



**The needs and challenges of SMEs in the City of Johannesburg: A focus on
the Entrepreneurship Ecosystem**

*A research report submitted to the Faculty of Commerce, Law and Management,
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Master of Management in Entrepreneurship and New Venture Creation*

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ABSTRACT

Entrepreneurship ecosystems have increased in popularity as an approach to fostering more entrepreneurial activity and, hence, spurring economic growth. This research was a propagation of this phenomenon within the context of Africa and Johannesburg, South Africa.

The objective of the research was to explore the City of Johannesburg's entrepreneurship ecosystem by achieving three aims. The first was to aggregate primary data of the ecosystem through the entrepreneur's perspective and the second was to map this data over the city's geography based on Isenberg's (2011) entrepreneurship ecosystem framework as a theoretical foundation. Then lastly, it was to create a framework to better understand the entrepreneurship ecosystem of Johannesburg in order to fill the gaps.

A survey was performed on entrepreneurs across the city in divisions of geographic categories known as regions, where there are seven in total. Data was collected via paper surveys and the surveys were then aggregated and analysed through simple observation, comparison and pattern recognition. Then data reduction was performed in order to extract deeper insights from the data where a framework could be considered and developed, using literature and the data.

The map of the City of Johannesburg's entrepreneurship ecosystem, as depicted in the study, indicates that the issues faced by entrepreneurs across different regions are not different by much and that there is relative homogeneity. The key challenges (in no specific order) were access to markets, equipment, and suppliers and the key needs identified were investors, suppliers, and entrepreneurship education.

The entrepreneurship ecosystem domains were access to markets, finance and human capital which represent the most significant challenges and needs of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem.

A contextual model was developed to consider approaches and it was based on residual and latent interrelatedness between the domains, access to markets, finance, human capital and policy (Isenberg, 2011). Complex network theory aligns with the contextual

model's suggestion for the role and importance of social networks in facilitating the multiplexity of interactions of economic agents between the identified domains in a context of supportive policy for entrepreneurship to thrive (Bull & Willard, 1993; Ferrary & Granovetter, 2009).

Keywords: Entrepreneurship ecosystem, Complex network theory, Entrepreneurs challenges, Entrepreneurship economic development, Entrepreneurs needs,

DECLARATION

I, *Buntu Majaja*, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the Field of Entrepreneurship and New Venture Creation at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



Buntu Majaja

Signed at ...*Johannesburg*.....

On the 26..... day of February..... 2019.

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ACRONYMS

NAME	DEFINITION
COJ	City of Johannesburg
EE	Entrepreneurship Ecosystem
EI	Entrepreneurial Intention
ERIS	Entrepreneurial Regional Innovation System
GDP	Gross Domestic Product
GEDI	Global Entrepreneurship Development Institute
GEM	Global Entrepreneurship Monitor
GEN	Global Entrepreneurship Network
OECD	Organisation for Economic Co-operation and Development
PAF	Principal Axis Factoring
RIS	Regional Innovation System
SA	South Africa
TEA	Total Entrepreneurial Activity
UNDP	United Nation Development Programme
WEF	World Economic Forum

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1 INTRODUCTION

The field of entrepreneurship is a new field of study within the scholarly area of business and management. This implies that many elements about it are still in discovery which explains the reason why there are many perspectives to define it (Moroz & Hindle, 2011; Rwigema, Urban, & Venter, 2010). The different academic conceptualisations of entrepreneurship vary from process-based to behavioural and cognitive and many more (Mars Rios-Aguilar, 2009; Rwigema, Urban, & Venter, 2010). Scholars have studied the entrepreneurship phenomenon from numerous perspectives and have established different models that result in fragmented literature of entrepreneurship and this makes it a challenge to distinctly define entrepreneurship as well as generically define entrepreneurship (Moroz & Hindle, 2011). However, there are certain areas of overlap and recurring patterns between scholars and these reinforce each other to begin to build a tangible body of literature of entrepreneurship (Moroz & Hindle, 2011; Mars & Rios-Aguilar, 2009).

One of the increasingly recurring themes within entrepreneurship literature is the application of entrepreneurship theory to market-orientated phenomena and academic capitalism (Mars & Rios-Aguilar, 2009). Entrepreneurship has, to a large extent, become a unique perspective for university contributions to the topic of economic development (Audretsch, Belitski, & Desai, 2014; Mars & Rios-Aguilar, 2009; Martinez-Ferro, Biedma-Ferrer, & Ruiz-Navarro, 2016). The study of entrepreneurship and its relations to economic growth, development and competitiveness have been extensively studied as one of the main lines of study in the field (Martinez-Ferro, Biedma-Ferrer, & Ruiz-Navarro, 2016). These contributions create entrepreneurship and economic policy that is aimed at encouraging business creation and growth (Figuroa-Armijos & Johnson, 2016; Martinez-Ferro, Biedma-Ferrer & Ruiz-Navarro, 2016). This is because a positive relationship has been broadly recognised between entrepreneurship and sustainable economic growth (Figuroa-Armijos & Johnson, 2016; Martinez-Ferro, Biedma-Ferrer & Ruiz-Navarro, 2016).

If the economy is an interplay of value creation and exchange between legal entities known as firms, then it can be considered that the firms are nodes within a network. This behaviour is mimicable to the relationships that organisms have within a habitat. This concept is known as an ecosystem. One can take the notion of an ecosystem seriously for entrepreneurship and hence, the economy (Auerswald, 2015). The economic ecosystem is embedded in it some level of entrepreneurship because, in order to establish the value of exchange brought about through a transaction, an opportunity needs to be identified. This process of opportunity recognition is also defined as entrepreneurship therefore, entrepreneurship becomes the unit of the economic ecosystem. This is parallel to how the basic units of nature also form the wider and complex system of ecology, however, one can argue the model of the entire earth and universe to be an ecosystem composed of ecosystems as units (Auerswald, 2015). The notion of the ecosystem extends beyond biological and living matter and includes inorganic matter too. This is because, without value creation or innovation, there can be no constant exchange between various ecosystems and between the units (Auerswald, 2015). It then becomes important to notice the economy as an ecosystem with the entrepreneurship ecosystem and innovation ecosystem alike to be part of it. Some of the ecosystems may overlap in nature and function, in terms of how they serve the overall economic ecosystem (Ferrary & Granovetter, 2009). To make this connection is to make a multinodular modelling of the way the economy functions and the importance of the entrepreneurship ecosystem as part of this model. In the ecosystem it becomes important to consider the ecosystem as a multiplexity of ties between economic agents where the total entrepreneurial activity and innovation that results is an outcome of the economic agents interacting in the ecosystem (Ferrary & Granovetter, 2009).

Entrepreneurship ecosystems are becoming increasingly popular in public and private institutions across the world as more governments, universities, corporations, and communities have realised the importance of an holistic and integrated approach to foster regional entrepreneurial activity and enable innovation (Simatupang, Schwab & Lantu, 2015). We can consider the entrepreneurship ecosystem to be a complex network of stakeholders, capital support systems (financial and intellectual) and entities that serve different roles and purposes that represent integrated policies, structures, programmes

and processes that enable the entrepreneurial process and behaviour (GEN, GEDI and Sea Africa, 2017; Ferrary & Granovetter, 2009; Isenberg, 2011, Levin, 2017; Simatupang, Schwab & Lantu, 2015). The entrepreneurship ecosystem involves layers of participating stakeholders, laws, regulations, formal and informal institutions (GEN, GEDI and Sea Africa, 2017; Simatupang, Schwab & Lantu, 2015). The importance of networks when considering entrepreneurship cannot be over stated because entrepreneurship literature has cited its impacts in challenges for women and disenfranchised community's entrepreneurs, it has been noted to enable cross border ventures in Africa such as catalysing Chinese investment in Africa, literature has emphasised how entrepreneurs should draw from strong personal relationship as well as independent ones (Berrou & Combarous, 2011; Brautigam, 2003; Malaza, 2010; Preisendorfer, Bitz & Bezuidenhout, 2012; Xie & Amine, 2009). When considering South Africa's past in relation to apartheid and spatial divide policies and institutions the effect of networks and the entrepreneurship ecosystem layout deserves attention in relation to the entrepreneurial intention and activity gap (Colenbrander and Gil, 2017; Phasha, 2005; Preisendorfer, Bitz & Bezuidenhout, 2012). Theory highlights the importance of networks for entrepreneurial economic development and how South Africa's past may have created institutional and cultural network limitations. This report adds to the literature in this context with outcomes that have implications on the South African network effects.

The South African entrepreneurship ecosystem is more developed and more invested in, compared to other African nations although it is not showing increased entrepreneurial activity (GEN, GEDI and Sea Africa, 2017; Herrington, Kew, & Mwanga, 2017). The South African entrepreneurship ecosystem's foundation has stronger supporting institutions compared to the rest of the continent because the South African government has been promoting entrepreneurship since 1994 (GEN, GEDI and Sea Africa, 2017).

The South African entrepreneurship ecosystem though still needs improvement in areas such as skills level, financial inclusion, technology infrastructure and risk capital in order to produce better, innovative and growth orientated entrepreneurs (GEN, GEDI and Sea Africa, 2017; Levin, 2017). These elements are crucial in order to break the entrepreneurship ecosystem bottlenecks; such bottlenecks are preventing the elimination

of the dual economy inequalities. With elements such as better risk financing, entrepreneurs have a better chance of creating global brands. In order to achieve this, the entrepreneurship ecosystem in South Africa also needs to provide world-class technology (GEN, GEDI and Sea Africa, 2017; Levin 2017).

Theoretical literature then argues that the above entrepreneurial economic development inefficiencies need to be considered in relation to core elements that need to be present within the complex interactions that form part of the complex network effects and the entrepreneurship ecosystem models (Clarysse, Wright, Bruneel & Mahajan, 2014; Ferrary & Granovetter, 2009). The theoretical elements that are considered in this report include the dynamism or fluidity, proximity or connectedness, density and diversity of the entrepreneurship ecosystem model that is developed based on Isenberg (2011) major ecosystem theory. The study considers a factor analysis of the challenges and needs in the ecosystem through a reduction method that identifies complex network theory dynamics between the measured variables and presents them through a framework. The multiplexity of heterogeneous interactors and interactions in the ecosystem are an important consideration to make in order to understand the latent and residual impacting factors of the City of Johannesburg's entrepreneurship ecosystem. This adds to the systems theory and complex network theory discussions especially in the context of Africa.

1.1 Purpose of the study

This is an empirical study to explore and understand the needs and nature of challenges faced by COJ entrepreneurs with the objective of mapping these challenges and needs to the entrepreneurship ecosystem, identify gaps and propose a framework to understand and consider a functional City of Johannesburg entrepreneurship ecosystem.

1.2 Theoretical background

Drawing from Daniel Isenberg's entrepreneurship ecosystem domain concepts and network theory this study investigates the state of the City of Johannesburg's entrepreneurship ecosystem. The ecosystem approach is influenced by a theoretical framework known as the network theory which is a theme that has been showing

exponential growth of citations within literature (Borgatti & Halgin, 2011; Halgin, 2012). It has transdisciplinary applications from physics, biology, social sciences, innovation, creativity and ethics (Halgin, 2012). The theory is characterised by similar theoretical ambiguity as is entrepreneurship in the sense that there are many scholarly perspectives without unison and distinction (Borgatti & Halgin, 2011; Moroz & Hindle, 2011; Rwigema, Urban, & Venter, 2010). Network theory can be considered as the processes and dynamics involved when network structures interact and bring about certain outcomes (Borgatti & Halgin, 2011). Another perspective looks at the outcomes themselves, whereby network theory is defined as the results and consequences of network variables and interconnectedness (Borgatti & Halgin, 2011). Increasing inter-connectedness is a common trend in society and technology, which in itself, brings about complexity (Trend Compendium 2030, 2011).

Complexity is one of the characteristics of networks. The interacting elements and factors of networks do so in a convoluted and complex manner. The nodes within a network are defined by the context that creates them through the connection it has made. This context is not only state dependent but path dependent as well, where the outcomes and dynamics form the body of complexity and it is this very complexity that defines the network theory and its nature (Borgatti & Halgin, 2011; Ferrary & Granovetter, 2009; Jen, 2005). Complexity theory also informs the economic and commercial nature and value of entrepreneurship. When entrepreneurship is considered through the lens of complex network theory as an ecosystem, one can then align with the notion that entrepreneurship ecosystems promote economic development (Audretsch, Belitski, & Desai, 2014; Ferrary & Granovetter, 2009; Mars & Rios-Aguilar, 2009; Martinez-Ferro, Biedma-Ferrer & Ruiz-Navarro, 2016). This is because economic complexity correlates with growth and innovation at a country level (Stangler & Bell-Masterson, 2015). This is the value of the entrepreneurship ecosystem and complexity makes it difficult to isolate and distinguish elements of an ecosystem or network; it begs for the researcher to consider the ecosystem in its entirety and holistically.

Entrepreneurship is often seen as an individual-based construct, in other words, it is conceptualised through the experiences and behaviour of the individual (Rwigema,

Urban, & Venter, 2010). This individual is the entrepreneur, and the entrepreneur is the central player in the entrepreneurship ecosystem (Isenberg, 2011; Rwigema, Urban & Venter, 2010). This means that entrepreneurship is also defined by cognitive elements of the entrepreneurs (Beynon, Jones & Pickernell, 2017; Rwigema, Urban, & Venter, 2010). One can define entrepreneurship as the process taken by the entrepreneur to identify, develop and exploit opportunities (Rwigema, Urban, & Venter, 2010). This means that the ability of the entrepreneur to perceive the opportunities within the entrepreneurial climate will dictate the entrepreneurial activity of the entrepreneur (Beynon, Jones, & Pickernell, 2017; Herrington, Kew & Mwanga, 2017; Rwigema, Urban & Venter, 2010). The Global Entrepreneurship Monitor measures perceptions of self-capabilities and perceptions of the opportunities in the entrepreneurial environment (Beynon, Jones, & Pickernell, 2017; Herrington, Kew & Mwanga, 2017). Therefore, when one discusses the entrepreneurship ecosystem with the entrepreneur at the centre they are taking the theoretical framework that views entrepreneurship as an individual-based phenomenon. This then goes on to inform the importance of perception in linking the entrepreneur within the entrepreneurship ecosystem and entrepreneurial activity. The self-perception theory allows the judgement of the entrepreneur to represent the performance of the entrepreneurship ecosystem.

Over the last few decades, there has been an increasingly interdisciplinary approach to entrepreneurship whereby elements such as urban economics, geographic economics, and entrepreneurship economics have come together to contextualise entrepreneurship (Stam & Spigel, 2016). Entrepreneurship ecosystem research has gained much polarity among researchers as the notions of social context, individualism and cultural elements have become more established in the realm of entrepreneurship (Rwigema, Urban & Venter, 2010; Stam & Spigel, 2016). It is a trend in entrepreneurship research because the ecosystem approach is finding favour and interest from policymakers and entrepreneurs themselves (Stam & Spigel, 2016). It becomes important, however, to increase the focus on this approach to entrepreneurship research because not enough of it is scientifically explored in different environments of different sizes and nature outside of the common Silicon Valley and Israel examples (Stam & Spigel, 2016).

1.3 The context of the study

This study took place in South Africa in the Gauteng province – the city of Johannesburg, focusing on SMMEs that operate in the different regions of the city. Entrepreneurship is a process of creating economic value (Rwigema, Urban, & Venter, 2010). There is a large amount of research on the factors that influence economic progress (Van Stel, Carree & Thurik, 2005). There are economic and non-economic factors that have been suggested to contribute to economic development and they span climate, education, property rights, the presence of seaports (Van Stel, Carree & Thurik, 2005). The connection between entrepreneurship, the process of creating economic value, and economic progress are rarely proven. The number of entrepreneurs in the form of small to medium enterprises (SMEs) has been shown to correlate with economic development (OECD, 1997). They are important to the economies of developed nations where they account for 95% of enterprises and create the most jobs (60%-70%) (OECD, 1997). Governments all over the world have identified and accepted entrepreneurship education and entrepreneurship ecosystems as critical to economic development (Maritz, Koch & Schmidt, 2016).

There are dynamics related to the stage of development that Figueroa-Armijos and Johnson, (2016); Martinez-Ferro, Biedma-Ferrer, and Ruiz-Navarro (2016) highlight as important considerations regarding the entrepreneurship and economic development relationship. South Africa's economic developmental stage is described as an efficiency-driven economy (Herrington, Kew, & Mwanga, 2017). This considers various characteristics of the nature of the South African economy and how it affects entrepreneurs. This classification by the Global Entrepreneurship Monitor (GEM) South African report is adopted from the World Economic Forum (WEF) economic development level classification. The classification is based on three categories, namely, factor, efficiency and innovation-driven. Factor-driven economies are economies which are dominated by agricultural and resource extraction businesses while relying on labour (mainly unskilled) and natural resources. Efficiency-driven economies are economies that have developed some efficiencies in the production process and quality. This is the South African categorisation (Herrington, Kew, & Mwanga, 2017). Lastly, there are innovation-driven economies, and these are economies where business is knowledge-driven and there is a strong service sector (Herrington, Kew, & Mwanga, 2017).

South Africa's macroeconomic indicators and trends in comparison to other efficiency-economy driven countries also show relatively poor performance. The country's economic growth has been low, although projected to increase into 2018 (National Treasury, 2017; OECD, 2017). Major challenges have been weak consumer demand, high and rising unemployment, persistently decreasing business investment environment, policy uncertainty and prolonged drought (National Treasury, 2017; OECD, 2017). Other efficiency-driven economies have faced similar challenges; however, South Africa's largest socio-economic ills are the high levels of unemployment and inequality (National Treasury, 2017). South Africa could boost economic growth and tackle these challenges through job creation, building an inclusive economy and enabling entrepreneurship (National Treasury, 2017; OECD, 2017). In order to achieve this, the economy needs strong and sustained economic growth (National Treasury, 2017). The country has started taking steps to address the low levels of entrepreneurial activity that are compounded by the already challenging economic environment for starting a small business (OECD, 2017).

South Africa has a relatively low total entrepreneurial activity rate in comparison to its peer emerging economies, efficiency-driven economies and the general African sub-Saharan economies (Herrington, Kew, & Mwanga, 2017; OECD, 2017). This can be considered as surprising, considering that South Africa's economic development levels are higher in comparison to other African states. South Africa's entrepreneurial activity performance is not only low, but it is also declining. The opportunity perception and capability perceptions have dropped compared to 2015 (Herrington, Kew & Mwanga, 2017). These levels have remained below the averages of efficiency-driven economies and also below the African region levels (Herrington, Kew & Mwanga, 2017). The entrepreneurial intention has also dropped by more than 30% since 2013 and more than 50% since 2015 (Herrington, Kew & Mwanga, 2017). This is concerning considering the unemployment and inequality rates in the country (Herrington, Kew & Mwanga, 2017; OECD, 2017). Entrepreneurial activity rates have also dropped since 2015 (Herrington, Kew & Mwanga, 2017). All these results can be attributed to an entrepreneurship ecosystem that is inefficient as an encompassing framework. The impact on the economy is unclear because entrepreneurship is generally considered to be positively related to

the levels of competitiveness and development (Martinez-Ferro, Biedma-Ferrer & Ruiz-Navarro, 2016). The state of South Africa's entrepreneurial scene is dismal because the established business rate is one of the lowest out of all international states that participated in the 2017 Global Entrepreneurship Monitor. South Africa is ranked 61st out of 65 economies (Herrington, Kew, & Mwanga, 2017). South Africa not only has economic challenges to address but entrepreneurship challenges as well, where these need to be understood in order to build the potential capacity to address the key national unemployment and inequality challenges. The entrepreneurship ecosystem context provides a basis from which to consider the South African economy and its entrepreneurs.

The context is also defined by a scope of geography and this is based on the view that entrepreneurship ecosystems are best considered under regional circumstances (Isenberg, 2010). The understanding is that entrepreneurship ecosystems develop in a unique path-dependent process, depending on their surrounding environment and thus cannot be exported/imported to a different region (ANDE, 2013; Isenberg, 2011). There have not been many studies of entrepreneurship ecosystems at the city level within the United States, however, the geographical proximity in Europe has allowed for city-level studies (Audretsch, Belitski, & Desai, 2014). In South Africa and Africa, very limited entrepreneurship ecosystem research has been found to focus on the city level, let alone provide useful frameworks for this. The research is thus based on the geographic context of the city of Johannesburg.

The City of Johannesburg (COJ) is the economic hub of the country where 17% of the country's gross domestic product (GDP) is generated in Johannesburg (StatsSA, 2016). The City of Johannesburg is also the most populated city in the country with nearly 4.43 million people. Cape Town and Ethekeini, the second and third most populated cities in the country follow with 3.74 million and 3.44 million people each (StatsSA, 2016). The City of Johannesburg's economic performance then becomes a significant factor in relation to the country's ailing macroeconomic performance and entrepreneurship performance (Herrington, Kew, & Mwanga, 2017; OECD, 2017).

1.4 Problem statement

The entrepreneurship ecosystem models that have been developed across various modes and categories speak to innate system and network theory in relation to entrepreneurship (Auerswald, 2015; Cohen, 2006; Isenberg, 2011; Stam & Spigel, 2016; Theodoraki, Messeghem & Rice, 2017). Entrepreneurship theory is at the core of entrepreneurship ecosystem literature and entrepreneurship theory has been relatively more developed for Africa when compared to entrepreneurship ecosystems, from the challenges for entrepreneurs, its relation to economic development and comparison to other emerging economies and training etc. (Moses, 2002; Munemo, 2012; Nafukho & Helen Muyia, 2010; North, 2002). Entrepreneurship ecosystem research and literature in the context of Africa, is more limited. When considering that economic development and youth unemployment are often referenced as the purposes and motivations for entrepreneurship research, the external and exogenous factors that are contained within entrepreneurship ecosystem theory should be more considered in the African context because entrepreneurial success in Africa is possible in an efficient entrepreneurship ecosystem in Africa (Atiase, Mahmood, Wang & Botchie, 2018; Sheriff & Muffatto, 2015). Entrepreneurship is pervasive across the continent however the cause of differing outcomes is due to the environments that entrepreneurs find themselves in, when compared to other African nations, emerging economies and developed markets (Sheriff & Muffatto, 2015).

There are various approaches to considering entrepreneurship ecosystems based on the extent to which the system nature and the network nature of the theory is to be considered. The main considerations in this report are the systems approach which is the basis of this study, the systems-network approach and the configurational approach (Auerswald, 2015; Cohen, 2006; Isenberg, 2011; Stam & Spigel, 2016; Theodoraki, Messeghem & Rice, 2017). These schools of thought are applicable in the regions where they were developed in the global north however the extent to which they apply in Africa is still unclear. How can policy for entrepreneurial economic development be developed in an African context when there are various foundational models for entrepreneurship ecosystems. It then becomes important to contextualise the relevance of these through this study in particular the model by Isenberg (2011). This is important as policies and

communities endeavor to invigorate and transform the economic conditions of the countries in Africa through entrepreneurship.

There are various challenges that face African countries. Africa boasts the youngest continent in the world with more than 200 million people in the 15-24 years age group who will need jobs and opportunities as it adds another 620 million people over the next three decades until 2050 (UNDP, 2017). Although entrepreneurship can be a solution, it has been identified that the main challenges for entrepreneurs can be classified as a lack of access to information, network, funding and mentoring (UNDP, 2017). The challenge, in the African context, is the lack of these support services and the limitations on the ecosystem to provide a conducive environment for such. Even at a country level, when considering South Africa, this problem persists despite South Africa's relatively high levels of development when compared to other emerging nations across the globe, the country's severe inequality means there are still people that live in poverty and in underdeveloped socio-economic conditions (Phasha, 2005). Much of the challenges are a result of the structural factors within the economy and various communities in the country that are a result of the historical policies and conditions. Therefore, they are systematic contributors to inequality and poverty in the environment, meaning that they are not enabling equal economic opportunities to be accessed and exploited.

Most notably are the opportunities required to be identified, developed and exploited by entrepreneurs. There are systematic elements in the ecosystem that hinder much of the potential development that could be contributed by South African entrepreneurs. This becomes even more of an important factor when considering the COJ, which is considered the economic hub and driving engine for economic development..

The COJ does not perform well when observed through a lens of efficiency in how it provides a sustainable entrepreneurship ecosystem. When considering the city's policies regarding innovation and innovation ecosystem elements, it performs below average compared to similar cities around the world (CITIE, 2018). This becomes an important observation when one considers the parallel nature of entrepreneurship and innovation (Rwigema, Urban, & Venter, 2010). Therefore, the entrepreneurship ecosystem of Johannesburg itself is assumed to be below average as well.

According to Colenbrander and Gil (2017), the economic efficiency of the city is also affected by the elements of spatial divide where access to opportunities is a problem not only for entrepreneurs but even for city citizens. This includes the economic burden of long commutes and sub-optimum use of infrastructure investment compared to if there was no spatial divide (Colenbrander & Gil, 2017). This contributes to the burdens on the entrepreneurship ecosystem and it becomes important to take this problem into account when it comes to studying the entrepreneurship ecosystem.

South Africa's youth unemployment is the second highest in the world at 54.5% (Trading Economics, 2017). The South African economy is in a technical recession and this means that employment is not being created by existing business and the hope lies in entrepreneurship in order to lift the economy (Rossouw, 2017).

When considering the motivations of the research based on the problem that addressing the African economic and entrepreneurial challenges is challenging when there is limited contextual literature on the exogenous factors for entrepreneurial economic development. There are also various models that can be applied but they are developed in the global north and often not tested within emerging economies, Africa. These models therefore need to be considered and compared in the context of African entrepreneurs such that they apply can be applied to policy and framework development for African entrepreneurship ecosystems. This study recognises this problem and seeks to develop a model and framework that can be used for the City of Johannesburg's entrepreneurship ecosystem and similar entrepreneurship ecosystem regions across emerging economies especially Africa.

The problems for the study are therefore depicted by the following:

Main Problem: To explore the state of the City of Johannesburg's entrepreneurship ecosystem and better understand the gaps/weaknesses that cause the ecosystem not to function optimally.

Sub Problem 1: To identify the challenges of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem.

Sub Problem 2: To determine the needs of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem.

Sub Problem 3: To map the challenges and needs of entrepreneurs according to the six domains of the Entrepreneurship Ecosystem framework by Isenberg (2011).

Sub Problem 4: To formulate a framework that can be used to understand and address the challenges and needs of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem

Research Question: What is a framework that can be used in order to identify and address the major issues in the City of Johannesburg's entrepreneurship ecosystem using the six entrepreneurship ecosystem domains by Isenberg (2011).

1.5 The significance of the study

There are a plethora of studies that have been conducted regarding challenges and the needs of entrepreneurs and the entrepreneurship ecosystem itself. However, these studies just investigate the challenges and needs of entrepreneurs but fail to go further and investigate the link between what entrepreneurs need and face as challenges and the non-functional entrepreneurship ecosystem or environment in which they operate. There are also more studies of entrepreneurship and the endogenous factors that affect the potential of entrepreneurial economic development in Africa, when compared to those looking at the environmental, contextual and exogenous factors (Sheriff & Muffatto, 2015). Therefore, it becomes important to extend the sources of literature that have more assimilated application to the African context, and entrepreneurship in Africa such that policy makers, entrepreneurs and entrepreneurship development organisations have access to more specific insights to advance their efforts.

There are studies that have made contributions to clarifying the notion of an entrepreneurial ecosystem, although researchers agree that there is still a lot to study in this nascent stream of research, especially in the emerging markets (Stam & Spigel, 2016; Theodoraki, Messeghem & Rice, 2017). There are various approaches to understanding the entrepreneurial ecosystem that are taken in order to study it. These include a process approach to creating and exploiting value in the environment (Stam &

Spigel, 2016). This theoretical view is important when considering the trajectory of individuals or firms within the ecosystem and this is the view that this study holds regarding process perspectives. There are also theoretical approaches that take a system approach in how ecosystem elements interact with interdependence in order to create economic value (Auerswald, 2015; Isenberg, 2011; Stam & Spigel, 2016; Theodoraki, Messeghem & Rice, 2017). Other approaches are configurational where they consider the composition of the ecosystem and how the composition of different elements optimally enable entrepreneurs' success (Harrington, 2017; Theodoraki, Messeghem & Rice, 2017). A network theoretical perspective is another approach to defining the entrepreneurial ecosystem which is related to network theory and is considered important on the basis of this study, this study endeavours to build on it (Theodoraki, Messeghem & Rice, 2017).

The current reality of entrepreneurial ecosystems is that they are not well understood and well defined (Theodoraki, Messeghem & Rice, 2017). There is an increasing academic interest in studying the phenomenon, however, more research is required to expand and contribute to the knowledge because sustainable entrepreneurship ecosystems play a key role in sustainable regional economic development (Simatupang, Schwab & Lantu, 2015; Stam & Spigel, 2016; Theodoraki, Messeghem & Rice, 2017). To be more specific, entrepreneurship ecosystem theory is underdeveloped in three ways, according to Simatupang, Schwab and Lantau (2015). Firstly, entrepreneurship ecosystems have been conceptualised to a limited degree and the supporting empirical research has remained under-theorised, therefore there is a need to integrate the entrepreneurship ecosystem research with the existing organisational and management theory. These are standing and established theoretical constructs that can validate the entrepreneurship ecosystem theory to an extent. Secondly, the specific factors and interactions that influence entrepreneurship ecosystem economic development outcomes are not well known. This makes it difficult to study the defining and driving factors in order to understand and manipulate the core nature of entrepreneurship ecosystems. Thirdly, there is substantive scholarly disagreement regarding what the entrepreneurship ecosystem economic development outcomes are and how they can be captured.

It becomes important to address these knots within the body of literature of entrepreneurship ecosystem literature. The report identifies that the literature is relatively young and undeveloped in general and therefore there is limited consensus on the approaches of conceptualising entrepreneurship ecosystem as reference is made to the systematic, network and configurational approaches. There are also areas connection that need to be made between the entrepreneur's challenges and needs to the ecosystem elements in the environment. All these elements are important in relating the entrepreneurship ecosystem conditions to entrepreneurship development as outputs and the economic development as outcomes (Stam, 2015). This relationship that entrepreneurship ecosystem theory has is important not only to develop and extend the entrepreneurship ecosystem literature by enriching and/or contextualising existing models as well as being important in order to address the socio-economic development challenges and problems in Africa (job creation, economic activity and investments etc.).

However, a consideration still needs to be made about the limitations that entrepreneurship ecosystem has in limited integration to established management theory, relatively unproven economic development outcomes and low levels of alignment on the theory (Simatupang, Schwab and Lantau, 2015). Therefore, more research such as this report, that extends entrepreneurship ecosystem literature in the context of economic entrepreneurial economic development and attempts to consider the various perspectives of entrepreneurship ecosystem theory in unison becomes important.

These In the context of this study, the contribution is beyond the increased understanding of the holistic nature of entrepreneurial ecosystems at various levels but also considers the regional context within a geographical community as COJ and how it interacts with the challenges and needs of entrepreneurs.

1.5.1 The contribution of the study

This study, therefore, contributes to the entrepreneurship ecosystem theory through a hybrid of the systems approach and the network theory approach by building on the principals of complexity network theory in particularly through the framework and ecosystem model for COJ. Both these approaches are considered to varying degrees within the explorative study and they are used to better understand the City of

Johannesburg's entrepreneurship ecosystem. Therefore, this study contributes to these areas of study while expanding on how they are relevant to an African and a South African level.

The study also contributes to the consideration of entrepreneurial ecosystems and how they can be understood from a regional level. This becomes important when noting that Isenberg (2011; 2014) mentions how entrepreneurial ecosystems are regional by nature and even national ecosystems can best be understood regionally because this is their development path. Therefore, adding to the regional studies of entrepreneurship ecosystems recognises that the contextual nature of ecosystems is influenced by regional elements and that is why scholars are increasingly finding it important to expand this knowledge area (Theodoraki, Messeghem & Rice, 2017).

The study also explores a context that has limited data and information, where emerging economy cities like the City of Johannesburg at an entrepreneurship level are not frequently studied. Therefore, primary data can be contributed through this study in the form of the challenges and needs that are faced by entrepreneurs within this context.

In addition to the contribution of primary data and information, the study goes further to consider the state of the entrepreneurship ecosystem across the city's geography and across various filters of the ecosystem and entrepreneurs (such as industry and age). By conceptualising this state, the study further attempts to consider a framework where the relationship between the entrepreneurship ecosystem and the entrepreneurs' key challenges and needs can be understood.

This framework is a model, based on Isenberg (2011) major ecosystem theory, that extends the existing entrepreneurship ecosystem theory by combining the foundational contributions to theory such as providing a regional perspective to entrepreneurship ecosystem research in the context of Africa, where there is limited data and information, and thus producing an entrepreneurship ecosystem model that can be used for the City of Johannesburg and similar regions in Africa.

The study aids entrepreneurs to identify the entrepreneurship ecosystem gaps that they face and give them guidance on how to navigate these gaps.

This study helps policymakers in order to guide them in their decision-making to implement practices and policies that lead to effective entrepreneurship ecosystems. By understanding the mapped landscape of the entrepreneurship ecosystem and having a framework to consider the dynamics in the ecosystem, one is able to address important issues by their driving factors.

Scholars are given more clarity into the determinants and performance variables of the entrepreneurship ecosystem within the City of Johannesburg. It becomes important to understand the requirements for entrepreneurs to grow and be successful from an African context. This study contributes to this element from a contextual point of view as well as a general entrepreneurship point of view.

All these contributions sum into a broad literature extension in a nascent field in the context of Africa, South Africa and Johannesburg where there is more information and data produced and a model, based on Isenberg (2011) major entrepreneurship ecosystem major theory, is developed for this context by conceptualising the various ecosystem literature perspectives.

1.6 Delimitations of study

The study is explorative, meaning that it takes a discovery approach where it considers a broad range of content, however, it is still bounded. This means that there are theoretical frameworks and scholarly concepts that are considered but not explored. Then there is also literature that is not considered in the account of this research.

This study does not consider certain aspects of ecosystem literature. These are aspects such as entrepreneurial policy, which considers the political and legislative framework in which entrepreneurs operate. It also excludes the part of entrepreneurial policy that spills over into government-funded institutions. The study also does not include support concepts of the ecosystem, such as, mentors of entrepreneurs. It also excludes the key element of culture and entrepreneurial culture in the society, which refers to how entrepreneurship is perceived and supported socially. All these concepts that are

excluded are difficult to measure and consider in the scope of this study therefore they are delimitations of the study.

Another area of exclusion is the entrepreneurship process. Most entrepreneurship ecosystem studies fail to connect the entrepreneurship process and the ecosystem because there is very little known about it. This study excludes this notion because the exploration is more on the entrepreneur's current experience in the ecosystem and less about the process experience of the entrepreneur in the ecosystem.

This study is concerned with the entrepreneurial environment acting on the entrepreneur and the perception of the entrepreneur about their entrepreneurial environment and/or ecosystems. The final delimitation of the study is to focus on the city of Johannesburg only.

1.7 Definitions of terms

1.7.1 Entrepreneurship-ecosystem

The entrepreneurship ecosystem represents the complex network and systematic nature of entrepreneurship. The entrepreneurship ecosystem describes the dynamics that are involved in creating, aiding, enabling and hindering entrepreneurship activity (Isenberg, 2017). It can be described as the environment in which entrepreneurs act and it is made up of public, private and non-profit actors who interact in a way that impacts on the entrepreneur (Isenberg, 2014).

1.7.2 Entrepreneurial intention:

The entrepreneurial intention is central to the discussion about entrepreneurship. This is because entrepreneurship can be viewed as a process that occurs over time (OlawaleOlufunso, 2010). This then makes entrepreneurial intention the first step or an antecedent to entrepreneurship (OlawaleOlufunso, 2010). This is fundamental to the theory of planned behaviour where potential entrepreneurs are driven not only to start but to achieve an ultimate planned goal (Krueger, Reilly & Carsrud, 2000; OlawaleOlufunso, 2010). The argument that stems from this is that the entrepreneurial behaviour and process is a planned expression and manifestation of the entrepreneurial intention

(Krueger, Reilly & Carsrud, 2000). Therefore, the intention itself proposes the behaviour, although there may be other motivators and obstacles that play a role when it comes to the manifestation thereof (Krueger, Reilly & Carsrud, 2000; Olawale Olufunso, 2010).

1.7.3 Total entrepreneurial activity:

It is defined as the prevalence rate of individuals in the working-age population who are actively involved in business start-ups, either in the phase of starting a new firm (nascent entrepreneurs) or in the phase spanning 42 months after the birth of the firm (owner-manager of new firms) (Dantas, Moreira & Valante, 2015).

Essentially, it means to consider the number of entrepreneurs who are being created and the amount of growth associated with established entrepreneurs.

1.7.4 Entrepreneurial gap

The entrepreneurial gap is defined as the relative difference between the Entrepreneurial Intention and the expression thereof (entrepreneurship) on a macro level. In this case, entrepreneurship can be measured as Total Entrepreneurial Activity (Herrington & Kew, 2015). Both of these are measurable and as a ratio can be compared to other economies and regions as an entrepreneurial gap. It represents the “distance” to be covered in order to have an ideal condition of perfect expression of entrepreneurial intention.

The entrepreneurial gap represents the difference between how many people intend to be entrepreneurs and how many people actually end up being entrepreneurs. Studying the entrepreneurship ecosystem is considered studying the external factors affecting the entrepreneurial gap at a macro level.

Having considered the overview literature, theoretical driving forces and research motivations of the study in the chapter above, a deeper dive into the core theory is warranted. The theoretical driving forces embedded in entrepreneurship theory, entrepreneurship development theory and complex network theory aggregate into a foundation for the deeper dive of entrepreneurship ecosystem theory and the enabling environment it creates for entrepreneurship to thrive. The following chapter discusses at length how to consider the entrepreneurship ecosystem from various perspectives.

2 LITERATURE REVIEW

This chapter takes an in-depth overview of the literature and key theoretical constructs that give context to the study. This chapter provides a detailed discussion that initially touches on the entrepreneur and the entrepreneurship construct. This is such that the entrepreneurship element of the entrepreneurship ecosystem theory is contextualised in a way that connects to the entrepreneurship ecosystem frameworks that are discussed in this chapter. These are categorised by their fundamental approach to the entrepreneurship ecosystem, such as, system approach, system-network approach and configurational approach. The chapter then closes by relating the entrepreneurship ecosystem phenomenon to other constructs that are built on the same ethos in the form of regional innovation ecosystems and industrial clusters.

2.1 Entrepreneurs and entrepreneurship

Entrepreneurship is a highly contested concept and is conceptualised in many ways without consensus or clear alignment between scholars, however, there is enough body of knowledge to support each perspective (Berglann, Moen, Røed, and Skogstrøm, 2011; Landström, Harirchi & Åström, 2012; Rwigema, Urban, & Venter, 2010). One of the reasons for this is because of the pervasiveness of the nature of entrepreneurship that extends across different fields and disciplines of study from social anthropology, to organisational theory and mathematical economics (Chandra, 2018; Croci, 2016; Rwigema, Urban, & Venter, 2010). It is also evident that the research field of entrepreneurship has morphed and evolved over time stemming from these various foundational disciplines, including management sciences as well as economics (Chandra, 2018; Landström, Harirchi & Åström, 2012). This is important to note when considering entrepreneurship because it begins to hint that entrepreneurship is at the core of what one considers the human social experience because it is drawn from so many fields that contribute to the make-up of modern and post-modern socio-economic society. This is to say that entrepreneurship and entrepreneurs may not only be at the centre of the entrepreneurship ecosystem but fundamentally, at the centre of human socio-economics.

The field of entrepreneurship has become more formalised over time as new concepts emerge that are unique and subjective to its core knowledge (Chandra, 2018; Croci, 2016; Landström, Harirchi & Åström, 2012). There are elements that seem to be shared between the scholars' perspectives such as new opportunities, risk-taking, new combinations of resources, innovation, resourcefulness, value creation, etc. (Landström, Harirchi & Åström, 2012; Rwigema, Urban, & Venter, 2010). Scholars have explored entrepreneurship theory from various perspectives which can be broadly categorised into three areas (Rwigema, Urban, & Venter, 2010)

- Behavioural focus which is concerned with the specific behaviour of the entrepreneur that sets them apart from others.
- Process focus which is concerned with the way in which entrepreneurs navigate the different components of being an entrepreneur, setting an enterprise and societies' perspective on the process.
- Outcomes focus which is concerned with the results of entrepreneurship and the impacts thereof.

Table 1 is a summary of various positions of different scholars and how they categorised entrepreneurship.

Table 1: Different scholarly perspectives of entrepreneurship

Category	Definition	Author(s)	Key elements
Behavioural	The entrepreneur is a co-ordinator of change and innovation where they bring new combinations of resources and form what is called an enterprise.	Schumpeter (1934)	Innovation, resourcefulness, coordinator, profit
	The entrepreneur is an agent of change by spotting opportunities and profiting from arbitrage.	Kirzner (1973)	Opportunities, change-agent, profit
	The entrepreneur deals with uncertainty and risk as they exploit opportunities.	Knight (1921)	Uncertainty, opportunity, facilitator
	Entrepreneurship is how, when and why some discover and exploit opportunities while others do not.	Shane and Venkataraman (2001)	Opportunity, innovation
	Individuals who are self-employed and adjust themselves according to the risk of uncertain returns.	Palich and Bagby(1995)	Risk, uncertainty, self-employment
	Individuals that lock onto an opportunity and pursue it relentlessly.	(Timmons, 1994)	Proactivity, Initiator
	The entrepreneur develops strategies in line with their own entrepreneurship understanding, therefore the entrepreneur makes a pioneering change.	Ozkara (2006)	Initiation, innovation
Process	The entrepreneur is able to detect opportunities in the environment, they then produce dreams from this	(Bozkurt, 2000)	Opportunity, innovation, intuition

	intuition, convert the dreams into projects and carry the projects.		
	The entrepreneur participates in a discontinuous process of combining resources to produce new goods and services.	Stoner, Freeman and Gilbert (1995)	Innovation, value creation, discontinuity.
	The entrepreneur is in a value creation process of something new by devoting the necessary time and effort, assuming the financial, psychic and social risks, and receiving the resulting rewards of monetary and personal satisfaction and independence.	Hisrich and Peters (1998)	Value creation, profit, pro-activity, risk-taking.
	Entrepreneurs are organisational actors who create rents through innovation. Rents are incomes relatively higher than industry norm and innovation is creating value out of new combinations.	Malone (1991)	Value creation, innovation
	The entrepreneur undertakes a venture, organises it, raises capital for it while assuming the majority or all the risk.	Burch (1986)	The initiative, risk-taking
Outcomes	The entrepreneur will shift economic resources from low productivity towards higher productivity and greater returns.	Jean-Baptiste Say (1803)	Profit, innovation
	Entrepreneurs are driven by motivation and outcome. They are	Ronstadt (1984)	Profit, initiative

	categorised into three groups (lifestyle, small profitable and high growth ventures).		
	An entrepreneur is someone who has founded a firm in the last two years or is planning to launch one in the next five years.	Busenitz and Barney (1997)	Initiation, proactive
	The entrepreneur creates new organisations.	Gartner (1990)	Initiative, innovation
	The entrepreneur is considered as self-employed, based on either being unemployed, self-employed or in wage employment. It is statistically measured through a number of self-employed people by surveys (International Labour Organisation) or dynamically as a rate of start-ups (Global Entrepreneurship Monitor).	Wennekers and Thurik (1999)	Pro-activity

Source: Adapted from Galawe (2017); Landström, Harirchi and Åström (2012)

The various entrepreneurship theories and perspectives form a core part of the entrepreneurship ecosystem theory and deserve a mention in this report. This is because of three main considerations, firstly, the entrepreneur is at the core of the entrepreneurship ecosystem in terms of how the ecosystem elements are viewed. They are viewed from the entrepreneur's perspective and how they impact on the entrepreneurial process, behaviour and outcomes. This report investigates the entrepreneurship ecosystem in the City of Johannesburg from the perspective of entrepreneurs in the city. The data that informs report is from the entrepreneurs' experience challenges and needs in the context of the ecosystem, which is the perspective that is explored and hence the perspective that the report has. Secondly, entrepreneurship theory is fairly more developed and more understood even from an African perspective when compared to the ecosystem and the external factors impact on

the entrepreneurial behaviour, process and outcomes (Atiase, Mahmood, Wang & Botchie, 2018; Audretsch, Belitski, & Desai, 2014; Mars & Rios-Aguilar, 2009; Martinez-Ferro, Biedma-Ferrer, & Ruiz-Navarro, 2016; Sheriff & Muffatto, 2015). Thirdly, entrepreneurship theory is also a developing literature field similarly to entrepreneurship ecosystem theory, and there are varying perspectives to entrepreneurship theory. However, as an exploratory study, the report considers an initial broad approach and considers various approaches for entrepreneurship as they feed into the entrepreneurship ecosystem theory review.

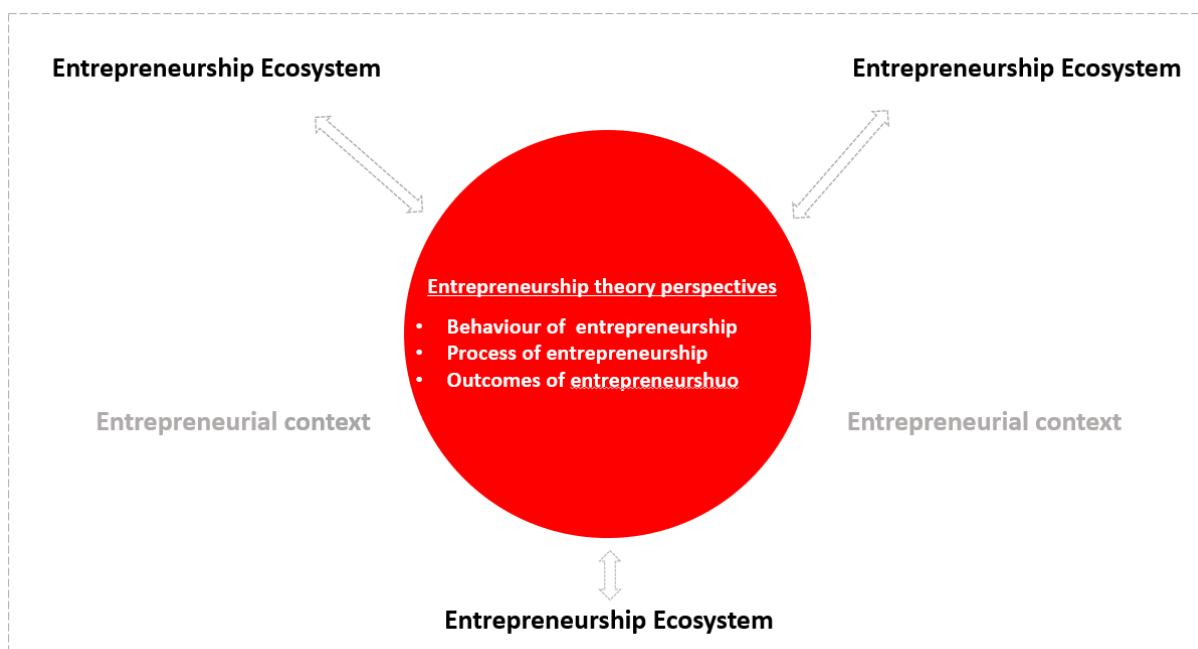


Figure 1: A model illustrating how entrepreneurship theory is contextualised within entrepreneurship ecosystem theory

The question that emerges is about how the challenges and needs of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem relate to entrepreneurship theory and the residual role to be considered in developing a contextualised entrepreneurship ecosystem framework and model, based on Isenberg (2011). It therefore forms the foundation for the main research problem as well as sub-problem 1 and sub-problem 2. The following paragraphs explore in more detail the different entrepreneurship ecosystem theory perspective, how they integrate and potentially relate to the endogenous

entrepreneurship theory perspectives. This exploration forms the core of the report's development of a COJ ecosystem model.

2.2 Entrepreneurship ecosystem frameworks

The entrepreneurship ecosystem framework has gained significant popularity over the years not for academics only but for policymakers and private organisations as well because they pose opportunities of economic development and innovation (Isenberg 2010; Stam, 2015). The entrepreneurship ecosystem model works well when considering the high growth and innovative companies because there is a clear shift from quantity of entrepreneurship to the quality of entrepreneurship as being more important for the economic outcomes that the policymakers and business leaders expect.

This study takes the notion of the entrepreneurship ecosystem to a city level. The amount of scholarly focus on this level shows an increased need for more work to be done (Audretsch, Belitski, & Desai, 2014). A city level is an appropriate unit of study for entrepreneurship and the entrepreneurship ecosystem in which they operate because most businesses are started within a local context often characterised as a city (Audretsch, Belitski, & Desai, 2014). The entrepreneurship ecosystem is built of policy settings, culture, and values, opportunity trends, human capital and networks which can be seen to have a local context (Audretsch, Belitski, & Desai, 2014; Isenberg, 2011).

The framework is useful however, it has been explored from various perspectives and conceptualised with a significant difference to notice the distinctions but with enough similarity to identify them as the same entrepreneurship ecosystem framework. The main perspectives that are unpacked in order to understand the entrepreneurship ecosystem framework are the following:

- A system approach;
- A network approach; and
- Configurational approach.

How do the entrepreneurship theory perspectives relate to the ecosystem theory perspectives as a part of the residual connection between the entrepreneur and the

entrepreneur's environment through the lens of theory? The research explores the entrepreneurship ecosystem perspectives above in relation to the entrepreneurship theory perspectives and based on the following chapter sub-sections it becomes considerable that the system approach (major theory basis of this report) relates closely with the all three perspectives (behaviour, process and outcome) perspectives of entrepreneurship theory. The network approach relates more to the behavioural perspective and the configurational approach because of its broader and time based view closely relates to the behavioural and process perspective.

There are residual implications on how the entrepreneurship ecosystem approaches are developed that strengthen the exploration hypothesis that the relevance of the way the research main problem takes the perspective of the entrepreneur in exploring the entrepreneurship ecosystem of the City of Johannesburg. The three above mentioned entrepreneurship ecosystem approaches are explored, in the following paragraphs, through the lenses of the scholars and authors driving the conversation within those approaches. Isenberg (2010) and Cohen (2006) are discussed under the systems approach as they have both contributed significantly through the same lens. The network approach is overlapped with the system approach through Stam (2015) as well as Stangler and Bell-Materson (2015). Finally, Spiegel (2017) considers the configurational approach to entrepreneurship ecosystems.

2.2.1 Systems approach

Cohen (2006) explores the entrepreneurship ecosystem as a systematic relationship between the formal and informal networks, infrastructure, and culture within a community that is conducive to entrepreneurial activity (Neck, Meyer, Cohen & Corbett, 2004). The system is also unique to the region in the way the ecosystem elements interact and hence an indication of complexity network theory that relates to the path dependency in the region of the entrepreneurship ecosystem (Borgatti & Halgin, 2011; Ferrary & Granovetter, 2009; Neck et al., 2004). These two elements represent the fundamental understanding when it comes to a systems approach to the entrepreneurship ecosystem (Neck et al., 2004):

- 1) The entrepreneurship ecosystem contains and supports or determines entrepreneurial activity and performance, and
- 2) The components evolve over time and therefore interact in a dynamic way that influences the entrepreneurial activity.

As much as scholars have focused on entrepreneurship as a process by the individual, it is also important to recognise that entrepreneurship is a phenomenon that happens within a context. The process of entrepreneurship is by itself influenced by external actors that transcend the boundaries of the process itself (Cohen, 2006; Neck et al., 2004). Economic activity and economic development are a macro aggregated scale of entrepreneurial processes within a complex web of dynamics between businesses and their environment (Cohen, 2006). This economic development is not only influenced by various factors within and around the economic development, but it is also influenced by itself whereby there is a virtuous cycle that shows increased investors lead to increased entrepreneurship and hence increased investors and entrepreneurs, and so on (Cohen, 2006; Neck et al., 2004).

The systems entrepreneurship ecosystem approach can be argued to support the basis of this report on Isenberg (2011), who takes a systems approach because there is an entrepreneurship process (entrepreneurship perspective 1) reference on how the environment affects the interaction between businesses in a network (entrepreneurship perspective 2) in order to affect other members of the ecosystem such as investor's in order to produce economic development outcomes (entrepreneurship perspective 3).

The following table depicts how Cohen (2006) considers the entrepreneurship ecosystem to be a system of interaction between formal and informal networks (Neck et al., 2004). This perspective takes into account the systems approach juxtaposed on the network approach:

Table 2: Informal and formal networks within the entrepreneurship ecosystem

System Component	Description	Ecosystem application
Informal networks	These are the ecosystem elements such as friends, family, colleagues, similar companies and general community members.	These networks can enable (disable) entrepreneurs in how they influence the entrepreneurs while providing mentorship, moral support, advice and cultural implications. The majority of entrepreneurs have expressed these informal networks to be something they rely on. Particularly in less understood industries where the formal intuitions are less prepared to understand them.
Formal networks: Universities	Universities are considered as research entities that provide primary research about entrepreneurship and provide skilled workers.	By nature, economic development requires a multidisciplinary approach which involves the various schools at the university. Universities are therefore in a position to influence the contribution to skills in the ecosystem, especially when considering specific technical areas that contribute to a specific industry.
Formal networks: Government	National, regional and local governments set the policies, tax incentives, subsidies,	Government is in the position to create an enabling environment for the ecosystem to evolve

	grants and levels of “red tape” within which entrepreneurs operate.	through increasing the dynamics, proximity, density and diversity of ecosystem interactions especially by recognising competitive advantages that should be strengthened by lowering barriers of entry and growth (Harrington, 2017; Stangler & Bell-Masterson, 2015).
Formal networks: Professional and support services	These are the actors in the ecosystem that support and strengthen the transactions of value and the credibility of value in the ecosystem.	The ecosystem can see more value when advisors and support providers understand the plights and needs of start-ups because they can be a hindrance to entrepreneurship if they do not.
Formal networks: Capital sources	Access to start-up capital in the form of venture capital or angel investment etc. is a central need for the development of the entrepreneurship ecosystem.	Capital sources can support by sharing the same values as the ecosystem and be able to sympathise with the needs and risks of the entrepreneur.
Formal networks: the talent pool	These are qualified employees that entrepreneurs have access to in order to start and grow their businesses.	Access to employees who are aligned to the needs of the ecosystem and sensitive to the requirements of working in an entrepreneurial environment would be helpful as this has been identified as one of the major bottlenecks for entrepreneurs (Isenberg, 2014).

Formal networks: Large Corporations	These entities operate in the economy with large resources and potential influence on the ecosystem.	Large corporations can have a large influence on the entrepreneurship ecosystem by promoting spin-off companies, training and skilling, supporting ex-employees to start businesses, and providing foundational technology or support base in the ecosystem.
Formal networks: Technology parks	These are support entities aimed at high-growth and innovative ventures, that need deeper investments and support in the form of financial and non-financial support.	These parks are helpful to the ecosystem by providing shared resources, office spaces, and networking investors and professional advisors. The impact of technology parks is multiplied by proximity and collaboration with universities.
Formal networks: Physical infrastructure	The infrastructure is represented by the state of transportation, real estate, utilities add environmental quality.	The influence of the infrastructure on the ecosystem cannot be taken for granted as it represents the physical platform on which entrepreneurs base their decisions on where to work and live. The more affordable and accommodating of the entrepreneurs needs the better it is for the ecosystem.
Formal networks: Culture	The culture is represented by the climate, natural environment, knowledge, spirit and collective interests of	The culture is important for the development of an ecosystem by sharing knowledge about entrepreneurship and valuing the

	the communities within the ecosystem	entrepreneur's risks and rewards.
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Source: Cohen (2006)

When considering how the systems approach interacts and relates to the other two entrepreneurship ecosystem approaches (networks and configurational), it can be a valuable lens to consider how to develop a contextual model for the COJ. Especially when considered with a network's approach for the it is valuable as a framework that takes into account the element of interaction complexity that is represented by the various heterogenous stakeholders, actors and factors (Clarysse, Wright, Bruneel & Mahajan, 2014; Ferrary & Granovetter, 2009; Simatupang, Schwab & Lantu, 2015). There is also an additional valuable between system and network approach because of the social capital and network effects of entrepreneurship in South African that cannot be ignored due to history (Colenbrander and Gil, 2017; Phasha, 2005; Preisendorfer, Bitz & Bezuidenhout, 2012).

2.2.1.1 Daniel Isenberg

Isenberg (2010) proposes a six-part framework to discuss entrepreneurship ecosystems, which is made up of six elements that make up another twelve sub-elements. Figure 2 portrays these elements:

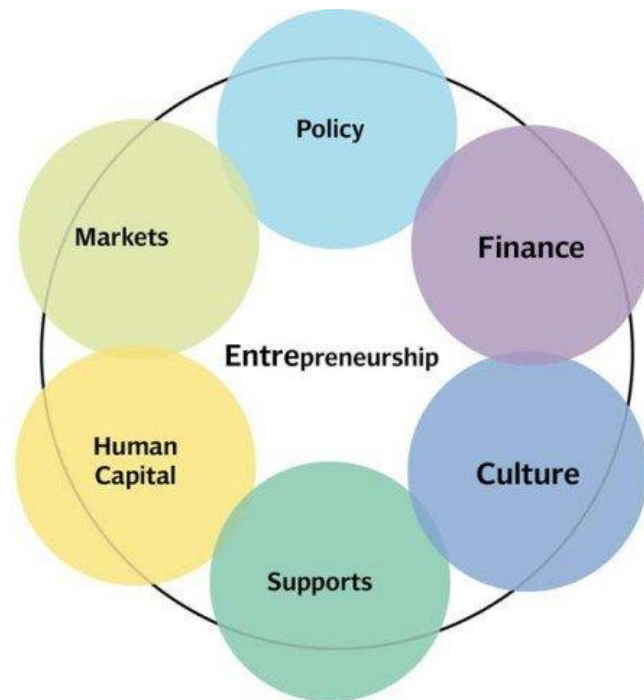


Figure 2: Six domains of an entrepreneurship ecosystem (Isenberg, 2010)

2.2.1.1.1 Finance

Finance is the backbone of the economic concept and hence the backbone of an economy. Financial systems affect economic growth in numerous ways and one of those ways is in how they affect entrepreneurship. Entrepreneurs are only able to access appropriate finance depending on the evaluation on which the financial system categorises, processes and considers their business (King & Levine, 1993). The efficiency of the financial system is based on its ability to mobilise savings in such a way that allocates them to productivity-enhancing and innovation-based activities (King & Levine, 1993).

SMEs contribute the most to the economic system, however they face the most challenges in operation and growth (Beck & Cull, 2014). Finance becomes an important factor in this issue because all businesses need finance in order to access resources so that they may start or grow (Herrington & Kelley, 2012). SMEs are faced with numerous challenges in accessing appropriate financial support. Financial institutions inherently deem them to be high risk (OECD, 2016). Additionally, there is an information asymmetry between financiers and SMEs, causing financial institutions to lend at higher interest rates compared to big businesses (OECD, 2016).

When considering emerging economies, there is a significant challenge regarding finance for entrepreneurs, particularly in Africa where the aggregate financial economic indicators represent a financial system that is inefficient and out of reach (Beck & Cull, 2014).

Access to finance and financial resources are considered one of the important impediments and issues within the entrepreneurship ecosystems in Africa and in particular, in South Africa (Chimucheka & Mandipaka, 2015; Leboea, 2017; Makina, Fanta, Mutsonziwa, Khumalo & Maposa, 2015). High levels of access to finance have been proven to positively influence the performance of entrepreneurs in attaining more revenue and growing the number of employees (Leboea, 2017; Makina et al., 2015). It also increases the chances of an SME to evolve from survivalist mode into a high growth business. Because the SME is able to access the required expertise, it is able to secure the input materials and supplies needed and weather difficult economic conditions, and all these are necessary for the business to not only be competitive, but to operate in the long term (Leboea, 2017). This is the resource dependency theory that is based on the dynamics that are central to the entrepreneurship ecosystem where organisations depend on their stakeholders and access to their resources in order to thrive in the ecosystem. A certain amount of resource scarcity can be positive for the ecosystem because it then coaxes entrepreneurs to be innovative in order to reduce risk and dependency in ways such as joint ventures, internationalisation and new cost reducing processes, etc. (Chimucheka & Mandipaka, 2015).

Most studies attribute the challenge of access to external finance, particularly in developing economies and South Africa to the information asymmetry and credit market inefficiencies that exist when it comes to SMEs (Leboea, 2017; Makina et al., 2015). There is, therefore, a finance gap between funding supply from banks and SMEs accessing the funding which then results in most SMEs resorting to informal finance which has less impact on firm growth (Chimucheka & Mandipaka, 2015; Leboea, 2017; Makina et al., 2015). Another option is to approach venture capitalists who do not have any experience as entrepreneurs (Endeavor, n.d.).

Chimucheka and Mandipaka (2015) explain that this information asymmetry comes in two forms, namely the components-knowledge gap where entrepreneurs are unaware of the

funding option and opportunities that are available to them in their entirety. However once these are identified, then the funding institutions do not understand the SME context, related to costs, revenue and finance requirements.

These are attributable to the efficiency and effectiveness of an entrepreneurship ecosystem. The ecosystem is meant to function with fluidity, connectivity, diversity, and density so that the probability, through complex interactions, of information diffusion for funding parties and entrepreneurs to better understand each other happens, thus the importance of mapping challenges and needs to the domains to identify those that lead to inefficiencies of the ecosystem in Johannesburg (Stangler & Bell-Masterson, 2015).

2.2.1.1.2 Policy

There has been an increased focus on entrepreneurs by policymakers. This is because entrepreneurship has been shown to aid economic progress. Therefore, in order to drive a productive economic state and market new market formations, regulatory frameworks should catalyse the entrepreneurial spirit (Kreft & Russel, 2005). Such policies could directly address the entrepreneur's needs, which may include business development programs (Rigby & Ramlogan, 2013). Alternatively, pro-entrepreneurship policies may be through broadcast methods such as addressing the education policy (Rigby & Ramlogan, 2013).

State support for entrepreneurship through entrepreneurship-focused policy is limited, especially in emerging markets, although there is a growing belief that SMEs contribute to economic development and growth (Moos, 2014). Government's role has to be to support entrepreneurs to grow to a critical mass across various industries and sectors, however because of resource constraints, government support may need to be focused. This is an unavoidable factor of SME support in emerging markets because it would make it more likely to succeed as it becomes simplified administratively and financially (Wattanaputtipaisan, 2003).

Moos (2014) has found that it is possible, and it does happen that entrepreneurship policies fail, even the best ones, purely because of the complexity of factors at play. In South Africa, it is identified that the small business policy needs to become more

sophisticated in categorising the different type of businesses in terms of start-up to high growth and small business (Moos, 2014). This sophistication allows the policy to be impactful for more types of businesses in order to create more diversity in the ecosystem because it is currently only impacting small business and not start-ups which could develop into a venture or high growth business (Moos, 2014; Stangler & Bell-Masterson, 2015).

2.2.1.1.3 Culture

Scholars have researched the relationship between entrepreneurship and culture in different ways to differing degrees. There have also been empirical patterns and significant relationships between the two elements (George & Azahra, 2002). Culture is seen as an enduring set of shared values within a nation, region or organisation. These values may strengthen or weaken the social norms towards entrepreneurship such as the value of entrepreneurship as a career (George & Azahra, 2002). An entrepreneurial culture is also a theme that transcends national borders and in a way that isolates the culture of entrepreneurs as being unique in terms of how they think. This is in comparison to how “non-entrepreneurs” think, regardless of the national boundary (George & Azahra, 2002).

In countries where the society has developed a national culture, the entrepreneurship culture in that country is one dimensional, following the national culture, however in a Sub-Saharan Africa perspective and arguably other emerging economies where ethnic cultures are still differentiable to the national culture, the national entrepreneurship culture is more complex (Mungai & Ogot, 2012). This means that the entrepreneurship ecosystem and its culture can be more fragmented with the representation of different views from heterogeneous representations of the national culture.

South Africa in particular, shares similar characteristics and additional factors which impact the entrepreneurship ecosystem. These are matters related to the negative perspectives of wealth and wealth creation, as well as employee career culture being very popular (Endeavor & FNB, n.d.). However, there are clear shortfalls that hinder these ecosystem enablers in achieving their purposes such as lack of differentiation or specialisation, collaboration and funding (Cunningham, Cunningham & Ekenberg, 2014).

Isenberg (2014) argues that there is no specific and proven evidence to support the effectiveness of incubators and accelerators in enabling the ecosystem

2.2.1.1.4 Support

Support systems for entrepreneurs come in soft and hard forms. The hard form refers to the infrastructure that entrepreneurs need in order to operate and grow; this can include, roads, internet access, and water. The soft form refers to support mechanisms that directly give additional support to entrepreneurs, in the form of incubators, technology centres and universities (Roig-Tierno, Alcázar & Ribeiro-Navarrete, 2015). The combination of these supports has been shown to have positive results on the performance of young firms (Roig-Tierno, Alcázar & Ribeiro-Navarrete, 2015). These various elements of support can collaborate in an ecosystem. The collaboration of universities with NGOs and other local entrepreneur supports can increase entrepreneurial skills (Ceptureanu & Gabriel, 2016).

Sub-Saharan incubators are the support structure for entrepreneurs, and they help SMEs by overcoming market gaps, building business skills, meeting infrastructure limitations and creating networks, they essentially play a core ecosystem enabling role for SMEs (infoDev, n.d.).

2.2.1.1.5 Human Capital

Human capital is conceptualised in various ways, however, it demonstrates the capability of an individual or a firm. In the case of an ecosystem, it can be considered from the perspective of the entrepreneur's human capital or the access the entrepreneur has to human capital for the business. In other words, the skills the entrepreneur can employ beyond their human capital. Human capital can be considered through several constructs (Marvel, Davis & Sproul, 2014) such as work experience, education, entrepreneurial experience and demographics.

- Work experience: It can be considered the most important human capital element because it is the most commonly investigated human capital construct in relation to entrepreneurship (Marvel, Davis & Sproul, 2014). This is considered as the number of years that one has spent working in the industry through a series of

tasks, projects or activities with outcomes (Marvel, Davis & Sproul, 2014). It can also be considered as the number, level and years of management positions previously held, the industry in which one gained the experience, whether it was international or not (Unger, Rauch, Frese & Rosenbusch, N., 2011). It can play a role as being an indicator of certainty regarding the future performance of the entrepreneur and future venture (Bublitz et al., 2015).

- Education: This is represented by the formal qualification and training that one receives. These may be technical in a specific profession or trade and they may also be broader knowledge and cognitive skills such as a Master's in Business Administration. Education is the second most investigated human capital construct in relation to entrepreneurship (Marvel, Davis & Sproul, 2014). Learning theoretical perspectives and accumulating of knowledge is distinguished as human capital outcomes that affect venture success (Unger et al., 2011).
- Entrepreneurial experience: This is a human capital element that is considered as previous start-up experience or prior business ownership (Marvel, Davis & Sproul, 2014). This is an increasingly important measure of human capital, especially in the consideration of what venture capitalists consider when making an investment decision (Unger et al., 2011).
- Demographics: These are the less frequently measured and considered elements of human capital, which entail factors such as age, gender and family entrepreneurial experience. However there has been research that indicates a gender gap in relation to entrepreneurial human capital (Lin, 2016). There is also evidence to show that older entrepreneurs tend to be more successful, however this is attributable to the level of other human capital variables that are developed and acquired by older entrepreneurs.

All of the above play a role in firm performance to a varying degree. They are lenses through which entrepreneurship can be understood (Marvel, Davis & Sproul, 2014). It is also understood that higher levels of human capital increase or better the chances of SME growth (Nishantha & Kawamura, 2011).

Human Capital is a construct that is more useful in its practical application than its mere presence. It therefore becomes important to distinguish it across a plan such as:

x-axis: The level of task relatedness

The level of task relatedness is a measure of how practical and useful the human capital is to the current tasks at hand for the start-up (business skills, technical skills, start-up experience, industry experience. While these remain important in the success of a venture, they are not always readily measurable and so non-task related human capital constructs (formal education, work experience) are usually used as indirect indicators for the probability of task related human capital (Marvel, Davis & Sproul, 2014). This is the one that is considered more important for understanding human capital as beneficial to entrepreneurship (Unger et al., 2011).

y-axis: Investment vs outcome based human capital

The same applies to the notion that investment based human capital that is measured and represented by years of experience or formal education (or level etc.) however it may not mean realised or applicable knowledge. It may be important as indirect indicators of human capital, however, outcome based human capital constructs (specific knowledge and skills) are better indicators of success (Marvel, Davis & Sproul, 2014; Unger et al., 2011).

2.2.1.1.6 Markets

Markets in the entrepreneurship ecosystem primarily consider two things. The first being access to markets and the second being the network of entrepreneurs (social capital). Social capital has been shown to be a significant factor in increasing the innovative capability of firms and thus resulting in sustainable growth (Khurram Ali, Ismail, Khurram, Bte Soehod, & Zaidi Wan Omar, 2014). Social capital may come in the form of contacts that the entrepreneur has in other firms or in universities where they are able to access markets or human capital. Social capital is considered to enable entrepreneurs to access a broad range of “assets” through the norms of trust and reciprocity within a society. Social capital is a significant driver for SME growth (Nishantha & Kawamura, 2011). This can also address how entrepreneurs are able to create client and market opportunities.

Isenberg (2010) conceptualises the entrepreneurship ecosystem across these main six domains and describes it as a system comprised of the activities, services and platforms within each of these domains. Cohen (2006) also takes a similar system view, however across a different conceptualisation of the domains.

The system view by Cohen (2006) and Isenberg (2010) overlaps in many ways and represents the systematic interaction between entrepreneurship ecosystem elements, however, this approach can be taken a step further by including a network approach to the system relationships within the ecosystem (Stam, 2015; Stangler & Bell-Materson; 2015).

This concept is further explored, because this becomes an important aspect of how the study considers the literature in developing a model in the context of South Africa, the system theory basis influenced by Isenberg (2011) is lensed with the network effects that are important in the South African context. This is especially true when contrasting the significance of the study and problem motivations of the study as being connected to entrepreneurial economic development outcomes. The systems-network approach appreciates how the entrepreneurship ecosystem should be considered in a boarder context that includes the other systems that are in network with the entrepreneurship ecosystem network (Stam, 2015; Stangler & Bell-Materson; 2015). The core elements overlap with Isenberg's (2011) view however expand on how ecosystem is valuable in a broader picture. This approach closely links to sub-problem 4, where in contextual model of the entrepreneurship ecosystem of the City of Johannesburg should be produced.

2.2.2 Systems-network approach

Stam (2015) argues that the entrepreneurship ecosystem approach is a useful framework to explain the entrepreneurship phenomenon although it does have its drawbacks. What becomes important to consider are the various elements at play in the environment that can be categorised as networks and resources (Stam, 2015). It is generally agreed that an entrepreneurship ecosystem is the factors, elements and actors that independently act in order to enable productive entrepreneurship, where productive entrepreneurship means an entrepreneurial activity that contributes to the economy (Isenberg, 2010; Simatupang, Schwab & Lantu, 2015; Stam, 2015). The system approach to the

entrepreneurship ecosystem is based on interdependent elements (conditions) of the ecosystem enable entrepreneurship (output) which hence produced value (outcome) for the society or economy in the form of innovation, production value and job creation. (Stam, 2015). An holistic view that considers the elements considered by other scholars, such as Cohen (2006) and Isenberg (2010), is depicted in Figure 2:

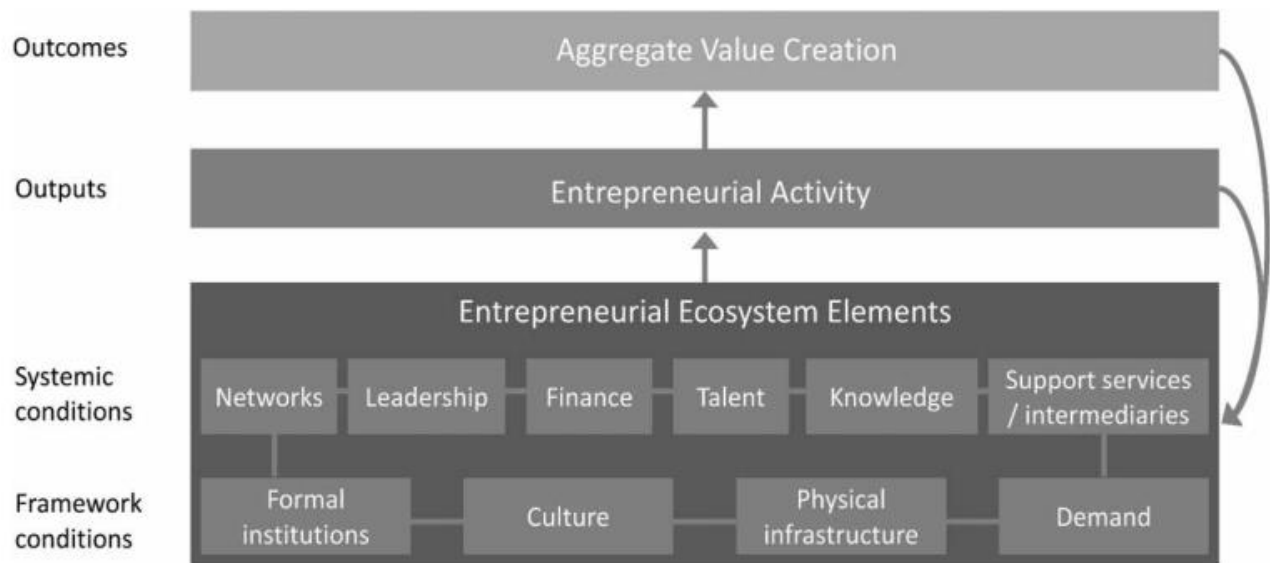


Figure 3: Configurational entrepreneurship ecosystem model (Stam, 2015)

This model depicts the ontological causal effects within the entrepreneurship ecosystem at different layers of interaction (Stam, 2015). The model by Stam (2015) shows the holistic entrepreneurship ecosystem framework which is made of two pillars:

- Social conditions or interactions (formal and informal institutions), and,
- Physical conditions that enable or constrain social conditions or interactions.

These are considered the internal conditions that interact in a way that creates entrepreneurship outcomes (Stam, 2015). These internal conditions are made up of the elements depicted in table 3.

Table 3: Internal conditions of the entrepreneurship ecosystem

Ecosystem Element	Description in ecosystem
Networks of entrepreneurs	Provide a flow of information, capital and labour.
Leadership	These are visible leaders who provide direction and role models for the ecosystem who are committed to the region.
Finance	Financiers are committed enough to provide riskier financing than conventional financing with the purposes of long-term returns.
Talent	Access to skilled and diverse workers is one of the most in-demand ecosystem elements and important elements (Isenberg, 2011).
Knowledge	Opportunities are often found in public and private organisation's knowledge base.
Support services	These are important actors in lowering barriers of entry and time-to-market factors.

Source: Stam (2015)

Stam (2015) also emphasises the importance of considering the network effects that are at play in the entrepreneurial process within the ecosystem and hence recognising it as a system of networks (Stam, 2009). Entrepreneurship is a social activity in the nascent days where the choice of where to do business and what business is significantly influenced by the entrepreneur's social ties and opportunities in the networks (Stam, 2009; 2015). This acquiring of resources and information is largely through networks, as well as cost-saving opportunities are attained through collaborative efforts within their networks (Stam, 2009). The way in which the entrepreneur interacts, collaborates, and relates to these networks is varied and dependent on the intuitions, opportunities and players in the ecosystem.

The networks and systems approach to considering the entrepreneurship ecosystem are useful in order to understand the dynamism and complexity of the entrepreneurship ecosystem framework, however, there is an added layer of complexity that is related to

time-based configurations where the networks systematically interact differently across different development paths which result in different configurations. This consideration is explored by Spigel (2015). By bringing in time dependency we are able to consider the implications of process dynamics as discussed in the entrepreneurial process theory, although the motivation of the study is not understand the challenges and needs of entrepreneurs over time, but at this point in time, and how a model can be developed in order to apply now. However one can argue that the application of a contextual theoretical model at this point in time has implications into the future and therefore a process consideration does need to explored such as that discussed within the configurational approach to entrepreneurship ecosystem theory.

2.2.3 Configurational approach

Given the recognition that there is limited research into entrepreneurship ecosystems and how they manifest as entrepreneurial innovation, there has also been an increased interest of research into space. The majority of the research in the space makes identification of the various elements that play a role in the make-up of the entrepreneurship ecosystem. These elements have been discussed above, such as cultural outlooks, policies, investment capital, networks, universities, talent and corporations (Cohen, 2006; Isenberg, 2010; Spigel, 2015; Stam, 2015). The research that looks at how these elements relate interdependently and ultimately produce the overall ecosystem effect is more limited, therefore the configurational approach to consider the entrepreneurship ecosystem is a way of highlighting these interrelated factors within the ecosystem (Spigel, 2015). The entrepreneurship ecosystem concept is also not devoid of other economic development business and entrepreneurship literature, such as industrial clusters and regional innovation systems, however the relationship to this literature is also not explored (Spigel & Harrison, 2017).

The network approach does take into account interrelations at the stakeholder relationship level and how they create causal effects, however it is important to note that the discussed approaches: Systems approach, networks approach, and configurational approach are not mutually exclusive, but merely provide a different set of lenses to look

at the same things and in turn, provide a unique conceptual understanding of entrepreneurship ecosystems.

The portion of understanding brought by the configurational approach is broken into three categories (Spigel, 2015):

- Cultural attributes which inform the understanding and norms of interfirm co-operation and knowledge sharing by enabling or disabling these activities,
- Social attributes that guide the flows of knowledge, entrepreneurial opportunities and connections to finance through social networks; and
- Material attributes contributed by support structures such as universities, governments and incubators that supply the networks and cultural elements with facilities, events, skilled workers and removing institutional barriers, etc.

The concept of “configurational” is derived from the way in which these three categories of attributes are represented within any entrepreneurship ecosystem, where the configuration is informed by the process and path in which the ecosystem developed (Spigel, 2015; Spigel & Harrison 2015). The configurational approach is underpinned by the process dependency notion of entrepreneurship or entrepreneurship ecosystem. Therefore, the configuration that results in the entrepreneurship ecosystem is dependent on the elements that are constituent of various configurational categories.

The following table expands on the various elements that are constituent in each category.

Table 4: Configurational elements in the entrepreneurship ecosystem

Category		Category element	Description
Cultural		Supportive culture	Norms and beliefs within the community and ecosystem that support entrepreneurial characteristics such as those described in entrepreneurial orientation (Rwigema, Urban, & Venter, 2010).
		Histories of entrepreneurship	Prominent stories and examples of local and relatable entrepreneurship success. These can affirm cognitive decision related to entrepreneurship intention and the perceived capability to succeed (Herrington, Kew & Mwanga, 2017; Rwigema, Urban, & Venter, 2010).
Social		Worker talent	This is the availability of skilled workers who are able and willing to enter the start-up labour force.
		Investment capital	The access to investment finance that is available within the ecosystem from various sources such as family, angel investment, venture finance, friends, etc.
		Networks	This is a flow of knowledge, skills and opportunities between connected friends, investors, advisors, workers and entrepreneurs.

		Mentors and role models	The presence of successful and established entrepreneurs who provide support, information and opportunities to younger entrepreneurs.
Material		Policy and governance	Government legislation and regulation that either provides support to start-ups through programmes, funding, incentives and removing barriers to success.
		Universities	These are knowledge institutions that provide training for entrepreneurs and workers while also creating potentially innovative knowledge spillovers. This becomes important when one recognises that innovation is a key entrepreneurial construct (Rwigema, Urban, & Venter, 2010; Simatupang, Schwab & Lantu, 2015; Stangler & Bell-Masterson, 2015)
		Support services	These are firms and organisations that will serve entrepreneurs through accessory business requirements such as legal, accounting, marketing and incubation.
		Physical infrastructure	This is the availability of sufficient and efficient utilities that give entrepreneurs the platforms to

			transact, communicate, operate and grow. These include real estate, telecommunication and transportation.
		Open markets	Access to local opportunities to make the venture sustainable as well as access to international markets.

Source: Spigel (2015)

The configurational approach not only overlaps with established theorisation about the different elements in the ecosystem that play a role in creating a dynamic and prosperous ecosystem, but also infer that the network effect that manifests through ecosystem density is present through the relationships between category elements (Spigel, 2015; Stangler & Bell-Masterson, 2015). This means that there is a relationship between the different category elements that is promoted by the proximity and density of the category elements in order to create a more opportune environment and ecosystem for entrepreneurs (Motoyama & Watkins, 2014; Spigel, 2015; Spigel & Harrison, 2017; Stangler & Bell-Masterson, 2015).

The three different approaches that have been discussed in order to conceptualise the entrepreneurship ecosystem provide a useful internal consideration of the entrepreneurship ecosystem. To add an additional layer of conceptualisation to the entrepreneurship ecosystem, a zoom-out is considered in the form of examining other frameworks that have been used to explain developmental economics and performance economics phenomena alike, similar to the entrepreneurship ecosystem.

2.3 Entrepreneurship ecosystems and related theories

The entrepreneurship ecosystem theory and literature has been criticised for not being truly unique and just another form of previous theories that consider the systematic, network and configurational effects between interconnected elements resulting in superior economic performance, although there is no specific proof to indicate these

relationships (Isenberg, 2011; Spigel & Harrison, 2017). It is important to recognise that there are overlaps between these theories and literature, but the entrepreneurship ecosystem construct is unique although it does build on earlier derived approaches.

2.3.1 Industrial cluster

The entrepreneurial ecosystem construct builds on three elements of the industrial cluster theory (Spigel & Harrison, 2017):

- 1) The connections of firms within the industry or sector can offer a competitive advantage because they provide access to value chains, knowledge spillovers of market intelligence and accessing initial customers.
- 2) Industrial cluster and entrepreneurship ecosystems both draw on the premise that economic performance and firm success is influenced by external factors.
- 3) Entrepreneurship ecosystem theory argues that geographic regional proximity increases the performance of firms and the industrial cluster argument similarly follows.

2.3.2 Regional innovation systems

The regional innovation systems (RIS) concept is based on three core elements which are: (1) regionality which act as the geographic container for (2) innovation, which is driven by a resource intense institution acting as the central knowledge and innovation provider within a (3) system, where it represents the interdependence and connected nature of the innovation activity (Isenberg, 2010; Spigel & Harrison, 2017). There is a variation to this known as the entrepreneurial regional innovation system (ERIS). The variation here is based on the presence of venture investment activity, disruptive innovation and market-focused innovation (Spigel & Harrison, 2017). The entrepreneurship ecosystem construct builds on three elements of the RIS and ERIS

- 1) The role of networks and socially connected entrepreneurship benefits knowledge sharing for opportunities and gathering resources. RIS research implies the systematic socio-political networks whereas entrepreneurship ecosystem focuses on the informal networks.

- 2) The presence of anchor organisation, such as universities and large corporations, provide spillovers of innovation, resources and talent into the wider ecosystem.
- 3) The general transacting and operating environment or landscape is crucial, as provided by the state through policies, regulations, incentives, infrastructure, etc.

These theories have formed the basis on which entrepreneurship ecosystems have been developed and now continue to evolve. These are important to consider as they more closely relate to industrial and economic development outcomes compared to the entrepreneurship ecosystem. Comparisons are made with an emerging realisation that there are little differences to the entrepreneurship ecosystem except that the entrepreneurship ecosystem draws more from the entrepreneurial perspective than the industrial and application perspective.

The nature of entrepreneurship ecosystems is discussed as being characteristic of a multiplexity of perspectives and interactions as being founded in systems, networks and configuration approaches. These build and bind to the perspective that is discussed in this report through complex network theory as a lens to consider not only the different ecosystem approaches but also how at their core interrelate as comparable theories. Entrepreneurship being at the core of the entrepreneurship ecosystem and being a configurational economic resource process, behaviour and mindset, it then turns the entrepreneurship ecosystem into a complex network of complex economic acting agents. These elements are considered as an exploration in the City of Johannesburg, they are explored as a foundational approach to future studies that build on the complex network theory and ecosystem implication in the context of Africa, emerging economy cities and the City of Johannesburg. The following chapter integrates these considerations into a process and method of exploration in order to meet the research study's motivations.

3 RESEARCH METHODOLOGY

This chapter discusses the methodology adopted for the study during the research process. It discusses the following elements of the research methodology: the research paradigm, population, sample and sampling method, research instrument, the procedure for data collection, data analysis and interpretation of said data and the validity and reliability of the research. This then forms the basis on which the research is conducted.

3.1 Research paradigm

The research paradigm encapsulates the sets of beliefs that guide the researcher's approach which, as cited by Galawe (2017), is the post-positivist philosophical orientation which is scientific while often taking a quantitative approach (Creswell, 2013). The approach assumes that reality is observable from an objective point of view although the absolute truth can never be found. The objectivity is built on the ability to build arguments on logical reasoning that extends the nature of data to be generalisable. Due to this widespread use in social sciences, it becomes applicable in management and entrepreneurial science (Phillips & Burbules, 2000).

This research study is a quantitative, cross-sectional exploratory research study based on the entrepreneurship ecosystem within the City of Johannesburg in South Africa. "you cannot do or understand research unless you are clear about fundamental philosophical issues of ontology, epistemology and axiology" (Arthur, Waring, Coe & Hedges, 2012, pp. 5).

This research is conducted on a city-wide sample using a self-administered survey tool where the focus groups are entrepreneurs distributed in seven regions of the City of Johannesburg.

This research is a peculiar cross between an explorative paradigm taking a quantitative approach in order to better understand the topic at hand. An exploratory approach is suggestable due to the limited knowledge and data about the nature of ecosystems, in

general, let alone the workings of the entrepreneurship ecosystem in Johannesburg. It makes it important to pursue an exploratory research paradigm as the design theoretical framework because there is a limited structure in our research material and limited data, the exploratory research design is ideal (Burns & Bush, 2010).

Research is a way of acquiring knowledge and answers to questions and the unknown through methods and paradigms that have been established to provide objective results (Kumar, 2012). These paradigms and approaches vary, depending on the objective of the researcher. The research is based on three pillars, namely, contextualisation within a set philosophy; use of methods, procedures and techniques that have been validated and tested for their reliability; and considers biases and subjectivism.

The following table considers these different paradigms and their usefulness:

Table 5: Several research paradigms

Research type	Description	Usefulness
Descriptive	Provides a systematic explanation of a phenomenon, situation, or a problem.	Getting an objective understanding of a matter that is not well understood.
Correlation	Determines a relationship, interdependence or association between two or more aspects of a situation	Understand influencing factors or representing factors that can infer others and be used to control the others.
Explanatory	Clarifies why and how a relationship exists between two aspects of a phenomenon.	Provides an understanding of the specific influencing elements between two related aspects.
Exploratory	Explores an area of research that is not well known.	Creates an holistic base of understanding new knowledge in order to better understand how to build it.

Source: Kumar (2012)

Exploratory research is a more applicable type for this study because there is limited literature that can be found regarding entrepreneurship ecosystems, especially in emerging economies, in South Africa and Johannesburg. Exploratory research designs are meant for gathering information in an informal and unstructured manner (Burns & Bush, 2010; Reiter, 2017). They are not limited to qualitative or quantitative paradigms because they are useful when the researchers know little about the topic or issue and need to clarify or discover the matter further (Babin & Zikmund, 2016; Burns & Bush, 2010). Analysing data from secondary resources such as published works and statistics is a common way of conducting an exploratory research design however, in the case of this study, relevant secondary data to the topic is limited; therefore, when there is limited data then field research is required (Babin & Zikmund, 2016).

Therefore, the study is an exploratory cross-sectional study using quantitative metrics. This means that the study focuses on a snapshot of data collection of the sample at a particular “point” in time (Kumar, 2012). It is a useful consideration for this study because it is simple to administer, considering the complex nature of the topic, therefore it allows for a better probability to conduct an effective study. It is also useful to understand the situation of the entrepreneurship ecosystem as it stands and in its current form (Kumar, 2012). Quantitative studies are also valuable when considering large data sets, such as broad and generalised insights of the City of Johannesburg’s entrepreneurship ecosystem. They allow researchers to observe patterns and draw insights hidden inside the system level of interrelated complex information sets.

3.2 Population

The research study was conducted by self-administered surveys which were distributed to entrepreneurs within the City of Johannesburg and filled in by paper survey or “hard copy” within a distribution of seven geographical categories or groups. There are certain things that are specific to this methodology and the following table expands on the various elements and how they are important for this study.

Table 6: Key elements of the research design and their relevance

Design	Justification
Survey	Collect quantitative data
Self-administered	Removing questioner bias or the influence of an observing third party between the survey-entrepreneur relationship
Paper survey	South Africa's internet connectivity is relatively low with only 40% of South Africans having access to the internet (Goldstuck, 2018). Considering the high levels of inequality in the country, the type of entrepreneur with regular access to internet connectivity is not representative of Johannesburg's entrepreneurs. Paper surveys are important to capture a more realistic sample.
Eight geographical categories	Entrepreneurship can be considered as a regional phenomenon and the city can be divided into relatively non-homogenous regions in which surveys are given to complete (Auerswald, 2015; Harrington, 2017; Stangler & Bell-Matterson, 2015).

The survey was designed based on entrepreneurship ecosystem research and the common elements and needs expressed in the entrepreneurship ecosystem literature for entrepreneurs.

The population is the selection of respondents who are relevant to the subject of inquiry or study within the research (Greener, 2008; Kumar, 2012). In this case, the population are entrepreneurs in Johannesburg because they are the main actors of the entrepreneurship ecosystem and they have the most holistic experience of how the entrepreneurship ecosystem performs in order to serve them, enable them or inhibit them to achieve their ambitions (Audretsch, Belitski, & Desai, 2014; Isenberg, 2011).

Considering that the City of Johannesburg has in excess of four million people, the probability of identifying and receiving answers from all the entrepreneurs within this four million population becomes impractical (Statssa, 2017). Therefore, a sample is required.

3.3 Sample and sampling method

A sample is a representative extrapolation of the population that can be used as the most practical approximation of the population, where there is an impact of validity related to how close the sample is able to represent the population (Greener, 2008; Kumar, 2012).

This study sample was based on a multi-stage cluster sampling method and indirect random selection because there are several stages of sampling the sample populations (entrepreneurs in Johannesburg) (Greener, 2008).

The geography is based on a clustering of samples based on regions within the city and then within each region, a non-probability sampling (non-probability sampling relies on the researcher's judgement to choose a sample (Polonsky & Waller, 2005)) is indirectly performed based on the respondents' interests to participate, in each region. This means that some of these respondents may not be representative of the entrepreneurs within that region because of their interests (Kumar 20120).

3.4 Research Instrument

The research instrument was a survey that is both a string and selection survey. It was constructed in order to find out three main things about the entrepreneurs and respondents:

- The profile and type of the entrepreneur, in terms of understanding the subjective influences and characteristics of the respondent
- The challenges and issues the entrepreneur has with the entrepreneurship ecosystem in which they are operating. In other words, the perspective of the entrepreneur regarding the entrepreneurship ecosystem.
- The stakeholders and ecosystem players that the entrepreneurs are interested in communicating with or engaging with within the entrepreneurship ecosystem.

The two latter parts of the survey accommodate the tenets and literature of an entrepreneurship ecosystem in terms of the elements, factors and various actors' categories in literary frameworks. Therefore, the questions that inform the perspective of the entrepreneur's perspective of the ecosystem's perspective are built by asking how the entrepreneur experiences the elements of the ecosystem that are described by literature. The wording and the phrasing are adjusted in order to accommodate the context of Johannesburg as well as the layman's context.

The following table indicates the connection between the constructs that are measured by the research instrument in the form of a survey and the theoretical constructs that inform the study's foundation. It illustrates how the instrument is designed on the basis of the of the research problem and aims.

Table 7: Research instrument measurements and constructs

Ecosystem element	Measured perspective	Measured item	Description of issue/problem⁽¹⁾	Source
Policy	Challenge	Regulation	The city's entrepreneurship policies and level of intervention with the market	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Compliance	The limited extent to which the city enforces regulation or has extensive requirements	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	CoJ supply chain	The rules and regulations surrounding how CoJ SME's engage with the government of a Johannesburg for business	(Isenberg, 2011; Mason & Brown, 2014)
Finance	Challenge	Expansion	Access to growth capital	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Equipment	Access to asset finance	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	Investors	Access to equity finance	(Isenberg, 2011; Mason & Brown, 2014)
Culture			N/A ⁽²⁾	
Supports	Challenge	Productivity	Access to enablers and support services and efficiency enabling infrastructure	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	Marketers and PR	Access to professional services	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	Incubators	Access to capacity development institutions	(Isenberg, 2011; Mason & Brown, 2014)
Human Capital	Challenge	Financial Management	Understanding of financial modelling and business financial literacy (Access to the talent)	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Expansion	Application of business growth strategy (Access to the talent)	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Productivity	Application of business administration and	(Isenberg, 2011; Mason

			management (Access to the talent)	& Brown, 2014)
	Challenge	Processes	Application of business administration and management (Access to the talent)	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Profitability	Application of business administration and management (Access to the talent).	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	Entrepreneur education (i.e. college or university)	Access to entrepreneurship education institutions	(Isenberg, 2011; Mason & Brown, 2014)
Markets	Challenge	Access to Markets	Access to early customers and clients through network	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Suppliers	Access to sustainable supply contracts through networks	(Isenberg, 2011; Mason & Brown, 2014)
	Challenge	Expansion	Access to early customers, reference customers and distributor channels	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	Suppliers	Access to sustainable supply contracts through networks	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	CoJ supply chain	Access to information flows about CoJ supply chain opportunities through networks as well as partnerships for the bids	(Isenberg, 2011; Mason & Brown, 2014)
	Desire	Marketers and PR	Access to distributors networks	(Isenberg, 2011; Mason & Brown, 2014)

(1) The description will not be provided to respondents but left to their interpretation as to not interfere with the data input. (2) Culture is a non-considered measure because of the limitations in quantifying its nature.

3.5 Procedure for data collection

Data was collected by issuing questionnaires at entrepreneurs' events that were held at different locations in the City of Johannesburg. The gatherings were a good opportunity to administer the survey and to collect as much data as possible because it can be challenging to collect enough written surveys from a diversified selection of entrepreneurs. The surveys were handed out to the entrepreneurs to complete with

minimum explanation and then collected. The questionnaires were then captured into a digital format as a spreadsheet for each respondent.

The questionnaires were distributed and collected at each of the seven occasions within a day, however the entire data collection happened over three weeks. Then the questionnaires were collected and captured into digital form where a level of quality control was implemented, and all poor respondents were excluded from further analysis.

3.6 Data analysis and interpretation

It is important to recognise that data needs to be organised, examined and interpreted into something useful for it to be considered research (Blanchard, 2016). To consider this importance equal to the other matters of research including literature and methodology, means to avoid overlooking the thinking about specific data and its significant importance to the research outcome. (Greener, 2008).

The data in this case follows an exploratory process which does not seek to confirm pre-existing constructions of literature but to establish new perspectives on the literature (Reiter, 2017). There are a number of tools that were used in order to better understand the data, explore the data and extract insights using the following suggested work flow:

- 1) Rewrite and examine the data or notes that one has into some levels or categories, it does not have to be clear, but it is useful to have a structured model of raw data (Kumar, 2012);
- 2) Find themes and transcribe the data, into themes through a repeated process of refinement, overlaps and differences (Kumar 20120); and
- 3) Apply the use of computer programmes in order to run complex statistical measures that may uncover insightful statistics and numerical patterns (Kumar, 2012).

The data was analysed following the above-mentioned process, through which important themes were identified and then further examined using examinations such as variation statistics that could possibly indicate insightful patterns if there were significant variances in the data and the analyses. Often statistics are considered as background noise to be

normalised but they can be analysed to provide statistical information (Gould, 2004). Frequency distributions provide context to the data and data reduction analyses. and exploratory factor analysis is a multivariate and complex instrument used to pull residual driving forces between seemingly unrelated data sets (Taherdoost, n.d.).

The analysis tool that was used is a factor reduction tool in order to isolate and group related ecosystem elements produced by the research. Principal factor analysis (PAF) was applied because it assumes that there is a latent and residual yet unmeasurable factor that is embedded in the results (Fabrigar & Wegener, 2012). In the case of perceptions of entrepreneurs where different responses can be given to the same question and same circumstance, it could be assumed that there are latent influencers. This may imply that the data points can be dynamic and interdependent

The chosen ecosystem framework upon which this interpretation and analysis was performed was based on Isenberg's (2011) work, that represents the entrepreneurship ecosystem as six domains.

3.7 Validity and reliability of the research

A valuable piece of research work is able to make accurate and correct estimations, explanations and reflections of reality and the universe (Kumar,2012; Reiter, 2017). This ability for research to engage the phenomenon of interest in such a way that the results can be deemed valid is called validity and reliability, and it is influenced by the way in which the study is designed and its methodology (Kumar, 2012). There are different forms of validity which are external and internal, and these are discussed below.

3.7.1 External validity

This form of validity is also called generalisability or transferability, which essentially considers the ability for the study to be replicated or used as a generalisation for other contexts of similar interest. The question is what has been done to ensure this and what limitations should be considered in terms of this (Greener, 2008; Kumar, 2012).

This study can be externally validated by the consideration that the participants are representative of the average Johannesburg entrepreneur because the study is carried out throughout the city incorporating the different areas and region.

3.7.2 Internal validity

This form of validity can also be considered as credibility and is a consideration of the extent to which the results and measures is reflective of the opinions or responses of the participants. The internal validity is based on whether the results can be credible to the participants and whether they see why the study's measures are important (Greener, 2008; Kumar, 2012).

The entrepreneurship events at which the study's data was collected is based on understanding that the attendees are interested in entrepreneurship and its development. Therefore, the survey participants were entrepreneurs who wished to contribute to the challenges of entrepreneurs. This therefore represents a strengthening of the internal validity related to the responses of the participants.

3.7.3 Reliability

Reliability is also considered as dependability or confirmability, which essentially means the ability of the study to produce the same results if repeated by the same researcher or other researchers (Kumar, 2012). Therefore, the design of the study must be transparent and clear so that it is consistent over time (Greener, 2008).

The reliability of this study is supported by the fact that the surveys were filled in by the participants without involvement of the researcher. Therefore, it is more likely that their opinions and answers would prevail over time. The reliability was further strengthened by performing a reliability analysis that altered the combination of data by removing an aspect of it to determine whether the model can be improved.

The limitations of the study's reliability were because of two factors where the first is the process of capturing the data from written paper to digital format. Considering the number of data points that were being captured manually, there was a high chance of errors being produced. This was unavoidable as there is always an expected error rate averaging 2% for manual data capture and might only be reduced by double checking and highlighting

this matter to the capturers (Hong, Yao, Pedersen, Peters, Costello, Murphy, Hovens, & Corcoran, 2013). In this case, quality control was done by sifting the data for abnormalities and outliers and redone if any were found. Secondly, is the fact that in each case or day of data collection there was a chance for the participants to interact. This is because they were not isolated as they responded to the surveys and could have potentially influenced each other's responses. This could have been reduced by giving time to answer the questions in silence and to collect all the surveys once the time was up.

Having designed and implemented a process and method of exploring the complex network theory of the City of Johannesburg's entrepreneurship ecosystem through the lens of challenges and needs of the entrepreneurs it then becomes important to review the results. The following chapter is the outcome of chapter 3 having been implemented as close as possible to the described method.

4 PRESENTATION OF RESULTS AND DATA ANALYSIS

This chapter presents the results of the research: *“Mapping the challenges and needs of SME’s in COJ seven regions – The COJ Entrepreneurship Ecosystem”*.

The chapter starts off by describing the basic and apparent characteristics of the data, from whom it was collected and the actual responses of the participants. Then the data is further explored through exploratory factor analysis (EFA) techniques that extract patterns and trends that may infer further relationships and insights.

The research is presented considering the challenges and the needs of entrepreneurs in the context of the entrepreneurship ecosystem in Johannesburg, representative of an emerging markets perspective.

4.1 Sample characteristics

The data was collected over a three-week period in seven regions of the city as defined by the City of Johannesburg where a full working day (8 hours) was spent in each region collecting data through the research instrument. The total number of respondents was 1243. The number of unusable respondents was 144 and these were respondents with incomplete surveys and hence, respondents with missing data. Therefore, the number of usable and quality respondents is 1099, which represents the number of respondents considered as analysed data in the following section and in the report. The respondents with incomplete data were discarded and the following table is a summary of the survey statistics:

Table 8: Data set overview descriptive statistics

REGION	Number of Respondents	Usable Sample	% Usable	Participants %	Population (000's)	Population (%)
A	80	34	42%	7%	250	9%
B	143	112	78%	8%	198	7%
C	71	50	70%	6%	225	8%
D	458	550	120%	33%	1,058	37%
E	191	157	82%	17%	394	14%
F	130	59	45%	12%	433	15%
G	170	139	82%	17%	270	10%
TOTALS	1243	1099	-	00		-

The three top represented regions in the total study are regions D, E, and G respectively.



Figure 4: Map of City
the seven geographical regions represented

of Johannesburg with

4.1.1 Demographics

The demographics and characteristics of the participants were also captured as per the survey sheet. These details are depicted in the following graphical representations and where the response is indicated as “other” it means the value reported in the survey

weren't any of the options available, it may imply that respondents were not willing to reveal their age, or that they do not identify with the available options.

When considering the sample characteristics, one was able to notice that the level of participation as a ratio of the total is aligned to the population statistics of the City of Johannesburg (Openup and Media Monitoring Africa, 2018). This means that the sample population is considered reliable and representative of the City of Johannesburg's entrepreneurs.

This may be due to the natural and organic gravitation of respondents to the survey as a result of the relative density and availability based on the population in that region. It may be because this was a hard copy and paper survey which made it more accessible to respondents from all walks of life.

4.1.1.1 Gender

This section shows the gender distribution of the sample, some of the respondents chose not to indicate to their gender as this was a self-administered survey.

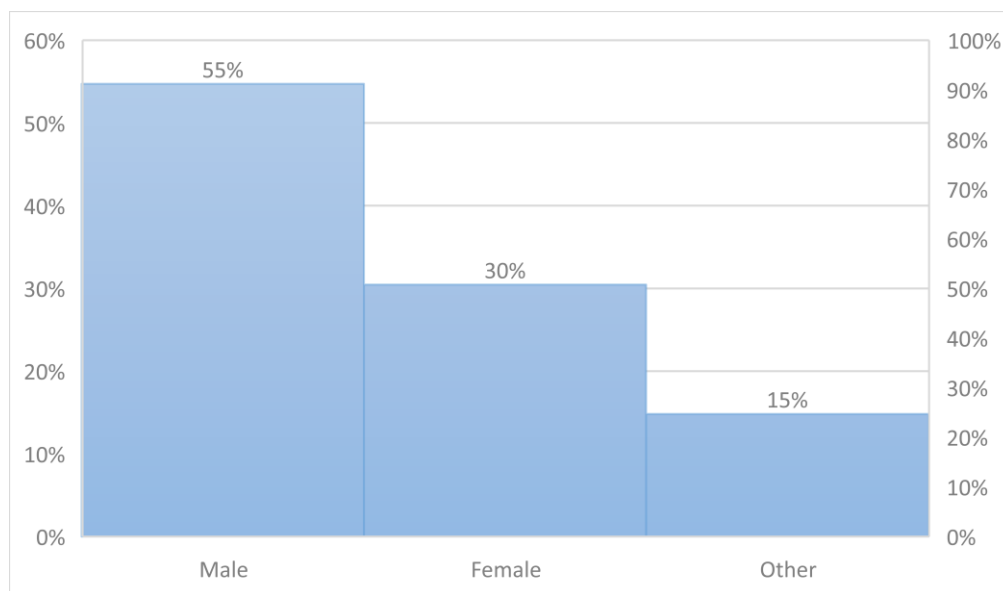


Figure 5: Gender representation of the data set

Most entrepreneurs in the survey were male (55%), almost double the number of females which was 30%, whereas the number of people that preferred to not to specify their gender was only 15% which is about half the number of females in the survey.

The respondents in the sample show a clear over-representation of males in the gender category. This might be due to various factors that limit the economic participation of women in South Africa (from cultural elements to psychological and opportunity limitations).

The City of Johannesburg's values are based on the South African constitution's principles of equality and equal opportunity. These results imply that there is a systemic impact on the levels of entrepreneurial intention and orientation (interest and participation) of women that need to be addressed.

4.1.1.2 Age

Figure 6 represents the age distribution of the respondents.

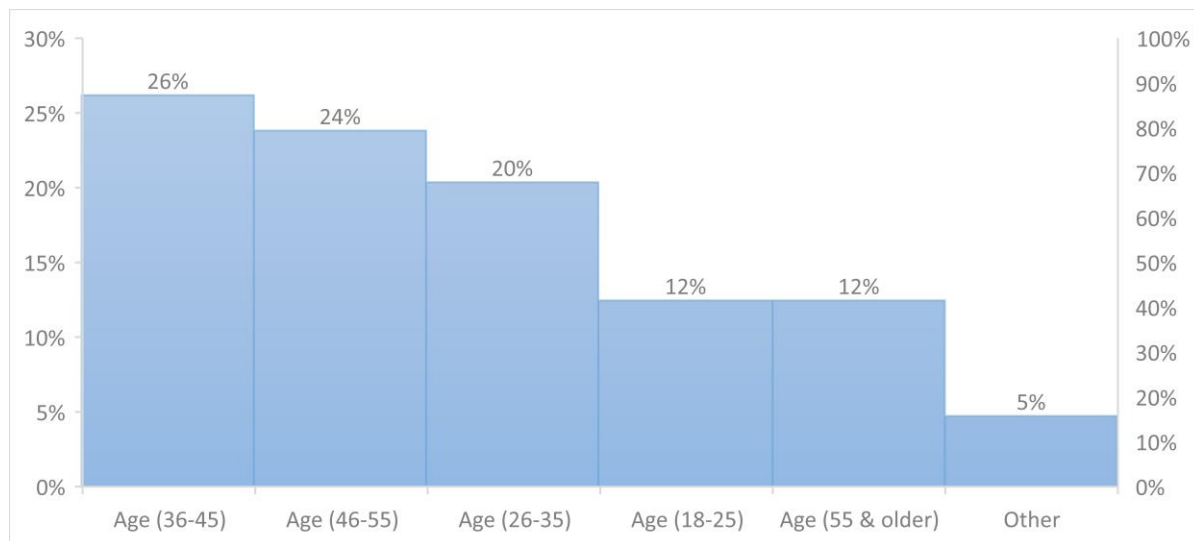


Figure 6: Age representation of the data set

The largest age group amongst entrepreneurs is middle-aged respondents i.e. considered to be between the ages of 36-55, this is about 52% of the survey. This could be due to the ability of these people with experience to identify and successfully exploit opportunities due to the human capital and networks gained over time as compared to younger people, likely with much less human capital (Unger et al., 2011). The youth entrepreneur category considered to be between the ages of 18-35 represents 34% of the survey which is still a significant portion of the sample which is understandable when considering the average age of South Africans is 25-27 years old (Statssa, 2017). Seniors

(who are older than 55 years of age) are 13% and there is a 5% population of the sample that chose not to disclose their age.

There is a slight disparity between the respondents of the research survey and the population of Johannesburg in relation to the age groups (OpenUp and Media Monitoring Africa, 2018). The research survey shows a higher participation of older age groups, this implies that older age groups participate in entrepreneurship. This is aligned with literature which concludes a higher success rate and participation rate of older age groups in entrepreneurship (Unger et al., 2011). This is because older age groups have better and higher levels of human capital, access to markets in the form of networks and accumulated financial capital, etc. (Marvel, Davis & Sproul, 2014). These are all elements of the entrepreneurship ecosystem that increase the entrepreneurial intention and orientation.

4.1.1.3 Disability

Figure 6 represents the portion of the respondents that identified as having a physical or mental disability. The following metric measures the number of respondents who are disabled.

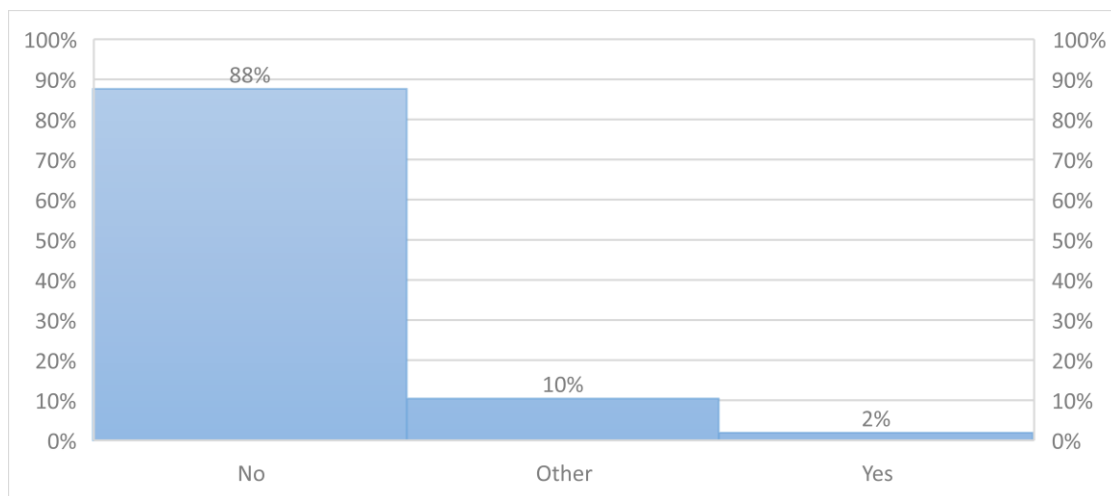


Figure 7: Representation of disability in the data set

The majority (88%) of respondents are not disabled while only 2% are disabled; however, the next group are respondents that chose not to disclose or do not identify as either “disabled” or “not disabled”. Literature notes that differently-abled entrepreneurs and non-

disabled entrepreneurs show similar entrepreneurial traits, however disabled entrepreneurs do show more characteristics of being more resilient and persistent when it comes to dealing with failure, stress and uncertainty (Saxena & Pandya, 2018). However, because disabled people represent a small percentage (2%) of the sample, this slight difference will not affect the results.

4.1.1.4 Racial background

Figure 8 represents the racial self-identification of the respondents. This metric becomes important when considering South Africa's racial history and how ethnic background affects the access to opportunities and perform socio-economically, whereby success in entrepreneurship falls within this domain.

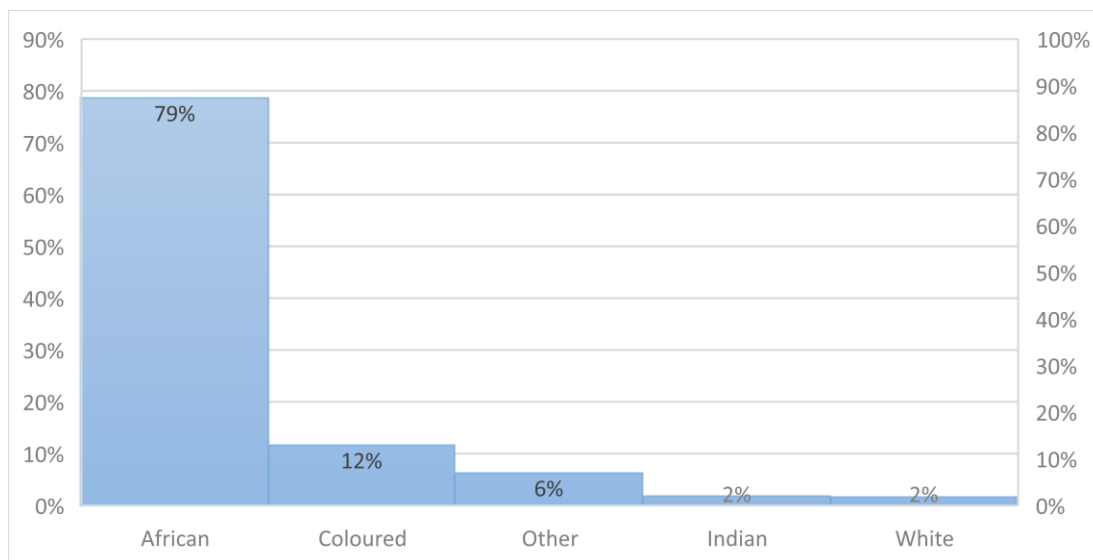


Figure 8: Representation of racial demographic in the data set.

The ethnic category is aligned with the broader demographics of Johannesburg's entrepreneurs. The majority (79%) representation of African racial background suggest the findings might be biased accordingly.

4.1.1.5 Industry distribution

Figure 9 is the self-identified industry in which the entrepreneur is operating as per the options given. If the options were not representative, then the "other" option was available. The chosen industries to be included in the survey were as aligned to the City of Johannesburg's strategic economic development industries.

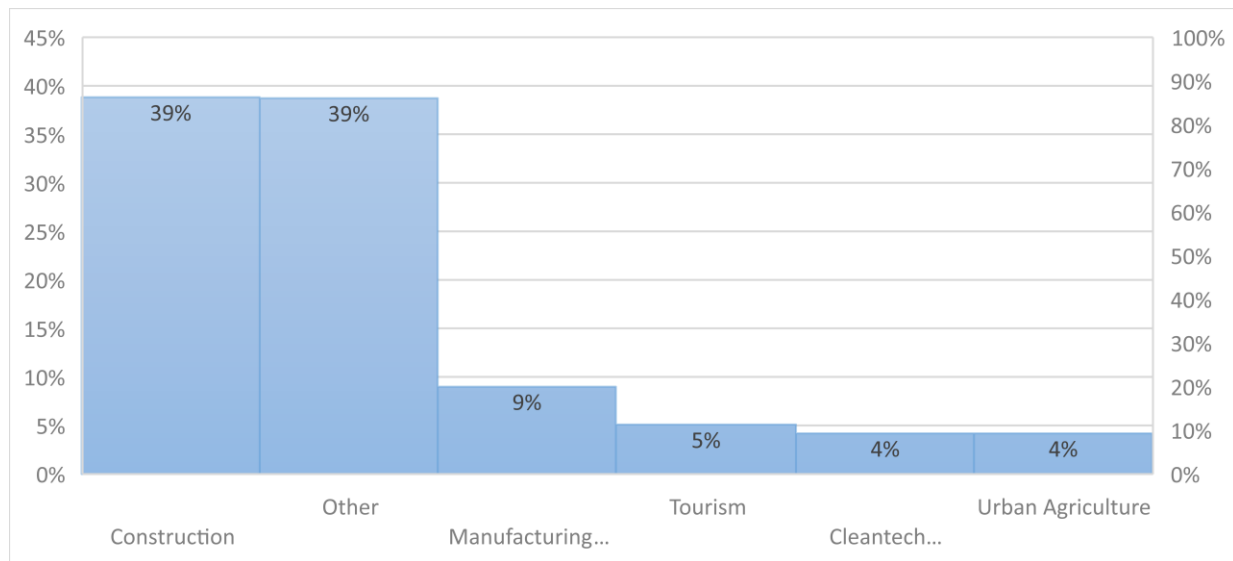


Figure 9: Representation of business industry in the data set

The largest represented industry in the survey is the construction industry (39%) with more than three times the representation of the next industry which is manufacturing (9%) while tourism (5%), cleantech/greentech (4%) and urban-agriculture (4%) follow closely on each other.

The industries represented in the research survey seem to be skewed, based on two elements. The first element is the over-representation of entrepreneurs identifying within the construction industry. This may represent various factors such as through what channels the survey was marketed and the construction industry is a favoured industry for early-stage entrepreneurs in Johannesburg, South Africa.

The second element is the fact that the most represented industry group (equal to the construction industry) is the “other”. This means that there is a skewed number of entrepreneurs as respondents who do not identify as any of the options provided in the survey. The industry options in the survey were based on the City of Johannesburg’s outlined industries to provide focused entrepreneurship support as being the most effective employment provider and holding large numbers of entrepreneurs. The wide diversity may be due to a misalignment with the City of Johannesburg’s priorities and expectations caused by misinformed research results.

4.2 Descriptive statistics

The following are the key descriptive statistics for the “challenges” and the “needs” results for the entrepreneurs. The “C” before the variable denotes “Challenges ”, while the “N” before the variable denotes “Need and desire”.

Table 9: Statistics that show basic descriptive statistics of the data set

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
C_Access to Markets	1.33	.472	1099
C_Financial Management	1.50	.500	1099
C_Suppliers	1.46	.499	1099
C_Expansion	1.64	.481	1099
C_Productivity	1.72	.451	1099
C_Processes	1.72	.451	1099
C_Equipment	1.40	.489	1099
C_Profitability	1.66	.474	1099
C_Regulation	1.72	.449	1099
C_Compliance	1.69	.464	1099
C_Other	1.94	.244	1099
N_Incubators	1.67	.470	1099
N_Investors	1.41	.491	1099
N_Suppliers	1.50	.500	1099
N_Marketers and PR	1.55	.497	1099
N_Entrepreneur education(i.e. college or university)	1.58	.493	1099
N_CoJ supply chain (please specify)	1.65	.478	1099
N_Other	1.93	.252	1099

The descriptive statistics show stable and clean data in the form of all the challenges and needs having equal totals well as how the standard deviations are close to 0.5 because the data is all binary. The only exception is “other challenges” and “other needs” which show skewness. The mean indicates which side the skewness lies (close to 2, where 1 is yes for challenges or needs and 2 is no for not challenged and no needs).

4.2.1 Challenges of entrepreneurs

The respondents were given a list of challenges to choose from where they could select whether that specific challenge was pertinent to them or not. This then provided a view of various challenges. Figure 10 below represents this.

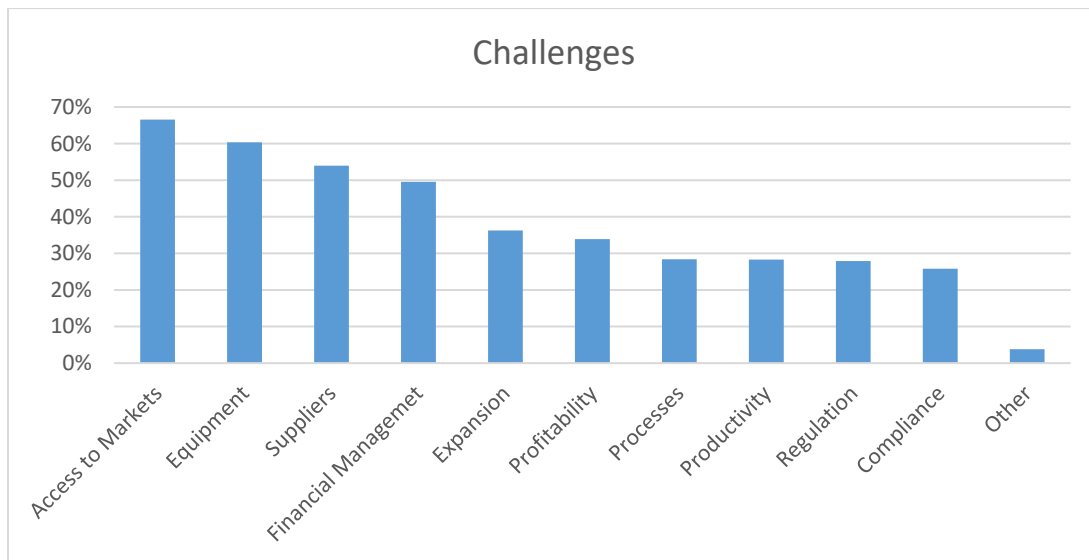


Figure 10: Challenges experienced by entrepreneurs in the Johannesburg entrepreneurship ecosystem

The most pertinent challenges that entrepreneurs are facing come from being able to transact as a business or having access to profitable markets. This is shown by access to markets being a challenge for 67% of entrepreneurs. Following not far behind is having the right equipment (60%), accessing appropriate suppliers (54%) and managing their finances (50%). These are the top four challenges the entrepreneurs are facing, with each of them having a majority representation within the survey.

The data was further granularised to investigate how the challenges were being faced in different parts of the city. This granularised representation shows the challenges in the different regions as a percentage of the sample from each region.

	Region						
	A	B	C	D	E	F	G
Access to Markets	62%	58%	83%	65%	66%	66%	69%
Equipment	52%	59%	52%	62%	68%	51%	63%
Suppliers	53%	54%	48%	53%	55%	43%	64%
Financial Managemet	51%	42%	35%	46%	54%	47%	61%
Expansion	39%	25%	45%	35%	37%	31%	42%
Profitability	43%	36%	36%	30%	36%	32%	36%
Processes	34%	26%	33%	26%	28%	28%	30%
Productivity	31%	22%	21%	28%	22%	26%	40%
Regulation	32%	31%	29%	25%	25%	29%	33%
Compliance	44%	41%	21%	29%	0%	0%	40%
Other	13%	1%	0%	0%	0%	0%	10%

Figure 11: Heat map of challenges experienced by entrepreneurs from different regions in the Johannesburg entrepreneurship ecosystem

Figure 11 shows the challenges being faced by entrepreneurs in a specific region of the City of Johannesburg where those shown in a darker red colour represent a higher percentage of entrepreneurs who are facing this challenge. When it is a moderate percentage of entrepreneurs facing this challenge the colour is closer to yellow. If a low percentage of entrepreneurs are facing this challenge, then it is shown in a greener colour.

This method can be important in recognising patterns that are hidden in the data. This could be a result of over-representation by a certain group or under-representation by another.

The heat map is aligned and coherent with the macro view in Figure 10 in the sense that the four most pressing issues are still:

- 1) Access to markets,
- 2) Equipment,
- 3) Suppliers, and
- 4) Financial management.

It is also interesting to observe some regions seem to be performing at a better level, on average, across the ecosystem. In other words, region B, D and F show more green areas and less orange-red areas.

However, when considering specific challenges faced by entrepreneurs in each region, it does not seem that there is any region that is doing significantly better or worse than the others. This remains true for all challenges except the challenge of accessing markets for region C where 83% of entrepreneurs face this challenge.

When the analysis is granularised by age, it becomes visible whether age is an influence on the challenges faced by entrepreneurs. Figure 12 indicates the percentage of entrepreneurs of a certain age who are experiences certain challenges.

	Age					
	Age (18-25)	Age (26-35)	Age (36-45)	Age (46-55)	Age (+55)	Other
Access to Markets	64%	69%	68%	66%	66%	58%
Equipment	64%	59%	61%	59%	61%	56%
Suppliers	49%	51%	57%	55%	56%	50%
Financial Managemet	55%	48%	44%	50%	56%	52%
Expansion	34%	38%	34%	39%	38%	33%
Profitability	39%	35%	31%	34%	33%	37%
Processes	26%	29%	26%	29%	36%	27%
Productivity	28%	28%	26%	28%	29%	40%
Regulation	20%	28%	28%	29%	32%	31%
Compliance	10%	24%	23%	28%	30%	27%
Other	1%	3%	1%	5%	2%	4%

Figure 12: Heat map of the challenges experienced by entrepreneurs across different age groups.

There is no clear discrepancy between any of the different entrepreneur ages in relation to the challenges they face. The challenges are faced to a similar extent across the ages without a clear variance as an influence of the age of the entrepreneur.

Another consideration looks at the challenges faced by entrepreneurs in each industry that is represented.

	Industry					
	Cleantech/ Greentech	Construction	Manufacturing /Automotive	Tourism	Urban Agriculture	Other
Access to Markets	63%	73%	73%	73%	61%	58%
Equipment	50%	63%	68%	63%	70%	55%
Suppliers	48%	66%	49%	50%	54%	44%
Financial Managemet	43%	53%	53%	52%	57%	45%
Expansion	30%	38%	38%	41%	41%	33%
Profitability	26%	36%	31%	36%	39%	32%
Processes	15%	33%	28%	27%	37%	24%
Productivity	26%	30%	30%	30%	33%	26%
Regulation	17%	30%	26%	25%	41%	26%
Compliance	17%	27%	21%	27%	26%	21%
Other	2%	4%	1%	0%	4%	3%

Figure 13: Heat map of the challenges experienced by entrepreneurs across different industries

The challenges in Figure 13 are aligned with the other granularised perspectives on the data, based on age and region. The urban agriculture industry seems to have more of the entrepreneurs facing challenges. The entrepreneurs categorised as other (industry) have lower than the averages of the industry-specific responses.

4.2.2 Needs of entrepreneurs

This metric is based on the needs of the entrepreneurs when considering which entrepreneurship ecosystem players and enablers they would like to engage with or engage more with.

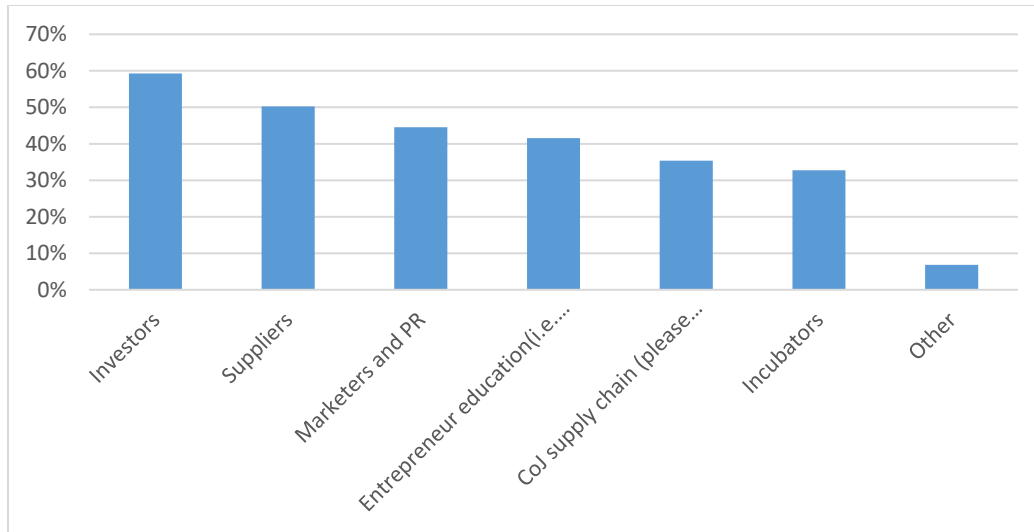


Figure 14: Needs of entrepreneurs in the Johannesburg entrepreneurship ecosystem

The entrepreneurship ecosystem players that the entrepreneurs wish to engage with the most are investors with 59% of entrepreneurs indicating this. Following this is suppliers at 50% of entrepreneurs expressing this need, which is followed by marketers and PR services (45%), then entrepreneurship education (42%).

When the needs of entrepreneurs are considered at a more detailed and granular level one can investigate whether there is a relationship between the regions of the city and the needs for which the entrepreneurs are most hungry.

	Region						
	A	B	C	D	E	F	G
Investors	57%	56%	56%	65%	59%	56%	55%
Suppliers	44%	52%	52%	53%	47%	47%	51%
Marketers and PR	45%	38%	48%	45%	42%	38%	53%
Entrepreneur education(i.e. college or university)	40%	44%	41%	38%	46%	38%	46%
CoJ supply chain (please specify)	43%	45%	47%	33%	33%	22%	39%
Incubators	31%	36%	35%	28%	39%	29%	37%
Other	21%	2%	2%	5%	6%	14%	4%

Figure 15: Heat map of needs of entrepreneurs across different regions in the Johannesburg entrepreneurship ecosystem

The heat map agrees with the collective voice in Figure 14 voice in terms of the highest in demand stakeholders by entrepreneurs in each region. These areas are:

- 1) Investors,

- 2) Suppliers, and
- 3) Marketers and public relations providers.

Region F seems to be the best performing region by scoring relatively low needs for stakeholders than other regions, except for “other” stakeholders’ category. This is where region F significantly has a higher demand in comparison.

There is a further opportunity to consider the needs faced by different entrepreneurs depending on their age.

	Age					
	Age (18-25)	Age (26-35)	Age (36-45)	Age (46-55)	Age (+55)	Other
Investors	69%	63%	58%	52%	61%	56%
Suppliers	50%	50%	55%	46%	49%	48%
Marketers and PR	46%	45%	44%	45%	42%	50%
Entrepreneur education(i.e. college or university)	46%	43%	42%	39%	39%	40%
CoJ supply chain (please specify)	28%	36%	42%	35%	31%	29%
Incubators	32%	33%	35%	31%	30%	37%
Other	4%	7%	7%	8%	3%	13%

Figure 16: Heat map of needs of entrepreneurs in the Johannesburg entrepreneurship ecosystem across different age groups

The changes across the ages for the needs of ecosystem stakeholders by entrepreneurs are similar to the macro view in Figure 14 with no apparent differences. This is most probable for all considerations of the figure above except Age (46-55). They seem to require slightly less contact with the desired ecosystem stakeholders across the ages.

An additional consideration is a granularised view of the needs of entrepreneur’s data by industry.

		Industry					
		Cleantech/ Greentech	Construction	Manufacturing /Automotive	Tourism	Urban Agriculture	Other
Investors	AG	65%	59%	67%	52%	76%	56%
Suppliers	AH	43%	57%	56%	48%	54%	42%
Marketers and PR	AI	41%	46%	48%	50%	52%	41%
Entrepreneur education(i.e. college or university)	AJ	48%	41%	44%	45%	50%	39%
CoJ supply chain (please specify)	AK	33%	46%	23%	30%	20%	30%
Incubators	AF	30%	38%	28%	43%	39%	27%
Other	AL	4%	8%	3%	5%	11%	6%

Figure 17: Heat map of the needs experienced by entrepreneurs across different industries

This heat map also indicates similar results with the other heat maps, where there is general unity in terms of factors that are most needed. Areas of interest include the need for investors in urban agriculture (76%), manufacturing/automotive (67%) and cleantech/greentech (65%). The entrepreneurs in urban agriculture (11%) and construction (8%) seem to have more needs that are not considered in the list compared to other industries.

4.3 Mapping the City of Johannesburg entrepreneurship ecosystem

Figure 18 represents how the needs and challenges of Johannesburg's entrepreneurs configure and fit into the entrepreneurship ecosystem framework per Isenberg (2011). The figure is also represented by a percentage representing the average rating of the framework category as an average of its constituent elements. Some of the constituent elements or factors are represented within more than one framework element.

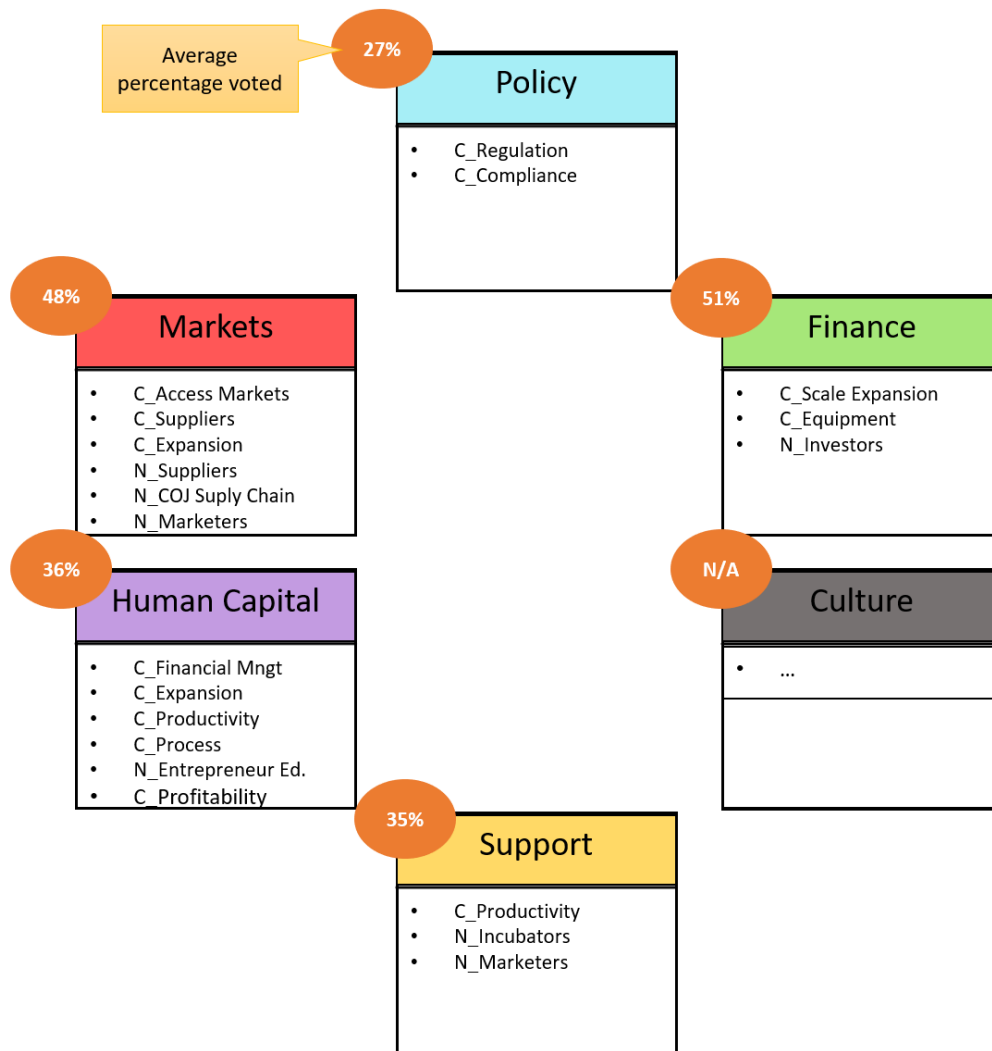


Figure 18: Isenberg entrepreneurship ecosystem mapped across the research challenges and needs of entrepreneurs.

Figure 18 shows how the challenges and needs that have been provided by the respondents align with Isenberg's (2011) entrepreneurship ecosystem framework. Some of the challenges and needs are represented in more than one ecosystem domain, however the most represented domains are Markets and Human Capital domains. Furthermore, the highest rated domains on the basis of the most challenges and needs faced by entrepreneurs are the finance (51%) and access to markets (48%) domains. Following these is the human capital (36%), support (35%) and policy (27%).

These domains, as represented by the most rated challenges and needs of entrepreneurs, are mapped geographically across the regions of the City of

Johannesburg; this map also represents the number of respondents. The number of challenges and needs are also mapped according to the colours of the domains in Figure 18.

The most faced challenges and needs as mapped in Figure 19. The map has a table of high rated challenges or as needs of entrepreneurs and these factors are essentially those that are ranked highest (top three). Sometimes there is a minor difference between any of the top four ranked factors and then four may be represented where two share the 3rd place are interchanged based on their ranking.

Table 10: Symbols for the mapped challenges and needs considered the most important in the City of Johannesburg

Rank	C = Challenges	N = Needs
1 st	AM = Access to Market	IN = Investors
2 nd	EQ = Equipment	SU = Suppliers
3 rd	SU = Suppliers	MP =Marketers & PR
	FM = Financial Mngt	EE = Entrepreneur Ed

The map in Figure 19 has a respondents table that indicates the number of respondents from that region of the City of Johannesburg and what percentage that represents from the research respondents. This is represented in the following table.

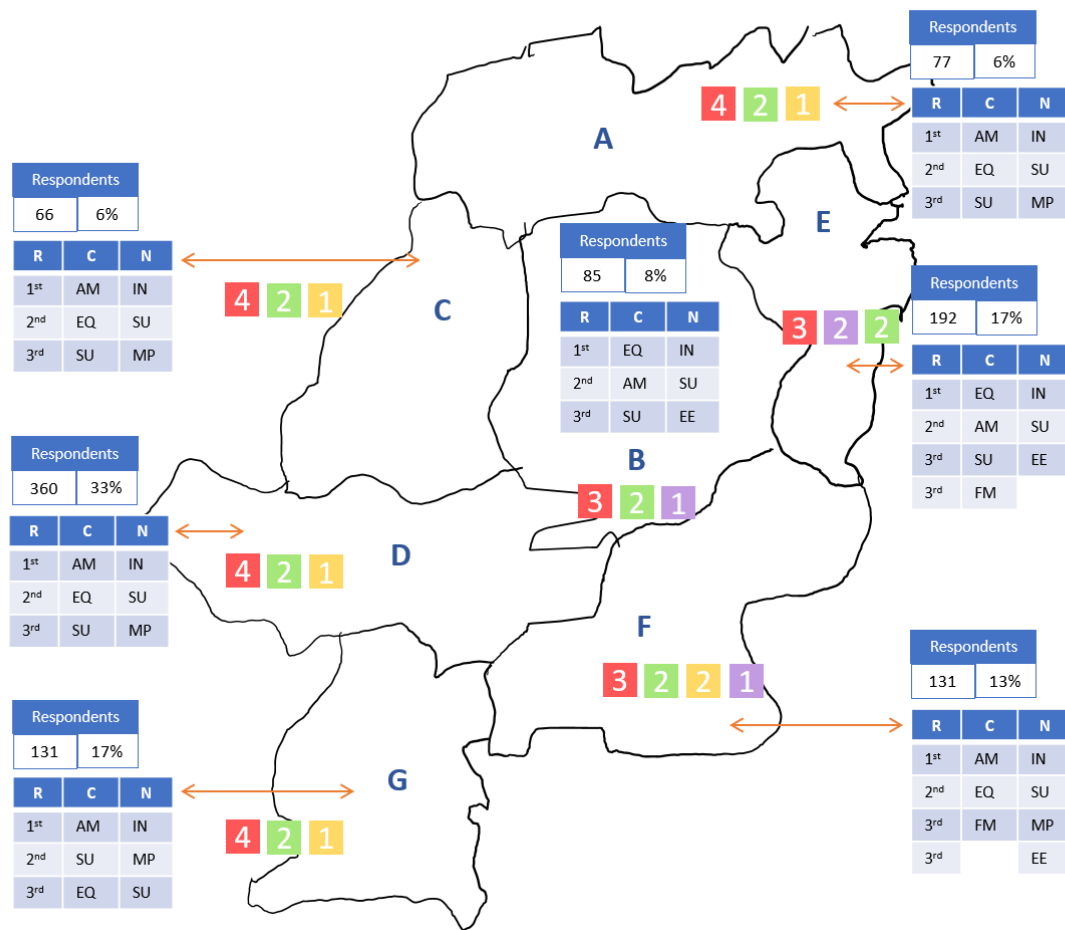


Figure 19: Mapping of the critical challenges and needs of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem

The mapping of the entrepreneurship ecosystem of the City of Johannesburg's entrepreneurs indicates how the challenges and needs faced by entrepreneurs are distributed across the city. It was observable that the key challenges and needs faced in the ecosystem are shared and similar across the ecosystem, however, there are certain parts of the ecosystem that are unique to the region. This is the context of where the entrepreneurs reside and operate emerges, however it is meshed with the reality that not all the businesses only operate in their region and hence the homogeneity of challenges and needs across the map.

This was interesting when contrasted with Figure 18's most rated domain where it was not the most represented by the number of rated challenges and needs but by severity. In other words, the mapping of Figure 19 shows how there are more measures for access to markets domain than there are in the finance domain.

However, like Figure 18, the map indicates how the most faced challenges and needs are contained in the entrepreneurship domains of access to markets and finance.

4.4 Exploratory data analysis

This chapter explores the data using statistical analyses that reduce the data in order to understand whether it can be explained using predictable models and relationships between the factors. A factor reduction method was applied, which is the principal axis factoring (PAF) method.

Principal axis factoring is a recommended exploratory factor analysis method when the factors being reduced are suspected to be correlated.

The following table represents the statistical significance of the extracted model. This was represented by the significance of Bartlett's Test of Sphericity.

Table 11: KMO and Bartlett's test for the principal axis factoring

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.908
Bartlett's Test of Sphericity	Approx. Chi-Square	4173.186
	df	153
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.908 which was high, showing that the model had enough data to produce an accurate model. This was positive for the analysis, including Bartlett's Test of Sphericity, which showed a significance of less than 0.000 which represents the high significance of the analysis output.

This table indicates the statistical cumulative predictability of the reduction model for this set of data.

Table 12: Eigenvalues and cumulative predictability for principal axis factoring

Factor	Total	Initial Eigenvalues	
		% of Variance	Cumulative %
1	5.088	28.267	28.267
2	1.314	7.302	35.568
3	1.230	6.833	42.401
4	.987	5.484	47.884
5	.940	5.220	53.104
6	.853	4.740	57.844
7	.808	4.487	62.332
8	.784	4.358	66.690
9	.728	4.042	70.731
10	.718	3.988	74.720
11	.694	3.857	78.577
12	.670	3.720	82.297
13	.633	3.518	85.815
14	.556	3.088	88.903
15	.531	2.950	91.853
16	.507	2.818	94.671
17	.486	2.701	97.372
18	.473	2.628	100.000

Table 12 indicates the process through which the analysis uses eigenvalues to build a model and extracts simplified factors. It does so by building a predictive model with each eigenvalue iteration. In this case, a model is limited to Eigenvalues above one where only three factors are reduced. The cumulative predictability of 42.2% was low and this meant that the model could only explain the nature of the data or variance of the data up to 42.2% of the time which represents a flawed basis for the research. However, it could provide a vague model that can guide a direction to build further on through additional research.

The researcher was also able to consider how many factors to extract through the scree plot in .which levels off through eigenvalues 3 and 4 which indicates that with each iteration the model returns diminishing returns of predictable accuracy.

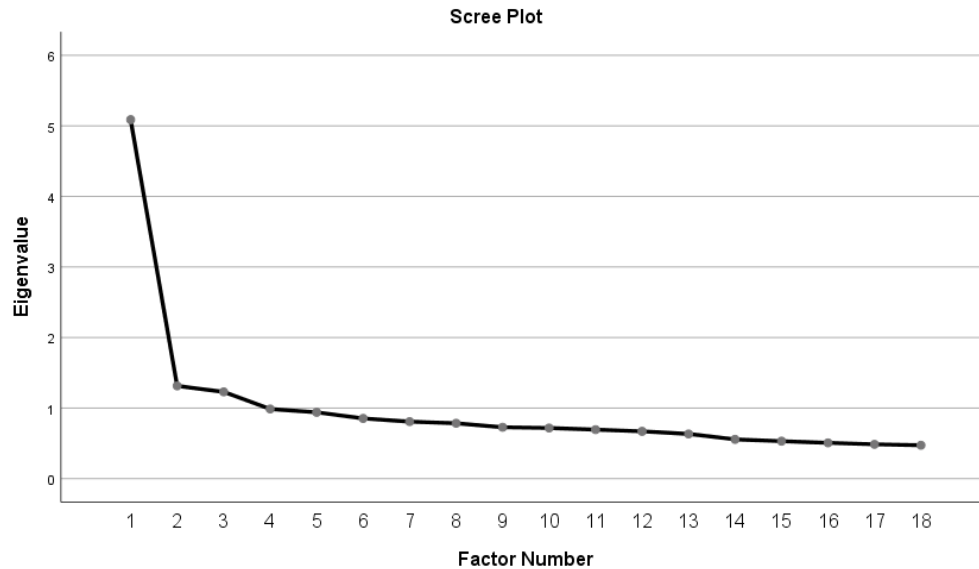


Figure 20: Scree plot for principal axis factoring

Three factors being extracted was relatively low for 18 input factors, the cumulative predictability was also low for the number of extracted factors. The incremental gain in cumulative predictability was relatively negligible for the additional extracted factor (beyond 3), therefore using the Eigenvalue value of “1” as a reference sufficed.

Table 12 represents the correlation of the different measures or questions as based on the three factors that have been extracted from the data.

Table 13: Pattern matrix of principal axis factor data reduction through Promax rotation method

Pattern Matrix ^a			
	Factor		
	1	2	3
c1			
c2	.505		
c4	.519		
c5	.615		
c6	.687		
c8	.672		
c9	.678		
c10	.489		
c11			.420
n2		.566	
n3		.533	
n5		.464	
n7			.474

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

The pattern matrix represents which of the questionnaire questions or measures are reduced into which factor and how the data has been reduced into three factors. When considering

Table 13, it was possible to see that the three factors can be defined as factor 1 (challenges), factor 2 (needs) and factor 3 (other challenges and needs) and factor 3 does not meet the criteria of being a valid factor since only two items loaded on it.

There were some elements or measures from the data that did not fit into the pattern matrix where their factor loadings were lower than 0.4. These factor loadings were suppressed in order to manage the quality of the reduction outcome. This was an indication of the accuracy of the model which has already been established as low when considering Table 13.

Table 14 represents the correlation between the extracted components.

Table 14: Factor correlation matrix for principal axis factoring

Factor Correlation Matrix			
Factor	1	2	3
1	1.000	.654	.468
2	.654	1.000	.365
3	.468	.365	1.000

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser

Normalization.

The factor correlation matrix shows how there was a relatively high correlation between factor 1 (Challenges) and factor 2 (needs). There was a limited correlation between these two factors and the third factor (other challenges and needs). This meant that when an entrepreneur needs a certain entrepreneurship ecosystem domain then it could also be regarded as having a challenge in that domain. To put it simply, both factors 1 and 2 were therefore representative of the negative perception of experience with respect to succeeding as an entrepreneur within the context of the ecosystem.

4.4.1 Reliability analysis

The reliability of how well the factors predict the data was determined by measuring the Cronbach's Alpha. It represented the significance of the correlation between the questions and the extracted components.

The following table represents the Cronbach's alpha for factor 1 (challenges).

Table 15: Reliability statistics of the first eigenvalue for principal axis factoring

Cronbach's Alpha	N of Items
.811	7

Cronbach's alpha of 0.811 showed a high level of reliability for the relatedness of the elements within factor 1 (challenges). This meant that they are interdependent and are driven by similar or the same residual forces in order to dictate their outcomes. They, therefore, have to be considered together, not only as challenges faced but as elements of the ecosystem in general. Table 16 tests whether the reliability of factor 1 can be increased by removing some of its constituent questions.

Table 16: Reliability statistics for the first eigenvalue based on item-total statistics if a component is deleted for principal axis factoring

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
c2	10.14	3.843	.468	.801
c4	10.01	3.810	.517	.791
c5	9.93	3.779	.587	.779
c6	9.93	3.729	.619	.773
c8	9.98	3.724	.581	.780
c9	9.92	3.767	.598	.777
c10	9.96	3.933	.469	.799

Since the Cronbach's alpha cannot be improved by removing one of the elements in the factor, it meant that the factor is reliable in the way it has been reduced. The following table represents the Cronbach's alpha for factor 2 (needs).

Table 17: Reliability statistics of the second eigenvalue for principal axis factoring

Cronbach's Alpha	N of Items
.528	3

The Cronbach' alpha for factor 2 (needs) was moderate which represented a fair level of reliability for the reduced model with respect to factor 2 (needs). This meant that the overall model for factor 2 (need)'s outcome was moderately reliable. The following table tests whether the reliability of factor 2 (needs) can be increased by removing some of its constituent questions.

Table 18: Reliability statistics for the second eigenvalue based on item-total statistics if a component is deleted for principal axis factoring

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
n2	3.08	.607	.372	.375
n3	2.99	.621	.333	.439
n5	2.90	.640	.317	.464

There was a significant decrease in factor 2's (needs) Cronbach's alpha when removing one of the elements, this meant that factor 2 was optimised. Factor 3 fails as a factor because it violated the number of loadings law where there is a requirement of three or more loadings to qualify.

4.5 Summary of key findings

The objective of this section was to capture the most important overall insights of the data analyses.

The study showed how the challenges and needs of entrepreneurs ranked in the City of Johannesburg's entrepreneurship ecosystem. This was also performed across filters

such as geographic region, industry and age of the entrepreneur where the same top needs and challenges remained resilient and top ranking in the heat maps.

Table 19 indicates which of these challenges were ranked the highest in the bar graph heatmaps represented from Figure 10 to Figure 13.

Table 19: The four highest represented challenges in the City of Johannesburg's entrepreneurship ecosystem

Challenges	Percentage representation
Access to markets	67%
Equipment	60%
Suppliers	54%
Financial Management	50%

The next most voted challenge by entrepreneurs was expansion, however, there was a significant gap of recognising this challenge that was on average almost twice (13%) the largest gap between the top four challenges (7%). This expansion challenge can be attributed to some of the factors in the top four, however, the gap might represent an added categorisation of the importance of these top four challenges.

The gradient between the representation of entrepreneurship needs in the ecosystem is more gradual and can be seen in Table 20.

Table 20: The six highest represented needs in the City of Johannesburg's entrepreneurship ecosystem

Needs	Percentage representation
Investors	59%
Suppliers	50%
Marketers and public relations experts	45%
Entrepreneurship education	42%
COJ supply chain	35%
Incubators	33%

These needs could be recognised as the same category of importance however the “other” needs were disregarded as they have a relatively negligible representation of 7%. The same applies to “other” challenges at 4%.

The entrepreneurship ecosystem map indicated the leading challenges and needs of entrepreneurs across different regions. The regions were mostly similar in the challenges and needs faced by entrepreneurs. This means that the City of Johannesburg entrepreneurship ecosystem can be considered homogenous across the city. The map also uncovers the main problems across the city as is reflected by the framework of Isenberg (2011). This showed that pressing areas of entrepreneurs are the access to markets and finance ecosystem elements.

The factor analysis reduced the data into a reliable set of two factors where the last factor fails to be considered a factor as it has two variables. The following tables Table 21 to Table 26 represent the outcomes of the factor analysis.

Table 21: Outcome 1 of principal axis factoring summary

Factor1 (Challenges)	Cronbach's Alpha = 0.811
-----------------------------	---------------------------------

Table 22: Outcome 1 of principal axis factoring relation to research elements

Variable code	Variable name
C2	C_Financial Management
C4	C_Expansion
C5	C_Productivity
C6	C_Processes
C8	C_Profitability
C9	C_Regulation
C10	C_Compliance

*The PAF component 1 is the same as the PCA component 1

Table 23: Outcome 2 of principal axis factoring summary

Factor 2 (Needs)	Cronbach's Alpha = 0.528
-------------------------	---------------------------------

Table 24: Outcome 2 of principal axis factoring relation to research elements

Variable code	Variable name
N2	N_Investors
N3	N_Suppliers
N5	N_Entrepreneurship Education

Table 25: Outcome 3 of principal axis factoring summary

Factor 3 (Other challenges and needs)	Cronbach's Alpha = 0.442
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Table 26: Outcome 3 of principal axis factoring relation to research elements

Variable code	Variable name
C11	C_Other
N7	N_Other

The results are summarised and aggregated into overview snapshots as seen above and then they are discussed individually as well as holistically in order to extract insights and research outcomes in the following chapter.

5 DISCUSSION OF RESULTS

The objective of the study was to explore and understand the needs and nature of challenges faced by COJ entrepreneurs with the objective of mapping them to the entrepreneurship ecosystem, identify gaps and propose a framework for a functional ecosystem. This chapter discusses how the objectives were achieved and what the limitations were in achieving these objectives. The discussion of the results is built on the exploratory findings of the study which are then mapped across the COJ's regions. It explores what has been captured and what was expected. Then it further discusses the significance of the findings related to the ecosystem in the form of a framework of addressing the entrepreneur's challenges as described in Chapter 4. Finally, it draws parallels and comparisons with the current literature and defines potential hypotheses as conclusions. The study and discussion was based on the main problem for undertaking the research and the main problem as the following.

Main Problem: To explore the state of the City of Johannesburg's entrepreneurship ecosystem and better understand the key issues and how they could be addressed.

5.1 The challenges of entrepreneurs

Sub Problem one: To identify challenges of entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem.

The research was able to establish that the following elements were the challenges that entrepreneurs are facing the most: access to markets (67%), equipment (60%), suppliers (54%) and financial management (50%). These challenges are consistent across different granularisation filters, such as geographic region of the City of Johannesburg, age of the entrepreneur and industry of the entrepreneur. These challenges do not change in priority and they do not change much in order of priority across any of these granulation filters, except for the industry in the following ways.

Geographic region C faces more expansion (45%) challenges than financial management (35%). Geographic region F faces more financial management (47%) challenges than

challenges with suppliers (43%). Entrepreneurs aged 18-25 also face more financial management challenges (55%) than challenges with suppliers (49%).

Financial management is a more faced challenge by the manufacturing/automotive, tourism, urban agriculture and other industries than challenges with suppliers. This is however averaged out in the bigger scheme of things by the large disparity faced within the construction industry where challenges with suppliers (66%) is more than financial management (53%), a 13% delta compared to the average 2.5% across the above mentioned industries.

The reduction method through factor analysis extracted component, which contains only measures that were defined as challenges for entrepreneurs in the research instrument. It therefore did not include any of the measures that were defined as needs or desires for entrepreneurs as per the measurement instrument. However, it also deselected a few measures that were defined as challenges.

When one considers which measures were included in component one by the factor analysis and relate them to the Isenberg's (2011) entrepreneurship ecosystem framework you are then able to observe the following.

Table 27: Factor analysis component one results as per Isenberg (2011) framework.

Isenberg (2011) domain	Policy	Human Capital	Finance	Markets
Measured variable	C_Regulation	C_Expansion	C_Expansion	C_Expansion
	C_Compliance	C_Financial Management		
		C_Productivity		
		C_Processes		
		C_Profitability		

One can observe from Table 27 that component one comprises of challenges for entrepreneurs and that these are the challenges that are interrelated and interdependent. They form a collective challenge that ranges across Isenberg's (2011) domains of human

capital, policy, finance and markets in order of representation. What also seems to be clear is that finance and markets are part of this component based on a single measure that influences the entrepreneur in a similar way in both domains and that is based on social capital when considering network theory and complexity theory (Borgatti & Halgin, 2011; Ferrary & Granovetter, 2009; Neck et al., 2004).

However, the including of the finance and the markets domain could also be a result of the factor analysis having selected the “challenge for the expansion” measure which in this case is shared between the three domains (human capital, finance and markets). Therefore, the component one reduction could only apply to the human capital and policy frameworks as being interrelated through residual yet unmeasurable factors between them (Fabrigar & Wegener, 2012).

The added considerable outcome of the factor analysis component one is that by virtue of reducing only challenges faced by entrepreneurs, it also deselects challenge measures that were not included and hence highlights them, as unrelated to selected measures. The following measures we “unselected”.

Table 28: Factor analysis component one results of unselected challenges for entrepreneurs, as per Isenberg (2011) framework

Isenberg (2011) domain	Markets	Finance
Measured variable	C_Suppliers	C_Equipment
	C_Access to markets	

The measures of challenges for entrepreneurs that were “unselected” are arguably supporting the discussion above that implies that the reduced component one results only apply to Isenberg’s (2011) policy and human capital domains.

How these measured challenges and their reduced outcomes are significant within the broader ecosystem and literature are discussed in the context, including subsequent sections (sub-problems three and four) of the chapter.

5.2 The needs of entrepreneurs

Sub-Problem two: To determine the needs of entrepreneurs in the City of Johannesburg

The most important needs and desires for the entrepreneurs were identified as investors (54%), suppliers (50%), marketers and public relations (45%) and entrepreneurship education (42%). The needs are consistent across various filters from other geographic regions, age of entrepreneurs and industry of entrepreneurs. This is true except for a negligible 1%-2% difference in two regions and the cleantech/greentech industry where entrepreneurship education (48%) is the second highest need followed by the need for suppliers (43%) and marketing and public relations (41%). The driving force behind this need is important to the cleantech/greentech industry is a point beyond the scope of this sub-problem, but an opportunity for future research.

When considering the outcomes of the factor analysis for component two, the researcher can observe that, similarly to the component 1, component two extracted instrument measures defined as “needs for entrepreneurs”. When these extracted needs are considered through the lens of Isenberg’s (2011) entrepreneurship ecosystem framework domains the following implies that Finance, Market and Human Capital are related and interdependent domains within the City of Johannesburg’s entrepreneurship ecosystem as based on the needs of entrepreneurs in this study.

Table 29: Factor analysis component two results as per Isenberg (2011) framework

Isenberg (2011) domain	Finance	Human capital	Markets
Measured variable	N_Investors	N_Entrepreneurship Education	N_Suppliers

The additional considerable outcome of the factor analysis in relation to component two is the “unselected measured variables” that were defined as needs for entrepreneurs. There are just as many of these “unselected” ones than the are those that are related as part of component 2 as displayed in the following table.

Table 30: Factor analysis component two results of unselected needs for entrepreneurs, as per Isenberg (2011) framework

Isenberg (2011) domain	Supports	Finance
Measured variable	N_Marketers and PR	N_Marketers and PR
	N_Incubators	N_CoJ supply chain

The unrelated needs in terms of Isenberg's (2011) domains according to Table 30 indicate that Supports and Finance are inconclusive whether they are interdependent domains. However, one can argue that due to the spread of the factor analysis results in relation to component two as being related to the defined needs and desires of entrepreneurs, it is a weak interdependence or relatedness.

5.3 Mapping the challenges and needs of entrepreneurs

Sub-Problem 3: To map the challenges and needs of entrepreneurs according to the six domains of the Entrepreneurship Ecosystem framework by Isenberg (2011).

The entrepreneurship ecosystem framework mapping of the research factors indicates that the leading challenges and needs faced by entrepreneurs within the City of Johannesburg are (in order):

- 1) Finance (51%);
- 2) Access to Markets (48%);
- 3) Human Capital (36%);
- 4) Supports (35%);
- 5) Policy (27%)

The sixth, "culture" framework element is not measured or captured in the research questionnaire.

This is aligned to existing literature about the major challenges and needs of entrepreneurs in the South African context and the cities like the City of Johannesburg (Endevour, 2018; Endeavor & FNB, n.d.; Fal, 2013; Seed Academy, 2017).

The framework mapping also shows that regions B, E and F are less prone to suffer from the “access to markets” framework element. This might be due to the spatial divide effect in the city where the regions B (Sandton) and F (Central Johannesburg) are the economic centres of the city and region E is very near to region B (Colenbrander & Gil 2017; Harrington, 2017; Phasha, 2005).

5.4 Entrepreneurship ecosystem framework for COJ

Sub-Problem 4: To formulate a framework that can be used to understand and address the challenges and needs of entrepreneurs in the City of Johannesburg’s entrepreneurship ecosystem.

The fourth objective of this study is to build on the first three objectives by conceptualising a framework to consider when addressing entrepreneurs’ challenges and desires in the COJ. The framework considers two factors:

- 1) The most pressing issues in the COJ entrepreneurship ecosystems as experienced by entrepreneurs; and
- 2) The interrelatedness of some of the issues and the domains of the entrepreneurship ecosystem.

This means that folding the elements into groups that are interdependent and then the important issues are considered in unison with their interdependence. The researcher can then realise which issues, as grouped together, need to be simultaneously considered and addressed in the ecosystem otherwise efforts may not be effective. By then making a connection to literature, one can consider which literature domains to simultaneously consider and to prioritise as major issues.

The extracted factors in relation to component 1, have revealed interrelated entrepreneurship ecosystem Isenberg (2011) domains in terms of challenges, as discussed in section 5.1 above. The component 2 extracted elements that are extracted as needs of the entrepreneurs from the COJ ecosystem from the factor analysis also reveal a set Isenberg (2011) ecosystem domains that are interrelated as discussed in chapter 5.2 above.

The study is based on understanding the challenges and the needs of entrepreneurs in the entrepreneurship ecosystem of COJ, and by virtue of this objective being measured from the entrepreneur's perspective the needs and the challenges measured are negative reflections of the ecosystem. This means that both the challenges and the needs represent what should be improved in the COJ ecosystem, and thus the measured outcomes overlap, and they are connected in how they represent the same outcome. The factor analysis is then able to take these measures and group them into in related question level measures. However, the outcome of the factor analysis when looked through the Isenberg (2011) ecosystem lens produced overlapping domains. However, the highlighted domains by the challenges and needs of entrepreneurs factor analysis are the following:

- Policy (challenges);
- Human Capital (challenges and needs);
- Finance (needs); and
- Markets (needs).

Three of the highlighted domains above as those that are interrelated are also measured as those with the highest represented issues (challenges and needs of entrepreneurs) from the COJ entrepreneurship ecosystem.

When considering the most represented issues in the entrepreneurship ecosystem by looking at the top 4 most represented challenges and needs of entrepreneurs we can see that three of the top four challenges and needs for entrepreneurs are interrelated as per the extracted components of the factor analysis. These interrelated extracted components can be transposed through the Isenberg (2011) ecosystem model and alignment is evident as discussed in *Table 27* to *Table 30*. The following *Table 31* and *Table 32* indicate this relation among the top four most pressing issues and their respective ecosystem domains and they can be summarised to three domains of the ecosystem framework by Isenberg (2011). These three domains are Access to Markets, Finance and Human Capital (Isenberg, 2011). These three factors are commonly conceptualised and outlined by scholars and distinctly incorporated within entrepreneurship ecosystem models that are provided within literature (Cohen, 2006; Isenberg, 2010; Spigel, 2015; Stam, 2015).

This means that they are recognised and relatively robust ecosystem domains to consider when discussing examining the entrepreneurship ecosystem literature.

Table 31: Top four most important challenges for entrepreneurs in COJ ecosystem and their interrelated components and Isenberg (2011) domains.

Challenges	Isenberg (2011) domain	Percentage representation
Access to markets*	Markets	67%
Equipment*	Finance	60%
Suppliers	Markets	54%
Financial Management*	Human Capital	50%

Table 32: Top four most important needs for entrepreneurs in COJ ecosystem and their interrelated components and Isenberg (2011) domains.

Needs	Isenberg (2011) domain	Percentage representation
Investors*	Finance	59%
Suppliers*	Markets	50%
Marketers and public relations experts	Supports/Markets	45%
Entrepreneurship education*	Human Capital	42%

When considering entrepreneurship ecosystem the can be summarised to three domains of the ecosystem framework by Isenberg (2011). These three domains are Access to Markets, Finance and Human Capital (Isenberg, 2011). These three factors are commonly conceptualised and outlined by scholars and distinctly incorporated within entrepreneurship ecosystem models that are provided within literature (Cohen, 2006; Isenberg, 2010; Spigel, 2015; Stam, 2015).

5.4.1 Markets

This entrepreneurship ecosystem element is represented by the following variables based on literature:

- N_Suppliers;
- N_Marketers;
- C_Suppliers; and
- C_Access to Markets.

This result is aligned with the latest literature that examines the challenges of entrepreneurs and SMEs in South Africa, where the connections and networks within the ecosystem are not dense and strong enough (Endeavour, 2018; Endeavor & FNB, n.d.; Fal, 2013; Seed Academy, 2017).

5.4.2 Finance

This entrepreneurship ecosystem element is represented by the following factor two variables:

- N_Investors;
- C_Equipment.

These are elements that the research has outlined as one of the most important areas to focus on in Johannesburg, South Africa's and Africa's entrepreneurship ecosystem(s) and this is aligned to what is found in literature (Endeavour, 2018; Endeavor & FNB, n.d.; Fal, 2013; Seed Academy, 2017).

5.4.3 Human capital

This entrepreneurship ecosystem is represented by the following variable:

- N_Entrepreneurship Education;
- C_Financial Management

This element is an element that can be represented in literature by echoing the limited talent challenge faced by entrepreneurs (Endeavour, 2018; Endeavor & FNB, n.d.; Fal, 2013; Seed Academy, 2017). This is in the sense that technical and professional talent with entrepreneurial orientation or interest in working with start-ups is limited.

This implies that there is an interdependent relationship between these three domains within the context of the most pertinent challenges and needs of entrepreneurs in the City of Johannesburg's entrepreneurship, where the success or failure of a domain in the ecosystem of one of these means a success or failure for the other two.

Whereas Markets and Finance are largely influenced by connections and social capital in the ecosystem in order to exchange value and resources in a way that expands each other, Human capital is largely a basis of the entrepreneur's ability to access these networks through experience and know-how. Whether based on credibility, legitimacy, close ties and/or market understanding, the entrepreneur is the driver and representative of the human capital domain in the ecosystem. There is also the element related to the employment human capital to which the entrepreneur has access, however in this study, human capital is scoped around the entrepreneur and assumes it as a function of the broader human capital in the ecosystem.

With this in mind, the study is then able to combine the six domains of the entrepreneurship ecosystem as described by Isenberg (2011) with the systems-network approach concept of the ecosystem (Stam, 2009 2015; Stangler & Bell-Masterson; 2015) in order to discuss the interrelatedness between the key challenges and needs of entrepreneurs in COJ's entrepreneurship ecosystem.

The following figure signifies a framework based on this thinking, where the three most pertinent ecosystem domains (Isenberg, 2011) representing the highest rated challenges and needs by COJ entrepreneurs, are nested in a system of layered formal networks, informal networks, social ties, interactions and relationships that create ecosystem outcomes and outputs (Stam, 2009, 2015; Stangler & Bell-Masterson, 2015).

The systems-network approach to how these three domains interact can be further understood through the following factors of ecosystem dynamics: connectivity, density, fluidity, and diversity, where they represent the nature of economic interactions within the social capital nature of the markets and finance domains in the context of this study's framework (Harrington, 2017; Meyers, 2015; Theodoraki, Messeghem & Rice, 2017; Stangler & Bell-Masterson, 2015).

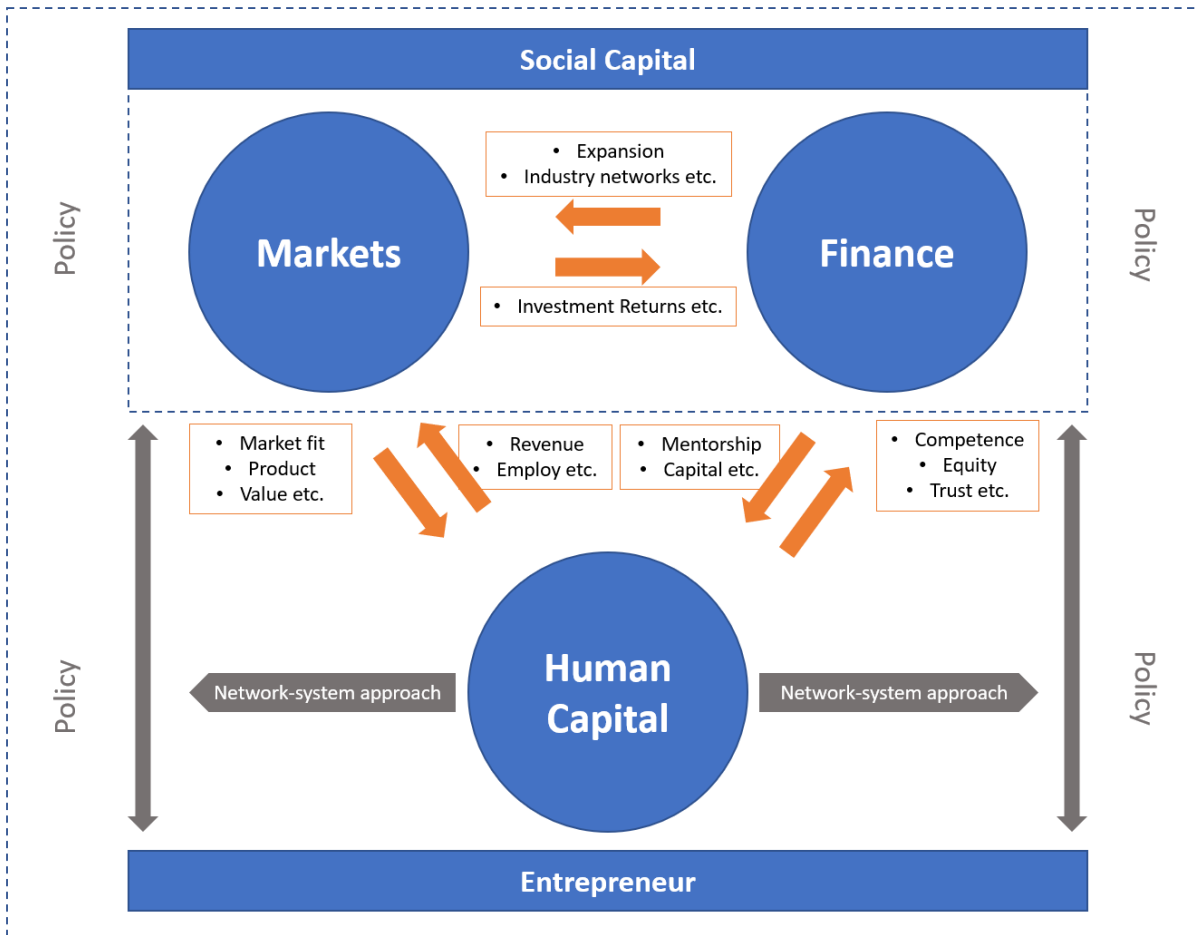


Figure 21: Entrepreneurship ecosystem framework to consider the challenges and needs of COJ's most pertinent challenges and needs (showing sample outcomes and outputs)

Source: a Conceptualised framework based on above discussion

As discussed in chapter 5.1, the Isenberg (2011) policy domain is also an interrelated domain to the domains mentioned above. Therefore, although it is not identified as a pressing issue (leading challenges), it becomes important to realise that is interrelated with very pressing issues as per the rating of challenges and needs across the whole ecosystem. Thus the policy domain does have to be considered within this model in Figure 21 as one of the interrelated domains where a multipronged approach may be required to change. Policy is a holistic encompassing factor for entrepreneurship development and its implications are broadly affecting directly and indirectly, all element of entrepreneurship ecosystems and hence the framework above (Moos, 2014;

Wattanapruttipaisan, 2003). That is why the framework encapsulates the three domains that have been cited as central to the critical challenges and needs faced by entrepreneurs with the complex interrelated policy domain.

The framework above can be used as a lens to consider an holistic approach to addressing the key gaps in the entrepreneurship ecosystem in COJ by discussing the interactions and residual network effects between the most pertinent challenges and needs of COJ entrepreneurs. It is however important to recognise that the framework is idiosyncratic because of the complexity and nature of network effects within entrepreneurship ecosystems (Borgatti & Halgin, 2011; Ferrary & Granovetter, 2009; Isenberg, 2011; Preisendorfer, Bitz & Bezuidenhout, 2012). This framework aligns to the importance and role of social networks of interdependent economic agents that interact through a flow of capital, information and labour (talent) as they are in successful and robust ecosystems that create innovations (Ferrary & Granovetter, 2009; Jen, 2005). The essence of these three domains being the most critical and connected domains in the COJ ecosystem could imply the complex network theory significance as communicated through this framework that serves as an approach to creating a supporting environment for entrepreneurship to thrive (Bull & Willard, 1993; Ferrary & Granovetter, 2009).

This framework can also be considered further through academic study that builds on the understanding of COJ's entrepreneurship ecosystem's current gaps (including other similar urban regions around the world). The role of knowledge networks and Each region would however consider the framework through a contextualised lens because each region has unique chrematistics that play out over time through idiosyncratic circumstances (Isenberg, 2011).

The discussions entailed in the chapter above form the core of how the entrepreneurs that are engaged represent the entrepreneurship ecosystem of COJ as well as how their challenges and needs shape within the entrepreneurship ecosystem model by Isenberg (2011). Then all these considerations are combined into a holistic model that extracts latent and residual factors between the challenges and needs in order to produce a framework and model, although contextual to COJ, has implications in similar regions and indicates foundations of complex network theory as part and parcel of other ecosystems.

6 CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter takes a summary of the study by recalling the conclusions made by the study as connected to the purpose of the study. It then goes on to outline the implications of the conclusions made by the study as well as the recommendations to be considered by stakeholders related to the study topic. Then the limitations of the study are considered as well as the suggestions this study makes for future studies.

6.2 Conclusions and of the study

The conclusions of the study are considered based on the study's purpose. The conclusions are presented in three categories as they relate to the aims of the study. The three categories are the identified challenges and needs, the mapping of the entrepreneurship ecosystem challenges and needs, and the reduced elements into factors of relatedness that reveal a COJ Entrepreneurship Ecosystem framework that can be used to identify and address the challenges and needs (exploratory factoring). Through these categories, the researcher is able to uncover how market access, finance and human capital, encapsulated by policy implications, are the gaps in the ecosystem and that they are interdependent in a complex way that requires them to be simultaneously considered in order to address the issues.

6.2.1 Identified challenges and needs

The study was able to uncover a representation of the City of Johannesburg's entrepreneurs in terms of who they are, where they are, and what they do. The sample is a representation of the City of Johannesburg's statistics. They show that certain groups of the population are participating in entrepreneurship more than others across groups such as age, gender, race, region of residence.

The challenges and needs of entrepreneurs in the ecosystem can be seen as gaps represented by negative experiences or issues of entrepreneurs (challenges and needs).

The challenges that are identified are led by access to markets, equipment, suppliers and financial management. The needs are led by the desire for investors, suppliers, marketers and public relations support and entrepreneurship education. These are the major challenges and needs faced by entrepreneurs that can be condensed to market access, finance and human capital challenges and needs.

The existing literature (Endeavour, 2018; Endeavor & FNB, n.d.; Fal, 2013; Seed Academy, 2017) supports these findings in a broader South African context but not for the City of Johannesburg's entrepreneurship ecosystem. The pertinent challenges and needs are also supported by literature on a South African level. This part of the study adds data and information to the topic in the context of South Africa and Africa. This data and information comes in the form of highlighting the challenges and needs of entrepreneurs in the form of an ecosystem lens on the basis of Isenberg (2011) for COJ. This is an important element of strengthening the theory by contesting its application in different contexts, especially because entrepreneurship ecosystem theory is regional based in nature (Theodoraki, Messeghem & Rice, 2017).

6.2.2 Entrepreneurship ecosystem mapping

The study revealed the areas of challenges and the areas of need for the City of Johannesburg's entrepreneurs. These major challenges are represented in the different heatmaps, regardless of age, industry or region, as consistent. The major challenges are then revealed across the map of the City of Johannesburg. This enables the researcher to understand where the gaps in the entrepreneurship ecosystem, from a geo-position perspective, are nestled on top of the entrepreneurship ecosystem framework.

The mapping also identifies a unifying pattern about the challenges experienced across the City of Johannesburg. This conclusion is supported by the literature that outlines how entrepreneurship ecosystems develop and are best considered at a regional level, such as a large city, due to the frequency and strength of systems interactions that happen at city level proximities and economic levels (Auerswald, 2015; Harrington, 2017; Stangler & Bell-Masterson, 2015).

The distribution of the challenges and areas of needs for entrepreneurs reveal that there is an effect of spatial divide. This is supported by the density and fluidity considerations of the entrepreneurship ecosystem (Harrington, 2017).

6.2.3 Entrepreneurship ecosystem framework with COJ context

The study reduced the challenges and needs into a model represented by four domains where a framework is conceptualised by taking the challenges and needs that are most critically faced by entrepreneurs and challenges and needs that are interrelated and looking at them through the domain ecosystem domains (Isenberg, 2011) and systems-network literature (Stam, 2009 2015; Stangler & Bell-Masterson; 2015). It then can represent an holistic and interrelated approach through which addressing, researching or considering the entrepreneurship ecosystem in the City of Johannesburg can be done.

This framework also can be understood through the ecosystem literature that represents how money, information and labour can flow through value creation as products, services (for customers and suppliers), capital growth and returns (for investors) (Harrington, 2017; Meyers, 2015; Theodoraki, Messegheem & Rice, 2017; Stangler & Bell-Masterson, 2015). However; the consideration of complexity theory and network theory behind this is explored and appreciated in the study and through the framework (Borgatti & Halgin, 2011 Trend Compendium 2030, 2011). The domain that is related to policy becomes a useful consideration for policy makers to understand that the pivotal role that policy implications have on entrepreneurship ecosystem development (Kreft & Russel, 2005; Moos, 2014; Rigby & Ramlogan, 2013).

6.3 Implications and recommendations

The research has revealed important areas of consideration in relation to existing literature and the nuances of the City of Johannesburg entrepreneurship ecosystem. These implications are extracted from the three different levels of findings which are the demographics, mapping and the ecosystem framework.

The following implications and recommendations are mostly directed at policy makers in Johannesburg and similar regions across South Africa and the world.

- There should be an increased focus on entrepreneurs who are considered older or non-youth. These are the age groups which are represented in 35 years old and above. They are the most represented age groups in entrepreneurship and their entrepreneurial journeys are unique to their circumstances. Therefore, catering to these age groups' circumstances in a way that optimises their chances of success is important. The reason this is important is because research shows that these entrepreneurs are up to four times more likely to succeed due to their increased experience as they get older. It is recognised that youth unemployment is a key social ill and issue in South Africa therefore interventions can continue to be directed at this problem. However, more can be done to address this issue like supporting older entrepreneurs to create employment because they are more likely to succeed and fulfill the hypothesis that entrepreneurship solves unemployment.
- Equity balances in gender represent increased diversity which is healthy for the ecosystem. This means more programmes to support women-led or co-founded businesses should be improved or established in order to increase the representation of women that is causing a gap between intended women entrepreneurs and actual women entrepreneurs.
- The challenges and needs for entrepreneurs in the City of Johannesburg's entrepreneurship ecosystem is relatively homogenous, meaning that the same approach could be applied across the city except for Region B, but this region is still not too different. However, the main challenges identified in the City of Johannesburg are interconnected and interrelated. These leading challenges and needs can be condensed into: finance, markets, and human capital (e.g. Entrepreneurship Education) If not addressed in unison, the intended impacts and changes are likely to be limited.
- The framework is a recommendation about the key levers to pull in order to affect the gaps in the COJ entrepreneurship ecosystem. The first is the emphasis on network theory and complexity theory within the context of entrepreneurship ecosystems (system-network approach, density, connectivity, etc.). Although difficult to predict the relationship function, it seems that the more social capital networks are promoted, the higher the probability of creating network effects that

may elevate the ecosystem's outcomes and outputs. The second key consideration is human capital that is considered holistically through experience, knowledge, entrepreneurial experience and available labour. Human capital elevation is a multiplier effect on the intrinsic value of the interactions in the network.

6.4 Limitations of the study

The following points represent the weaknesses of the study and they open the conclusion up to vulnerability. These are areas that the researcher has identified as limitations in the study's conclusions.

- The questionnaire instrument was composed of questions that would identify challenges and needs for COJ entrepreneurs. However, these challenges and needs that were proposed in the questionnaire were not completely aligned to the entrepreneurship ecosystem literature. They, therefore, do not allow the study to fully explore the ecosystem domains as they are expressed in literature. These questions were based on the consensus of challenges and needs that COJ entrepreneurs had.
 - The mapping, however, is adopted from the entrepreneurship ecosystem defined in literature through six domains;
 - This also extends to industries tested for, or the way that the industries were surveyed, because there is a misalignment that skews the data towards the “construction” industry which the respondents may have regarded as over-represented in the questionnaire;
- The sample source comes from a series of entrepreneur events for the purposes of addressing entrepreneurs' challenges and needs, however this form of sampling COJ entrepreneurs may not be representative as certain entrepreneurs are attracted due to the nature of the invitation as well as due to the channel of invitation. This can be seen in the concentration of “construction” related entrepreneurs while there are a plethora of unrepresented entrepreneurs in the “other”.

- From an analysis perspective, there is a limitation in the way the data is used to extract insights. The data is based on averages and this can be useful to simplify data, but it can also hide patterns and data points that cannot be revealed through averages.
- The framework is developed using limited statistical extractions of the data where the statistical model used to extract and reduce the data was not necessarily strong due to the cumulative model prediction being less than 50%. Therefore the extracted factors are flawed to an extent, only being able to explain a vague relatedness and residual interdependence.

6.5 Suggestions for further research

The study is an exploratory study that is aimed at uncovering and discovering aspects of the COJ entrepreneurship ecosystem that are not existent in current literature. This means that it is based on creating a foundation upon which more research can be performed in order to better understand the issues and elements of the entrepreneurship ecosystem in COJ.

This study has outlined the key issues for entrepreneurs in the COJ, the study has also mapped these issues geographically, then reduced these to those that are related that can be considered interdependent. This opens the opportunity to dig deeper in and try to understand why these dynamics are represented the way they are in COJ. One can have better odds of resolving the ecosystem issues by understanding why the key issues of finance and access to markets have arisen in the ecosystem.

Further research would be valuable in understanding the descriptive statistics that have been uncovered by this study. These are statistics such as the distribution and representation of age, gender and industry. The objective would be understanding why these distributions and representation are as they have been discovered in this study. This also includes falsifying or enforcing the finding in this study.

The mapping allows researchers to identify geographic areas of the city in relation to the challenges that entrepreneurs experience. The different regions are identified to be similar and the City of Johannesburg's entrepreneurship ecosystem seems to be

homogenous. The reason for this remains unclear and it is also unclear whether the reason behind each region's entrepreneurs' challenges are the same or caused by different factors. This becomes an area of further research that could take a closer look at the economic-geographic factors that be affecting the mapping in this study, in each region.

The factors, having been bundled into related component (variables), allows researchers to focus on challenges that will affect each other. This means that further research could focus on the reduced factors of this study that are interrelated. This could mean understanding why and how they are interrelated in the context of COJ which means better understanding how the major challenges for entrepreneurs could be addressed. There is also an opportunity to strengthen the framework or falsify it by re-examining the relationships it concludes through an extended set of factors measuring similar entrepreneurship ecosystem concepts and constructs.

APPENDIX 1: SURVEY INSTRUMENT

Entrepreneurship Ecosystem Research Instrument

The following questions are section one of the survey and they are to collect the basic and background information of you as the entrepreneur. Please fill according to the option that you closest identify with.

Name					
Surname					
Ages	18-25	26-35	36-45	46-55	55 & older
Please mark with x					
Race	African	White	Coloured	Indian	Other
Please mark with x					
Company name					
Contact number					
Contact email					
Gender	Male	Female	Disability	Yes	No
Industry sector	Manufacturing/Automotive		Tourism (hospitality and retail)		
	Cleantech/greentech		Urban agriculture		
	Construction		Other		

The following sections are related to the challenges and needs in the entrepreneurship ecosystem in the City of Johannesburg, please answer to your interpretation.

Which of the following do you recognise as a need (Please select as many as apply)	
	Incubators
	☐
	COJ supply chain
	☐
	Entrepreneur education (i.e college/university)
	☐
	Marketers/public relations companies
	☐
	Investors
	☐
	Suppliers
	☐
	Other (if so)
	☐

Which of the following to recognise as your biggest challenges (Please select as many as apply)	
	Processes ☐
	Equipment ☐
	Connecting with suppliers ☐
	Scale/expansion ☐
	Regulation ☐
	Clients/customers/access to markets ☐
	Money management ☐
	Profitability ☐
	Productivity ☐
	Compliance ☐
	Other ☐

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