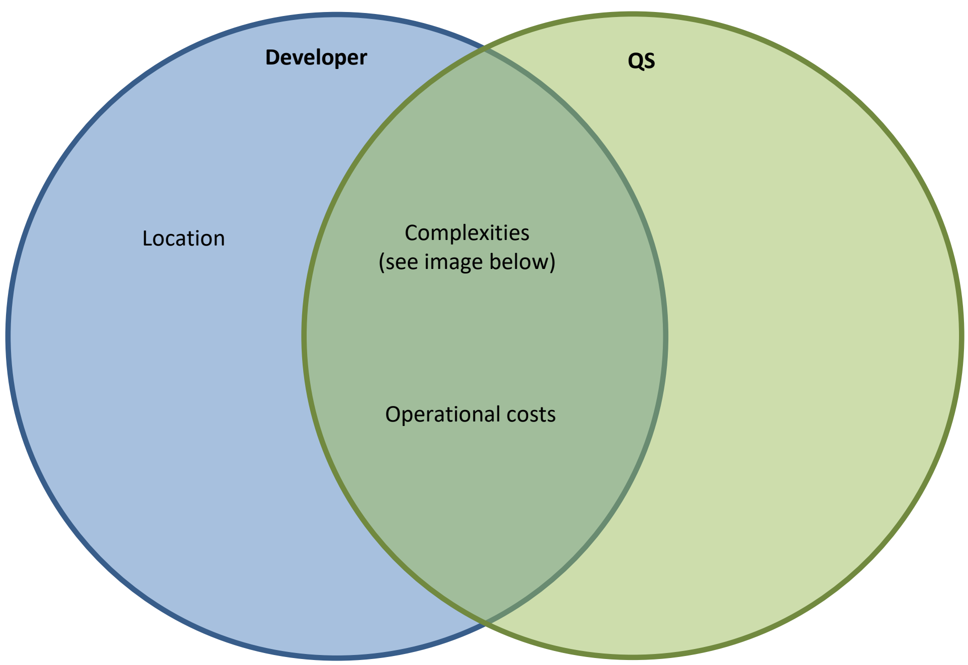

Figure 7.11: Project-specific actants

While the project complexities and operational costs have emerged through both perspectives, the location was not considered by the QS. This resonates with the developer who stated: "*Sometimes feasibility studies tend to be … that aren't connected to anything.*" The complexities are discussed in detail in the next figure.

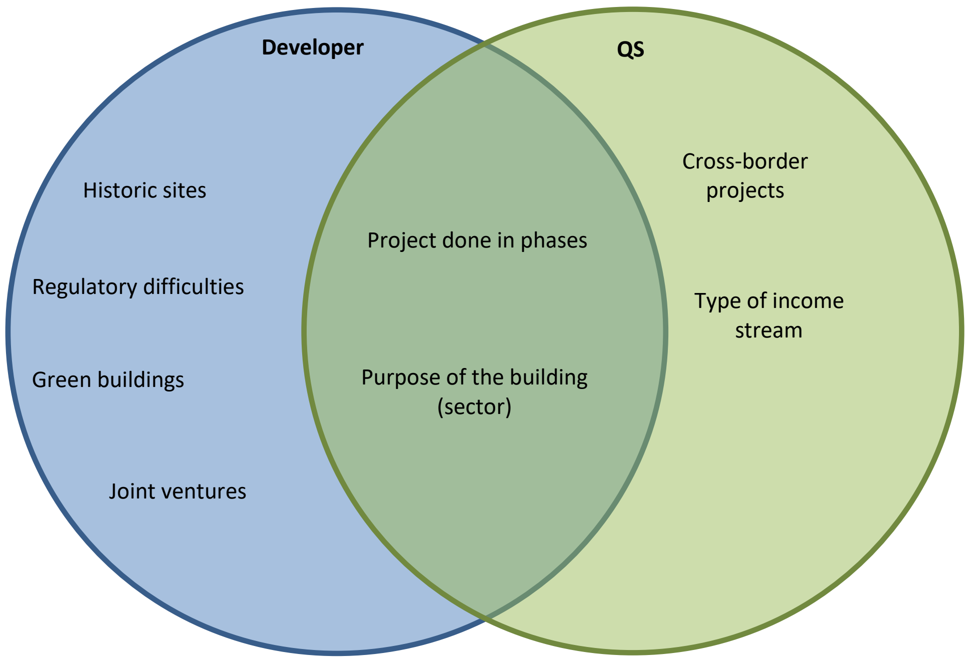

Figure 7.12: Complexities

As presented in Figure 7.12, complexities manifest in various ways. While the QSs focus on the complexities that manifest in the feasibilities, the developer is concerned with other issues, such as working together in a joint venture or dealing with regulatory issues.

Figure 7.13 indicates elements specific to the communication process. While the QS is concerned about how to communicate the feasibility, the developer is concerned on how they want to receive the communication or the manner in which they will receive the communication. Both perspectives refer to an adequate document design; however, the specifics of the adequate design are unclear, as well as what constitutes an adequate design. This will be addressed further in the next chapter.

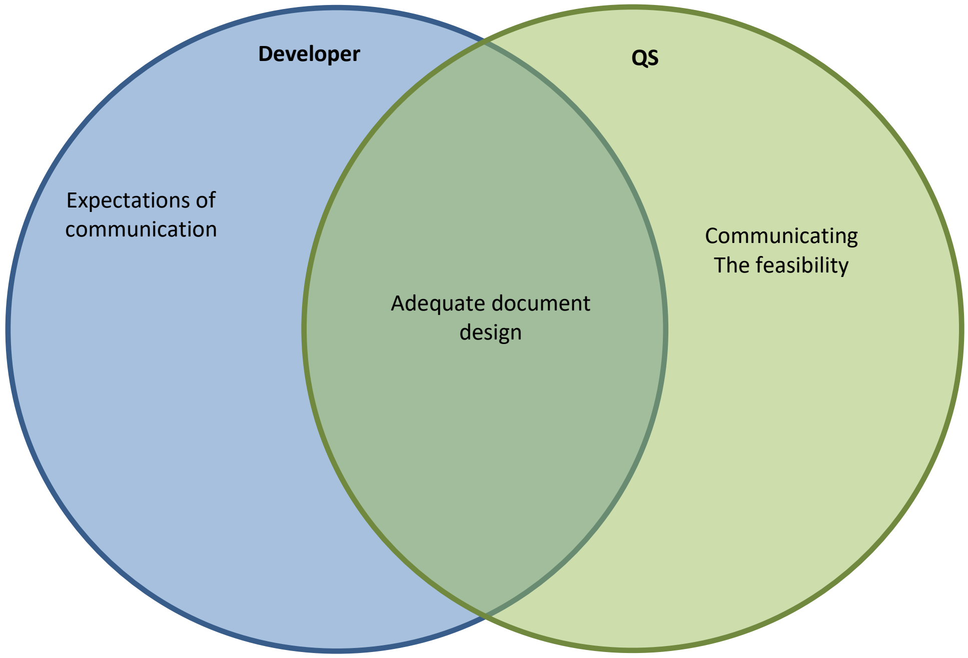

Figure 7.13: Communication

Since some success factors require the project to be finished prior the determination of the success level, the success of the feasibility does not stop once the concept and viability stage is over. Two elements emerged from both perspectives as indicated in Figure 7.14: ongoing cost management during construction and then actually comparing the outcome with the estimate. In itself, the comparison for the project in question is not of sole importance, but for future reference as well. The comparison creates the opportunity to highlight mistakes and record them, to be taken into consideration with the next feasibility. This occurrence though, seems not to exist prominently in the QS profession.

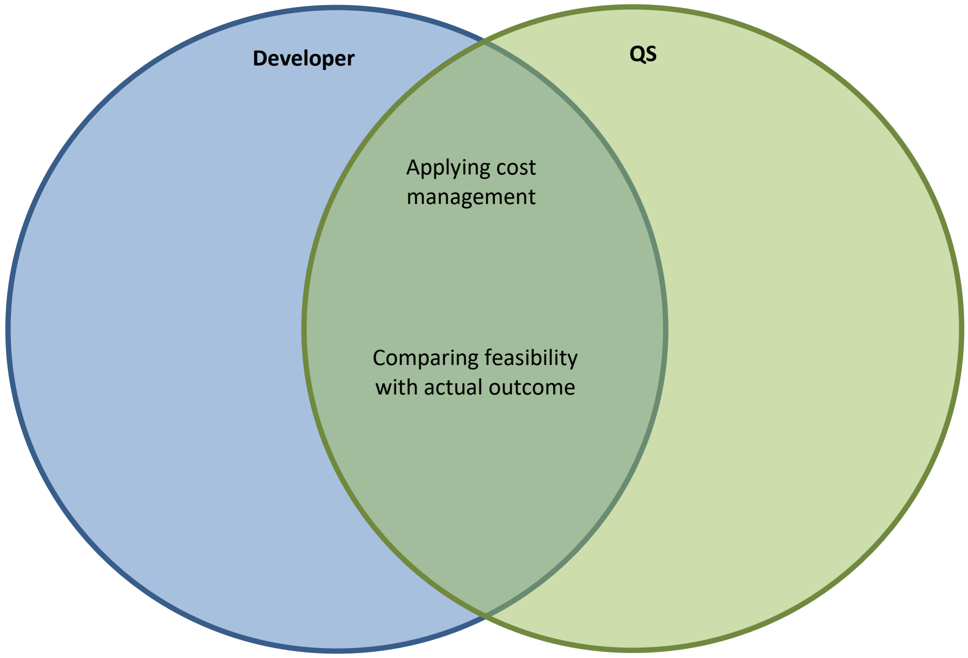

Figure 7.14: Post feasibility

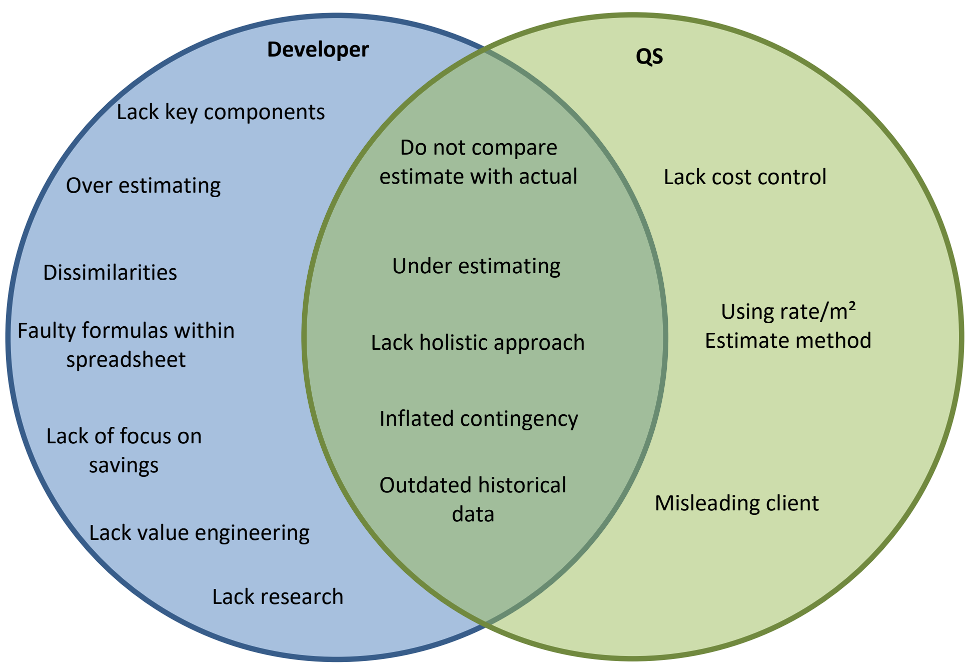

Figure 7.15: Errors

Figure 7.15 illustrates the errors that occur in the feasibility process. The QSs seem to be unaware of a significant number of errors or possibly do not want to admit to them. Either way, the developers are aware of it and QSs need to be made aware of these issues.

7.6 SUMMARY OF THE CHAPTER

This chapter gives an account of the findings, synthesised from the systematic literature review, developer interviews, and QS interviews. The data is categorised within four themes: the role of financial feasibility studies; additional identified actants; the nature and occurrence of errors in feasibilities, and possible ways of improvements. Each theme was divided into sub-categories, and these are presented in a table format that stipulates the findings, integrate these findings, and illustrates the new findings of this study. Lastly, this chapter portrays the major differences in the two key perspectives and draws conclusions based on this.

The most important findings of this chapter are the prominent differences in perspectives. The findings expanded on what is considered successful feasibilities. Furthermore, the developers have many more usages for feasibilities than what QSs imagine. Prominent contradictory underlying meanings emerged that influences the success of studies and what is considered a successful feasibility. The developers also make many more decisions based on the feasibilities than what QSs realise. The QSs emphasised the importance of a cost conscious team, which was not mentioned by the developers. Interestingly, literature did not present errors relating to the communication of the document, however this study highlighted some of these errors. The developers are much more aware of errors made by QSs than QSs themselves. The next chapter analyses the feasibility study reports gathered from QS practitioners.

CHAPTER 8: ANALYSING FINANCIAL FEASIBILITY STUDIES

Chapter 8 presents phase two of the research design: analysis of financial feasibility study documents used in practice. Findings are presented and the results of data analysis techniques applied to the raw data are displayed. A conceptual content analysis is applied to the content of each document, then a differentiating comparative analysis is applied in order to describe the differences that occur among these findings. This chapter attempts to 'unbox' the black box of the actant, communication guidelines, that is applicable in the document design. This then forms an entire actor-network of its own.

8.1 FEASIBILITY STUDIES RECEIVED

The selection criteria for adequate and applicable feasibility studies emanates from the scope of this study and the complexities that manifest within these feasibilities. The scope is construction projects within the building sector that are centred on commercial success and the aims for economic feasibility and benefits, while owned by private developers. These projects include retail, commercial, warehouses, residential on large scale, and other specialised buildings. The complexities that manifest within these studies are the usage, the method of income, and other complexities, such as green elements and phased projects. Table 8.1 maps the feasibility studies received according to the selection criteria.

Table 8.1: Feasibility studies received according to the selection criteria

	Method of income			**Other complexities**	
Type	***Sales***	***Rental***	***Hybrid***	***Green***	***Phased***
Retail		F4, F6, F10, F11			
Residential	F2, F3, F12, F16	F1, F3			
Commercial	F15, F17	F5, F14		F5, F17	
Industrial		F8			
Mixed use		F7	F13	F7	F7
Specialist		F9, F18			

The aim was to gather at least two feasibility studies to match each selection criterion; however, only one was received of the following: phased project, hybrid income and an industrial building. At least two were received of the following: retail, residential, commercial, mixed use, specialised buildings, sales, rental and green. A total of 18 feasibilities were received. Even though only one study was received in some categories, sufficient studies were gathered to draw meaningful conclusions. A conceptual content analysis was applied. Content analysis is "*a research technique for the objective, systematic and quantitative description of the manifest content of communication*," (Berelson, 1952).

The main goal is to examine the nature and occurrence of certain concepts. These concepts include readability and complexity. Readability is affected by four main categories: content, style, format and features of organisation (Gray and Leary cited in (DuBay, 2004)). These categories will form the main concepts that will be analysed. Additionally, a differentiating comparative analysis will be done in order to explain the differences that occur among these feasibility studies. The aim of this chapter's analysis is to investigate the nature and occurrence of financial communication, as communicated in feasibility studies. It therefore relates to objective 5 of this study:

- Features of organisation (8.2)
- Format (8.3)
- Style: Terminology and consistency (8.4)
- Content: Audience analysis and goal of communication (8.5)
- Complexities (8.6)

8.2 Features of Organisation

'Features of organisation' is one of the four categories that affects the readability of documents (DuBay, 2004). This category includes logical order, headings, sub-headings, tables and graphs (Terblanche *et al.*, 2019). This discussion relates to:

- Headings and logical order (8.2.1)
- Tables (8.2.2)
- Graphs (8.2.3)

8.2.1 Headings and logical order

As can be observed in Annexure A, the following is clear: There are major inconsistencies in terms of sections used and the order that these sections appear in, for example (Table 8.2):

Table 8.2: Inconsistencies in existing sections

F4	F17	F9
-Executive summary -Breakdown of elemental cost estimate -Project cashflow -Financial analysis of investment over 20-year period	-Cost summary -Notes & Yield -Detailed costings -Rate build-ups -Project payment summary	-Section A: Director's Summary -Section B: Estimated total escalated capital outlay -Section C: Cash flow projections -Section D: Estimate of returns -Section E: Proposed tenant mix/rental -Section F: Sales information -Section G: Construction cost analysis -Section H: Builder's work – summary -Section I: Special items – summary -Section J: External works – summary -Section K: Sensitivity study -Section L: Project information, assumptions -Section M: Assumptions -Section N: Exclusions -Section O: High value elements -Section P: Design development concerns

In terms of the sections used, these types of inconsistencies are not limited to feasibilities 4, 9 and 17, as presented in Table 8.2, but can be seen across all 18 feasibilities that formed part of this study. Table 8.3 presents the sections that occur in F10 and F11, and illustrate the lack of consistency of the order of the sections that actually occur in both. In addition to Table 8.2, it also indicates the inconsistency of what sections are present. F11 has a total of 11 sections, where F10 has a mere five.

Table 8.3: Presenting the lack of consistency in the order of sections

F11	**F10**
-Attention	-Section 1: Executive summary
-Detail estimate	-Section 2: Notes
-Tenant installations	-Section 3: Improvement cost
-Rental income	-Section 4: Capital outlay
-Detail estimate feasibility study	-Section 5: Project rental income
-Executive summary	
-Total development cost analysis	
-Bond detail	
-Revenue statement and rental details	
-Development analysis by graphs	
-Anticipated cash flow	

Table 8.4 presents the lack of consistency in the items within the sections.

Table 8.4: Presenting the lack of consistency in the items within sections

F9	**F16**
-Estimated total escalated capital outlay:	-Total capital outlay:
-Land cost	-Building cost
-Building cost	-Contingencies
-Escalation	-Preliminaries
-Professional fees	-Escalation
-Sundry costs	-Subtotal builder's work
-Finance costs	-Professional fees
-Contingency	-Subtotal builder's work
-Total capital outlay	-Land and related
-Less: Income from sales	-Total development cost excl.
-Total development cost	-Finance
	-Externals
	-Total development cost excl.
	-Total development cost incl. Profit

When there are sections that correspond (for example, the total capital outlay in sections in F9 and F16), the items and/or sub-headings within these sections are presented in different orders. Additionally, some items occur explicitly in F16 that do not occur in F9, including Preliminaries; Externals; Total development cost including VAT, and Profit. The aforementioned items are in red text. These types of inconsistencies occur across all the collected feasibilities. In addition to the above, the categorisation of items is inconsistent. For example, 'Land Cost' are made up of different items depending on the feasibility. This is presented in Table 8.5.

Table 8.5: 'Land Cost', 'Contingency', 'Improvement Costs' and its meanings

'Land Cost'	**What 'Land Cost' represents**
F1	Price of land only
F2	Just an item under 'Development Cost' representing price of land only
F3	Price of land + legal fees + bulk contributions
F5	'Land and Related'. This item included price of land and all sundry costs
F9	Price of land + geotechnical investigation + topographical survey + traffic impact
F13	'Land Acquisition Costs'. Price of land + municipal contribution costs + fee for municipal contribution cost update + rates during development + legal costs
F16	'Land and Related'. This item included price of land and all sundry costs
'Contingency'	**What 'Contingency' represents**
F6	Building work contingency + design/development contingency separately
F10	Building work contingency only
F13	General development contingency
F16	Building work contingency only
F18	Building work contingency + design/development contingency as one item
'Improvement Costs'	**What 'Improvement Costs' represents**
F3, F7, F10, F18	All construction work (Building, external and direct contracts) + Contingency + Escalation + Professional fees
	Only F3, F7, F10, and F18 categorised costs under 'Improvement Costs'. None of the other feasibilities had the 'Improvement Costs' category.

The discrepancies between categories and what the categories represent are not limited to 'Land Cost', 'Contingency' and 'Improvement Costs'; however, Table 8.5 sufficiently demonstrates that QSs categorise items and define items based on their own insight rather than following standards and guidelines. This impedes the possibility to compare projects and feasibilities.

It is clear that feasibilities have different sections, a different order of the sections, and different items within the sections, while the order of the items is also dissimilar. Furthermore, the meaning of terms and what they represent differ from feasibility to feasibility, indicating a lack of standards and guidelines followed in terms of items included, format, organisation, logical order and terminology.

8.2.2 Tables

With regarding to tabulation, most of the studies included some form of tabulation, however, the use thereof differs substantially, as indicated in Table 8.6: One (5%) of the studies used tables minimally; five (28%) made moderate use of tables; and 12 (66.5%) feasibilities made extensive use of tabulation.

Table 8.6: Appearance of tables per feasibility

Categories	Placement of Feasibilities	%
Minimally	F12	5.5%
Moderately	F3, F6, F9, F11, F18	28%
Extensively	F1, F2, F4, F5, F7, F8, F10, F13, F14, F15, F16, F17	66.5%

8.2.3 Graphs

The analysis indicated that 89% of the feasibilities did not have any graphs; 5.5% had four graphs and 5.5% had eight graphs. The breakdown and statistics are given in Table 8.7.

Table 8.7: Appearance of graphs per feasibility

Categories	Placement of Feasibilities	%
None	F1, F2, F3, F4, F5, F7, F8, F9, F10, F12, F13, F14, F15, F16, F17, F18	89%
4	F11	5.5%
8	F6	5.5%

8.3 FORMAT

'Format' is the second category that affects the readability of documents (DuBay, 2004). This category includes font type and size, white spaces and spacing, margin justification, length of lines, and contrast between text and background (Terblanche, Ozumba and Root, 2019). Due to the financial nature of the document, margin justification and length of lines are deemed irrelevant for this study. The analysis consists of the following:

- Font size (8.3.1)
- Font type (8.3.2)
- Capitals (8.3.3)
- White spaces and spacing (8.3.4)
- Colouring and contrast (0)

8.3.1 Font size

Font sizes differ for each feasibility. Some of the font sizes, however, are less than 10 points and impact on the readability of the document. Most of the feasibility studies used adequate font sizes throughout the document. However, 39% of the studies had too-small text sizes, as indicated in Table 8.8.

Table 8.8: Appearance of font sizes per feasibility

Categories	Placement of Feasibilities	%
Too small	F1, F5, F8, F9, F10, F11, F13, F14	39%
Adequate	F2, F3, F4, F6, F7, F12, F15, F16, F17, F18	61%

8.3.2 Font type

Some font types are more difficult to read, and each feasibility has been compiled with a unique font. Some of the font types, however, make the readability of the document more difficult. Most (94%) of the feasibility studies were compiled in easy-to-read font. However, one study made use of a font that made it more difficult to read. The statistics are indicated in Table 8.9.

Table 8.9: Readability of font types per feasibility

Categories	Placement of Feasibilities	%
Difficult	F13	6%
Easy	F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F14, F15, F16, F17, F18	94%

8.3.3 Capitals

Most of the feasibilities (78%) used all capitals for the main headings and the sub-headings; 11% for the main headings only; 5.5% had minimal usage of all capitals, and 5.5% had the whole document in all capitals. Table 8.10 presents the detailed allocation of each feasibility and the statistics.

Table 8.10: Capital usage per feasibility

Categories	Placement of Feasibilities	%
Minimally	F4	5.5%
Main headings	F6, F18	11%
Headings and sub-headings	F1, F3, F5, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17	78%
All capitals	F2	5.5%

8.3.4 White spaces and spacing

Due to the financial nature of the document, densely populated tables are common. The analysis indicated that 44% made use of strategic white spaces and spacing; 11% showed some strategic use of white spaces and spacing and some moderately densely populated text; 16.5% mostly had moderately densely populated text, and 27.5% had a high density of text and tabulation. Therefore, 55% of the feasibilities lack the strategic use of white spaces and spacing that challenge readability. Table 8.11 presents where the feasibilities are placed in the categories as well as the statistics related to each.

Table 8.11: Density of text and formatting per feasibility

Categories	Placement of Feasibilities	%
Strategic	F3, F5, F6, F7, F11, F12, F16, F18	45%
Some	F1, F9	11%
Moderately dense	F2, F4, F17	16.5%
High density	F8, F10, F13, F14, F15	27.5%

8.3.5 Colouring and contrast

As indicated by the analysis in Table 8.12, with regards to colour usage for the text and background, there is no consistency in the feasibilities. Some combination colours of text on background have less contrast and hinder the readability. In summary, eight (44%) of the feasibility studies had less-desirable contrasting text on background. Six (33%) made use of only black text; the remainder made use of black as well as other colours. Two (11%) made use of an entirely white background; 61% had mostly a white background with some colour; 11% had almost half as a coloured background, and 17% had mostly a coloured background.

Table 8.12: Colouring and contrast

Feasibility	Text colour	Background colour	Contrast satisfaction
F1	Mostly black Some red	Table columns and rows various colours: blue, orange, red, purple, green	Efficient
F2	Headings and sub-headings white Remainder black	Table rows with headings and sub-headings blue/light grey/dark grey Remainder white	Some moderate Most of the report is efficient
F3	Black	Mostly white Some percentages highlighted in orange	Efficient
F4	Headings and sub-headings Blue/orange/white Remainder Black	Some table rows highlighted green/yellow/grey Remainder white	Some moderate Most of the report is efficient
F5	Black	Top row of pages grey Remainder white	Efficient
F6	Mostly Black Some blue	Some grey or yellow highlights	Efficient
F7	Mostly black Some white, some red	Some navy, some grey Remainder white	Some moderate

			Most of the report is efficient
F8	Some black Some purple	Some grey Remainder white	Some moderate Some efficient
F9	Mostly black Some red	Some highlights: grey/ yellow/ blue/green Remainder white	Efficient
F10	Mostly black Some maroon, some grey	Some grey Some white	Some moderate Most of the report is efficient
F11	Black	Some blue Remainder white	Efficient
F12	Mostly black Some grey, some white	Some grey Remainder white	Efficient
F13	Mostly black Some white	Some black, brown, green, grey, pink, blue Remainder white	Some moderate Most of the report is efficient
F14	Mostly black Some red	Mostly highlighted blue, green, grey, orange Remainder white	Moderate
F15	Mostly black Some red, some blue	Mostly highlighted blue, green, grey, orange Remainder white	Moderate
F16	Black	Minimal highlights, grey/yellow Remainder white	Efficient
F17	Black	White	Efficient
F18	Black	White	Efficient

8.4 STYLE: TERMINOLOGY AND CONSISTENCY

Standardised terminology is an item under ‘style’, and the latter is one of the four categories that affects the readability of documents (DuBay, 2004). The length of paragraphs, and sentences, usage of common/superfluous/abstract words, hidden verbs, passive voice, common language, and consistency are elements of the same category. However, due to the financial nature of the report, the length of paragraphs and sentences are minimal and often non-existent and therefore so is the usage of tenses. The words used are industry specific, with a high percentage of complex words (more than three syllables), which are nevertheless easily comprehended by investors and industry participants (Loughran and McDonald, 2009).

The aforementioned elements are thus considered not applicable to this study. The focus will then remain on terminology and consistency.

According to literature, the construction industry lacks standardised terminology (Lu *et al.*, 2015; He *et al.*, 2015) as well as terminology used in feasibilities (Simango, 2017), yet the industry will greatly benefit from a defined terminology (Cintron, 2019). Additionally, Mackenzie and Cusworth (2007) found that the adoption of a set of standards and a standard table of contents, ensure consistent terminology in feasibilities. This study found that inconsistent terminology manifests in feasibilities conducted by quantity surveyors. Most often this is the group where inconsistencies appear:

- The indicator is referred to as ‘return’, ‘overall rate of return’, ‘Initial return on total capital outlay’, ‘yield’.
- The total cost of development is referred to as ‘Total estimated project cost’, ‘Total estimated capital cost’, ‘Total development cost’, ‘Total capital outlay’, ‘Total capital development expenditure’.
- The escalation phases are referred to as ‘Pre-contract escalation’, ‘Prior to construction’ versus ‘Post contract escalation’, ‘During construction’.
- The building cost is referred to as ‘building works’, ‘building cost’, ‘builder’s work’, ‘value of tender’, ‘principal contract value’, ‘estimated final construction cost’.
- ‘Attorney fees’ versus ‘Legal fees’
- ‘Landscaping’ versus ‘Garden works’
- ‘Electrical installation’ versus ‘Electrical reticulation’
- General development cost is referred to as ‘Development fees’, ‘General costs and finance charges’, ‘Other development cost’, ‘Sundry cost’
- ‘Executive summary’ versus ‘Summary of results’ versus ‘Director’s summary’
- ‘Direct contractors’ versus ‘Early works’

- ‘Finance charges’ versus ‘bond fees’ versus ‘gearing’ versus ‘interest’ versus ‘capitalised interest’ versus ‘Finance costs’
- ‘Elemental cost’ versus ‘orkings’ versus ‘rate build-up’
- ‘Operating expenses’ versus ‘operating costs’
- ‘Land and ancillary cost’ versus ‘land and related cost’ versus ‘land and allied cost’
- Cash flow stages: ‘pre-tender’, ‘principal contract’, ‘project close out’ versus ‘pre-construction’, ‘pre-main contract’ (direct), ‘construction’
- ‘Lettable’ versus ‘rentable’ versus ‘sellable’
- ‘Feasibility’ versus ‘viability model’ versus ‘financial feasibility’
- ‘Sensitivity analysis’ versus ‘variation analysis’
- ‘Programme’ versus ‘development period and dates’
- ‘Broker’s fee’ versus ‘brokers commission’
- ‘Improvement cost’ (F3, F7, F10, and F18) versus ‘estimated final construction cost’ (F12), both represent building cost + contingency + escalation + professional fees
- ‘Contractual information’ (F16) versus ‘programme’

8.5 CONTENT: AUDIENCE ANALYSIS AND GOAL OF COMMUNICATION

The ‘content’ is the fourth category that affects the readability of documents (DuBay, 2004; Terblanche *et al.*, 2019). The ‘audience’, a key stakeholder of feasibility studies, means the developers in the context of this study. Drawn from the interviews with the ‘audience’, the following aspects were identified as the most important touch points:

- To be present in the executive summary:
    - Spatial allocation (parking, rental, communal)
    - GBA (Gross building area) to GLA (Gross Lettable Area) ratio

    - Total construction cost
    - Total rate per square on the construction cost
    - Preliminaries allowance
    - Contingency
    - Escalation allowance
    - Professional fees total and percentage
    - Land cost
    - Capitalised interest
    - Total capital outlay
    - Percentage allocation of elements
    - Cost per unit
    - Total expected income
    - Operational costs per square meter
    - Performance indicator
- To be present overall
    - Totals of sub-contractors
    - Tenant installation allowances
    - Clarity on assumptions
    - Time allocation and programme
    - Cash flow
    - Sensitivity analysis
    - Value engineering suggestions

The content analysis indicates the frequencies of what aspects are present in the executive summary, present elsewhere or not present at all.

8.5.1 The executive summary

Spatial allocation (parking, rental, communal, external, etc.) only occurs in 16.5% of the feasibilities in the executive summary; 67% is presented elsewhere in the document and 16.5% does not present the spatial allocation at all. Further details are given in Table 8.13.

Table 8.13: Spatial allocation in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F6, F9, F15	16.5%
Elsewhere	F1, F2, F3, F5, F7, F10, F11, F12, F13, F14, F16, F17	67%
No	F4, F8, F18	16.5%

The **GBA to GLA ratio** occurs in only 6% of the feasibilities. In 33%, however, the quantities of the GBA and GLA do occur in the executive summary but lack the ratio calculation. In 39% of the feasibilities the GLA and GBA quantities are presented elsewhere in the document and the remaining 22% does not include the GBA and GLA quantities at all. These findings are indicated in Table 8.14.

Table 8.14: GBA and GLA in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Ratio	F11	6%
Quantities only	F5, F6, F7, F9, F10, F13	33%
Quantities elsewhere	F1, F2, F3, F12, F14, F15, F16	39%
No	F4, F8, F17, F18	22%

The **total construction cost** was reflected in 72% of the feasibilities in the executive summary, while in 28% of the feasibilities it occurred elsewhere in the document. The detailed breakdown and statistics are given in Table 8.15.

Table 8.15: Total construction cost in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F2, F4, F5, F7, F10, F11, F12, F13, F14, F15, F16, F17	72%
Elsewhere	F3, F6, F8, F9, F18	28%

As per Table 8.16, the **construction cost/m²** occurred in 61% of the feasibilities in the executive summary; in 33% it occurred elsewhere, and 6% did not have it included.

Table 8.16: Construction cost/m² in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F2, F5, F7, F10, F11, F12, F13, F14, F15, F17	61%
Elsewhere	F3, F4, F6, F9, F16, F18	33%
No	F8	6%

The amount for **preliminaries** is reflected in 28% of the feasibilities in the executive summary; in 44% of the feasibilities it occurred elsewhere in the document, and 28% did not display the amount that pertained to the preliminaries and general only. The findings are indicated in Table 8.17.

Table 8.17: Preliminaries in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F2, F5, F12, F15, F16	28%
Elsewhere	F3, F6, F7, F9, F10, F11, F14, F17	44%
No	F1, F4, F8, F13, F18	28%

The **contingency** amount occurred in 61% of the executive summaries and the remaining 39% reflected the amount elsewhere in the documents. The allocation of each feasibility, as well as the statistics, are presented in Table 8.18.

Table 8.18: Contingency in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F2, F4, F5, F7, F10, F12, F14, F15, F16, F17	61%
Elsewhere	F3, F6, F8, F9, F11, F13, F18	39%

The **escalation** amount reflected in 61% of the feasibilities in the executive summary and in 28% of the feasibilities it occurred elsewhere in the document, while 11% did not specify this amount. These statistics and allocations of the feasibilities are presented in Table 8.19.

Table 8.19: Escalation in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F2, F4, F5, F7, F10, F12, F14, F15, F16, F17	61%
Elsewhere	F3, F6, F9, F11, F18	28%
No	F8, F13	11%

Only 50% reflected the amount of the **professional fees,** as well as the related percentage in the executive summary. Furthermore, 5.5% reflected the amount but the percentage elsewhere; 11% reflected the amount and never the percentage; 28% reflected both elsewhere, and 5.5% does not reflect any detail on professional fees. These findings are presented in Table 8.20.

Table 8.20: Professional fees' amount with applied % in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F2, F5, F7, F11, F12, F14, F15, F17	50%
Amount yes, % elsewhere	F10	5.5%
Amount yes, no %	F4, F16	11%
Amount and % elsewhere	F3, F6, F9, F13, F18	28%
No	F8	5.5%

In Table 8.21, the **land cost** reflected in 61% of the feasibilities in the executive summary, and in 39% of the feasibilities, it occurred elsewhere in the document.

Table 8.21: Land cost in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F4, F5, F7, F10, F11, F13, F14, F15, F16, F17	61%
Elsewhere	F2, F3, F6, F8, F9, F12, F18	39%

The **capitalised interest** occurred in 61% of the feasibilities in the executive summary and in 39% of the feasibilities, it occurred elsewhere in the document. The analysis and statistics are presented in Table 8.22.

Table 8.22: Capitalised interest in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F4, F5, F6, F7, F10, F11, F14, F15, F16, F17	61%
Elsewhere	F2, F3, F8, F9, F12, F13, F18	39%

As shown in Table 8.23, the **total capital outlay** occurred in 83% of the feasibilities in the executive summary and in 17% it occurred elsewhere.

Table 8.23 Total capital outlay in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F2, F4, F5, F6, F7, F8, F9, F10, F11, F13, F14, F15, F16, F17	83%
Elsewhere	F3, F12, F18	17%

The frequency of **percentage allocation of each element**/cost distribution of the total capital outlay in the executive summary is merely 11%; 17% does indicate it but not in the executive summary, and the remaining 72% does not indicate it at all. These findings are given in Table 8.24.

Table 8.24: Percentage allocation of each element of the total capital outlay in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F2, F7	11%
Elsewhere	F6, F9, F11	17%
No	F1, F3, F4, F5, F8, F10, F12, F13, F14, F15, F16, F17, F18	72%

The **cost per unit** occurs in 6% of the executive summaries, elsewhere in the document in 33% of the feasibilities, and the remaining 61% does not reflect a cost per unit. The analysis is presented in Table 8.25.

Table 8.25: Cost per unit in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F16	6%
Elsewhere	F2, F3, F11, F12, F13, F18	33%
No	F1, F4, F5, F6, F7, F8, F9, F10, F14, F15, F17	61%

The **total expected income** reflected in 39% of the feasibilities in the executive summary, and in 61% of the feasibilities it occurred elsewhere in the document. The findings are illustrated in Table 8.26.

Table 8.26: Total expected income in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F6, F7, F10, F11, F13, F16, F18	39%
Elsewhere	F1, F2, F3, F4, F5, F8, F9, F12, F14, F15, F17	61%

The **operational costs per square metre** are presented in 8% in the executive summary; 8% present it in the executive summary but not expressed as a rate/m²; 23% presented it elsewhere in the document; 46% presented it elsewhere in the document but not expressed as a rate/m², and finally 15% does not reflect the operating costs. These statistics are illustrated in Table 8.27.

Table 8.27: Operational costs per square metre in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F10	8%
Amount but not/m2	F8	8%
Elsewhere	F6, F11, F14	23%
Amount elsewhere but not/m2	F1, F3, F4, F7, F9, F18	46%
No	F5, F13	15%
Not applicable	F2, F12, F15, F16, F17	

As per Table 8.28, 50% of the feasibilities reflected the **performance indicator** in the executive summary, and in the remaining 50%, it was presented elsewhere in the document.

Table 8.28: Performance indicator in the executive summary per feasibility

Categories	Placement of Feasibilities	%
Yes	F6, F7, F9, F10, F11, F13, F14, F16, F18	50%
Elsewhere	F1, F2, F3, F4, F5, F8, F12, F15, F17	50%

8.5.2 Document

The amounts allowed for each **sub-contractor** are reflected in 44% of the feasibilities. The remaining 56% does not stipulate the amounts allocated. Table 8.29 presents these findings.

Table 8.29: Sub-contractor allowances per feasibility

Categories	Placement of Feasibilities	%
Yes	F2, F4, F5, F7, F9, F14, F16, F17	44%
No	F1, F3, F6, F8, F10, F11, F12, F13, F15, F18	56%

Of the applicable feasibility studies, 62% presented the **tenant installation** allowances and 38% did not stipulate the specific amounts allowed for each tenant. Ten of the 18 feasibilities, however, are not applicable to this item. The detailed breakdown is presented in Table 8.30.

Table 8.30: Tenant installation allowances per feasibility

Categories	Placement of Feasibilities	%
Yes	F10, F11, F13, F14, F15	62%
No	F4, F6, F7	38%
Not applicable	F1, F2, F3, F5, F8, F9, F12, F16, F17, F18	

The interviewees with the developer background emphasised that clarity regarding the **assumptions** is quite important. However, 33% of the feasibility studies did not discuss the assumptions as indicated in Table 8.31, with the detailed breakdown.

Table 8.31: Clarity on assumptions per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F3, F4, F6, F9, F10, F11, F12, F13, F14, F17, F18	67%
No	F2, F5, F7, F8, F15, F16	33%

The assumed **programme** around which the feasibly is compiled is reflected in 72% of the feasibility studies and does not occur in the remaining 28%. The findings are presented in Table 8.32.

Table 8.32: Programme per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F3, F6, F7, F9, F10, F11, F12, F13, F14, F16, F17, F18	72%
No	F2, F4, F5, F8, F15	28%

The **cash flow** is an integral part of the feasibility, yet 33% lacked the presentation of a cash flow. Table 8.33 illustrates this analysis.

Table 8.33: Cash flow per feasibility

Categories	Placement of Feasibilities	%
Yes	F1, F3, F4, F6, F8, F9, F11, F13, F14, F15, F17, F18	67%
No	F2, F5, F7, F10, F12, F16	33%

Each feasibility should have a **sensitivity analysis**; however, an overbearing number of 72% does not adhere to this requirement. The findings are shown in Table 8.34.

Table 8.34: Sensitivity analysis per feasibility

Categories	Placement of Feasibilities	%
Yes	F2, F3, F6, F9, F10, F13, F17	39%
No	F1, F4, F5, F7, F8, F11, F12, F14, F15, F16, F18	61%

Value engineering suggestions only occur in 6% of the feasibility studies; the remaining 94% does not offer this insight, as indicated in Table 8.35.

Table 8.35: Value engineering suggestions per feasibility

Categories	Placement of Feasibilities	%
Yes	F9	6%
No	F1, F2, F3, F4, F5, F6, F7, F8, F10, F11, F12, F13, 14, F15, F16, F17, F18	94%

8.6 COMPLEXITIES

From the quantity surveyor's perspectives, the following elements create complexity:

- Usage of the building (8.6.1)
- Green rated buildings (8.6.2)
- Type of income stream (8.6.3)
- Phased construction (8.6.4)

The baseline for the indication of complexities, in the context of this study, is feasibility studies prepared for residential units to be sold.

This is the most basic usage of a structure with the simplest income stream, and yet it can be developed for economic benefit. By analysing the feasibility studies received, the way the complexities manifested could be identified.

8.6.1 Usage of the building

As pointed out by Dandan *et al.* (2019), the usage of the building contributes to the complexity of the feasibility. In the **residential for rent** sector, the complexities manifest in the feasibility studies in the following way: A vacancy factor needs to be applied; escalation of rental income; and operating expenses need to be allowed for.

In the **retail** sector, the complexities manifests in the feasibility studies in the following way:

- Vacancy factor needs to be applied
- Different shops pay different rates per square
- Escalation of rental income
- Operating expenses need to be allowed for
- Amount of parking bays and parking income
- Tenant co-ordination fees
- Tenant installation costs and direct payments

In the **industrial** sector, the complexities manifests in the feasibility studies in the following manner:

- Vacancy factor needs to be applied
- Escalation of rental income
- Operating expenses needs to be allowed for

In the **commercial (offices)** sector, the complexities manifest in the feasibility studies in the following manner:

- Vacancy factor needs to be applied (for rentals)

- Escalation of rental income (for rentals)
- Operating expenses needs to be allowed for (for rentals)
- Number of parking bays and parking income (for rentals)
- Letting agent fees (for rentals)
- Tenant installation costs

In **specialist buildings**, the complexities manifest in the feasibility studies in the following manner:

- Specialist items under building cost
- Specialist consultants
- Medical suites for rental:
    - Escalation of rental income
    - Operating expenses needs to be allowed for
    - Amount of parking bays and parking income
    - Different sections pay different rates per square
    - Tenant installation costs
- Hotel:
    - High initial vacancy rates
    - IRR calculation over 20 years
    - Allowance for furniture and equipment
    - Interior design and decoration fees
    - Escalation rental rate
    - Apply single and double occupancy rate
    - Apply different rates per type of room
    - Allow for income on food (breakfast, lunch and dinner)
    - Allow for sales of beverages
    - Allow for conference income
    - Depreciation calculations on furniture, soft finishes and equipment

- Calculate taxable income

In **mixed-use buildings**, the complexities manifest in the feasibility studies similar to each sector's complexities, as indicated above. Additionally, a matrix needs to be added, keeping each sector's cost and income separate.

8.6.2 Green-rated buildings

Green-rated buildings require additional costs for which there needs to be allowance. These include: Specified items to achieve green rating; Consultants specialising in sustainable building design; and rating and certification fee.

8.6.3 Type of income stream

Selling is the baseline against which the complexity is measured. **Rental income** adds the following complexities to feasibility studies:

- Vacancy factor needs to be applied
- Escalation of rental income
- Operating expenses needs to be allowed for
- Letting agent fees

A **hybrid** scheme has additional complexities to the aforementioned:

- A matrix needs to be added to keep the income streams separate
- Methodology for division of fixed-cost items
- Proceeds from sales is an additional method of gearing
- Sales after the acquisition of bank financing/debt cause additional calculations to capital interest

8.6.4 Phased construction

The complexities that manifest in feasibility studies of phased construction projects include the following:

- The improvements costs and general costs need to be divided into the respective phases
- Separate escalation costs need to be calculated for each phase
- Capitalised interest needs to be calculated for each respective phase

The phases of projects cannot stand alone, as each phase impacts the other.

8.7 Evaluation Tool

The evaluation tool is set out in Table 8.36. The evaluation consists of three categories: (i) the document design according to communication guidelines for documents; (ii) the occurrence of items in the executive summary as per the audience analysis; (iii) and the occurrence of best practice items in the overall document. The codebook (Table 4.5 under sub-section 4.5.6.2) was used to develop the evaluation tool. Each item that is present in the document is allocated one point, if the item occurred somewhat but not fully as per the requirements, half a point is allocated. If an item occurred elsewhere in the document when the requirement was to be in the executive summary, half a point was also allocated. “Priority” items were not weighted more for two reasons. Firstly, through the ANT lens, all items are given the same priority. Secondly, the evaluation tool’s most important attribute is to evaluate which best practice items are present and which are missing.

Category (i) has a maximum total of nine points, category (ii) is sixteen and (iii) is seven. The overall total is a maximum of 32 points.

Table 8.36: Tool to evaluate the quality of feasibilities

Element	Category	Points
Document Design (9)		
Logical order	Organised and logical	1
Table	Moderately	1
Table	Minimally/Extensively	1/2
Graphs	Presence of graphs	1
Font size	Adequate	1
Font type	Easy to read	1
Capitals	Minimally/Headings	1

White space and spacing	Strategic	1
White space and spacing	Some/moderate	1/2
Contrast	Efficient	1
Contrast	Mix/Moderate	1/2
Terminology	Standardised	1
Executive Summary (16)		
Spatial allocation	Yes	1
Spatial allocation	Elsewhere	1/2
GBA vs GLA	Ratio	1
GBA vs GLA	Only quantities/elsewhere	1/2
Total construction cost	Yes	1
Total construction cost	Elsewhere	1/2
Construction cost/m²	Yes	1
Construction cost/m²	Elsewhere	1/2
Preliminaries	Yes	1
Preliminaries	Elsewhere	1/2
Contingency	Yes	1
Contingency	Elsewhere	1/2
Escalation	Yes	1
Escalation	Elsewhere	1/2
Professional fees %	Yes	1
Professional fees %	Elsewhere/Amount only	1/2
Land cost	Yes	1
Land cost	Elsewhere	1/2
Interest	Yes	1
Interest	Elsewhere	1/2
Total capital outlay	Yes	1
Total capital outlay	Elsewhere	1/2
% of elements	Yes	1
% of elements	Elsewhere	1/2
Cost per unit	Yes	1
Cost per unit	Elsewhere	1/2
Total income	Yes	1
Total income	Elsewhere	1/2
Operation cost/m²	Yes	1
Operation cost/m²	Amount only/Elsewhere	1/2
Performance indicator	Yes	1
Performance indicator	Elsewhere	1/2
Best practice (7)		
Sub-contractors	Yes	1
Tenant installations	Yes	1
Assumptions	Yes	1
Programme	Yes	1
Cash Flow	Yes	1
Sensitivity analysis	Yes	1
Value engineering	Yes	1
		Maximum points: 32

8.8 EVALUATIONS

Table 8.37 is a matrix that presents the raw data of the evaluation process and lists the elements applicable to the evaluation process; the scores of each feasibility per element; the totals achieved for each element, as well as the overall totals for each feasibility.

Table 8.37: Evaluations of feasibilities

	Feasibilities																		
Elements	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	**Totals**
Logical order	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	**4**
Table	0.5	0.5	1	0.5	0.5	1	0.5	0.5	1	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	1	**11.5**
Graphs	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	**2**
Font size	0	1	1	1	0	1	1	0	0	0	0	1	0	0	1	1	1	1	**10**
Font type	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	**17**
Capitals	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**17**
Spacing	0.5	0.5	1	0.5	1	1	1	0	0.5	0	1	1	0	0	0	1	0.5	1	**10.5**
Contrast	1	0.5	1	0.5	1	1	0.5	0.5	1	0.5	1	1	0.5	0.5	0.5	1	1	1	**14**
Terminology	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Spatial allocation	0.5	0.5	0.5	0	0.5	1	0.5	0	1	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0	**9**
GBA vs GLA	0	0.5	0.5	0	0.5	0.5	0.5	0	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0	0	**7**
Construction cost	1	1	0.5	1	1	0.5	1	0.5	0.5	1	1	1	1	1	1	1	1	0.5	**15.5**
Construction cost/m²	1	1	0.5	0.5	1	0.5	1	0	0.5	1	1	1	1	1	1	0.5	1	0.5	**14**
Preliminaries	0	1	0.5	0	1	0.5	0.5	0	0.5	0.5	0.5	1	0	0.5	1	1	0.5	0	**9**
Contingency	1	1	0.5	1	1	0.5	1	0.5	0.5	1	0.5	1	0.5	1	1	1	1	0.5	**14.5**
Escalation	1	1	0.5	1	1	0.5	1	0	0.5	1	0.5	1	0	1	1	1	1	0.5	**13.5**
Professional fees	1	1	0.5	0.5	1	0.5	1	0	0.5	0.5	1	1	0.5	1	1	0.5	1	0.5	**13**
Land cost	1	0.5	0.5	1	1	0.5	1	0.5	0.5	1	1	0.5	1	1	1	1	1	0.5	**14.5**
Interest	1	0.5	0.5	1	1	1	1	0.5	0.5	1	1	0.5	0.5	1	1	1	1	0.5	**14.5**
Capital outlay	1	1	0.5	1	1	1	1	1	1	1	1	0.5	1	1	1	1	1	0.5	**16.5**
% of elements	0	1	0	0	0	0.5	1	0	0.5	0	0.5	0	0	0	0	0	0	0	**3.5**
Cost per unit	1	0.5	0.5	1	1	1	1	1	1	1	0.5	0.5	0.5	1	1	1	1	0.5	**15**
Total income	0.5	0.5	0.5	0.5	0.5	1	1	0.5	0.5	1	1	0.5	1	0.5	0.5	1	0.5	1	**12.5**
Operational costs/m²	0.5	n/a	0.5	0.5	0	0.5	0.5	0.5	0.5	1	0.5	0	n/a	0.5	n/a	n/a	n/a	0.5	**6**
Performance	0.5	0.5	0.5	0.5	0.5	1	1	0.5	1	1	1	0.5	1	1	0.5	1	0.5	1	**13.5**
Sub-contractors	0	1	0	1	1	0	1	0	1	0	0	0	0	1	0	1	1	0	**8**
TI	n/a	n/a	n/a	0	n/a	0	0	n/a	n/a	1	1	n/a	1	1	1	n/a	n/a	n/a	**5**
Assumptions	1	0	1	1	0	1	0	0	1	1	1	1	1	1	0	0	1	1	**12**
Program	1	0	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	**13**
Cash Flow	1	0	1	1	0	1	0	1	1	0	1	0	1	1	1	0	1	1	**12**
Sensitivity analysis	0	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	**7**
Value engineering	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
Totals	**18**	**17**	**18**	**17**	**18**	**22**	**22**	**9.5**	**22**	**21**	**23**	**19**	**16**	**21**	**19**	**20**	**21**	**16**	**18.64**

These scores are based on the evaluation tool (Table 8.36 under sub-section 8.7) and codebook (Table 4.5 under sub-section 4.5.6.2) compiled specifically for this thesis. The totals for the feasibilities are generally out of 32; however, some of the elements are not applicable (N/A) to all feasibilities, resulting in a total out of either 30 or 31. The average score of the 18 feasibilities is 18.64.

Table 8.38 presents the scores of each feasibility per category in points and percentage. The percentage calculation takes the number of applicable elements into account. The average of each category is calculated to provide a benchmark for below and above average. The scores of the feasibilities that are above average are highlighted in green.

Table 8.38: Feasibility scores per category

	Feasibilities																		
Totals and sub-totals	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	**Ave**
Document design sub-total	4	3.5	6	4.5	4.5	7	6	3	5.5	4	6	6.5	2	3	4	5.5	5	6	4.78
% of sub-total	44%	39%	67%	50%	50%	78%	67%	33%	61%	44%	67%	72%	22%	33%	44%	61%	56%	67%	53%
Executive summary sub-total	11	11.5	7.5	9.5	12	11	14	5.5	10	13	12.5	10	9	12.5	12.5	12	11	7	10.64
% of sub-total	69%	77%	47%	59%	75%	69%	88%	34%	63%	81%	78%	63%	60%	78%	83%	80%	73%	44%	68%
Best practice sub-total	3	2	4	3	1	4	2	1	6	4	4	2	5	5	2	2	5	3	3.22
% of sub-total	50%	33%	67%	43%	17%	57%	29%	17%	100%	57%	57%	33%	71%	71%	29%	33%	83%	50%	50%
Totals	18	17	17.5	17	17.5	22.5	21.5	9	21.5	20.5	22.5	18.5	16	19.5	18.5	19.5	21	16.5	18.56
% of totals	58%	57%	56%	53%	56%	70%	67%	29%	69%	64%	70%	60%	52%	61%	60%	65%	70%	53%	60%

The Venn diagram in Figure 8.1 illustrates the distribution of the feasibility scores per category. If the feasibility's score of a category is above average, it is included in the circle. If a feasibility has an above-average score in two categories, it is included in the overlap of the two applicable circles. Feasibilities that achieved an above-average score in all three categories are included in the overlap of all three circles, indicating which feasibilities are deemed acceptable overall. Two feasibilities achieved a below-average score in all three categories and did not make it into any of the circles. Eight of the feasibilities managed to score above average in two of the categories and only three feasibilities scored above average in all the categories: F6, F11 and F17. Therefore, only 16.66% of the feasibilities are deemed adequate.

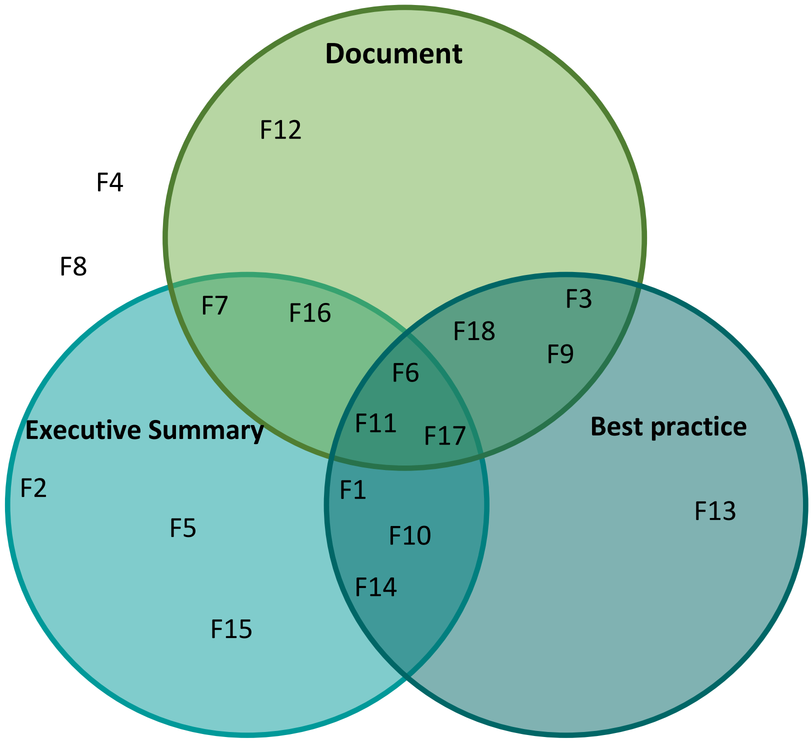

Figure 8.1: Distribution of feasibilities according to scores and categories

8.9 SUMMARY OF THE CHAPTER

Communication guidelines to achieve adequate document design is imperative. This chapter unboxed these guidelines (an actant) and allowed a network to emerge from the 'black box'. Documents, readability and complexity formed the main aspects of the analysis. The analysis demonstrates the differences among the documents, as well as the adequate financial document communication guidelines that should be implemented, compared to what has been implemented.

While this study is predominantly exploratory and descriptive, the opportunity arose to evaluate the feasibility documents based on information gathered from the rich interview data. This creates a better understanding of how QS practitioners communicate their reports and what is lacking.

An evaluation tool was created based on Plain Language guidelines and the audience analysis, consisting of three categories: document design, executive summary and best practice. The evaluation test totalled 32, if all the elements were applicable to the feasibility. The average score of all 18 feasibilities is 18.65. Two feasibilities achieved a below-average score in all three categories. Eight of the feasibilities managed to score above average in two of the categories, and only three feasibilities scored above average in all the categories: F6, F11 and F17. Therefore, only 16.66% of the feasibilities are deemed adequate in terms of efficient document design and what the audience expects to see. The next chapter incorporates the findings of this chapter with the findings of Chapter 7, and ultimately maps the actor-network and presents the framework.

CHAPTER 9: DATA SYNTHESIS PART 2

This chapter is a continuation of Chapter 7. The fourth source – feasibility document analysis – is synthesised with the previous findings. The findings are presented according to the themes, then consolidated into a framework:

- The role of financial feasibility studies (9.1)
- Additional actants (9.2)
- Nature and occurrence of errors in feasibilities (9.3)
- Possible ways of improvements (9.4)
- The feasibility process overlaid with the communication process (9.5)
- Mapping the actor-network (9.6)
- Framework for understanding and optimising actants in the feasibility study process (9.7)

9.1 THE ROLE OF FINANCIAL FEASIBILITY STUDIES

The role of feasibility studies is divided into five categories: elements of successful feasibilities, the usages of feasibilities, the underlying meaning of feasibilities, decision-making factors, and the impact on investment decisions. Each category is presented in a table format, which stipulates the findings supported by the applicable source or sources, drawn from the previous chapters.

Table 9.1: Elements of successful feasibilities

Findings	Literature	Dev.	QS	FS	Total
Acceptable margin of error 4–5%	(Bettini *et al.*, 2016)	x	x		3
NPV larger than zero	(Sudhana, 2016)			x	2
For hospitality PP should be less than 10y	(Sudhana, 2016)			x	2
Return is more than bank interest or other investment opportunities	(Sudhana, 2016)		x	x	3
Client dependent	(Huxham, 2010)		x		2
Reasonable yield (8–12.5%)	(Salman *et al.*, 2007)	x	x	x	4
When a project finished within the parameters of the feasibility		x	x		2

Accurate, honest and realistic study		x	x		2
A comprehensive study where all components are included		x	x	x	3
When the project is realised			x		1
Funds are secured at anticipated interest rate			x		1
Client receives anticipated income		x	x		2
Not a big saving		x			1
Detailed behind the estimate		x		x	2
Market related		x			1
Logical approach and layout		x		x	2
Clear communication of components in study		x		x	2
Negotiated professional fees		x			1
Value engineering already applied		x		x	2
Perception of a successful feasibility		x	x		2

The various elements of successful feasibility studies that emerged from the literature and interviews are presented in Table 9.1. The elements that become apparent in the feasibility reports are indicated as such. These elements are limited to what can be seen in the feasibility. Most of the success factors, however, cannot be gauged by simply looking at a feasibility, but are dependent on other aspects, for example does the feasibility indicate what the developer deems to be successful, or have the fees indicated in the feasibility been negotiated?

Table 9.2: Usages of feasibilities

Findings	**Literature**	**Dev.**	**QS**	**FS**	**Total**
Setting up a budget	(Anees *et al.*, 2018; Kimaru, 2018; Willemse, 2019)	x	x		3
Setting up a cash flow	(Anees *et al.*, 2018; Syed Alwee *et al.*, 2019)			x	2
A tool for effective cost control/management	(Perera *et al.*, 2016; Anees *et al.*, 2018; Kgaka, 2018; Willemse, 2019; Okereke *et al.*, 2020)	x	x		3
Basis for value engineering	(Kwaku Osei, 2016; Schmidt, 2017; Anees *et al.*, 2018; Syed Alwee *et al.*, 2019)	x	x	x	4

Basis for negotiations and contracts (consultants and contractors)	(Anees *et al.*, 2018; Kimaru, 2018)	x	x		3
Basis for key dates	(Anees *et al.*, 2018)			x	2
Quality management system (QMS)	(Anees *et al.*, 2018)				1
A sound financial turnover mechanism	(Anees *et al.*, 2018)				1
For the QS to secure income			x		1
Tool to advise on investment			x		1
Tool to make investment decisions on		x	x		2
Acquire financing	(Kimaru, 2018)	x	x		3
To initiate a sensitivity analysis			x	x	2
Determine the amount of acceptable debt		x			1
Negotiations on land costs		x			1
Facilitates deals with tenants		x			1
Basis for progress measurement		x			1
Basis for as built feasibility		x			1
Determine risk in terms of total capital outlay		x		x	2
Provides clarity on the investment risk	(Mukherjee and Roy, 2017)				1
Achieve maximum profit	(Syed Alwee *et al.*, 2019)				1
Analyse problem areas and the solutions	(Syed Alwee *et al.*, 2019)				1
Summarise the life cycle costs	(Syed Alwee *et al.*, 2019)				1
Ensure most of the client's requirements are fulfilled	(Syed Alwee *et al.*, 2019)				1
Guide the facility manager during the functional period of the proposed project	(Syed Alwee *et al.*, 2019)				1
Guiding risks	(Zakaria *et al.*, 2015)	x			2

Among the many usages of feasibilities, grouped in Table 9.2, only a few visibly emerge on the document itself, for example the cash flow, value engineering, key dates, sensitivity analysis, and total capital outlay. The bulk of the usages does not manifest on the document and could be the reason for the various perspectives on the usages of feasibilities.

Table 9.3 lists the underlying meaning of feasibilities. These, however, are not noticeable from the feasibility document itself.

Thus, the in-depth interviews contributed significantly to these findings, while the document analysis did not contribute at all.

Table 9.3: The underlying meaning of feasibilities

Findings	Literature	Dev.	QS	FS	Total
The possibility to suffer a substantial loss of funds due to incorrect decisions	(Alao *et al.*, 2019)				1
To get projects off the ground	(Lock, 2020)	x	x		3
Opportunity for QSs for earlier involvement			x		1
Make projects possible to earn an income	(Syed Alwee *et al.*, 2019)		x		2
The QS's output			x		1
Gives the opportunity for a sense of accomplishment / rewarding work			x		1
Determine the success of QS firms			x		1
Creates the opportunity for a specialist field			x		1
The assurance of a return		x			1
Determine the success of projects		x			1
Roadmap for a project		x			1
Serves as a business plan	(Syed Alwee *et al.*, 2019)	x			2
Gives credibility to projects		x			1
Assists in problem solving within projects		x			1

Table 9.4: A feasibility's impact on investment decisions

Findings	Literature	Dev.	QS	FS	Total
Decision to proceed	(Mackenzie and Cusworth, 2007; Heralova, 2017; Lock, 2020)	x	x		3
Decision on how to proceed	(Syed Alwee *et al.*, 2019; Lock, 2020)	x	x		3
Supports emotional or prior decisions/beliefs		x	x		2
Decision on when to proceed		x			1
Decision on which project to proceed	(Syed Alwee *et al.*, 2019)				1
Decisions on what tenants to include		x			1
Supports continues decision-making	(Mukherjee and Roy, 2017; Kimaru, 2018; Dagne, 2019)	x			2

The impact a feasibility has on investment decisions, Table 9.4, is not observable in the document.

9.2 ADDITIONAL ACTANTS

Additional actants are divided into 10 categories: QS related, developer related, relationships and the team, dependencies, the process, external uncertainties, building related, complexities, communication, and non-significant actants. Each category is presented in a table format that stipulates the findings supported by the applicable source or sources, drawn from the previous chapters.

Table 9.5: QS-related actants

Findings	**Literature**	**Dev.**	**QS**	**FS**	**Total**
QS area of expertise	(Salman *et al.*, 2007; Lim *et al.*, 2016)	x	x		3
The feel		x	x		2
Delayed exposure to feasibilities			x		1
The QS's approach	(Lim *et al.*, 2016; Bettini *et al.*, 2016; Dandan *et al.*, 2019; Githaiga, 2006)		x		2
Competition in the QS profession			x		1
Feasibilities being intellectual property			x		1
QS motivation		x			1
Lowered professional fees	(Salman *et al.*, 2007)		x	x	3
Risk work	(Ramawela, 2017) contradicts	x	x		3
Time available	(Dandan *et al.*, 2019)	x	x		3

As for the QS-related actants, only the 'lowered professional fees' manifest within the document (Table 9.5). The bulk of the QS-related actants are abstract concepts of which the QSs need to be cognisant.

Table 9.6 tabulates the developer-related actants. Similar to the QS-related actants, most of these elements are abstract and do not manifest in the feasibility. However, certain items, such as the preferred profit margins of the developer, should be indicated within the feasibility to provide the benchmark and be an indicator of whether the feasibility is achieving the goal or not.

Table 9.6: Developer-related actants

Findings	**Literature**	**Dev.**	**QS**	**FS**	**Total**
The developer's approach	(Huxham, 2010; Zakaria *et al.*, 2015; Al-Hawsah, 2020)	x	x		3
Developer level of knowledge	(Sudhana, 2016; Kgaka, 2018; Dandan *et al.*, 2019; Willemse, 2019; Al-Hawsah, 2020)	x	x		3
The developers influence on the template		x	x		2
False perceptions created by technologies			x		1
Clarity of the developer's brief	(Dandan *et al.*, 2019)				1
The developer's budget	(Dandan *et al.*, 2019)				1
Organisational culture	(Al-Hawsah, 2020)				1
Unreasonable objectives /expectations/budget decisions	(Al-Hawsah, 2020)		x		2
Expectation of profit		x			1
Perception of decision-making factors:					
Risks involved	(Zakaria *et al.*, 2015)				1
Profit margins and profitability indicators	(Huxham, 2010; Zakaria *et al.*, 2015)	x			2
Benefit to cost ratio	(Yun and Caldas, 2009)				1
Profit margins: Based on a minimum return		x			1
Profit margins: Return relative to prime rate		x			1
Profit margins: Return based on project goal		x			1

Elements concerning the team and other input is tabulated in Table 9.7. While the relationship dynamics are not observable within the documents, the input is. The feasibilities, however, rarely indicate where the input stems from when it is not from the QS – whether it is the electrical engineer's input or property broker's input. Clarity of the input could increase efficiency of communication. Some published information, such as the SAPOA guidelines for the calculation of the rentable area, are often used in feasibilities, but rarely referred to as such.

Only one of the feasibilities referred to the SAPOA guideline; however, most QSs make use of this guideline. Clarity on guidelines used could also enhance communication efficiency.

Table 9.7: Relationships and input to gather

Findings	Literature	Dev.	QS	FS	Total
QS-developer relationship	(Dandan *et al.*, 2019; Al-Hawsah, 2020)	x	x		3
QS-team relationship	(Bettini *et al.*, 2016; Syed Alwee *et al.*, 2019)	x	x		3
Cost-conscious team	(Bettini *et al.*, 2016; Schmidt, 2017; Syed Alwee *et al.*, 2019)		x		2
Information available	(Lim *et al.*, 2016; Dandan *et al.*, 2019)		x		2
Input from the team	(Syed Alwee *et al.*, 2019)	x	x	x	4
Input from elsewhere:					
Published information (BER, ASAQS, SAPOA, etc.)	(Syed Alwee *et al.*, 2019)		x	x	3
Regulations (country/municipality specific, NHBRC, environmental, etc.)	(Syed Alwee *et al.*, 2019)	x	x	x	4

Table 9.8 lists the dependencies. While none of the elements could be observed within the document analysis, the financiers' requirements should be documented.

Table 9.8: Dependencies

Findings	Literature	Dev.	QS	FS	Total
Financiers' requirements		x	x		2
Financiers' changes in interest rate	(Okereke *et al.*, 2020)				1
Investors and joint ventures		x	x		2
Tenants	(Karas, 2017)	x	x		3
Contractors	(Lock, 2020)	x			2
Municipalities: delay in plan approval	(Kgaka, 2018)	x			2
Municipalities: inconsistencies in rates and taxes			x		1
Municipalities: delay in bulk services		x			1

The process in terms of reiterations and value engineering emerged from all the sources and is indicated in Table 9.9. The reiterations manifest in the revision number of the feasibility. The value engineering, however, only emerged in one of the feasibilities and should be articulated more clearly within feasibilities to increase effective communication about the process.

Table 9.9: The process

Findings	Literature	Dev.	QS	FS	Total
Reiterations	(Mackenzie and Cusworth, 2007; Costello and Preller, 2010; Lock, 2020)	x	x	x	4
Value engineering	(Kwaku Osei, 2016; Schmidt, 2017)	x	x	x	4

While none of the elements given in Table 9.10 featured in the feasibilities, the volatility of the exchange rate and market should be addressed. For example, the exchange rate at the time of estimate should be given, as well as expectation of changes in these rates. When this is incorporated within the feasibilities, arguably, the risk is more transparent, and it could be managed better.

Table 9.10: External uncertainties

Findings	Literature	Dev.	QS	FS	Total
The volatility of exchange rates	(Dandan *et al.*, 2019; Okereke *et al.*, 2020)		x		2
Volatility of the market	(Kgaka, 2018; Okereke *et al.*, 2020)	x			2
Construction mafia		x			1
Unpredictability of inflation	(Dandan *et al.*, 2019; Okereke *et al.*, 2020)				1
Political risks (leadership decisions)	(Okereke *et al.*, 2020)				1

The building-related actants that are not considered non-significant are presented in Table 9.11.

Table 9.11: Building-related actants

Findings	Literature	Dev.	QS	FS	Total
Location	(Costello and Preller, 2010; Sudhana, 2016)	x			2
Complexities (discussed in detail below)	(Dandan *et al.*, 2019)	x	x	x	4
Operational costs	(Stefánsdóttir, 2015)	x	x	x	4

The various complexities and operational costs featured in the document analysis. The location, however, is hardly addressed. Due to the location being an important actant on the success of feasibilities, it should be addressed within the report in terms of the type of location (rural/high density/upcoming development area), as this directly influences the feasibility.

Table 9.12: Complexities

Findings	**Literature**	**Dev.**	**QS**	**FS**	**Total**
Cross-border projects			x		1
Project executed in phases		x	x	x	3
Purpose of the building/sector	(Dandan *et al.*, 2019)	x	x	x	4
Type of income stream			x	x	2
Historic sites		x			1
Regulatory difficulties		x			1
'Green' buildings		x		x	2
Joint ventures		x			1

Only four of the complexities given in Table 9.12 manifest within the feasibility report: phased projects, the purpose of the building, the type of income stream and green buildings. While the other complexities need to be addressed when conducting the feasibility, these four complexities need to be addressed within the formatting and calculations of the reports.

Table 9.13: Communication

Findings	**Literature**	**Dev.**	**QS**	**FS**	**Total**
Communicating the study			x		1
Expectation of the communication		x			1
Adequate document layout	(DuBay, 2004; Terblanche *et al.*, 2019)	x	x	x	4

Table 9.13 presents the communication elements. Adequate document layout is an important factor that can be addressed within the document itself; hence, this was analysed and unboxed in Chapter 8. The post-feasibility approval actants in Table 9.14 do not feature within the feasibilities.

Table 9.14: Post-feasibility approval

Findings	Literature	Dev.	QS	FS	Total
Applying cost management	(Kgaka, 2018; Okereke *et al.*, 2020)	x	x		3
Comparing approved feasibility with actual outcome post project	(Hyari and Kandil, 2009)	x	x		3

Table 9.15 tabulates the non-significant actants. While only the project size is visible on the feasibility document, the other factors cannot be drawn from the feasibility. However, a brief description of the geotechnical conditions, specialist work, greenfield versus brownfield and type of structure within the document could be beneficial to clear communication.

Table 9.15: Non-significant actants

Findings	Literature	Dev.	QS	FS	Total
Site conditions including geotechnical conditions	(Dandan *et al.*, 2019)				1
Specialist work	(Dandan *et al.*, 2019)		x		2
Project size			x	x	3
Type of project structure (concrete, steel, masonry, etc.)			x		1
Greenfield versus Brownfield		x			1

9.3 NATURE AND OCCURRENCE OF ERRORS IN FEASIBILITIES

The nature and occurrence of errors in feasibilities are divided into two categories: errors relating to the process and errors relating to the document report. Each category is presented in a table format that stipulates the findings supported by the applicable source or sources, drawn from the previous chapters. Thirteen of the 24 errors that occur in the feasibility document or process can be and have been observed in the document analysis, as given in Table 9.16. The rest of the errors cannot be observed within the document, and arguably, due to the non-observability of these errors, the QS could be oblivious to them.

Table 9.16: Errors relating to the feasibility process

Findings	Literature	Dev.	QS	FS	Total
Lacks key components and information	(Mackenzie and Cusworth, 2007; Shen *et al.*, 2010; Stefánsdóttir, 2015; Willemse, 2019)	x		x	2
Do not compare end/actual results with initial study	(Hyari and Kandil, 2009)	x	x		3
Underestimating	(Abou-Zeid *et al.*, 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Mukherjee and Roy, 2017)	x	x		3
Lacks holistic approach		x	x		2
Lacks cost control			x		1
Inflated contingency	(Lim *et al.*, 2016)	x	x	x	4
Using the rate per square estimate method	(Bettini *et al.*, 2016)		x	x	3
Using outdated historical data	(Abou-Zeid *et al.*, 2007; Lim *et al.*, 2016; Mukherjee and Roy, 2017)	x	x		3
Misleading clients to benefit from the job (inflated income)	(Ramawela, 2017; Kgaka, 2018)		x		2
Over estimating		x			1
Dissimilarities throughout the industry	(Shen *et al.*, 2010)	x		x	3
Lacks focus on providing savings		x			1
Lacks proper value engineering	(Kwaku Osei, 2016)	x		x	3
Lacks proper research		x			1
Too complex	(Terblanche *et al.*, 2019)			x	2
Do not follow best practices	(Stefánsdóttir, 2015)			x	2
Neglected	(Mohammed *et al.*, 2019)			x	2
Inconsistent terminology	(Simango, 2017)			x	2
Inconsistent organisation				x	1
Lacks communication best practice				x	1
Not presented in a standardised manner			x	x	2
Not conducted in a standardised manner			x		1
Lacks audience analysis		x		x	2

The errors that relate specifically to the document report are listed in Table 9.17. Faulty formulas could not be observed, since copies without the formulae were collected; however, inconsistency in the industry, as well as companies, have been observed. While most of the feasibility documents were compiled using Excel, there is a package available to assist feasibilities. This package or software, however, lacks flexibility as confirmed by the one QS that made use of this package that formed part of the participants.

Table 9.17: Errors relating to the document report

Findings	Literature	Dev.	QS	FS	Total
Faulty formulae within the spreadsheet		x	x		2
Lack of flexibility			x		1
Inconsistent formatting in the industry		x	x	x	2

9.4 POSSIBLE WAYS OF IMPROVEMENTS

This section stipulates the factors that contribute to the success of feasibilities. Each factor is presented in the table below, supported by the applicable source or sources, drawn from previous chapters in this study.

Table 9.18: Factors that contribute to the success of feasibilities

Findings	Literature	Dev.	QS	FS	Total
Incorporate three feasibility phases: Scoping study, pre-feasibility study and the feasibility study	(Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009)				1
Develop a consistent approach to the scoping and conduct of feasibilities	(Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009; Kwaku Osei, 2016; Syed Alwee *et al.*, 2019)				1
Implement independent peer reviews	(Mackenzie and Cusworth, 2007; Hyari and Kandil, 2009)				1
Before-and-after feasibilities	(Hyari and Kandil, 2009)				1
Using effective tools	(Kwaku Osei, 2016) (Dandan *et al.*, 2019)				1
Site visit prior to the preparation of a feasibility should be compulsory	(Syed Alwee *et al.*, 2019)				1
Create a database, made accessible to all relevant parties consisting of clear-cut guidelines for all projects	(Syed Alwee *et al.*, 2019) (Dandan *et al.*, 2019)				1

Closely and constantly follow the available guideline	(Syed Alwee *et al.*, 2019)			1
Professional advice given by structural and mechanical engineers at the start of a project can improve the efficiency of the feasibility.	(Syed Alwee *et al.*, 2019; Dandan *et al.*, 2019)			1
Increase involvement of the entire design team	(Syed Alwee *et al.*, 2019)			1
The more information gathered the more accurate the feasibility	(Syed Alwee *et al.*, 2019)			1
Carry out more research on previous projects	(Syed Alwee *et al.*, 2019)			1
All members must work as a team to meet the design and cost requirements	(Syed Alwee *et al.*, 2019)			1
All information available from government, local authorities and others as well as private organisations must be stored on a database and made available	(Syed Alwee *et al.*, 2019)			1
Improve team coordination	(Syed Alwee *et al.*, 2019)			1
Promote knowledge sharing	(Syed Alwee *et al.*, 2019)			1
The manual for comprehensive feasibilities should include recordings of previous problems and solutions	(Syed Alwee *et al.*, 2019)			1
The manual for comprehensive feasibilities should include the format and type of information to be considered	(Syed Alwee *et al.*, 2019)		x	2
Utilisation of checklists to ensure completeness	(Dandan *et al.*, 2019)			1
Effective communication between client and design team	(Dandan *et al.*, 2019)			1
Doing an audience analysis	(DuBay, 2004)			1
Standardise terminology	(DuBay, 2004; Cintron, 2019)		x	2
Use reliable methods of estimating	(Lim *et al.*, 2016; Bettini *et al.*, 2016; Dandan *et al.*, 2019)	x		2

Table 9.18 presents the methods of possible improvements drawn from current literature. These are considerations that need to be taken into account while

compiling the feasibility, while only two of these considerations manifest visibly in the feasibility: the type of information and format, and standardised terminology.

9.5 The Feasibility Process Overlaid with the Communication Process

As derived from the literature, a standardised methodology to conduct feasibilities, which includes the required format and type of information to be considered, is necessary. To develop the aforementioned framework of methodology, the actants that act on the feasibility process need to be understood and optimised. The communication process, in the context of feasibility studies conducted and communicated by QSs to private commercial developers, can be modelled, as seen in Figure 9.1.

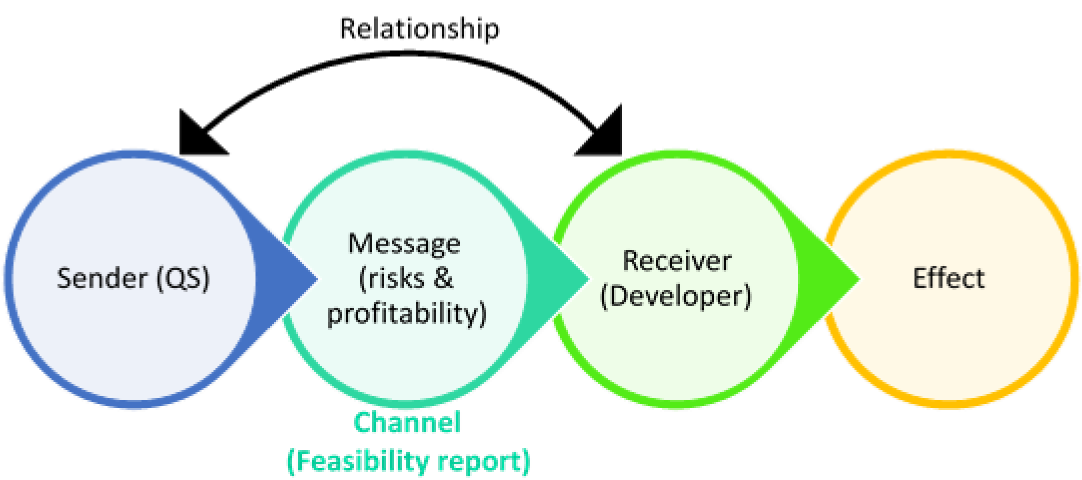

Figure 9.1: Modelling the communication process in the context of feasibilities

The relation of actants in the feasibility process to the communication process is modelled in Figure 9.2. This model indicate the boundaries of the actor-network and serves are a guide for the framework discussed in the next section.

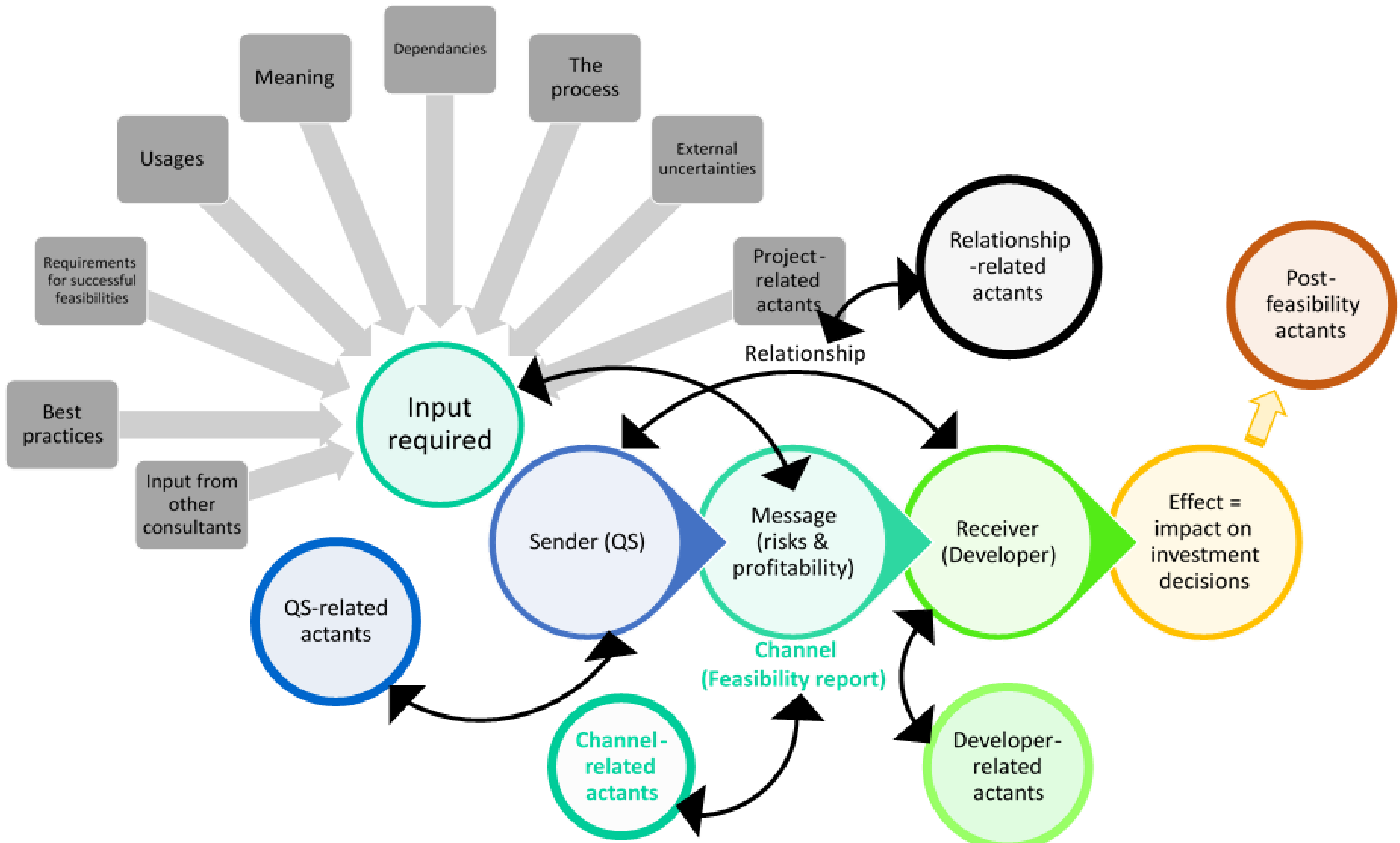

Figure 9.2: Communication process overlaid with the actants (boundaries of the actor-network)

9.6 MAPPING THE ACTOR-NETWORK

The graphical presentation of the network can be seen in Figure 9.3 and the interpretation of the actants and the corresponding relationships are discussed hereunder.

With the objectives of giving and receiving correct advice in terms of economic feasibility of a proposed construction project (abbreviated as objective), the QS and developer form key actants of the network, along with the financial feasibility study report. The literature review, in combination with the interviews, presented actants that form part of the actor-network. These data sources are deemed complementary in the mapping and interpretation of the feasibility actor-network.

The QS as the source actant imposes on the objective (target) by their perception of a successful feasibility (translator), which should be aligned with the developers' view of a successful feasibility. Some QSs do recognise that the success of the study is dependent on the parameters set by the developer: *"A successful feasibility study depends on what the client wants at the end of the day."* (Q01) Another perspective of a successful feasibility is that it is only deemed successful once the project is completed within the constraints of the study. Some argue that the success is directly related to the return presented by the study. An additional perspective is that the feasibility should be accurate and honest, irrespective of the predicted return. A final perspective is that the study is deemed successful once the project has been approved: *"It's successful when we get to a point that we can turn a paper exercise into a real project."* (Q12) If the perception of the QS does not align with the developer, the following happens: *"And I think it's one of the biggest problems in the market generally, is that we as QSs are trying to, try and convince our clients that they must do this development. Every scheme is a good scheme, and it's not always the case."* (Q06) Or the expected income is manipulated by the QS to make the project seem feasible to get the project approved (Kgaka 2018).

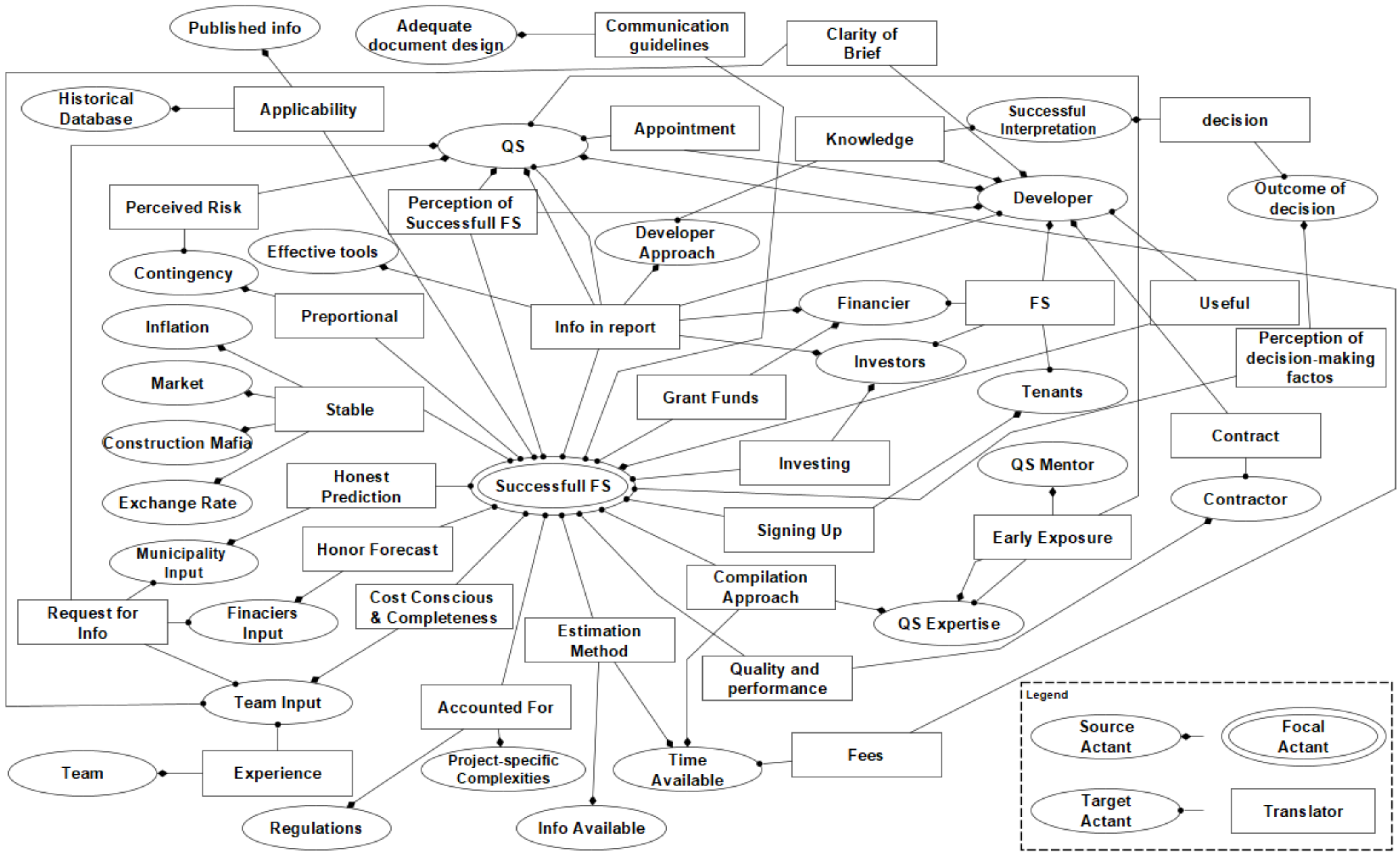

Figure 9.3: Feasibility process actor-network

Given that various perspectives exist in the QS profession, regarding what constitutes a successful feasibility, it is imperative that the QS's perspective is aligned with the developer's perspective to work towards the same goal. Further to the QS being the source actant, the QS is responsible for compiling the report and requests input (translator) from the professional team (architect and engineers) (target), from financiers (target), as well as the municipality (target). The quality of the input (source) from the team is dependent on the experience of the team. In turn, the input from the professional team (source), enacts on the objective (target) by the level of completeness of the input and being cost conscious (translator): *"In the end the feasibility is only as accurate as the information that you get."* (Q04) *"Good architects, in my opinion are very good at design, but also have a sense of cost."* (Q18) *"…makes a huge impact, you have consultants that [are] cost conscious, and you have ones that really [don't] care."* (Q04) If the team is not cost conscious, tension would often arise between the QS and the design team: *"Tension builds, we fight with everyone because I need to protect the feasibility and protect the estimate."* (Q09)

Similarly, the input from the municipality (source) affects the objective, by giving an honest and trustworthy estimate (translator) of the expected rates and taxes. Unfortunately, however, municipalities in South Africa seem to change their rates and taxes once the building is in use, causing a significant decrease in return: *"There is things like increases in rates that can have a major effect on the feasibility, when the council ups his rates by 100% for no real reason."* (Q06) Additionally, the input from the financiers (source) influence the objective, by honouring the forecasted interest rate (translator) when they were initially approached.

The QS (source) decides on the contingency (target), based on their perceived risk (translator) in the project. The contingency (source), however, needs to remain proportional (translator) to the total project cost, to avoid overthrowing the potential investment: *"But we also find that contingency can kill a job and you got to be realistic with the contingency."* (Q06)

The QS level of expertise (source) changes the QS (target) by early exposure of the required knowledge (translator). The QS level of expertise is deemed the source actant, due to the knowledge reaching the QS instead of the QS finding the knowledge. However, the expertise level (target) is imposed by the mentor (source) of the QS, by allowing the inexperienced QS to gain exposure (translator) to feasibilities. Nonetheless, in the industry it is often seen that there is a delayed exposure to feasibilities and a reluctance of knowledge sharing: *"Specifically the younger QSs don't get exposed to it."* (Q16) Furthermore, the QS level of expertise (source) contributes to the objective (target) by means of the compilation process (translator). Some participants referred to having *"a feel for the feasibility"* (Q07). Kahneman (2011) explains that this ‘knowing-without-knowing’ is knowledge gained over time and stored in memory and this intuition is merely an experience of memory. Therefore, the ‘feel’ occurs when a QS has a certain level of experience, which is a required actant to contribute to the stability of the network.

Irrespective of the expertise level of the QS, the time available (source) to compile the feasibility infringes on the objective (target) by means of the compilation approach (translator) and estimation method (translator): *"We would go into as much detail as we've got time available, to be honest, because the more detail you can put into it, it's all the better for decision-making".* (Q01) *"Sometimes you do it in square metres, because the client wants it the next morning."* (Q05) Other participants expressed their concerns about the rate-per-square method of estimating: *"They put a rate per square, which is extremely dangerous, we don't ever do that, we do not recommend that."* (Q09) In turn, the amount of information available (source) also impact the estimation method (translator).

While the QS is compiling the feasibility, project-specific complexities (source) need to be accounted for (translator) as well as the applicable regulations (source), to contribute to the objective (target). The complexities that manifest in a feasibility are the type of income stream, operational costs and projects done in phases, and were expressed by various participants*: "So the income side is always this sort of uncertain and operational costs as well."* (Q09) *"And it's not only just the income; it's also the operational costs and we find ourselves getting more and more involved in."* (Q06*)* *"And then the hard part comes, which is operational costs."* (Q06) *"If it is phased, it is more complicated."* (Q14)

The applicability (translator) of the historical database (source) and the use of publishes information (source) is vital. Published information include items like BER and SAPOA rules.

External actants that impose on the success of a feasibility (target) are the exchange rate, inflation rate, market and construction mafia (sources). If the exchange rate, inflation and market remain stable (translator), the negative impact is mitigated: *"60% of the building is reliant on import duties, and an exchange rate."* (Q07) *"You need to actually have a look. Is the project mechanically intensive? Are there lots of lifts? Are there lots of important air conditioning equipment or whatever that might affect the Rand-Dollar, that might affect your escalation?"* (Q06)

Moving to the developer (source) – QS (target) relationship, the developer approaches the QS with the objective to get correct advice in terms of the economic feasibility of a proposed construction project. The relationship is translated through an appointment or an agreement with the QS. However, in South Africa, the compilation stage of the feasibility is often done as risk work: *"Especially in South Africa, a lot of [the] private sector, commercial projects are done on a risk basis."* (Q02) Furthermore, the professional fees (translator) have been decreasing lately: *"…the professional fees, and that's just getting less and less every year."* (Q11) Both the aforementioned factors motivate the limited time (target) that the QS profession is willing to spend on the compilation of a feasibility, which in turn negatively affects the quality of feasibilities.

As part of the feasibility process, financing needs to be sourced (if required), investors need to be attracted (if required), and tenants need to be signed up if it is rental scheme. The developer (source) approaches financiers (target) and investors (target) with a preliminary feasibility (translation) with the aim to source funding. The financier (source) acts on the success of a feasibility (target) by granting funds (translator). The investor (source) contributes to the success of a feasibility (target) by investing (translator). Additionally, the developer (source) need to appoint a contractor (target) through a contract (translator). The contractor (source) influence the success (target) through their quality of work and performance (translator). The clarity of the brief and communication (translator) from the developer (source) is vital to what input (target) the team is going to give.

Additionally, the investors (source) and financiers (source) have requirements in terms of the information in the report (translator): *"We've had a couple of specifications or criteria from financiers, how they want to see it, they would want to see specific calculations for financing purposes, as well on the capex, which we have incorporated."* (Q01) *"Does he plan to get partners involved? Because that all kind of stipulates how you would present this feasibility."* (Q01) In a rental scheme, the developer (source) needs to sign tenants up (targets) and usually use the preliminary feasibility study (translator) as a negotiation medium. The tenants (source) impose on the success of the feasibility (target) by signing the tenant contract (translator): *"Especially with retail, one day you've got 70% let scheme, the next day 30% of them is pulled out."* (Q10)

Once the feasibility is compiled, the QS (source) presents the information (translator) to the developer (target). The developer (source), with the right knowledge level (translator), interprets the feasibility and advice presented successfully. Once interpreted (source), a decision (translator) is made to reach an outcome (target). The outcome (source) of the decision impact the objective (target) through the perception of the decision-making factors (translator).

In the industry however, developers have various levels of knowledge when it comes to the feasibility: *"All of the clients aren't educated in the built environment. So that is why you actually have to lecture them through your feasibility study."* (Q03) Additionally, the developer's (source) level of knowledge (translator) has an impact on the approach (target) that the developer takes in the feasibility process. This approach becomes a source actant and influences the information in the report (translator) of the QS (target): *"The one developer said to me now, I don't want to see all this, I want to see how much it costs. The other developer, he wants to see the nitty gritty."* (Q17) This information (translator) require correct tools (source) to be used in order to be presented without formula or formatting issues.

The correctness and comprehensiveness of the information of the feasibility is not the only factor when it comes the report, but also how the information is presented in the document. The adequate document design (source) is reliant on communication guidelines (translator) in order to present/communicate the information successfully.

Ultimately, a successful feasibility (source) impose on the developer (target) through being useful. This means that the feasibility could be utilised for its intended use. Given that there are various usages of feasibilities, it needs to be clear on what the intended use of the feasibility will be to ensure its usefulness.

9.7 FRAMEWORK FOR UNDERSTANDING AND OPTIMISING ACTANTS IN THE FEASIBILITY STUDY PROCESS

9.7.1 Introduction

9.7.1.1 Defining financial feasibility studies

A comprehensive definition of a financial feasibility study can be stated as follows: the financial feasibility study is one of the first steps of a construction development and a communication tool that defines a project in terms of the investment goal, total capital outlay and total expected net income, to provide a basis for value engineering, the budget, cost control, acquire financing, negotiations, risk guidance and to determine the residual land value (if needed), estimated cash flow, payback period, feasibility and profitability, to ultimately recommend whether the project is worth the investment or not.

9.7.1.2 Gaining the expertise

Universities do provide an introduction to feasibilities; however, they do not manage to adequately prepare QSs for conducting feasibility studies in real practice. This could be assigned to not spending enough time or emphasis on it, lecturers being out of touch with common practice, and the assignments being out of touch with real projects. Instead, knowledge on conducting feasibilities is predominantly gained from experience while working. Quantity surveying mentors play a significant role in guiding inexperienced QSs with feasibilities. First, a company needs to allow inexperienced QSs to participate in feasibilities. Most companies, however, are reluctant to expose new quantity surveyors to feasibilities, due to it being such an important document, where accuracy is key. Therefore, quantity surveyors often have a delayed exposure to feasibilities.

Nevertheless, the best way to optimise your experience with feasibilities is to run a project from start to finish, and to compare the feasibility with the actual outcome. This way, you gain insight on important aspects that form part of the process, as well as those items that should not be neglected. You gain a deeper understanding of all the components that form part of the feasibility. Some QSs claim that they gained the experience by trial and error. Accuracy is fundamental to the success of feasibilities, therefore an understanding of errors and actants in the feasibility process could contribute to avoiding the ‘trial and error’ method.

In South Africa, the ASAQS has published guidelines and examples of feasibilities.

9.7.1.3 The contribution of expertise

Prior to experience, QSs need to ask a significant number of questions due to limited understanding to eventually be able to compile the feasibility, and this takes time. Experienced quantity surveyors can conduct feasibilities quicker, more accurately and know what to look out for. More back-up details are produced due to a better understanding of each element and component. With experience, some QSs have learnt that the document needs to be visually attractive and not overly complicated. In fact, simplicity is key.

Experienced QSs have the opportunity to be much more involved in the initial activities of a construction project. This includes dealing directly with municipalities, leasing agents and other professional consultants.

9.7.1.4 Evolution of feasibilities

Over time, feasibilities have evolved. Before the electronic age, feasibilities were typed using type machines and Tipp-Ex® to fix errors. Measurements were done by using hard copies and scale rulers. Nowadays, the documents are compiled either on Excel or through software programs specifically developed to compile a feasibility. Measurements are done electronically by using software programs like CAD and captured in other programs like WinQS to produce either an elemental estimate or a full bill of quantities. Subsequently, the change in technology contributed to shorter turnaround times and more accurate measurements.

Some components were included over time. The operational costs changed considerably over time, as quantity surveyors became more involved. Sensitivity analyses have lately been implemented.

9.7.2 Actants impacting the QS

Actants that influence quantity surveyors directly influence the success of feasibilities. The actants include:

9.7.2.1 The QS's area of expertise

Various sectors and types of buildings exist within the construction industry, for example: private residential, bulk residential, commercial offices, retail, industrial warehouses, hospitality, health, specialist buildings, mining, and infrastructure. Each of these sectors requires a different approach and different focus points. QSs usually acquire expertise on one or just a few of the sectors. Therefore, QSs should be aware of the challenges of moving into an unfamiliar sector, or it could compromise the success of the feasibility and project.

9.7.2.2 Delayed exposure to feasibilities

It is common that QSs only acquire experience later in their careers or sometimes not at all, and the number of years of experience as a QS do not reflect their capabilities in terms of conducting feasibilities. As an inexperienced QS, it is important to get exposure early.

9.7.2.3 The approach the QS takes to conducting the feasibility

The approach taken by a QS affects the success of a feasibility. Unreliable estimate methods, for example, rates per unit or rate-per-square-based estimates can contribute to an inaccurate estimate. Not communicating openly and regularly with the team and client, and not following a checklist, meticulously contribute to information being missed. Additionally, information provided by the design team should be double-checked to ensure area schedules and parking ratios are correctly indicated. This information has a significant impact on the success of a feasibility and project, and therefore accurate data should be used.

9.7.2.4 Risk work

In South Africa, the first two construction stages are risk work for the professional team, including quantity surveyors. This includes the feasibility stage. QSs mentioned that only one of five to seven feasibilities done is approved. Furthermore, the feasibility stage can last up to six years, if not more, before the project is realised. The entire time the team works on risk, and the team usually does not get compensated for projects that never realise.

9.7.2.5 Time available

The fast pace of the industry allows minimal time to conduct a feasibility study. Even though modern technology contributes to quicker measurements and faster turnaround time, adequate time should be allowed for conducting a proper feasibility.

9.7.2.6 Lowered professional fees

In addition to the risk work, quantity surveyors are generally compensated less for their consultation than before. Whether it is due to more consultants that form part of the team or economic conditions, lowered professional fees can impact on the resources a company uses for risk work and therefore could impact the quality of the feasibility.

9.7.2.7 QS motivation

Since a QS firm's income is dependent on projects getting off the ground, which is supported by the feasibility, QSs need to be careful not to manipulate the outcome of a feasibility for the prospects of receiving a fee.

9.7.2.8 Intellectual property

QSs often view their feasibility studies as confidential and their intellectual property. This causes the mistakes made and lessons learnt to become lost in the industry, instead of enriching the profession. Knowledge sharing with the client, the team and the profession could contribute to higher quality feasibilities.

9.7.2.9 Increasing competition in the profession

In recent years, the QS profession in South Africa has become more saturated. This could contribute to more QSs willing to work on risk, work for lower fees, to poach clients, work under more pressure, which ultimately jeopardise the quality of feasibilities.

9.7.2.10 The feel

Ultimately, as an experienced QS, you want to be able to make decisions on 'gut feel'. Kahneman (2011) explains that this 'knowing-without-knowing' is knowledge gained over time and stored in memory, and this intuition is merely an experience of memory. He further elaborates that to have a 'feel' that is trustworthy, the skills need to be acquired in an environment that is sufficiently regular and predictable and one should have the opportunity to learn these regularities through prolonged practice. This is why it is important to compare approved feasibilities with the actual outcomes.

9.7.3 Actants impacting the message

9.7.3.1 Best practices

First and foremost, the feasibility should include all the elements that form the best practices:

- Project overview and scope
- Project objectives (developer objectives)
- Duration and milestones
- Total capital outlay
- Value engineering
- Total project income and net income
- Cash flow projections
- Type of funding
- Profitability indicators including initial return, return on investment, net present value, and internal rate of return
- Sensitivity analysis
- Life cycle costing
- Recommendations

9.7.3.2 Requirements for successful feasibilities

The requirements of a successful feasibility can vary depending on the client's goal. For example, some developers are willing to invest provided the return is higher than the interest received at a financial institution. Other developers have a set return in mind, which can be anything between 8% and 25% in the current climate (2021). The NPV is usually expected to be larger than zero. The PP for the hospitality sector is usually 10 years, however, other sectors are expected to be less. These expectations should be clarified with the developer from the onset.

Additionally, a successful feasibility is comprehensive and includes all applicable components, as well as detailed backing of estimates and assumptions, market-related costs and income, a logical approach and layout, prior negotiated professional fees, and value engineering already applied or recommendations of cost saving approaches. There needs to be clear communication of all components in the study. Furthermore, the success of the feasibility is dependent on funds secured at the anticipated interest rates, the actual total capital outlay is within the expected parameters (4–5% either way of the estimated amount, or less if the client prefers it), and whether the client receives the anticipated income with the anticipated occupation rate. Therefore, if the project finishes within the set parameters of the feasibility, it is deemed successful.

Often, from the QS perspective, a feasibility is deemed successful if the project realises. In essence, this means that the QS will receive their fees. However, a QS should be careful not to strive to this goal, but rather to strive for a feasibility accurate, honest and realistic. This is even if it means the project does not realise. As an accurate, honest and realistic feasibility, this is a true successful study. Thus, the perception of a successful feasibility could influence the actual success thereof.

9.7.3.3 Usages

The feasibility becomes a basis for several aspects of a project and should thus be executed in such a way that each of the usages are fit for purpose. The feasibility becomes the budget of the project and is a tool used for effective cost management and control, quality management, and progress management. It forms the basis of the anticipated cash flow, value engineering, key dates, the as-built feasibility, negotiations with contractors, negotiations with potential tenants, negotiations for professional fees, negotiations for acceptable land cost, life cycle costs, and to analyse problem areas to be able to provide solutions.

The feasibility is used to determine: the risk in terms of the total capital outlay; how much debt would be acceptable; sensitivities, and profitability. Additionally, feasibilities are used to acquire financing, provide clarity on the investment risks, guide these risks, and to eventually guide facility managers during the functional period of the proposed project.

Ultimately, the feasibility is a tool: to help achieve maximum profit; to ensure the client's requirements are fulfilled; to support QS advice on investments; to support developer's investment decisions, for QSs to secure income, and therefore be a sound financial turnover mechanism.

9.7.3.4 The underlying meaning

The underlying meaning of feasibilities could contribute to the motivations of stakeholders, which could impact the overall success of a feasibility. For the developer, the feasibility could mean a possible loss of substantial funds, or it assures the developer of a return, it stipulates the success of projects, serves as a business plan, gives credibility to projects, provides a roadmap for the project, and assists in problem solving with projects. For both the QS and developer, a feasibility means getting projects off the ground.

For the QS, a feasibility means the opportunity of earlier involvement in projects, to earn fees, and the opportunity of a specialised field in the profession. Additionally, feasibilities determine the success of QS firms, give QSs a sense of accomplishment, and is in essence the output that clients and consultants can see. Thus, the signature of the QS.

9.7.3.5 Dependencies

The development, and therefore the feasibility, is dependent on certain entities. This includes financiers, investors, joint venture partners, municipalities, tenants and contractors. The project is dependent on financiers in terms of their requirements of what they want to see in a feasibility, what interest rate they offer and how this rate could change over time. The project and inherently the feasibility is dependent on investors in terms of what their requirements are of what they want to see in a feasibility, who they want to conduct the feasibility and the profit they expect. Joint venture partners have a similar impact to investors. Municipalities in South Africa are known for their incompetence and causes three major issues: delay in plan approval, delay in the provision of bulk services, and inconsistencies in rates and taxes.

Anchor tenants, or a certain percentage of the rentable area, are often required to have signed a contract in order for developers to acquire funding for a project. Furthermore, the success of the project is dependent on sufficient tenants to fulfil the anticipated occupation rate, as well as paying the estimated rent. Lastly, the success of the project is dependent on a competent contractor. Hence, the importance of the reputation of a contractor must not be underestimated.

9.7.3.6 The process

The process includes multiple reiterations, where with larger projects there can be up to 40 revisions over a six-year period, or even longer. During these reiterations, value engineering is constantly applied.

Starting the first version of the feasibility, knowing what to anticipate (multiple revisions and systematic value engineering), could alter the initial enthusiasm and input. This, along with the dragging process, can impede the success of feasibilities and the overall project.

9.7.3.7 External uncertainties

Be cognisant of external uncertainties and risks. It is not possible to allow a worst-case scenario for a project. Being overly conservative could be the cause of projects never seeing the light of day. However, external impacts could be the cause of project failures and should certainly be kept in mind when conducting a feasibility. These uncertainties include the volatility of the exchange rate, the volatility of the market, construction mafia, unpredictability of inflation, and political risks. In South Africa, around 60% of the construction cost is dependent on the exchange rate. Expected income should not be too enthusiastic, as the inflation for income does not increase at the same rate as expenses. In South Africa, the construction mafia causes a demand for higher labour rates and could cause days of no progress. The locals should thus be included in construction projects to avoid such events. Sudden steep inflation could cause projects to go over budget. The indices should therefore be carefully considered when conducting the feasibility. Lastly, political leaders could make public decisions that affect the economy in terms of the exchange rate and inflation.

9.7.3.8 Project-related actants

Project-related actants include the location, geotechnical conditions, brownfield versus greenfield, ‘green’ developments, project-specific complexities, and applicable operational costs. The location in terms of realistic income for the area, and typical construction costs (for example, Cape Town has higher construction costs than Johannesburg). Once a geotechnical report is complete, the risks are significantly lower in terms of underground conditions. Brownfield projects have different components to consider than greenfield projects.

Operational costs differ with the type of sector and need to be adjusted accordingly. Project-specific complexities that influence feasibilities are:

- Usage of the building
- Green-rated buildings
- Type of income stream
- Phased construction projects
- Regulatory difficulties including historic sites
- Cross-border projects
- Joint venture projects

The manifestation of the complexities is discussed in detail in section 8.6.

9.7.3.9 Input from the team and elsewhere

Firstly, the QS's relationship with the other consultants is vital to the overall success. The team must work aligned and towards the same vision and command as an integrated team, committed to the same goals, pursuing the fulfilment of the project requirements. Improved co-ordination among team members could greatly benefit feasibilities.

At the beginning of projects, architects often recommend a QS to the developer. To gain this recommendation, the QS and the architect need to work well together. Furthermore, QSs often negotiate the fees with the rest of the team, which is a sensitive aspect. Additionally, the QS is responsible for value engineering designs until a feasible option is found. This means that the QS recommends changes to designs, which takes a substantial amount of time to be developed. This is yet again a sensitive aspect.

Due to the QS managing the costs, the QS often stands separate from the rest of the team next to the client. This makes it difficult for the QS to maintain relationships and to work well with the rest of the team.

Given that the QS handles sensitive aspects and stands separate from the design team, tensions could arise between the QS and the team members. It is important to manage this tension or avoid it entirely, if possible. The developer expects the QS to work well with the rest of the team. This highly influences the decision of the developers, in terms of whom to appoint to the team.

The whole team needs to work together to reach the profitably goals, not only the QS. Therefore, a cost-conscious team influences the success of projects and the success of relationships. On the other hand, if the design team is not cost conscious, time delays occur, as well as tension, and ultimately this impedes the success of projects.

The level of input from the team sets the tone for actual accuracy; however, the developers seldom take this into consideration and expect the same level of accuracy, with or without information. This requires the QS to have sufficient experience, firstly, and secondly the project turns into a cost-driven design, where the QS needs to exercise constant and meticulous design control and cost control. This way, the project can finish within the estimated parameters, even though the information at the time was limited. Ultimately, the information available at the time of compilation has a significant impact on the approach of a feasibility, the number of assumptions, and the level of expected accuracy.

It is recommended that the information received from the engineers (electrical, mechanical, structural and plumbing) be as complete as possible.

If the QS do not receive the following input, then assumptions need to be made:

- Designs from the architect
- Structural requirements from the structural engineer
- Electrical requirements from the electrical engineer
- Mechanical requirements from the mechanical engineer
- Wet services from the wet services consultant

- Fire design from the fire engineer
- Landscaping requirements from the landscape architect
- Land and related costs from the developer
- Expected rental income or sales prices from property brokers and real-estate agents
- Specialist items by specialists
- Geotechnical report, usually from the civil/structural engineer (assumptions not advised)

This means the success of the feasibility is dependent on the quality of information the QS receives from the rest of the team.

Furthermore, information regarding regulations (country/municipality specific, NHBRC, environmental) should be researched, as ignorance thereof could cause the feasibility to lack key elements. Published information like BER, SAPOA methods of measuring rentable area, and ASAQS guidelines to feasibilities, elemental estimating and standard methods of measurements, should all be considered. Ultimately, this information could alter the feasibility.

9.7.3.10 Non-significant actants

It is noteworthy that the following actants are deemed negligible: site conditions, specialist work, project size and type of structure. Sites should be visited prior to conducting the feasibility to avoid any surprises; this includes a geotechnical report. Specialist work should not bring any surprises, since the QS should approach the applicable specialist directly while conducting the feasibility. While following the guide to elemental estimating or standard method of measurement, the project size or structure should not have an impact on the accuracy of the estimate.

9.7.4 Actants impacting the developer

The first actant relates to the approach of a developer. Approaches differ substantially, including when the QS is included in the team; how much responsibility the QS assumes; a cost-driven design mind-set; the developer's level of involvement; the developer's preference to work with the same team, and the developer's preference to execute projects in phases. All of these choices can impact the success of a project.

Additionally, the level of knowledge of the developer, the clarity of the developer's brief, and the developer's budget, contribute to the success of projects. Unreasonable objectives and expectations in terms of profit and budget impede the success of feasibilities. Furthermore, organisational culture that creates an environment where trust and open communication is lacking, also impedes successes. Technology sometimes contributes to developer's false perceptions, in terms of how much help it provides to QSs. For example, 3D drawings may look impressive, and quantities can be drawn from the software; however, these drawings are still concept drawings and far from complete, and the QS needs to check the drawings for mistakes. The process remains timeous, and the false perception of a quicker turnover time due to help from the software program, puts unreasonable pressure on the QS.

The factors that contribute to the investment decision include the risks involved, benefit to cost ratio, or profit margins, based on a minimum return; a return relative to the prime rate, or a return based on the goal of the investment. The decision will depend on how the developer perceives these risks and profit.

9.7.5 Relationship requirements

Given that the QS is responsible for significant costs, an adequate relationship between the QS and the developer is essential. The developer needs to be able to trust the QS as a person and in their work.

The relationship needs to revolve around trustworthiness, reliance and honesty. It is believed that the relationship needs to be cultivated beyond a formal relationship, to a friendship. This creates the opportunity for the developer and the QS better to understand one another in terms of how they think and work, and the QS better understands what the developer wants. The longer the relationship, the more successful this can be. In this time, the developers need to see the value that a QS contributes to the project. Ultimately, the QS is the team member that is present at confidential meetings.

Additionally, the developer wants to see ethicality, loyalty, commitment, partnership and familiarity due to a long-term relationship.

9.7.6 Actants influencing the feasibility document

The method of presentation contributes to the overall success of the communication. Some QSs only email the documents; others email the document prior to the face-to-face meeting to create the opportunity of familiarisation, and some QSs are against emailing the feasibility study altogether, favouring face-to-face discussion only.

The risks that pure written communication entails are:

- Lack of reading by the stakeholders (especially the qualifications and assumptions)
- Lack of understanding/misunderstandings
- Missing out on the developer’s reaction
- Misinterpretations
- The misunderstandings and misinterpretations reflect badly on the QS

Notwithstanding the risks above, a feasibility document should include all the necessary information and explanations and be formatted in such a manner that everything is self-explanatory and easily communicated.

The preference of the presentation by the developer also has an impact, as their preferences vary between email only, emailing the face-to-face meeting, and face-to-face first.

Furthermore, an adequate document layout is required. This is grounded in logical order, tables, graphs, formatting in terms of readable font types, sizes (no smaller than 11 points), no overuse of capital letters, not densely populated or overcrowded, text contrasting against background, some colouring to emphasise certain aspects, consistency in the presentation and terminology, and an audience analysis (see section 8.5).

9.7.7 The impact on investment decisions

The full impact of the feasibility on decisions include:

- The decision to proceed
- The decision on how to proceed
- The decision on when to proceed
- The decision on which project to proceed with
- Continues decision-making throughout the project
- Decision on which tenants to include
- Sometimes to support emotional or prior decisions/beliefs

Therefore, the feasibility should be adequate to provide quality support to the aforementioned decisions.

9.7.8 Actants' post-feasibility approval

Once the feasibility is approved, and construction commences, further actants could cause a feasibility to fail. The QS needs to apply constant and meticulous cost control and management during the next four construction stages, until final accounts have been signed. Lack of cost control renders a feasibility pointless.

Finally, the approved feasibility needs to be compared with the actual outcome once operation starts. This is a vital step to first know whether the feasibility was a success in terms of finishing within the parameters of the estimate, and second, to ensure that mistakes (if any) are recorded to avoid the same in future projects. In fact, all mistakes that become apparent during the project should be recorded for future projects.

It is recommended that each project post-final account should have a report written by the QS, which indicates the failures, successes and errors. These reports should be consolidated in the QS firm, to guide next feasibilities and to avoid repeating mistakes. While this might not be a requirement from the clients, nor form part of the work done by the QS, in other words they won't get paid for comparing the feasibility with the actual outcome, it could greatly benefit QS firms by learning from their mistakes. If they don't know that they did something wrong, then they will keep making the same mistakes.

9.7.9 Formatting and content guidelines

The following formatting guidelines should be followed:

- Use tabulation moderately
- Make use of graphs to visualise the information
- Use a minimum font size of 11
- Use a legible font type
- Do not use all capitals, except for the main headings
- Use white space strategically to increase ease of reading
- Text must contrast properly with the background. Use dark text on light background.
- The executive summary must have all the required information as listed below
- The entire report must not be more than 5 pages

- Terminology consistent with the ASAQS must be used

The following must occur in the executive summary:

- Spatial allocation (how many square metres are each type of space)
- GBA vs GLA
- GBA vs GLA ratio
- Construction cost and cost per square metre
- Preliminaries
- Contingency
- Escalation
- Professional fees and the percentage of these fees in relation to the building cost
- Land cost
- Interest
- Total capital outlay
- Percentage allocation of the items in the total capital outlay, a pie chart demonstrates this the best.
- Cost per unit (residential unit/hotel bed/etc.)
- Total expected income
- Operational costs and operational costs per square metre
- Net income
- Performance/profitability indicators (yield, IRR, etc.)

The following must occur in the report:

- Allowances for sub-contractors
- Tenant installation allowances in the case of a retail development
- All assumptions made
- The time and programme allocation

- Cash flow
- Sensitivity analysis
- Value engineering recommendations
- Life cycle costing
- The final recommendation. Is it a good investment opportunity or not?

The above mentioned items fulfil the feasibility process given by the SACQSP which is:

- Assessment of the costs associated with developing the site
- Determination of the duration and milestones of the project
- Calculating the total expenditure and receipts
- Accounting for the effect of time
- Determination of the return/yield

It also includes the six major activities identified by Stefánsdóttir (2015):

- Project overview: project objectives; origin of the project; project background; and a requirements analysis
- Alternatives: develop at least two alternatives and at most six
- Income and expenses: expected income and total capital outlay
- Return/yield: calculate indicator (NPV, IRR, IR, PP)
- Sensitivity analysis: perform a sensitivity analysis
- Recommendations: recommend the best course of action

9.8 Summary of the Chapter

This chapter gives an account of the findings, synthesised and integrated from the four main sources: literature, developer interviews, QS interviews, and the document analysis. The data is integrated within four themes: the role of financial feasibility studies; additional identified actants; the nature and occurrence of errors in feasibilities, and possible ways of improvements.

Each theme was subdivided into categories, and these are presented in a table format that stipulates the findings. Each finding is supported by one or more of the four sources from where it is drawn.

The most important findings from this chapter includes the lack of communication best practice in the document design. Inconsistent organisation and inconsistent usage of terminology was conclusively proven. The actor-network of the feasibility process is mapped based on all four sources utilised in this study. Finally, a framework for better understanding and optimising the actants in the feasibility process is compiled in terms of actants impacting the QS, actants impacting the message, actants impacting the developer, relationship requirements, actants influencing the feasibility document, the impact on investment decisions, and actants post feasibility approval. Actants impose on every aspect of the feasibility process. The next chapter provides the final conclusions and recommendations.

CHAPTER 10: CONCLUSIONS AND CONTRIBUTION

Financial feasibility studies support informed investment decision-making within the real estate development context. Misunderstandings and errors within the feasibility process have consequences for the success or failure of a construction project. The quality of the communication, as an overarching concept, causes these misunderstandings and errors, and therefore forms the central concept of this thesis. Rationale for this research is the increasing issues of feasibilities in QS practice: poor execution (Mukuka, 2015), inconsistent (Shen *et al.*, 2010), complex (Terblanche *et al.*, 2019), neglected, and problematic (Mohammed *et al.*, 2019); and equally, the identification of the actants contributing to these issues and the development of a framework that enables these issues to be addressed.

Chapter 3 gives gestalt to the systematic literature review and the discussed current literature was found to highlight the literature gap. Chapters 5, 6 and 8 presented descriptions of the research findings of this study in the form of text, comments from the interviewees, and visual tables and charts. Chapters 7 and 9 offered an account of the findings, synthesised and integrated, in tabular form.

This chapter develops these findings and the subsequent discussions into conclusions, contributions and recommendations drawn from the theoretical constructs and conceptual model of the research. The chapter revisits the essence of the project, justifying the research topic, and explaining the intended outcome. The adopted philosophy, approach and research design, are discussed, and the scope of the thesis reaffirmed. Furthermore, this chapter confirms the objectives achieved and provides answers to the posed research questions. Finally, the limitations of the study are discussed, as well as recommendations for further research.

10.1 The Aim and Objectives Revisited

Quality of financial feasibility studies and communication thereof are variables that impact the business efficacy of construction projects. In that regard, the standard of these feasibilities and communication has consequences for business, investments and the wider public. This research investigates what is known and unknown in terms of the financial feasibility study and process in QS practice; the QS perspective, in terms of feasibilities and its process; the developer perspective, in terms of feasibilities and its process; the differences in the perspectives of these key stakeholders; the current nature and occurrence of the financial feasibility study document in quantity surveying practice in terms of communication and best practice guidelines; the actants in the feasibility actor-network, and a framework to improve understanding regarding the actants in the feasibility process.

The research aim is to improve understanding around the artefact from the perspectives of both quantity surveyors and developers, with the intent to provide a framework for optimising the success and reliability of financial feasibility studies.

10.2 Research Scope

This research project has explored the wider aspects of communication and narrowed to financial communication, document design, and communication in construction. South African private commercial construction projects establish boundaries for this research, focussing on the QS consulting profession and their clients. The Actor-Network Theory was used as an analytical framework.

The empirical part of the project is confined to contributions from experienced professional quantity surveyors and developers featured in the private commercial sector in South Africa. Additionally, feasibilities conducted and compiled by quantity surveyors that were utilised by developers in the aforementioned sector were analysed.

The phase of the construction project that is applicable is the concept and viability stage prior to actual construction, as set out by the South African Council for the Built Environment Act No. 43 of 2000. The outcome of this stage is to finalise the project concept in accordance with the brief, including the scope, scale, character, form, function and preliminary programme and viability of the project. This research is focused on the quality and improvement of financial feasibility studies conducted, compiled and communicated by quantity surveyors to developers in the private commercial sector in South Africa.

10.3 PHILOSOPHICAL STANCE, RESEARCH APPROACH AND DESIGN

This thesis is guided by the interpretivism and positivist paradigm, grounding it in the pragmatist philosophy, while leaning slightly towards interpretivism. An abductive approach has been used for the research in understanding feasibilities and actants that influence the success of these feasibilities.

Techniques adopted to explore this concept involved the use of mixed methods requiring semi-structured interviews with practising registered quantity surveyors and developers, as well as a document analysis. These techniques established a better understanding of the entire feasibility process.

10.4 THEORETICAL CONSTRUCTS

Research in the field of the quantity surveying profession and communication serves as the foundation for the theoretical constructs of this study. Critique of issues with feasibility studies emanating from the QS profession were the catalyst for this research. Furthermore, a useful way to look at a complex process, such as the compilation and communication of feasibilities, is through the lens of the Actor-Network Theory (ANT), especially to identify the factors involved in the process and the network that show how everything is connected.

10.5 CONCLUSIONS

There are limited standards when it comes to the compilations and communication of financial feasibility studies in QS practice, locally and internationally. This could be the cause of the multiple issues that have been reported with feasibilities, along with the lack of a holistic view of the full process, as it seems that literature does not present a holistic view of the feasibility compilation and communication process. The studies also lacked rich data from both key stakeholders: the compiler and communicator (QS), and the receiver, interpreter, and decision-maker (developer).

From the document analysis, it is clear that feasibilities in QS practice are mostly sub-standard or inadequate. They lack proper communication guidelines, best practices, and seem to not satisfy their audience. Developers have a wide range of level of experience, when taken into consideration. None of the developers that participated in this study originated from a property development degree. This indicates that feasibilities must be set up to be easy to read and easy to understand. Drawing from the author's experience as a QS, many of the collected feasibility documents were hard to read and some of the key aspects were hard to find. Considering that a QS finds it difficult, the audience (often inexperienced developers) would find it even more difficult.

From the rich data gathered from the interviews with the key stakeholders, current literature as well as the document analysis, a holistic view of the feasibility process emerged. The feasibility compilation and communication process/network are complex and consist of a significant number of actants. Actants are not limited to humans. These actants need to be well understood and optimised to increase feasibility success. Being a critical success factor in construction projects, feasibilities need to be executed and communicated correctly.

The findings suggest that there are actants that have an impact on the QS; the message; the developer; the relationship between the QS and developer; the document; the investment decision, and finally, post-feasibility approval. There are dependencies, external uncertainties, project-related actants, input from other consultants, best practices and requirements for successful feasibilities, usages, the process, underlying meaning, and complexities that also have an impact.

Data from both key stakeholders presented the opportunity to compare their perspectives. In the analysis, various differences emerged. A financial feasibility study fulfils different roles to each key stakeholder. These roles drive different motivations and contribute to different views of what constitutes a successful financial feasibility study and for what it is ultimately used. The difference in perspectives from the key stakeholders indicates a few things. First, the lack of knowledge of developers. However, they do pay the QS for their expert advice. Nevertheless, the developer is the interpreter and decision-maker, and a certain level of knowledge would be advantageous.

Secondly, the QSs are not entirely aware of what the developers deem important. This indicates a lack of communication with the developer during the briefing and compilation process. Additionally, this could indicate the lack of knowledge of QSs, in terms of questions that need to be asked during this time. Thirdly, the misalignment in their perspectives could be a driving force for wrong motivation, misunderstandings, and different objectives, leading to a failed project or a failed business relationship. Finally, a consolidated framework, including both perspectives and the areas of misalignment, could be beneficial to the industry.

Furthermore, these studies do not only contribute to the investment decision to proceed or not. It supports various other decisions on an ongoing basis. Sometimes it even supports decisions made before the study has been conducted. In this case, the study serves as a confirmation, rather than the decision-making tool.

The quality of the financial feasibility studies conducted by quantity surveyors are not satisfactory. Quantity surveyors are reluctant to admit this about their own work; however, the data gathered indicated otherwise. Quantity surveyors do not make use of guidelines to communicate financial communication efficiently, nor have they conducted an audience analysis, regardless of how highly a feasibility is regarded. Errors creep in from all directions, most likely due to unstructured and unstandardised methods of conducting feasibilities.

Actants of the feasibility process are intertwined with the communication process and providing a framework for understanding and optimising actants in the feasibility study process should be considered a guide to optimise the success of financial feasibility studies and therefore developments.

10.6 The Objectives and Aim Achieved

OB1: Identify what is known and unknown in terms of the financial feasibility study and process in QS practice

This objective was achieved by mapping the entire domain as thoroughly as possible, by doing an exhaustive and comprehensive search that yielded 25 primary studies. These studies are discussed in Chapter 3. From these studies, four overarching themes emerged: elements that influence the quality and success of feasibilities; the nature and occurrence of errors currently found in feasibilities; methods of improving feasibilities, and some perspective from developers.

None of these studies however, collected rich data that focused on the QS expertise. Nor did they study the communication aspect of the document, nor present a holistic view of the feasibility compilation and communication process. The existing literature did, however, serve as a basis on which to build knowledge.

OB2: Understand the QS perspective, a key stakeholder, in terms of feasibilities (the artefact) and the process

Through in-depth interviews with 23 QSs, each with more than five years of experience in practice, a clear perspective of this key stakeholder has emerged. Through the interview process, the QS view in terms of what feasibilities are used for, what constitutes a successful feasibility, and the underlying meaning to QSs, has emerged. They shared the process that they follow when compiling and communicating the feasibilities, as well as the influence it has on professional relationships. The discussions with the QSs presented rich data in terms of their perspective and contributed greatly to a holistic view of the feasibility process, as given in Chapter 5.

OB3: Understand the developer perspective, a key stakeholder, in terms of feasibilities (the artefact) and the process

Through in-depth interviews with 23 developers, each with more than five years of experience in practice, a clear perspective of this key stakeholder has emerged. Through the interview process, the developer view (in terms of what feasibilities are used for), what constitutes a successful feasibility, and the underlying meaning to developers, has emerged. They shared what they expected from feasibilities, as well as the overall involvement in the feasibility process. These discussions with the developers presented rich data in terms of their perspective and contributed greatly to a holistic view of the feasibility process. The detailed findings are presented in Chapter 6.

OB4: Identify the differences in the perspectives of the key stakeholders, QSs and developers

The fourth objective of this thesis was achieved by comparing the rich data received on the two perspectives. The main identified themes were analysed through Venn diagrams in Chapter 7.

Each diagram presented the opposite perspectives, as well as perspectives that aligned. This created a clear view on the differences in their perspectives.

OB5: Identify the current nature and occurrence of the financial feasibility study document (the artefact) in quantity surveying practice, in terms of communication and best practice guidelines

Through the document analysis in Chapter 8, guided by communication and best-practice guidelines gathered from previous chapters, this objective was achieved. An evaluation tool was created based on Plain Language guidelines and the developer interviews, consisting of three categories: document design, an executive summary and best practice. A total of 18 feasibilities, which were issued in practice, were collected and analysed according to this tool. This resulted in the identification of the current state of feasibilities in terms of communication and best practice guidelines.

OB6: Identify and map the actants in the feasibility actor-network, through the lens of the Actor-Network Theory

The integrated data from the literature review, both interviews and the document analysis created a holistic view of the feasibility compilation and communication process. With this information, actants that form part of the network could be identified and mapped (Figure 9.3), achieving the objective.

OB7: Build a framework to improve understanding regarding the actants in the feasibility process

The final objective was achieved by compiling a framework (Chapter 9), which could improve the understanding of the actants in the feasibility network/process. The framework was based on the overall data gathered for this study, as well as conclusions drawn from patterns that have emerged.

10.7 RESEARCH QUESTIONS ANSWERED

SQ1: What is known and unknown in terms of the financial feasibility study and process in QS practice?

The literature review presented studies that elaborated on the elements that influence the quality and success of feasibilities; the nature and occurrence of errors currently found in feasibilities; methods of improving feasibilities, and some perspective from developers. These studies, however, lacked rich data that focused on the QS expertise, and data on the communication aspect of the document, as well as the holistic view of the feasibility compilation and communication process.

SQ2: What is the QS perspective, a key stakeholder, in terms of feasibilities (the artefact) and the process?

The interviews with the QSs confirmed that they have various usages for feasibilities, as well as various roles that the feasibility study fulfils in QS practice. They do not follow the same process when compiling feasibilities, which indicates a lack of available standards. Furthermore, the feasibility plays a significant role among professional relationships.

SQ3: What is the developer's perspective, a key stakeholder, in terms of feasibilities (the artefact) and the process?

The interviews with the developers confirmed that they have various usages for feasibilities, as well as various underlying meanings to developers. The developers have various requirements when it comes to what they expect from feasibilities, which indicates an unstructured approach from the QSs. What is seen as a successful feasibility, varies among developers.

SQ4: What are the differences in the perspectives of the key stakeholders, QSs and developers?

First, there are different perspectives regarding what is seen as a successful feasibility study. For example, a QS considers it successful when a project realises; however, the developers consider it successful when there is clear communication, logical approach, and a certain amount of detail, among others. Various usages also exist among the key stakeholders, the most prominent difference in usage is that QSs use it to secure income for themselves, while developers use it as a business tool.

Additionally, QSs are focused on challenges relating to the profession and developers are focused on profit. Developers' involvement, however, is dependent on their level of knowledge. Developers are more cognisant of delay issues in plan approval and bulk services, where the QSs are more aware of the cost impact of sudden rates and tax changes. Likewise, developers are more concerned about the volatility of the market and the QSs are more focused on the volatility of the exchange rate.

Regarding complexities, QSs are focused on factors that influence the calculations in the feasibility document, whereas the developers are concerned with regulatory obstacles. Errors do occur in feasibilities; however, it seems that the QSs are more oblivious to these errors than the developers.

While there are some aligned perspectives, the differences in their perspectives could cause misunderstandings and divided objectives. However, these perspectives grounded in different professional backgrounds contribute to a holistic view of the process.

SQ5: What is the current nature and occurrence of the financial feasibility study document (the artefact) in quantity surveying practice in terms of communication and best practice guidelines?

Only 16.66% of the feasibilities collected are deemed adequate in terms of efficient document design and what the audience expects to see. Most feasibilities lack adequate document design.

SQ6: What actants does the feasibility actor-network consist of, and how is the network connected?

Figure 9.3 models the feasibility actor-network that includes the identified actants.

SQ7: How can a framework be compiled to improve understanding regarding the actants in the feasibility process?

A framework to contribute to the better understanding of the feasibility process was compiled by drawing from a systematic literature review, rich data from interviews with key stakeholders, as well as a document analysis of the artefact. Using the Actor-Network Theory as a lens, a better understanding of the process/network emerged.

Through the research sub-questions, this thesis has engaged in a deeper understanding around financial feasibility studies conducted by quantity surveyors as an artefact, and how the success of feasibilities can be optimised in terms of execution and communication.

Main research question: How can the financial feasibility study, as an artefact conducted by quantity surveyors in practice in the construction industry, and with the corresponding process, be understood better through the lens of the Actor-Network Theory?

Through the ANT, the actants could be identified in the feasibility process and therefore connections could be recognised.

A framework could be developed based on these connections that contribute to the better understanding and optimisation of the feasibility and feasibility process. Hence, this study succeeded in answering the posed research questions.

10.8 Limitations of the Study

10.8.1 Methodical

The methodical approach primarily consisted of the collection of qualitative data in small sample sizes. Because open-ended interviews were conducted, the responses acquired are not measured and the researcher is not able to verify the results objectively against the information given by the respondents. Because all qualitative studies are unique, they are difficult to replicate. The aim of qualitative analysis is a complete, detailed description and rare phenomena receives the same amount of attention as more frequent phenomena.

The feasibility studies received to analyse, is seen as qualitative data, since it presents the opportunity to analyse the artefact at question first-hand. Due to the communication aspect being analysed, the data is interpreted into qualitative data via a conceptual content analysis. Content analysis is a research technique for the systematic, objective and quantitative description of the manifest content of communication.

10.8.2 Physical constraints and scope limitations

A total of 23 QSs were interviewed, as well as 23 developers. The feasibility studies analysed amounted to a total of 18. Geographically, all the gathered data are limited to South Africa. The relatively small sample sizes and geographic area, hinders the validity of generalised findings. However, the empirical findings are conclusive to South Africa and the literature provided evidence that similar issues are likely to be seen globally.

Furthermore, the perspectives of the investors and occupiers were not collected, limiting this study to the short-term interest clients. This study did not address the Triple Bottom Line framework. Another aspect that was not reported on, is the analysis of annual returns on investment required by long-term clients like investors and occupiers. A further weakness of this study is that quantity surveyors cannot necessarily recognise accuracy or errors from information gathered from the team, while the quantity surveyors' expertise mostly lies with the capital cost estimate. Ultimately, a practising QS did not provide feedback on the framework that emerged from this study.

10.9 CONTRIBUTION TO BODY OF KNOWLEDGE

This study established and portrayed the perspectives of both key stakeholders, quantity surveyors and developers, on the financial feasibility study process. Both these perceptions, including the systematic literature review and document analysis, contributed to the following findings and therefore to the body of knowledge in the following manner:

- Stipulating what is currently known and unknown according to literature in terms of feasibilities.
- Presentation of both perceptions, quantity surveyors and developers, on the role the financial feasibility study fulfils.
- Identification of differences in the perspectives of these two key stakeholders.
- Stipulating what constitutes a successful financial feasibility study.
- Listing the various usages of financial feasibility studies.
- Depiction of the underlying meaning of financial feasibility studies.
- Presenting the full impact of feasibilities on investment decisions.
- Identification and mapping of the actants that influence the success of feasibility studies through the Actor-Network Theory lens.

- Portrayal of the nature and occurrence of errors in the financial feasibility study process.
- Creation of an evaluation tool and evaluation of current feasibilities in terms of communication guidelines and best practices according to the requirements of developers.
- The methods of improving feasibilities are given.
- Portraying the importance of communication as a significant aspect of the success of financial feasibility studies and the investment decisions it supports.
- A framework for understanding and optimising actants in the feasibility study process.

10.10 CONTRIBUTION TO PRACTICE

The contribution of this study to practice includes a framework that could be considered as a guide, by quantity surveyors and developers, to optimise the success of financial feasibility studies and therefore developments. Additionally, the evaluation tool that was developed can be a valuable tool to use in practice to make sure that their feasibility studies are up to standard. This study found that developers have far more uses for feasibility studies than what quantity surveyors realise, and these uses should be taken into consideration when compiling the feasibilities.

A better understanding of the feasibility process and network would be beneficial to the quality of the feasibilities, as well as the reputation of the industry. This study produced a framework and guidelines to the formatting and content of feasibilities, as well as a mapped network, which QSs could make use of to gain a better understanding of the holistic view and process of feasibilities. The preparation of a successful feasibility study requires this holistic approach.

Additionally, the industry could benefit from a consolidation of errors occurred in the feasibility process. Finally, standards should be created to be implemented.

To get to these standards, the entire feasibility network should be taken into consideration, as well as the needs of the client. Especially in the briefing of the project, the QS should ask the right questions, and a checklist of questions should ensure that nothing is missed.

10.11 Recommendations to Body of Knowledge

Addressing the methodological shortcomings first, this research can be expanded by introducing a quantitative component with a larger sample size and larger geographical area. Furthermore, the framework compiled in this study can be introduced to practitioners to gather their comments and to test its impact. A feasibility document template can be created based on the findings of this study in terms of communication guidelines and the audience analysis and distributed to QSs and developers for testing and input. Also, a study where a few different templates of the same feasibility study are presented to developers to test their preferences, comments, understanding and impact, could clarify some needs of the developers.

A theme that emerged was the tension that often exists among team members, especially between the QS and the designers. This theme can be further explored in terms of the impact on the success of projects, future work, and how the typical personality traits of each profession contribute to this tension.

Data sharing is rare in the QS profession among different firms, thus a research project focusing on collecting and consolidating errors occurred could be highly useful.

10.12 Closing Comments and Further Work

While the interviews and collected feasibilities provided rich data, it would have been interesting to sit with practising QSs and get their feedback and thoughts on the framework that emerged from this study.

Ultimately, I would have conducted the interviews slightly differently with both the developers and QSs, by presenting them with a few feasibilities prepared by different QSs (with their permission), and hold a discussion around the differences that occur and what thoughts they have regarding the quality of the document. With the developers, the discussion around the presented feasibilities would revolve around what they would prefer, and which of the feasibilities are easier to understand and follow. Other perspectives than could be investigated are those of investors as well as occupiers (parties with long-term interests). Their perspectives could add significant value in this field of study.

New studies should include the Triple Bottom Line framework as part of the analysis. While the quantity surveyors' expertise mostly lies with the capital cost estimate, the rest of the team that provided input should be investigated as well to give robust findings.

Nevertheless, the empirical data of this study presented exciting information with findings such as separate perspectives and underlying meanings. These findings could serve as a basis for a new direction of research in this topic area.

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ANNEXURE A: RAW DATA OF FEASIBILITIES

The name of sections, headings and sub-headings of each feasibility is listed below in the order presented in the studies received, with the aim to analyse and compare the features of organisation. Additionally, the information below represents the framework of each study and gives a good idea of the logical order and composition of each.

F1

- Notes
  - Introduction
  - Basis of estimate
  - Construction dates
  - Financial provisions
  - Exclusions/unknowns
- Area schedule
  - Tabled: Item no, description, units, beds, total beds, internal area, total area
- Executive Summary
  - Direct contractors
  - Builder's work
  - Subtotal
  - Estimated current building cost
  - Escalation
  - Estimated final building cost
  - Student accommodation items
  - Estimated final building cost
  - Professional fees
  - Mock-ups incl. FF&E
  - Other expenses
  - Development cost excl. finance charges
  - Subtotal incl. VAT
  - Finance charges on bank loan
  - Land
  - VAT

  - Bank loan value including finance charges
- Feasibility
  - Tabulated: Description, units, beds/unit, total beds, current rental/unit at PC, Gross rental income/month, Vacancy factor @5%, Less VAT @15%, operating expenses @ 35%, months, total nett income per annum
  - Total income
  - Total development cost excl. VAT
  - 1st year income
  - Rate of return
- Cashflow on construction
  - Tabulated: no, Payment month, Direct pre-main contractors, main contractor, student accommodated items, professional fees etc, DM fee, Ancillary costs (excluding land), accumulative finance charges, nett monthly requirement, cumulative, finance charges @7.25, VAT at 15%, Interest on VAT based on two-month lag at 7.25%
  - Pre-tender stage
  - Principle contract
  - Project close out

F2

- Preliminary Estimate – Final Summary
  - Tabulated: item, description, amount, elemental rate/m^2, %, comments
  - Building works
  - External works & provisional sums
  - Early works civil contract
  - Total estimated construction works
  - Preliminaries
  - Total estimated construction works including P&G
  - Contingencies
  - Total estimated construction works including P&G and cont.
  - Escalation
  - Total estimated value of tender
  - Professional fee allowances
  - Total estimated value of tender including professional fees
  - Development fees

    - Total estimated project cost excluding VAT
    - VAT
    - Total estimated project cost including VAT
- Executive summary
    - Tabulated: Item, description, amount, elemental rate/m^2, %, Comments
    - Building works
    - External works & provisional sums
    - Early works civil contract
    - Preliminaries
    - Contingencies
    - Escalation
    - Professional fee allowances
    - Development fees
    - Total estimated project cost excluding VAT
    - VAT
    - Total estimated project cost including VAT
- Feasibility study
    - Tabulated: item, description, area, no, total construction area, total sellable area, construction rate (incl. VAT), sales rate (incl. VAT), Construction cost (incl. VAT), total sales (incl. VAT), total profit (incl. VAT), % profit
    - Totals incl. VAT
    - Totals excl. VAT
- Price points (sensitivity analysis)
    - Sales rates/m^2 @ various price points
- Return at variable sales rates
    - Sales rates/m^2
    - Return

F3

- Estimated capital cost
    - Land
    - Improvement cost
    - General costs & finance charges
    - VAT
    - Total estimated capital cost

- Estimated net income and capitalised value
    - Tabulated: Unit, area (GRA), Rentable area (SAPOA), Gross rental per flat (on completion)
    - Gross monthly income
    - Less estimated operating costs
    - Net monthly income (month 1 VAT exempt)
    - Net annual income (year 1) (VAT exempt)
    - Revenue from sale of flats
    - Less estimated capital cost
    - Estimated project profit on total capital
    - Estimated project profit on equity input
- Annexure A: Estimated improvement costs
    - Building works
    - External works
    - Contingency allowances
    - Provision for cost escalation
    - Professional fees
    - Total estimated improvement costs (excl. VAT)
- Annexure B: General costs & finance charges
    - General costs
    - Finance charges
    - Total general costs & finance charges (excl. VAT)
- Annexure C: Assumptions
    - Programme
    - Income and expenditure
    - Basis of cost estimates
    - Exclusions
    - Inclusions

F4

- Executive summary
    - Building cost
    - External works
    - Professional fees
    - Other development cost
    - Total development cost
- Breakdown of elemental cost estimate

  - Tabulated: area, anchor tenant, sub-anchor tenant, line shops, distribution depot, light industrial, studio units, sub total
  - Total
- Project cashflow
  - Tabulated: building cost, architect, engineer, QS, land cost, betterment, rates & taxes, escalation, interest 12%, transfer fees, legal fees, insurance, bond fees, sales, total monthly expenditure, total cumulative
  - Add contingency
  - Cumulative expenditure
- Financial analysis of investment over 20-year period
  - Development cost
  - Assumptions for financial analysis over 20 years
  - Details of overdraft facilities
  - Estimated initial income
  - Initial return on total capital outlay

F5

- Area Schedule
  - Tabulated: Building area, lettable area, parking area, parking bays
  - Area summary
  - Total
- Summary
  - Tabulated: Element, basement, office building, external works, total building, elemental rate/m^2 building, elemental rate/m^2 total lettable
  - Preliminaries
  - Building
  - Estimated current building cost (excl. VAT)
  - Escalation
  - Estimated final building cost (excl. VAT)
  - Tenant installation
  - Sub-total
  - Professional fees
  - Sub-total
  - Fixtures, furniture and equipment
  - Sub-total
  - Land and related

  - Development cost excl. finance charges VAT @ 14%
  - Subtotal incl. VAT
  - Finance charges
  - Sub-total
  - VAT
  - Estimated total development cost (excl. VAT)
- Feasibility
  - Income
  - TCC
- Building cost summary
  - Tabulated: Element, %, Basement/parking, offices, External works, total
- Workings-parking
  - (Breakdown of building cost)
  - Building cost
- Workings-offices
  - (Breakdown of building cost)
  - Building cost
- External works
  - (Breakdown of building cost)
  - Building cost
- Workings-green
  - (Breakdown of building cost)
  - Building cost
- Workings-post-tensioning
  - (Breakdown of building cost)
  - Building cost

F6

- Summary of results
  - Critical programme dates
  - Project areas
  - Revenue and expenditure
  - Total capital outlay
  - VAT
  - Gearing

    - Performance indicators
- Contents
- Notes & Assumptions
    - Notes & Assumptions
    - Estimated method
    - Cost basis
    - Income and expenditure
    - Financial structure
    - Drawings and other information
    - Exclusions
- Summary (Financial feasibility and project analysis)
    - Project description
    - Programme assumptions
    - Project area analysis
    - Gearing
    - Estimated total capital outlay on completion excl. VAT
    - Net operating income (NOI) in first year of trading ending…
    - Maximum cash flow exposure (during trading excluding equity)
    - Internal rate of return
    - Net present value
    - Estimated initial return
    - Property valuation capitalised @ 8.75%
    - Return on Equity
- Estimated total capital outlay (Financial feasibility and project analysis)
    - Cost of land and allied
    - Estimated escalated construction cost at contract completion at …
    - Profession fees and disbursements
    - Management costs
    - Municipal & statutory charges
    - Finance related charges
    - Tenant costs, marketing & commissions
    - Legal cost
    - Contingencies
    - Lease up income and operating costs
    - Estimated total capital outlay (excl. VAT)
    - VAT

    - Estimated total capital outlay (including VAT) as at (date)
- Net operating income in first year of trading (Financial feasibility and project analysis)
    - Estimated net operating income (NOI) for first year ending …
    - Monthly profit / loss in first year ending …
- Sensitivity
    - Variance on yield
    - Variance on building costs
    - Variance on land costs
    - Variance on professional fees
    - Variance on gross rental income
- Definitions
- Annexure: Total capital outlay
    - Tabulated: Description, total, per m^2 CA, % of cost
    - Total excluding interest and lease up costs
    - Estimated capital outlay excluding interest
    - Estimated total capital outlay
- Annexure: Projected building cost and escalation cash flow
    - Tabulated: month number, month ending, monthly value of building work executed, monthly value of escalation, total monthly building cash flow, monthly index, minimum cumulative cash flow, expected cumulative cash flow, Maximum cumulative cash flow
- Annexure: Project cashflow
    - Tabulated: no, month ending, construction cashflow, professional fees, land and allied, other, net sale income, phased rent income, VAT outputs 14%, Capital costs VAT free, Cash flow excluding interest, interest on equity, interest on borrowings, cumulative cash flow incl. interest, Drawdown on equity, drawdown on borrowings
- Annexure: Cash flow of other costs
    - Tabulated: no, month, operating costs, commission on letting, development contingency, opening costs, reducing rates due to sales, occupational health and safety, development management fee, audit, bulk, conveyancing, raising, plan approval, NHBRC, tenant & legal, other, total
- Annexure: Cash flow and profit projections – excluding equity amortisation

- Tabulated: no, year-end, revenue, expenses, tax allowance, debt interest @ 10.5%, Sale of units, profit before tax, corporate tax, profit after tax, capital payments, cash flow, cumulative cash flow
- Annexure: Project internal rate of return
  - Tabulated: year no, year-end, revenue, expenses, corporate tax, terminal or sale of units, project return cash flow, present value @
- Annexure: rate of return on equity after corporate tax yielding
  - Tabulated: year end, revenue, expenses, debt interest, corporate tax, capital repayment on bond, terminal & sale of units, equity return cash flow, present value of cash flow
- Annexure: Net present value discounting future cash flows at an opportunity cost of capital of …
  - Tabulated: year end, revenue, expenses, corporate tax, terminal of sale of units, project return cash flow, present value cash flow

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F7

- Estimated development cost – overall scheme
  - Tabulated: Element, Phase 1A (office, retail, basement, structured parking, external works, subtotal), Phase 1B (residential apartments, external works, subtotal), Phase 2 (Office, retail, basement, structured parking, external works, subtotal), Total
  - Estimated development cost (excluding VAT)
  - Construction area
  - Construction cost (excl. VAT) per m^2 of GCA
  - Development cost (excl. VAT) per m^2 of GCA
  - Gross lettable area
  - Construction cost (excl. VAT) per m^2 of GLA
  - Development cost (excl. VAT) per m^2 of GLA
  - Net first year income
  - Yield
  - Extra cost for Greenstar 5 rating
  - Yield (including Greenstar cost)
- Estimated income, expenditure and return – phase 1A
  - Tabulated: Description of tenant, rentable area of tenant, equivalent current net rentals *date, net rental/m^2 commencing on *date escalation 6%, net monthly income
  - Subtotal – gross lettable area

  - Subtotal – supplementary area
  - Net monthly income – overall
  - Net first year income
  - Less: Annual expenditure
  - Net first year income
  - Net first year return (before tax) on development cost
- Ditto – phase 1B
- Ditto – phase 2
- Notes
  - Basis of estimate
  - PC sums allowed for residential
  - Programme
  - Cost Escalations
  - Exclusions
- Annexure A: Land
  - Tabulated: Element, phase 1A (office, retail), phase 1B (Residential), phase 2 (Office, retail), Total
  - Land cost
- Annexure B: Improvement cost
  - Tabulated: Element, phase 1A, phase 1B, phase 2, total
  - A1: Building works (phase 1A, 1B, 2)
  - A2: Services installations (phase 1A, 1B, 2)
  - A3: Fit-out/finishes (phase 1A, 1B, 2)
  - B: External works
  - C: Preliminary and general items
  - Principle contract value
  - D: Direct & extraneous contracts
  - Estimate of current construction cost
  - E: Escalation (phase 1A, 1B, 2)
  - Total of escalated construction cost
  - F: Professional fees
  - G: Contingency allowance
  - Estimate of final improvement cost
- Annexure C: General costs
  - Tabulated: element, phase 1A, phase 1B, phase 2, total
  - Estimated general costs

- Annexure D: Capitalised interest
    - Tabulated: element, phase 1A, phase 1B, phase 2, total
    - Land/property cost
    - Improvement cost
        - Phase 1A
        - Phase 1B
        - Phase 2
    - General costs
        - Phase 1A
        - Phase 1B
        - Phase 2
    - Estimated capitalised interest

F8

- Viability model
    - OMV based on cap rate
    - Cap rate
    - ROI before tax
    - IRR over 10yr term @ mkt value
    - NPV over 10 years
    - Market related rentals
    - Rental escalation percentage
    - Building area
    - Less: vacancies
    - Add: recoveries
    - Gross rental
    - Expenditure
    - Net rental income
    - Net rental income per m^2
    - Rations
    - Return/yield (on total Dev cost)
    - Return/Yield (on OMV)
    - Break even Ratio (cost/income)
    - Operating ratio (Exp./net gross rental)
    - Market value assuming 9% fixed rate
- Cash flow
    - Net cash flow (20-year horizon)

- Calculation of residual value on building Ann. Esc. in Value 8%
- Calculation of residual value of land Ann. Esc. In Value 8%
- Overall residual value with land and @ cost

F9

- Section A: Director's Summary
  - Gross building area
  - Lettable area
  - Parking bays required
  - Estimated escalated total capital outlay
  - Size of project bond required
  - Estimated returns
  - Programme dates
- Section B: Estimated total escalated capital outlay
  - Land cost
  - Building cost
  - Escalation
  - Professional fees
  - Sundry costs
  - Finance costs
  - Contingency
  - Total capital outlay
  - Less: Income from sales
  - Total development cost
- Section C: Cash flow projections
  - Land cost
  - Building costs & escalation
  - Professional fees
  - Sundry development costs & escalation
  - Development contingency
  - Monthly total before interest and bank cost
  - Interim income
  - Sales
  - Total outlay
  - Finance by bank
  - Own contribution
  - Interest calculation (bank)

  - Interest calculation (own)
  - Total interest
- Section D: Estimate of returns
- Section E: Proposed tenant mix/rental
  - Tabulated: no, tenant, unit, terrace, unit rate, terrace rate, parking rate, parking actual & rate (basement, covered, open), parking surplus/short, Total rental income
  - Basement
  - Ground floor
  - First floor
  - Second floor
  - Parking
  - Totals
- Section F: Sales information
- Section G: Construction cost analysis
  - Estimate
  - Summary of building cost
  - Estimated total current construction cost
- Section H: Builder's work – summary
  - Tabulated: building work, quantity, unit, amount, % of total, unit cost
- Section I: Special items – summary
  - Tabulated: Special items, quantity, unit, amount, % of total, unit cost
- Section J: External works – summary
  - Tabulated: external works, quantity, unit, amount, % of total, unit cost
- Section K: Sensitivity study
  - Construction cost
- Section L: Project information, assumptions
  - Initial development information
- Section M: Assumptions
  - Basic of estimate
  - Programme
  - Cost escalation
- Section N: Exclusions
  - Shell & core
  - Specialist services

    - Internal-fit-out
    - Other
- Section O: High value elements
    - Basic and specialist items
- Section P: Design development concerns
    - Areas of concern and possible constrains

F10

- Section 1: Executive summary
    - Total capital cost estimate (excl. 14% vat)
    - Projected nett annual rental income (excl. 14% vat)
    - Returns on investment
    - Variation analysis
- Section 2: Notes
    - General
    - Programme (assumed)
    - Contract escalation
    - General costs, capitalised interest & land
    - Mechanical & electrical installations
    - General specifications
    - External works
    - Standard shop specification
    - Exclusions
- Section 3: Improvement cost
    - Builders' work
    - Sub-total (excl. VAT)
    - Preliminaries and general
    - Sub-total (excl. VAT)
    - Contingency
    - Sub-total (excl. VAT)
    - Escalation
    - Sub-total (excl. VAT)
    - Professional fees
    - Sub-total improvement cost (excl. VAT)
- Section 4: Capital outlay
    - Sub-total improvement cost (excl. VAT) – brought forward
    - Acquisition cost

- Sub-total (excl. VAT)
- Capitalised interest calculations
- Sub-total (excl. VAT)
- General costs
- Total capital cost (excl. VAT)
- VAT
- Total capital cost (incl. VAT)

- Section 5: Project rental income
    - Tabulated: no, shop, GLA m^2, Gross rent per m^2, gross monthly rental, gross annual rental, gross tenant installation cost/m^2, gross total tenant installation cost
    - Sub-total (excl. VAT)
    - Operating cost per m^2
    - Gross rental income
    - Nett rental income

F11

- Attention
- Detail estimate:
    - A. Estimated building cost:
    - Building work – lower level
    - Building work – upper level
    - Tenant installations
    - External works
    - Preliminaries
    - Contingency
    - Escalations
    - B. Professional fees etc:
    - Professional fees
    - Other consultants
    - C. Other fees, contracts, etc.
    - Bulk services
    - Municipal contributions
    - Leasing
    - Centre management
    - D. Financial commitments
    - Loss if interest

    - Cost of land
    - Other
    - Total development cost
- Tenant installations
    - Tabulated: no, shops, m2, GLA, Direct payments rate/m^2, total tenant direct payments, building TI/m^2, electrical TI/m^2, mechanical TI/m^2, Total rate/m^2, total TI allowance
- Rental income
    - Tabulated: no, area, m^2, area, gross rent, gross income, comments
- Detail estimate feasibility study:
- Executive summary
    - Development period and dates
    - Financial summary (all amounts excl. VAT)
    - Analysis
    - Total development cost analysis
    - Bond detail
    - Areas
- Total development cost analysis
    - Land cost and land development costs
    - Final building cost
    - Professional fees (discounted fee)
    - Other fees, contract, etc.
    - Loss of interest
    - Development cost (excl. VAT)
- Bond detail
    - Financial details
    - Percentage return on development cost, etc.
        - Tabulated: year, average nett rental, average operating costs, average nett rental, net annual revenue, annual bond re-payment, profit/loss on rental, % return on development cost, % return on own capital.
- Revenue statement and rental details
    - Tabulated: Description area, unit, gross rental, operating cost, gross rental, operating cost, amount per month, amount per year, annual rental increase, annual opp. Cost increase, rental review every (end of year), rental review %, lease period (years), property broker’s fee.

- Development analysis by graphs
- Anticipated cash flow
    - Land cost and land development cost
    - Final building cost
    - Professional fees
    - Other fees, contracts, etc.
    - Loss of interest
    - Total cashflow

F12

- General notes
    - Professional consulting team
    - Scope of work
    - Estimate
    - Specification
    - Exclusions
    - Programme
    - Escalation
    - Value Added Tax
- Summary: Building cost
    - Tabulated: element, cost per block, rate/m2 construction, % of final cost
- Total project cost
    - Tabulated: element, cost R, rate/m^2 construction, rate/m^2 rentable
    - Total escalated building cost (incl. prof fees)
    - Development cost
    - Interest
    - Land costs
    - Total project cost
- Income and return – selling option
    - Estimated total financial commitment
    - Tabulated: Sales, selling area, number of units, sale price, total income from sales
    - Total nett income from units
    - Omit VAT
    - Omit sales commission
    - Total income after VAT and commission

    - Net profit

F13

- Index
- Executive summary
    - Headline analysis
    - Estimated final construction cost
    - Construction cost per m2 (GCA)
    - Sectional title area
    - Gross lettable area (GLA)
    - Gross construction area (GCA)
    - Total capital development expenditure
    - Future development cost per m2
    - Land purchase price
    - Rental return on investment (ROI)
    - Section title return on investment (ROI)
    - Hotel cost per key including land value
    - Sensitivity analysis:
    - Year 1 ROI: Sensitivity Analysis – Commercial Net rental (ROI)
    - Sensitivity analysis – commercial profitability (yield on sectional title sales – commercial)
    - Sensitivity analysis – residential penthouse profitability (yield on sectional title sales – residential penthouses)
- Estimate of capital development cost (excluding VAT)
    - Tabulated: Element, total, advertising screen, retail, office, hotel, penthouse
    - Land acquisition costs
    - Construction costs
    - Finance and general costs
    - Total capital outlay
    - Total future development cost/m^2 excluding VAT
    - Total future development cost/m^2 including VAT
    - Hotel cost per key including land value
    - Hotel cost per key excluding land value
    - Total cost excluding VAT discounted from *date at 5% per annum equates to a current day price of
    - Notes

    - Methodology for division of fixed cost items
- Sectional title office – sales schedule
  - Tabulated: Location, no of units, estimated unit area, estimated balcony/storeroom area, estimated total area, coat/m^2 excl. VAT, cost price excl. VAT, 20% deposit requirement, profit excl. VAT, total selling price after comm., brokers commission @ 3%, total selling price excl. VAT, selling price/m^2 excl. VAT
  - Notes
- Sectional title penthouse – sales schedule
  - Tabulated: Location, no of units, estimated unit area, estimated balcony/storeroom area, estimated total area, coat/m^2 excl. VAT, cost price excl. VAT, 20% deposit requirement, profit excl. VAT, total selling price after comm., brokers commission @ 3%, total selling price excl. VAT, selling price/m^2 excl. VAT
  - Notes
- Investment analysis
  - Retail: Nett annual income, cumulative nett income flow, return on investment (Net rental), Leasing agent commission (SAPOA)
  - Hotel: Nett annual income, cumulative nett income flow, return on investment (Net rental), Leasing agent commission (SAPOA)
  - Notes
- Net income schedule
  - Net rental schedule
  - Tabulated: Total no. of units, balcony/exclusive use area, unit area, unit area incl. balcony, total area, esc rate, gross rental, net rental, rent 12 months, rent 12 months
  - Sectional title profit
  - Tabulated: total no. of units, balcony area, unit area, total area, parking bays, sectional title profit
  - Notes
  - Income summary
- Net rental schedule
  - Tabulated: Total no. of units, balcony/exclusive use area, unit area, unit area incl. balcony, total area, esc. rate, gross rental, net rental, rent 12 months, rent 12 months
  - Notes

  - Income summary
- No title (Cash flow)
  - Land acquisition costs
  - Construction costs
  - Finance & general costs
  - Monthly cashflow
  - Cumulative cashflow
  - Development funding overview
  - Notes
- Development funding overview
  - Total cost of development
  - Less: Proceeds from sectional title offices, residential and penthouses
  - Remaining term funding required
  - Total rentable income
  - Yield on term funding

F14

- Notes:
  - Introduction
  - Basis of estimate
  - Construction dates
  - Financial provisions
  - Exclusions/unknowns
- Area Schedule:
  - Tabulated: Item No., Description, area, times, total area, unit
  - Sellable areas
  - Other common areas: Lettable
  - Other areas: Not lettable
  - Total GBA
  - Externals
- Building cost summary
  - Tabulated: Item No., element, value, cost/m^2, % of building cost
  - Direct contractors
  - Preliminaries and general
  - Builders work to common areas
  - Total building cost
- Executive summary

  - Direct contractors
  - Builder's work
  - Subtotal
  - Estimated current building cost
  - Escalation
  - Estimated final building cost
  - Project fees
  - Ancillary costs
  - Development cost excl. finance charges
  - Subtotal incl. VAT
  - Finance charges on bank loan excl. land – based on prime
  - Subtotal
  - VAT
  - TI
  - Bank loan value including finance charges
  - First year return
- Feasibility
  - Tabulated: rental, unit, size, gross, op cost & rates 'n taxes, rentals as per xxx, monthly income, months, annual income
  - Total income
- Cashflow – savings
  - Tabulated: no., payment month, direct pre-main contractors, main contractor, professional fees, etc, ancillary costs (excluding land), Nett monthly requirement, cumulative, finance charges @ 7,25%, Vat at 15%, interest on Vat based on two-month lag
  - Pre-tender stage
  - Principle contract
  - Project close out
  - Totals

F15

- Executive summary
  - Tabulated: Element, value, elemental rate/m^2 sellable, phase 1 only, elemental rate/m^2 sellable, difference
  - Direct contractors
  - Preliminaries
  - Building

    - Subtotal
    - Estimated current building cost
    - Escalation
    - Estimated final building cost
    - Professional fees
    - Ancillary costs
    - Development cost excl. finance charges
    - Subtotal
    - Subtotal incl. VAT
    - Finance charges (bank)
    - Subtotal
    - VAT
    - Estimated total development cost (excluding VAT)
    - Investor equity paid back (including interest @ …)
    - Land equity paid back (Including interest @ …)
    - Total development cost including land
- Building section comparison
    - Full model
    - Phase 1 model
- Area schedule
    - Tabulated: Floor description, review of floor areas, ratio per parking bay, number of parking bays, parking area, FAR sales office areas, terrace areas, store for sale, subtotal, stores (not sellable), common/shared toilets, common/shared passages, stairs, lift lobby (common), lifts core incl. 1 x fireman's lift, fire lobby, entrance lobby, plant room, refuse area, ducts, subtotal, total GBA
- Area schedule phase 1 only
    - Tabulated: Floor description, review of floor areas, ratio per parking bay, number of parking bays, parking area, FAR sales office areas, terrace areas, store for sale, subtotal, stores (not sellable), common/shared toilets, common/shared passages, stairs, lift lobby (common), lifts core incl. 1 x fireman's lift, fire lobby, entrance lobby, plant room, refuse area, ducts, subtotal, total GBA
- Feasibility – option 1 (sectional title sales)
    - Tabulated: Purchaser (supplementary areas), bays for sale, bay rate/m^2 excl. VAT, stores for sale, store rate/m^2 excl. VAT, sales price

excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Tabulated: Purchaser (sold), office sellable are (m^2), office rate/m^2 excl. VAT, balconies, balcony rate/m^2 excl. VAT, sales price excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Tabulated: Purchaser (in negotiation), office sellable are (m^2), office rate/m^2 excl. VAT, balconies, balcony rate/m^2 excl. VAT, sales price excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Tabulated: Purchaser (available), office sellable are (m^2), office rate/m^2 excl. VAT, balconies, balcony rate/m^2 excl. VAT, sales price excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Totals
  - Feasibility
- Feasibility – option 1 (sectional title sales) phase 1 feasibility
  - Tabulated: Purchaser (supplementary areas), bays for sale, bay rate/m^2 excl. VAT, stores for sale, store rate/m^2 excl. VAT, sales price excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Tabulated: Purchaser (sold), office sellable are (m^2), office rate/m^2 excl. VAT, balconies, balcony rate/m^2 excl. VAT, sales price excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Tabulated: Purchaser (in negotiation), office sellable are (m^2), office rate/m^2 excl. VAT, balconies, balcony rate/m^2 excl. VAT, sales price excl. VAT, sales price incl. VAT, Deduct 14% VAT, deduct 4.5% commission, sales price (Nett VAT & comm), parking – 4 per $100m^2$
  - Totals
  - Feasibility
  - Loss on income – explained
- Cashflow
  - Tabulated: Pre-construction, pre-main contract (direct), construction
  - Professional fees
  - Ancillary costs

    - Connections
    - Bulk service contributions
    - COJ
    - Other
    - Accounting fees
    - Direct contractors
    - Main contractors
    - Finance charges
    - Overall incl. finance charges

F16

- Notes
    - Consulting team
    - Contractual info
    - Estimate info
- Area schedule
    - Tabulated: Unit, internal, external, total
    - Total
- Total capital outlay
    - Tabulated: Unit A, unit B, unit C, unit D, External, total
    - Building cost
    - Contingencies
    - Preliminaries & general
    - Escalation
    - Subtotal builder work
    - Professional fees
    - Subtotal builder work
    - Land and related
    - Total development cost excl.
    - Finance
    - Externals
    - Total development cost excl.
    - Total development cost incl.
    - Profit
- Unit A – Breakdown
    - House construction
    - Provisional sums to the shell of the house

  - Provisional sums for finishes
  - Summary
  - External works
  - Summary
- External breakdown
  - External works
  - Summary

F17

- Cost summary
  - Tabulated: offices & Basement, Atrium, Green Bldg costs, Green fees, Total, cost/m^2
  - Building cost
  - Escalation
  - Contingency
  - Fees
  - Land and general costs
  - Finance charges
  - Total cost, excluding VAT
- Notes & Yield
  - Yield in year 1
  - Nett rent in month 1, excl. VAT & op. costs
  - Nett rent in year 1, excl. VAT & op. costs
  - Total costs, as above
  - Yield in year 1
  - Sales
  - Total sales, excluding VAT
  - Less – costs
  - Development profit, excluding VAT
  - Notes
- Detailed costings
  - Tabulated: element, unit, rate, offices & basement, atrium, green installations
  - Building
  - External works
  - Total excluding VAT
- Rate build-ups

- Project payment summary
  - Tabulated: previous payments, this payment, total to date, cost to completion, total project cost, budget, variance
  - Contractors, excel & contingency
  - Consultants
  - Other costs
  - Finance charges
  - Total excluding VAT
  - VAT
  - Total including VAT
  - Notes

F18

- A. General Appraisal
  - Scope of works
  - Schedule of Building Work
  - Total area for new facilities
  - Project programme
  - Basis for feasibilities and estimates
  - Assumptions
  - Exclusions
- B. Financial Summary
  - Project Returns
  - First Year Sales
  - Occupancies
- C. Projected Cashflow Statement (Years 1–10/11–20)
  - Key Statistics
  - Gross Income
  - Operating expenses
  - Gross operating profit
  - Capital expenses
  - Operating profit before tax
  - Attributable earnings
- C. Projected Cashflow Statement (Years 1–10/11–20)

  - Capital Expenditure
  - Depreciation
  - Taxation
  - Cashflow
- D. Projected Cashflow Statement (Years 1–10/11–20)
  - Key Statistics – Rooms
  - Total no of Rooms
  - Room Rate per night
  - No of bed nights sold per annum
  - Gross income – Rooms
  - Income for accommodation services
- E. Estimated Capital Cost
  - Land and current equity value
  - Improvement costs
  - Furniture Furnishings & Equipment
  - General costs & finance charges
  - Total estimated capital cost
- E. Estimated Capital Cost Annexure “A”
  - Estimated improvement costs
    - Building works
    - External works
    - Contingency allowances
    - Provision for cost escalations
    - Professional fees
- E. Estimated Capital Cost Annexure “B”
  - Furniture Furnishings & Equipment
    - Furniture & Softs
    - Equipment
    - Contingency allowances
    - Provision for cost escalations
    - Interior design & decoration fees
- E. Estimated Capital Cost Annexure “C”
  - General Costs & Finance charges
    - General costs
    - Finance charges