

**A digital earthmoving equipment service
platform to enhance customer aftermarket
experience.**

A Business Venture Proposal submitted to the Wits

Business School by

Nnanna Reshoketswe Molele

Student number: 607224

Tel: +27 82 4777 070

Email: 607224@students.wits.ac.za

Supervisor: Dr Renee Horne

February 28, 2023

Executive summary

The absorption of technology solutions has become more and more prevalent in the mining and construction industries. Mining and construction companies worldwide are implementing technology solutions as they seek to improve the safety, productivity, and profitability of their earthmoving operations. One of the most critical and capital intensive assets that these operations own and operate is their earthmoving equipment. The maintenance and repair of the equipment also contributes heavily to the operational expenditure of such operations (19% for large operations). It is critical for these operations for their equipment maintenance to be done in a timely manner, at the lowest possible cost, and with the highest possible level of quality so as to manage operational costs and reduce the impact of machine downtime on productivity.

This business venture is based on a South African company that supplies earthmoving equipment to mining and construction companies in the Southern Africa market. The company not only supplies equipment, but also aftermarket solutions (parts and maintenance & repair services). In the past five financial years, the company has seen a decline in revenue from its service business where it sells technician labour to the mining and construction markets for equipment maintenance and repairs. Its customer net loyalty score is also sitting at an average of 32% in the same period. Customer loyalty has been negatively impacted by customer dissatisfaction with the organisation's service quality, turnaround time, and communication, to name a few. The service business profitability has also been on a downward trend (14% in 2018 to 9% in 2022).

Given the size of the organisation and the number of countries it operates in, this paper only focuses on the Zambia market where the company's service business is currently seeing negative profitability trends and the lowest customer net loyalty score of 18%. In response to this business challenge, this paper focuses on using technology and third party equipment service providers (labour for maintenance and repairs) to propose a business model that will create shared stakeholder value. The business model seeks to address current customer challenges while improving the business profitability and making it more feasible for third partner service providers to partner with the organisation instead of operating as its competitors.

Table of Contents

1. Introduction	7
1.1. Overview	7
1.2. Purpose of the business venture proposal	7
1.3. Background of the study	8
1.4. The business challenge being addressed	9
1.5. Objectives of the business venture	10
1.6. Scope of the business venture	11
1.7. Study assumptions	11
2. Literature review	12
2.1. Introduction.....	12
2.2. Advancements of digitisation in mining and construction	13
2.3. Impact of heavy admin structures and lack of digitalisation in big organisations 15	
2.4. The platform, shared, and gig economies: leveraging solutions applied in other industries	17
2.4.1. Collaborative service provision, stakeholder value creation, and establishing a competitive advantage	19
2.4.2. Leveraging the gig economy and small businesses to mitigate technical skill shortage	21
2.5. Tools and techniques of entrepreneurship: new venture creation as a process 22	
2.5.1. Business Model Canvas	22
2.5.2. Minimal Viable Product and Customer Discovery & Validation	23
2.6. Management theories applicable to the business venture	23
2.7. Conclusion of the literature review.....	25
3. Methodology	26
3.1. Research methodology	26
3.2. Population and sample.....	26
3.2.1. Population	26
3.2.2. Sample and sampling method.....	27

3.3.	Data collection instruments	28
3.4.	Data collection procedures	28
3.5.	Data analysis and interpretation methods	29
3.6.	Data quality	29
3.6.1.	Credibility and verifiability of secondary data	29
3.6.2.	Credibility, confirmability, dependability, and transferability of qualitative data	29
4.	Study results	31
4.1.	Understanding how the service business operates.....	31
4.2.	Analysis of secondary quantitative data	32
4.2.1.	Customer loyalty analysis	33
4.3.	Analysis of primary qualitative data	39
4.3.1.	Quality of service	40
4.3.2.	Turnaround time	41
4.3.3.	Cost of service	42
4.3.4.	What the organisation needs to improve on to better serve customers	43
5.	The business venture	44
5.1.	Strategic business approach and solution offering	45
5.1.1.	The strategic business model.....	45
5.1.2.	Solution development and implementation: rollout initial product with minimal viability	49
5.1.3.	Determining financial viability of the solution.....	51
5.1.4.	Competitive advantages arising from the offering	54
5.1.5.	Execution plan.....	54
5.2.	Final Recommendations	55
6.	References	56

List of figures

Figure 1: The business problem: the impact of processes and skills on the organisation's service business.....	Error! Bookmark not defined.
Figure 2: High level structure of the service business.	Error! Bookmark not defined.
Figure 3: high level service business process map.	Error! Bookmark not defined.
Figure 4: Customer net loyalty score (October 2021 - September 2022).....	Error! Bookmark not defined.
Figure 5: Net loyalty score sample size by region (October 2021 to September 2022).	Error! Bookmark not defined.
Figure 6: Zambia five-year customer split by loyalty state.	Error! Bookmark not defined.
Figure 7: Zambia five-year customer net loyalty scores ..	Error! Bookmark not defined.
Figure 8: Five-year analysis of factors contributing to the net loyalty score	Error! Bookmark not defined.
Figure 9: Five-year service business profitability analysis.	Error! Bookmark not defined.
Figure 10: Zambia Five-year service business profitability analysis against rest of the business.....	Error! Bookmark not defined.
Figure 11: Understanding customer challenges in different market segments	Error! Bookmark not defined.
Figure 12: The proposed business model.....	46
Figure 13: Minimal solution design to address customer issues and improve business performance.....	50
Figure 14: Solution rollout plan.....	54

List of tables

Table 1: 2018 to 2022 technical skills loss.....	Error! Bookmark not defined.
Table 2: Stakeholder shared value creation.....	47
Table 3: Financial modelling of current business model	51

Table 4: Financial modelling of future service business	52
---	----

Glossary

Term(s)	Definition
Customer relationship management (CRM) system	CRM systems provide a central location where companies can store customer data and track customer interactions.
Do it for me customers	Customers that have an all-inclusive maintenance and repair contract with a service provider. The service provider handles all the maintenance and repair work and charges the customer an agreed flat rate or works on a job order basis (charge the customer for every maintenance and repair job done)
Do it myself customers	Customers that perform all their maintenance and repair work in house and rely on the services of an equipment provider as and when needed.
Do it with me customers	Customers that have a maintenance and repair contract that covers some but not all the maintenance and repairs that need to be done. These customers handle some of the work with their internal capabilities and outsource the rest.
Earthmoving	Earthmoving refers to any construction, mining or other activity which alters the surface of the land. This includes, but is not limited to, excavations, land development, and mineral extraction.

Equipment/ Heavy Equipment/ earthmoving equipment	Earthmoving equipment refers to any piece of heavy machinery that can move and grade soil and rock.
Field service	Machine service work that takes place in the field/ at a customer site where the machine would be operating. This type of service work normally takes place on unplanned breakdowns as opposed to planned maintenance work.
Field service technician	A technician/ mechanic that attends to equipment breakdowns in the field.
Equipment life	The number of hours that a machine can be operated for before it is rebuild/ refurbished or decommissioned.
Net loyalty score	A metric that measures the extent to which a customer is inclined to return to a company for their products and services.
Service/ Equipment Service	Equipment service refers to the maintenance and or repair of equipment at scheduled intervals (planned maintenance) or unscheduled intervals (unplanned maintenance).
Service/ maintenance contract.	An agreement between a service provider and a customer to allow the service provider to do part or all the customer's equipment maintenance and repairs.
Service warranty	Warranties that result due to workmanship errors. If a customer experiences one on their equipment because of service work that was performed by an equipment provider's technicians, then the customer can claim a service/workmanship warranty at the expense of the equipment provider.
Third party service providers	Organisations and individuals with the technical skills required to service equipment but do not provide the equipment.

1. Introduction

1.1. Overview

The world has become a fast paced and competitive environment in which organisations need to continuously evolve to remain relevant and compete. In the fourth industrial revolution, many organisations have adopted digital strategies to enable them to be more efficient and effective in how they conduct business (Ismail et al., 2017). The evolution of technology over time has enabled organisations to better serve their customers in new and innovative ways (Zouari & Abdelhedi, 2021). It is therefore critical for organisations to continuously evolve to stay relevant in their respective markets.

This business venture proposal seeks to utilise technology to address business challenges in an existing organisation. The organisation in question is a subsidiary of a R16bn publicly listed South African company that has been in existence for over 120 years (the Organisation, 2022). This subsidiary organisation provides construction and mining equipment to the earthmoving industries. It also provides aftermarket/ post equipment sales solutions to said industries. These solutions include the sale of equipment parts and services/ maintenance to support the diverse range of customers throughout the life span of the equipment that they purchase (the Organisation, 2022).

The company operates in several territories across the Southern Africa region. These territories include Zambia, South Africa, Malawi, Lesotho, Mozambique, Namibia, Botswana, Swaziland, Angola, and the Democratic Republic of Congo (the Organisation, 2022).

1.2. Purpose of the business venture proposal

The purpose of this business venture proposal is to explore the feasibility of a digital platform business model for the organisation's service division with the aim of transforming the current manual and admin heavy structure. The model seeks to create a service business solution that will improve the organisation's service market share, reduce service turnaround time, and reduce service labour pricing by digitising the current process and implementing a cost-effective labour structure that includes the organisation's current workforce and external contractors.

1.3. Background of the study

Mining and construction companies start the process of their revenue generation by moving the earth (Casey, 2018). For mining companies, the process of earthmoving involves drilling and blasting of Insitu mineralised and waste rocks and then transporting the different rocks to their respective destinations (waste dumps for waste rocks and processing plants for mineralised rocks) (Mahindra Admin, 2016). This process continues throughout the life of a mining project and can result in millions and even billions of tonnes of material being moved over several years depending on the size of the project (Casey, 2018). On the other hand, construction companies carry out their earthmoving operations during the early stages of their projects such as in road and dam construction (Fu, 2013).

Companies that run mining and construction projects rely on heavy equipment as the primary tools of moving the earth (Wollam Construction Admin, n.d). This equipment includes large trucks, drills, and loaders to name a few (Mahindra Admin, 2016). The capital required to purchase the equipment can go up to hundreds of millions of dollars for big project sites (Mining Technology Staff, 2022). On top of incurring equipment purchasing costs, these companies must also incur the costs of maintenance throughout the life span of the equipment or the life of a project (Christiansen, 2018). These maintenance costs contribute heavily to the overall costs of running such operations. In the mining industry, maintaining and/ or servicing equipment can account for 19% of all mining costs (Poxleinter, 2016). Christiansen (2018) also argues that mining companies can spend between 35% to 50% of their annual operating expenditure on equipment

maintenance and repair. As such, these companies are not only looking for quality maintenance and service solutions for their equipment, but also solutions that are cost effective.

It is critical for the organisation in question to position itself in a manner that will enable it to provide quality and cost-effective maintenance and service solutions to the diverse pool of customers in both the mining and construction industries. Currently, the organisation offers relatively high-cost solutions to a cost sensitive market (the Organisation's records, 2022). New ways of providing equipment services to customers need to be explored for the organisation's service department to stay competitive and profitable.

1.4. The business challenge being addressed

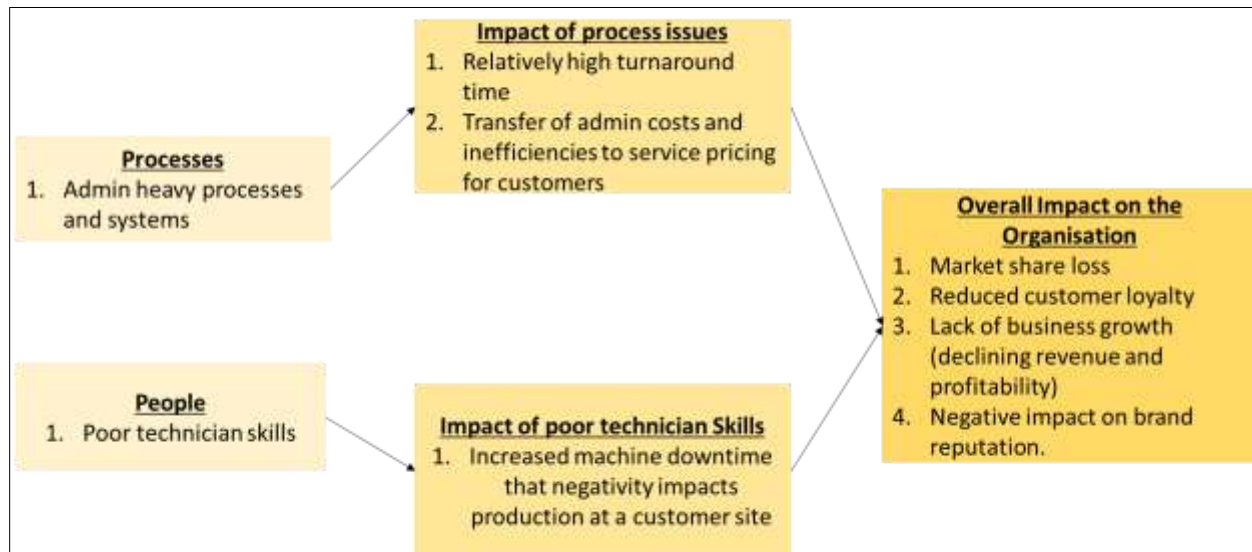
The five year historical performance of the service division was analysed from internal company records and served as a basis for stating the business challenge. Over the years, the organisation has been experiencing declining service revenue and profitability. From the end of its 2018 financial year (September 2018 to September 2022), the organisation's service contribution (profitability) as a percentage of overall service business revenue declined from 14% in 2018 to 9% in 2022 against a target of 18% (the Organisation's records, 2022). Revenue also declined from R5.9 billion to R5.3 billion in the same period. Revenue has declined due to the loss in service market share and the drop in customer net loyalty score. The average net loyalty score for the past five years is sitting at 32%, indicating that the organisation is at risk of further market share loss as customers continue to opt for alternative service providers (the Organisation's records, 2022). The organisation's current structure of the service business has also had a negative impact on its profitability due to high operating costs that mainly result from its admin labour. The current structure is admin heavy and consists of 55% productive labour vs 45% unproductive/ admin labour costs (the Organisation's records, 2022). This labour structure would be difficult to transform with the current admin intensive Customer Relationship Management (CRM) system in use. The organisation is also lagging in transforming and implementing innovative solutions in this part of the business (the Organisation's records, 2022).

The labour market has also been highly competitive resulting in loss of technically skilled labour to other big competitors, small service providers, and to the organisation's own customers. The organisation has lost twenty-eight skilled technicians in the past five years (the Organisation's records, 2022). The proposed digital solution in this study includes partnering with former employees of the organisation as well as small service providers that are currently competing with the organisation to better service customer equipment. Creating a digital solution that involves third party service providers has the potential to pose further market share loss to the organisation as these third parties can directly approach and serve the customers, as such, the business model needs to be structured in a way that makes the organisation a key value adding stakeholder. The organisation must not kick itself out of the market in an attempt to digitise in partnership with external service providers. Rather, it must find ways to turn its competitors into long term complementors for the business.

Essentially, the challenges that lie in the service processes and people skills are having a negative impact on the overall performance of the business. Figure maps out the business challenge faced by the service business. Addressing the processes and people challenges will result in improved customer service and business growth.

Figure 1

The business problem: the impact of processes and skills on the organisation's service business



Source: (Author's own work, 2022)

1.5. Objectives of the business venture

The main objective of this business venture proposal is to develop a business solution that focuses on improving the current revenue and profitability state of the equipment services business. This will be achieved by:

- Tackling processes and people challenges that have attributed to the organisation's high-cost structure, loss in market share and customer loyalty.
- Ensuring that the solution focuses on delivering value to every key stakeholder of the organisation's service business. This includes customers and any external equipment service providers who will be part of the solution.
 - Customers will receive quality equipment services at the lowest possible competitive price with relatively fast turnaround time.
 - External service providers will have the opportunity to generate revenue from an increased pool of customers.

Overall, this business venture seeks to tackle people and processes legacy issues while delivering shared value for all stakeholders, with focus on growing the service business in both revenue and profitability terms.

1.6. Scope of the business venture

This study focused only on the equipment service division of the organisation. It covered both the mining and construction markets. Considering time and resource constraints, the study only focused on one of the territories where the organisation operates. As one of the key mining and construction regions for the organisation, Zambia was the focus area for the study. This region also had the lowest customer net loyalty score in 2022 amongst all the regions of operation. Its net loyalty score was 18% versus an average of 49.8% for the entire organisation (the Organisation's records, 2022).

1.7. Study assumptions

Part of the study included qualitative data from nine respondents. The organisation serves twenty-one major/regular customers with the rest being irregular walk in customers. The nine respondents that were interviewed represent 43% of the regular customer population thus their experiences with the organisation can be taken as an accurate representation of the population's experiences. It is assumed that the respondents had enough knowledge in this area of research to clearly articulate answers to the interview questions. Secondly, it was assumed that respondents were truthful when answering all the interview questions. The truthfulness of respondents informs the quality of collected data and thus impact the proposed solution. The quantitative net loyalty score data was collected using a net loyalty score survey issued monthly to customers by the organisation. Again, the assumption is that the respondents of the net loyalty score survey were truthful in their responses and provided honest feedback on the organisation's service.

2. Literature review

2.1. Introduction

Businesses globally have been adopting technology to improve how they run their operations and how they serve customers (Zouari & Abdelhedi, 2021). Technology has enabled many businesses in different industries to do things efficiently and with improved effectiveness (Zouari & Abdelhedi, 2021). This literature review focused on understanding

technology trends in the mining and construction industries and how organisations operating in these industries have been impacted by implementing different technologies in their businesses. Secondly, with admin costs and lack of digitalisation being part of the challenges faced by the organisation in question, the literature review also focused on understanding the implications of maintaining heavy management/ admin structures together with lack of digitalisation on businesses and ultimately on the customers they serve. Thirdly, as this study explores the implementation of a digital platform as a potential solution to address the identified business challenge, the literature review also looked at how other organisations have digitalised to better serve their customers and other stakeholders. This includes organisations of digital origin as well as those who have evolved in their digitalisation journey. Although the idea of a digital platform solution is new to the space of servicing mining and construction equipment, it is not entirely new to the world of business as it is seen in other multiple industries such as e-hailing and retail with the likes of Uber and Amazon. Part of this literature review looked at how the successes and business models of such organisations can be leveraged in the process of establishing a solution that will best address the identified business challenge while delivering value to all relevant stakeholders. Lastly, the literature review also focused on understanding and leveraging the applicable Entrepreneurship Techniques and Management Theories to ensure high probability of success in the development and implementation of the solution.

2.2. Advancements of digitisation in mining and construction

The appetite for digitalisation in the mining and construction industries has grown over the years as mining and construction companies see the cost, safety, and productivity benefits associated with its application (Boudreau-Trudel et al., 2015)

"Digitalisation in mining refers to the use of computerised or digital devices or systems and digitised data to reduce costs, improve business productivity, and transform mining practices" (Barnewold & Lottermoser, 2020). Operating in the 4th Industrial Revolution, the mining industry is undergoing a digital transformation that is changing the business of today and will continue to shape the business of the future (Grehl et al., 2017). Mining companies have been employing and developing innovative digital solutions in a drive to

improve productivity, improve process efficiency, reduce costs, and enhance the safety of their operations (Sánchez & Hartlieb, 2020). Research conducted with the application of data mining techniques showed that there are currently 107 different digital technologies being pursued in the mining industry (Barnewold & Lottermoser, 2020). Automation of mining trucks, supply chain planning systems, virtual training, real time data tracking, and artificial intelligence are amongst the technologies in use to improve current operations (Barnewold & Lottermoser, 2020). The use of automation, Robotics, and remote control of equipment have enables mines to operate on an almost continuous cycle than never before thus significantly improving the production output of these operations at a relatively lower cost per unit/ per tonne of material mined when compared to traditional mining techniques (Sánchez & Hartlieb, 2020). In addition to process improvement, the application of digital solutions in mining has also been found to improve labour productivity (Boudreau-Trudel et al., 2015).

The drive to increase the productivity of operations while minimising costs makes mining equipment uptime essential. "Investors pay close mind to machine Reliability, Availability, and Maintainability (RAM) when considering use in operations" (Alaska Structures, 2016). in a mining operation, the major share of the initial capital investment goes towards excavation and material transporting equipment such as trucks and excavators (Arputharaj, 2015). The maintenance of these equipment also becomes part of the high-cost activities associated with running such operations (Arputharaj, 2015). maintaining and/ or servicing mining equipment can account for 19% of all mining costs (Poxleinter, 2016). The downtime of these equipment can have severe negative financial impacts on an operation. The estimated daily cost associated with an excavator breaking down at a large mining operation is 5 million USD and 1.8 million USD for a haul truck (Alaska Structures, 2016) thus making equipment uptime crucial.

Similar technological advancements are seen in the construction industry. The construction industry is critical to the socio-economic development of any country, particularly in developing countries where the lack of critical infrastructure still prevails (Aghimien et al., 2021). When construction companies transform from a traditional delivery approach to a more digitalised approach, they see significant improvement in

project delivery timelines and enhancements in their competitive advantage (Aghimien et al., 2021). Attainment of these advantages is evident in developed countries where the implementation of digital solutions is more advanced (Berger, 2016). There has, however, been an increasing uptake of digitalisation in the construction industry in developing economies (Aghimien et al., 2018). In South Africa, for instance, digitalisation is highly evident in the design and feasibility stages of projects (Aghimien et al., 2021). It is applied in processes relating to cost planning and cost control. Companies see the benefit of technology when it comes to time saving in the delivery of projects, increase in productivity, and quality of work (Aghimien et al., 2021).

These technological advancements in both industries make it critical for mining and construction equipment suppliers to ensure that their technology offerings and their own internal digital capabilities are in line with the needs of their mining and construction clients. Rapid/ disruptive technological advancements have proven to be a challenge for these types of organisations as they are large and asset intensive in nature (Siachou et al., 2021). Big and asset intensive organisations have over time, proven that they lack capabilities to change, and in some cases, they do not see the business opportunity or appreciate it enough to change their traditional ways (Gao et al., 2019). The organisations that do see the need for change have difficulty in goal determination and sequencing of actions to enable the realisation of the desired change (Gao et al., 2019). These types of organisations have traditionally experienced incremental change as opposed to disruptive innovation, thus making them relatively rigid in their ways (Siachou et al., 2021). It is essential for such organisations to overcome the inherent cultural obstacles that derail/ delay necessary business transformations to stay competitive and effectively deliver the services required by their clientele, with technology as a potential massive enabler.

2.3. Impact of heavy admin structures and lack of digitalisation in big organisations

One of the challenges the organisation in question faces is the presence of an admin heavy structure coupled with lack of digitalisation. This section of the literature review seeks to understand the impact of these two factors on big businesses and ultimately on their customers.

Big organisations with high non-productive labour costs usually have a top-heavy management model that is both cumbersome and costly (Hamel, 2011). A hierarchy of managers/ high number of administrative roles exacts a heavy tax burden on any organisation (Hamel, 2011). This heavy expense comes in several forms; Firstly, managers add high overhead costs, and as an organisation grows, the costs of management rise in both absolute and relative terms (Hamel, 2011). In addition to managers that are in direct operations, there is normally hundreds of employees in management-related functions, such as finance, human resources, and planning. Their job is to keep big organisations from collapsing under the weight of their own complexity (Hamel, 2011).

Apart from immediate overhead costs, a heavy management structure also increases the risk of bad decisions, disenfranchise employees, and slows progress which further costs organisations in the long run (Hamel, 2011). Admin heavy structures and their resulting complex processes can often result in what is referred to as organisational drag (Mankins, 2017). The average company loses more than 20% of its productive capacity (more than a day each week) to organisational drag (Mankins, 2017).

Big companies have managed to run well and achieve performance targets without management superstructures (Hamel, 2011). One extreme case is that of Morning Star, which is an organisation that employs over 600 employees and an additional 4000 seasonal employees (Minnaar, 2016). The company has seen double digit growth over the past 20 years while operating without managers (Hamel, 2011). In order to generating enough revenue to cover all overhead costs and costs associated with inherent process inefficiencies while still being profitable, organisations with heavy management structures have to transfer the pain to their customers.

in 1965, Theodore Levitt, a Harvard Business School economics professor, developed the time dependent product lifecycle model which consists of four phases: 1) product introduction, 2) product growth, 3) maturity, 4) and decline (McKeown, 2017). This product life cycle model remains relevant in today's business world, however, what is seen is the significant time reduction in which each of the four phases in the model occur (McKeown, 2017). The function of time is simply collapsing and businesses that do not leverage

technology to digitally transform will find themselves being competitively disadvantaged (McKeown, 2017). What is unique with 4th industrial revolution organisations is that taking risks with digital transformations is becoming a cultural norm to be able to develop competitive advantage (Ahmad & Murray, 2019). It has become critical for organisations to continuously reinvent their business models to match, and in some cases, define what the market looks like by introducing solutions that have never been seen before (McKeown, 2017). The digital economy has also made it easier to innovate, test, purchase, outsource and co-create than ever before (McKeown, 2017). Companies that are digitally advanced also stand a relatively better chance of retaining talent (Kane et al., 2015). "Employees across all age groups want to work for businesses that are deeply committed to digital progress. Company leaders need to bear this in mind in order to attract and retain the best talent" (Kane et al., 2015). Digital adoption is also associated with productivity gains for organisations, especially in the manufacturing industry and in industries with routine-intensive work (Gal et al., 2019). When it comes to big organisations that have been operating in their respective industries for a long time, successful branding simply does not guarantee immunity from changing market conditions (McKeown, 2017). Simply put, "Businesses that don't digitally transform will be washed away with the pace of change; it will happen with remarkable speed, and it will come with no warning" (McKeown, 2017). In today's environment, digital adoption has become imperative for the survival and growth of most organisations thus requiring leaders who are able to set clear digital strategies and foster cultures of change to continuously evolve (Ahmad & Murray, 2019).

2.4. The platform, shared, and gig economies: leveraging solutions applied in other industries

A digital platform business is simply a business that makes use of digital technologies to connect buyers and sellers, create network effects, and reduce transactional friction (Armstrong & Lee, 2021). Robin (2020) also defines digital business platforms as online businesses that enable a commercial interaction between consumer and supplier. Currently, seven out of the top ten firms in the world are platform businesses that have managed to disrupt global economics in just the last decade (Armstrong & Lee, 2021). By structuring access to markets, platform businesses have become gatekeepers for

billions of dollars in economic activity (Khan, 2019). A study published by Juniper (2017) as cited in Young (2020) forecasted that by 2022, the sharing economy alone, consisting of companies such as Uber and AirBnB, would be generating \$40 billion in revenue compared to the \$18.6 billion generated in 2017.

The exponential growth of these sharing-economy giants shows that collaborative consumption is here to stay and will continue to grow (Young, 2020). Young (2020) goes on to describe collaborative consumption as nothing new, but rather the reinvention of traditional market behaviours such as lending, swapping, sharing, and bartering. The only thing new behind the sharing economy is the technology behind it that is now enabling it to be done at a massive global scale (Young, 2020). The sharing economy is also growing amongst south African companies. By applying the AirBnB concept to a critical South African problem, Digs Connect has managed to grow itself in the sharing economy space by coming up with a solution to address the shortage of student accommodation through connecting students with potential landlords and housemates (Young, 2020).

The likes of Uber, AirBnB and Digs Connect are meeting the market need for collaborative consumption through collaborative provision. In other words, they are the technology giants behind what Young (2020) calls the reinvention of traditional market behaviours. The success of these companies is not only attributed to simply connecting service providers to service seekers but can also be attributed to their entrepreneurial initiatives, how they build and apply digital models, savvy branding, and customer-centric focus (Anwar, 2018).

Research conducted by McKinsey shows that apart from platform businesses, which include sharing economy businesses, there is generally a high rate of digitisation across multiple industries (Bughin et al, 2018). Despite this, many leaders in different organisations still underestimate the increasing momentum of digitisation with only 8% of surveyed companies saying that their current business model would remain economically feasible if their industries keep digitalising at their current rate (Bughin et al, 2018). Amongst organisations that are lagging behind in digitalisation are those whose digital strategies are simply failing due to the disruptive economic force that digitalisation

has become and its incompatibility with current traditional economic, strategic, and operating models (Bughin et al, 2018). Organisation have to avoid plugging in technology into existing structures and expecting business improvements (Bughin et al, 2018). Going digital is not something that you buy and plug into the organisation, It is multifaceted and involves more than just technology (Davenport & Westerman, 2018). Simply put, digital transformation is an ongoing process that requires investment in skills development, projects, and infrastructure (Davenport & Westerman, 2018).

Digitising brings big advantages for those who implement it early and well in their respective industries (Bughin et al, 2018). Firstly, Digital is driving what Bughin et al (2018) call winner-takes-all economics resulting from scale and network effects that enable certain organisations to dominate markets. This effect can be seen in the case of Amazon and how its market capitalisation tops those of other giant retailers or how apple is able to continuously capture over 90% of profits in the smartphone industry (Bughin et al, 2018). Timing also becomes critical in implementing digital solutions/ strategies. Going digital rewards first movers and some fast followers as a result of developing a learning advantage that puts them ahead provided that they continuously develop their solutions to stay ahead of the competition (Bughin et al, 2018).

2.4.1. Collaborative service provision, stakeholder value creation, and establishing a competitive advantage

This section of the report looks at how companies operating platform businesses create stakeholder value and competitive advantage while collaborating with other service providers. The goal is to leverage the business models of such companies to create a sustainable equipment service solution for the organisation.

Uber is one of the most successful digital platform companies in the world. The company saw a gap to improve service, availability, cost/ pricing, and turnaround time in the taxi industry (Hales & Mclarney, 2017). What was an opportunity for Uber is currently a weakness for the service business of the organisation in question, the only difference is the industries in which the two operate. To capitalise on the opportunities in the taxi industry (weaknesses of other taxi businesses), Uber used an innovative business model

that is based on networking and technology to capture a big market share in a short space of time (Pratap, 2022).

Uber uses a cost leadership and technology based differentiation strategy (Pratap, 2022). Unlike traditional taxi services, Uber takes small percentages (between 5 to 20%) of revenue generated from rides while using the networking effect to get more drivers on its platform (Pratap, 2022). Not owning its own vehicles means that the company does not have to incur costs related to infrastructure and maintenance thus further enabling it to operate as a low cost-high profit business that is still able to charge competitive rates to customers (Hales & McLaren, 2017).

Although the company has been successful competing with price, its technology based differentiation is the primary source of its competitive advantage (Hales & McLaren, 2017). Technology (the Uber app) is the main enabler of its services and plays a central role in its business model (Hales & McLaren, 2017). Through its app, Uber has been able to make taxi booking easy, reduced the industry turnaround time by connecting passengers with drivers close to them, and simplified the ride payments (Pratap, 2022).

Despite being a market leader in the e-hailing business, Uber continues to invest in product development to meet changing and emerging customer needs while staying competitive (Pratap, 2022). This can be seen with the company's introduction of Uber X, Uber Comfort and Uber Eats into the market. Being a first mover played a big role in the success of the company, however, continuous improvement of its products and introduction of new ones is what is playing a critical role in keeping it ahead of the competition.

Another organisation that was a disruptor in its industry is Airbnb. The company defines itself as "a social website that connects people who have space to spare with those who are looking for a place to stay", rather than a chain of hotels (Chaoudary, 2013). Just like Uber, Airbnb acts as a middle man operating a digital platform where hosts and travellers can connect, enabling transactions without the company actually owning any of the accommodations itself (Chaoudary, 2013).

Formed in 2008, the company operates in 190 countries with over 1.5 million accommodation listings in over 34 000 cities (Winkler & Macmillan, 2015). As of 2015, the company was valued at \$24 billion after being in operation for less than a decade, surpassing industry giant Marriott International Inc which was valued at \$21 billion despite having more than 4000 hotels (Winkler & Macmillan, 2015).

Its business model is one that is quite disruptive but yet very simple (Bashir & Verma, 2016). Apartment owners list their apartments on the Airbnb platform, decide their own booking schedule as well as pricing (Bashir & Verma, 2016). Airbnb simply generates its revenue from fees charged for connecting property owners with people seeking accommodation without having to own any properties itself (Bashir & Verma, 2016).

On top of its simple business model, Airbnb has strong value propositions for both accommodation seekers and property owners thus making itself a key enabler of the transactions (Bashir & Verma, 2016). Accommodation seekers get a large amount of choice and variety, often get cheaper rates than they would at a hotel and also get authentic stays and experiences while on the other hand, hosts get income generation and management tools to manage their reservations while also leveraging the long standing reputation of Airbnb (Bashir & Verma, 2016).

Looking at both the Uber and Airbnb cases, there is a lot that can be adopted to create a solution to a problem in another industry such as that of the organisation's service business. Both companies do not own any infrastructure other than their technology but have managed to structure their business models in a way that creates value for both suppliers and consumers on their platforms thus making them a key partner in the end-to-end process of the services being delivered.

2.4.2. Leveraging the gig economy and small businesses to mitigate technical skill shortage

There is currently a lack of skills globally for certain areas of the economy. The 2019 ManpowerGroup annual talent shortage report showed that the global skills shortage was sitting at an average of 54% while in Africa, the average was sitting at 34% (Janse van Rensburg, 2020). Amongst the top ten skill shortages is the lack of technicians (Janse

van Rensburg, 2020). This lack of skills is a challenge for the organisation as it needs skilled technicians to perform quality services on customer machines.

Over the years, the 'gig economy' has grown rapidly as a form of service delivery that challenges existing business models and labour-management practices (Healy et al., 2017). The development of online communication platforms has enabled the phenomenon of the gig economy, which is a new economic model that enables different forms of short-term employment (Banik & Padalkar, 2021). The gig economy has become a source of influence in today's generation of professionals with individuals in different areas of skills proving to be valuable resources for companies who need a specific set of skills for a certain amount of time (Green, 2018)

Organisations can derive several benefits by integrating the gig economy into their business models. These benefits include the ability to control levels of fixed versus flexible labour costs in a world full of economic uncertainty, opportunity to pull skilled labour when needed from a larger workforce base outside the organisation and increasing organisational productivity by pulling in skills during peak demand (RMM Admin, 2022).

2.5. Tools and techniques of entrepreneurship: new venture creation as a process

Successful entrepreneurs are those that can identify an unmet need in the market and produce solutions to best meet the need (Chisholm, 2020). They are also able to identify and understand the strengths and competitive advantages that can be achieved from the solutions they create to meet the identified need (Chisholm, 2020). There are several tools that entrepreneurs can use in the process of creating new business ventures or simply introducing innovative solutions to challenges in existing organisations. The three most critical tools and techniques are the Business Model Canvas, Minimal Product Viability, and Customer Discovery and Validation (Cousins, 2018). This chapter looks at the function of these three key entrepreneurial techniques and how entrepreneurs can apply them as they address customer needs and satisfy market demands in a way that makes them superior to their competitors.

2.5.1. Business Model Canvas

The Business Model Canvas is a strategic entrepreneurial tool that is used to describe, design, challenge, invent, and pivot the business model (Hemmer, 2016). It gives a clear visual of what the business model is and how the activities of the business should be aligned to deliver value to both the business and its customers (Hemmer, 2016). Using the Business Model Canvas can enable businesses to develop agile business models (Cousins, 2018). The mistake made by many companies today as they attempt to innovate is focusing heavily on the technology, product, and design while neglecting the process of figuring out the business (Alberdi, 2022). They neglect to figure out how the solution is going to enable the business to make money while meeting customer needs (Alberdi, 2022). Although the Business Model Canvas is a fluid concept that is specific to individual companies, it still consists of nine key building blocks that can help companies to structure what their business or what certain parts of their business will look like (Alberdi, 2022). These steps are: 1) Customer segments that the business will serve, 2) the value proposition, 3) Channels in which the product or service will be delivered to customers, 4) the different customer relationships, 5) revenue streams, 6) key resources of the business, 7) key activities that will be conducted to generate revenue while meeting customer needs, 8) key partners that are needed to make the business or solution a success and, 9) the cost structure (Hemmer, 2016). A suitable and sustainable business model is one that achieves product/market fit (Cousins, 2018). Simply put, the service or product needs to address customer needs and desires (Cousins, 2018).

2.5.2. Minimal Viable Product and Customer Discovery & Validation

The next step after developing a viable business model is introducing the product or service into the market (Cousins, 2018). The business should start by developing the simplest version of a product that will attract customers while providing an opportunity to maximise its learning for continuous improvement (Crash Course, 2019). A good Minimal Viable Product (MVP) needs to have key three characteristics: 1) it must have enough value to attract customers to start using it, 2) give customers an idea of what is to come in the future, and 3) it must also give the business feedback to learn from as it attempts

to improve the product or service in a manner that is value adding to the customer (Amit, 2022). The business must always be prepared to continuously revisit the drawing board until it hits upon the features that meet significant customer needs and wants (Cousins, 2018). There is no business plan that withstands initial contact with customers (Cousins, 2018). To create product longevity and sustainability, any business needs to be willing to course correct and improve its product or service based on the feedback received from customers (Cousins, 2018). Customer feedback needs to be at the centre of any improvement that will take place. Businesses need to foster quality interactions with customers to gather data and information that will be analysed to assist in revising value propositions to ensure that they are always in line with critical customer needs (Amit, 2022).

2.6. Management theories applicable to the business venture

This last chapter of the literature review considers the business challenge faced by the organisation and how different management theories can be applied in the development of a solution that will best address the current business challenge in a manner that adds value to customers. “Management theories are a collection of ideas that recommend general rules for how to manage an organisation or business” (Birt, 2022, para. 1). Throughout the history of their existence, management theories have enabled organisations to focus on their main goals, communicate and execute on those goals, and evolve over time (Birt, 2022). There are seven widely known management theories currently utilised by leaders in different organisations. These are: 1) The Scientific Management Theory, 2) Principles of administrative management theory, 3) Bureaucratic management theory, 4) Human relations theory, 5) Systems management theory, 6) Contingency management theory, and 7) Theory X and Y (Conlin, 2023). Of these seven, four are most applicable to the business venture at hand.

Frederick Taylor’s long standing scientific management theory demonstrates the importance of workplace efficiency and people development. Taylor argues that management should ensure simplification of tasks and processes to increase productivity and quality (Birt, 2022). Individuals in organisations and teams should also be assigned tasks that best match their capabilities. Ensuring process simplification and assigning the

right technicians (internal and external) to service jobs will improve service quality and turnaround time. While useful for task management, the scientific management theory has often been criticised for neglecting the humanity and needs of individuals (Birt, 2022).

In his fourteen principles of management, Henric Fayol stated that leaders had five main functions in their organisations; to forecast, plan, coordinate, command, and control (Fernandes, 2023). He then developed the fourteen principles to outline how leaders should organise and interact with their teams (Fernandes, 2023). The following four of the fourteen principles are most applicable to the business venture: 1) Remuneration of personnel – this is critical to retain internal skills and attract external skilled partners given the current technical skills shortages and competitive labour market. 2) and 3) Division of work and order– service jobs come in different complexities on different equipment type. assigning diverse types of service jobs to individuals with better skills to complete the task will be critical for the service organisation. these two principles are in line with two other principles from Max Weber’s Bureaucratic Theory. In his theory, Max Weber also emphasised the importance of task specialisation and formal selection of individuals based on qualification and skills. 4) Subordination of individual interest to general interests – this refers to achieving harmony between the interests of the organisation and individuals (Conlin, 2023). This is a significant aspect to consider for both talent retention and partnering with external service providers that have the potential to be competitors of the organisation’s service business.

Max Weber’s Bureaucratic Theory further contends that the significance of rules and requirements in a way that the previous two theories do not mention. He argues that it is critical for organisations to establish and use standard operating procedures (Fernandes, 2023). This is particularly significant in servicing mining and construction equipment given the importance of quality, turnaround time, and the repetitive nature of most of the work.

Lastly, in his Systems Theory, Ludwig von Bertalanffy’s argues that everything needs to work together for a business to succeed (Conlin, 2023). Given that the business venture focuses on digitalisation of several processes and partnerships with external providers, a system thinking approach will be critical to the success of the proposed solution.

Collaboration is also key in systems thinking, particularly when the business solution requires involvement/ changes from multiple departments (Whiteside, 2022). Different stakeholders from each department need to be brought together to understand the different needs that should be met through the systems thinking approach (Whiteside, 2022). It is also during this process that clear ways in which the different departments will work are identified (Whiteside, 2022). In addressing the organisation's business challenges, the proposed solution will require multiple departments (Service technical, service admin, parts, finance) to be part of the digital transformation process. To offer a single point of transaction for customers, the tasks and processes from the different departments will need to be integrated to form a system that will improve overall customer service.

2.7. Conclusion of the literature review

The uptake of technology in the mining and construction industries has grown over the years as companies see the cost, safety, and productivity benefits associated with its application. The digitalisation of systems and processes in these two industries is becoming a norm in many organisations. It is critical for organisations such as the one in question to overcome the inertia towards the application of technology as a result of the asset heavy nature of their businesses coupled with management/ admin super structures.

The uptake of technology has also grown across many organisations in different industries. This provides the organisation in question the opportunity to leverage their successful business models and adopt them to the mining and construction equipment servicing environment. Lastly, given that the digitalisation solution being proposed is new to the organisation in question, the application of Entrepreneurship Techniques and Management Theories can enable a high probability of success in both the development and implementation phase of the solution.

3. Methodology

3.1. Research methodology

In preparing the business venture proposal, a mix of secondary quantitative data and primary qualitative data was gathered and served as a basis for the business proposal. The secondary quantitative data (net loyalty scores and profitability trends) is of a time series nature and was used to analyse five-year trends of the service business performance and the causes of those trends. Secondly, the primary qualitative data was obtained through customer interviews and was used to further inform how the organisation needs to structure the service business to better serve customer needs. Literature on how other organisations have managed to successfully run platform businesses was also leveraged, together with Entrepreneurship Techniques and applicable Management Theories.

3.2. Population and sample

3.2.1. Population

The population of the study encompassed over fifteen mining and construction companies with multiple operations whose machines are serviced or have been serviced by the organisation's service department. The organisation also has a wide range of smaller/walk in customers that they serve on unpredictable demand levels.

Although the data collection was based on the Zambian market, the end goal is to create a service solution that can work to serve all customers in all the territories of operation in Southern Africa given that all the service organisations in the different territories have an identical business structure. As such, a solution that works in the Zambian market can potentially work in the rest of the territories.

3.2.2. Sample and sampling method

The conducted interviews for gathering the qualitative data focused on both mining and construction customers operating small, medium, and big fleets of equipment. The sample mix also contained customers that have or do not have existing equipment service contracts with the organisation.

This type of sampling is known as non-probability sampling as it involves non-random selection of participants from the population (McCombes, 2019). Although the sample was not random, the Zambian market contains a diverse range of customers who are also seen in the organisation's other territories of operation. The service departments in the different territories also have the same business structure meaning that they serve customers in same manner. As such, data collected from the Zambian market would not only inform the creation of a solution that is suitable for customers in Zambia, but potentially the entire Southern Africa region.

The conducted interviews consisted of nine mining and construction customers running their operations in the Zambian region. The established relationships that the organisation's Zambian team have with their customers was leveraged to motivate their participation/ cooperation in the study.

The secondary customer net loyalty score quantitative data was analysed over a five-year period with a rich sample size of 180 previously completed surveys. The survey results were used to inform the organisation off the different customer loyalty states (loyal, vulnerable, and at risk) and the overall net loyalty scores. Historical financial data was also analysed to understand the performance trends of the service business.

3.3. Data collection instruments

The secondary quantitative data used already existed and was retrieved from the organisation's databases. This time series data was used to analyse the performance trends of the service business, the causes of the trends, and the sustainability or unsustainability of the current business model.

The qualitative data was gathered through in-depth one on one interviews guided by a questionnaire focusing on the quality, cost, and turnaround time of the organisation's service department. The in-depth questioning around these focus areas aimed to enable the development of a solution that addresses the business challenge as detailed in section 1.4. The interviews also created opportunities to uncover other factors that are not detailed in section 1.4 but are of value to customers. As such, the proposed solution

also addresses other challenges not stated in section 1.4 but are of critical importance to the organisation's customers.

3.4. Data collection procedures

several types of quantitative data were collected from the organisation's databases. All these sets of secondary data were collected and analysed over a period of five financial years. Trends and their severity were identified and analysed over time. The data only focused on the Zambian market and included: i) financial performance data for the region's service department, ii) cost structure for the service business and how that impacts pricing for servicing customer machines, iii) net loyalty scores for the region to analyse how likely customers are to continue giving their business to the organisation or move to competitors.

The qualitative data was gathered through online interviews with mining and construction customers. The interviews were recorded, transcribed, and analysed at a later stage.

3.5. Data analysis and interpretation methods

Different data analysis methods were used to analyse both the quantitative and qualitative data sets. The secondary quantitative data was analysed using time series analysis methods. These methods of data analysis are used to study the characteristics of variables with respect to time (Pandian, 2021). Trends in the data were identified together with their causes.

There are several methods of analysing qualitative data. These include content analysis, narrative analysis, discourse analysis, thematic analysis, grounded theory, and interpretive phenomenological analysis (Warren, 2020). For this study, two methods of analysis were used: Namely, content analysis and thematic analysis. The two methods were chosen due to their suitability for analysing qualitative data gathered in interview form.

3.6. Data quality

3.6.1. Credibility and verifiability of secondary data

Data credibility refers to the level of trust that one can put in the data they are collecting (Aroh, 2014). It is important to consider who collected the data, for what purpose, and when and how the data was collected (Granderson, 2018). In the case of this study, the secondary data sources can be characterised into two; namely, financial and survey data. The financial data is continuously tracked to monitor the organisation's performance. Customer net loyalty score data is collected by the organisation through monthly surveys. All this data is tracked to see the performance of the service business as well as where it stands against other service providers in the market. Since this is a publicly listed organisation that releases its financials to the public and investors, it is assumed to be a credible source of data. The financial data is also audited prior to its release to the public.

3.6.2. Credibility, confirmability, dependability, and transferability of qualitative data

Guba's four major categories (Credibility, confirmability, dependability, and transferability) are the most common categories used to understand the means of establishing validity/ trustworthiness in qualitative research (Self, 2019). In this study, credibility was ensured through prolonged engagement with the data by the researcher as they were responsible for not only conducting all interviews with customers, but also transcribing all the data before it was thoroughly analysed using the methods outlined in section 3.5 above. Credibility was also ensured through triangulation of data (Self, 2019). For this study, the qualitative data was converged with the secondary quantitative data. In other words, the detailed information gathered from interviews regarding the organisation's service business was compared with the current performance data. Peer-debriefing and member checking are also other ways to ensure credibility in qualitative studies (Self, 2019). Peer-debriefing was done by experienced personnel in the service business as well as in the region where the study was conducted. Member checking was also done during the collection of data/ interviews by asking clarification questions were necessary.

To achieve dependability, the researcher ensured that the research process was logical, traceable, and clearly documented. The applied qualitative research instrument consisted

of questions that aimed to address the defined problem while also leveraging the literature review. Interviews were recorded and transcribed before any analysis of the data commenced.

Transferability focuses on the generalisation of study findings and attempts to apply them to other contexts and situations (Devault, 2019). Although researchers cannot definitively prove that outcomes based on the interpretation of the study data are transferrable, they can establish the likelihood (Devault, 2019). Qualitative data collection was done for the Zambian region only, however, the likelihood that the study findings could be transferable to other regions where the organisation operates is high given that service departments in all the regions are structured to serve customers in the same manner. It is highly likely that customers in different regions experience similar service challenges. Net loyalty score data was also relied upon to substantiate transferability.

Confirmability focuses on establishing that the researcher's findings and interpretations are clearly and accurately derived from the collected data, requiring the researcher to show how conclusions and interpretations have been reached. According to Guba and Lincoln (1989) as cited in Nowell et al (2017), confirmability is established after credibility, transferability, and dependability are all achieved.

4. Study results

4.1. Understanding how the service business operates

The organisation's service business consists of both technical (productive) and admin (non-productive) staff in all its territories of operation. On top of that, the organisation also has a line of business (LOB) service division situated at its head office in South Africa. This division operates as a support centre for all the regions on matters such as product and service warranties and implementation of processes. The operating costs for the LOB service division are paid for by the territories in the form of management fees, further adding on to the labour rate that the business sells to the market. Figure 2 shows a high-level view of the Zambia service business structure. Excluding the country management and the LOB service division, Figure 2 shows that the organisation has a technical to

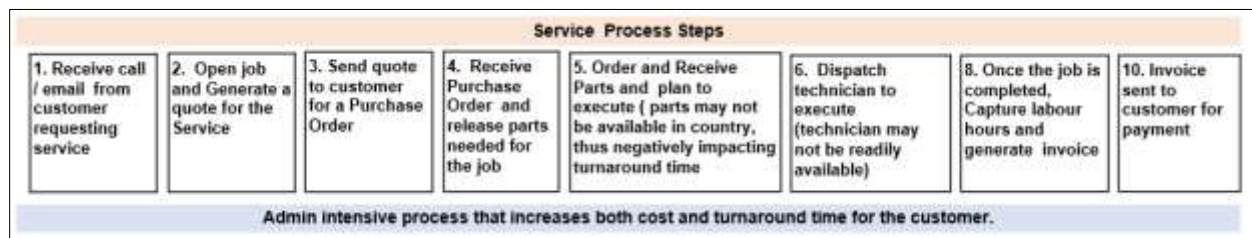
admin staff ration of 1: 0.6 (24 technical staff + 14 management and admin stuff). Due to this admin heavy labour structure, the organisation has a service cost structure with productive labour only accounting for 55% of total labour costs (the Organisation's records, 2022). A study conducted by organisation also showed that its service business holds the top position for a high-cost structure amongst its peers in the Africa and Middle East regions (the Organisation's records, 2022).

High level structure of the Zambia service business.

Source: (Confidential information of the organisation, 2022)

Figure 3

High level service business process map.



Source: (Confidential information of the organisation, 2022)

4.2. Analysis of secondary quantitative data

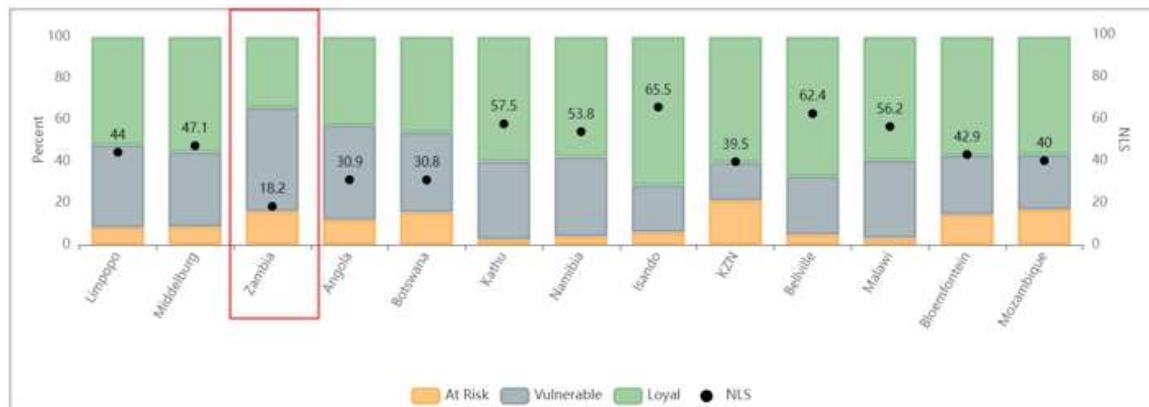
4.2.1. Customer loyalty analysis

to improve, grow, and sustain a business, it is critical to understand the likelihood that customers will return to purchase from the said business and or recommend the products and or services to other potential customers. Consistently gathering customer loyalty data allows the organisation in question to understand customer experience and what needs to be done to either improve or sustain the experience. The organisation has a net loyalty score target of 65% for the service business across all its territories. This would be a 15.2% increase from the current score of 48.9% for the overall service business as discussed in section 1.6. The score (as a %) is calculated by subtracting the number of at-risk customers from the number of loyal customers and dividing by the sample size. A 65% target score is 5% short of what would be considered world class, making it a suitable target for the organisation given that it is one of the market leaders for providing equipment and service solutions in both the mining and construction industries.

Figure 4 shows that of the thirteen regions that the organisation operates in, Zambia had the lowest customer net loyalty score (18.2%) for the 2022 financial year (October 2021 to September 2022). This placed 53% of its customers in a vulnerable state, 13% in an at-risk state, and only 32% in a loyal state.

Figure 4

Customer net loyalty score (October 2021 - September 2022).

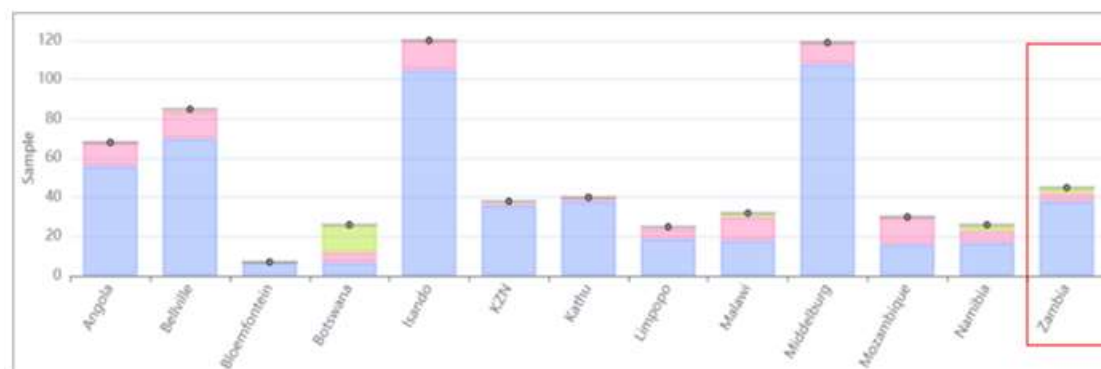


Source: (Confidential information of the organisation, 2022)

The 18.2% customer loyalty score was calculated from a sample of more than forty surveys (with data from thirty-eight surveys used in the calculations) as shown in Figure 5. Given the size of the Zambia market, the thirty-eight surveys (sample) make up more than 10% of its market of regular customers and can be considered to be a true reflection of the population's loyalty state. The net loyalty score of 18.2% is significantly lower than the percentage share of customers who are loyal to the organisation, indicating that most of the customers are either in an at risk or vulnerable state, thus making it highly likely for them to seek alternative solutions from competitors.

Figure 5

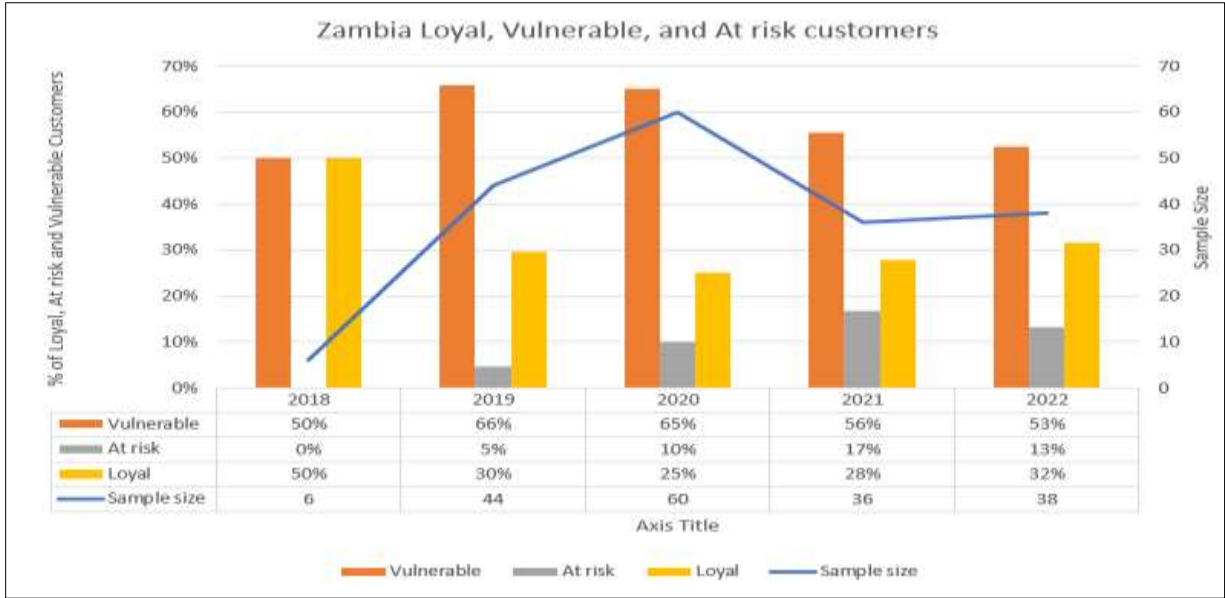
Net loyalty score sample size by region (October 2021 to September 2022).



Source: (Confidential information of the organisation, 2022)

For the past five financial years (2018 to 2022), most customers in Zambia have been outside the loyal pool. The number of customers that were loyal to the business has been between 25% to 50% as shown in Figure 6. The business only saw 50% of its customers being loyal once in the past five years. This resulted from a low sample size that can be considered to not be a true representative of the population, thus suggesting that the realistic percentage of customers who have been loyal to the organisation for the past five years is between 25% and 32%. This significantly threatens the suitability of the service business and also threatens the growth of the parts business given that part of the revenue brought in by service is generated from the parts required to perform the services.

Figure 6
Zambia five-year customer split by loyalty state.

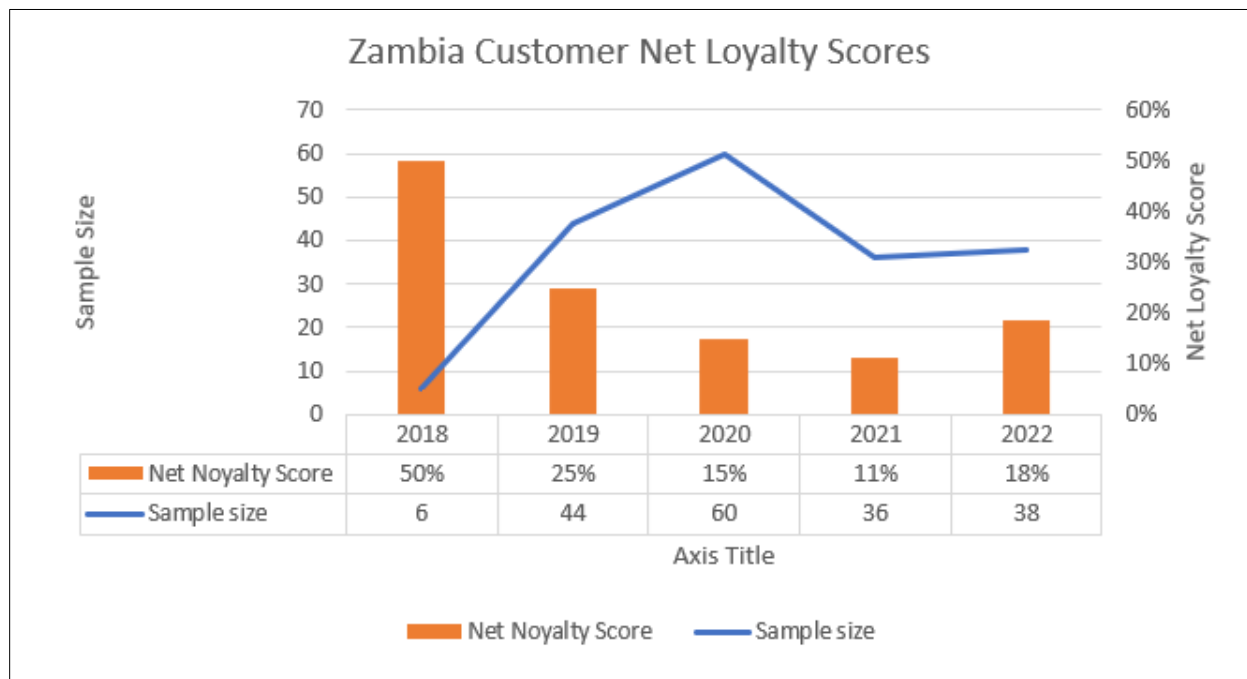


Source: (Confidential information of the organisation, 2022)

The net loyalty score has also been trending significantly below the 65% target for the past five financial years as shown in Figure 7. The true score falls between 25% and 18%, given the small 2018 sample size. Overall, the score has been on a downward trend since 2018 thus indicating that the number of customers finding alternative solutions for their equipment service needs has been increasing.

Figure 7

Zambia five-year customer net loyalty scores.



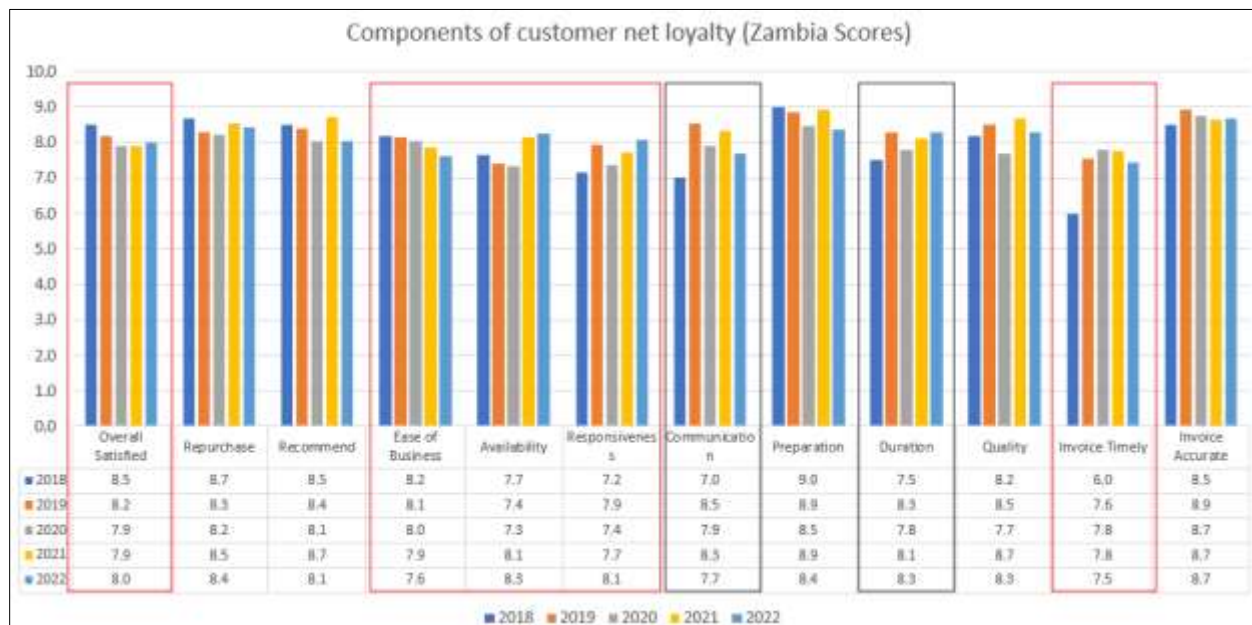
Source: (Confidential information of the organisation, 2022)

The number of loyal, vulnerable, and at-risk customers is calculated by taking customer satisfaction ratings averages on the twelve questions in Figure 8. An overall satisfaction rating between nine and ten indicates that customers are loyal, at-risk customers would have a satisfaction rating of five or less, and the remaining customers with satisfaction levels between five and nine would be classified as vulnerable.

Looking at the ratings in Figure 8, as averages of the samples in the individual financial years, the overall customer satisfaction figures have been on a downward trend since 2018, mainly due to the poor availability of either technicians or parts required to do the services, ease of doing business with the organisation, responsiveness, communication, and timely invoicing. The remaining factors such as quality and the likelihood to repurchase or recommend the organisation to other customers also need to be improved. Considering all the trends discussed in this section, there is an urgent need for the Zambia service organisation to improve how it services its customers in order to regain their trust and convert the high number of vulnerable and at-risk customers to loyal ones, and ultimately achieve a net loyalty score that is in line with the organisation's targets.

Figure 8

Five-year analysis of factors contributing to the net loyalty score.



Source: (Confidential information of the organisation, 2022)

One of the major factors that has been contributing to the lack of availability of technicians and quality score fluctuations is the loss of both technical capacity and capability over the last five financial years. The organisation has lost twenty-eight locally developed skills to the local and international mining and construction labour markets in this period. Some of the skills were also lost through restructuring due to the impact of the COVID19 pandemic on economic activity. Table 1 shows the different countries that the organisation lost its technical skills to, with the biggest consumer being the Australian market. There is a need to rebuild both technical capacity and capability either internally or through collaborations with external service providers.

Table 1

2018 to 2022 technical skills loss.

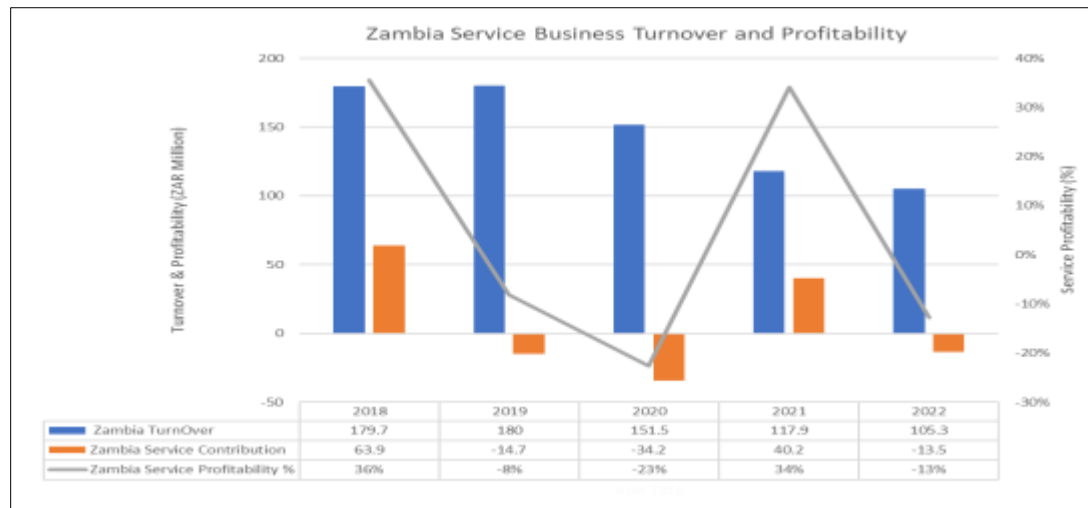
Quantity	Market where skills were lost to
1 x Technician	Canada
2 x Technicians	Democratic Republic of Congo
1 x Technician	Zambia market – to one of the organisation's customers
14 x Technicians	Australia
1 x Technician	Dismissal
9 x Technicians	Restructuring

Source: (Confidential information of the organisation, 2022)

The impact of the downward trending net loyalty scores is seen in the financial performance of the Zambia service business. the service business turnover has been on a downward trend for the past five financial years. The profitability of the business has also been in a loss-making state except in the 2018 and 2021 financial years. In 2018, the organisation was achieving relatively higher service labour margins due to favourable market conditions. The restructuring action that took place in response to the COVID19 pandemic also resulted in positive profitability in 2021 (the business made profit as result of cost reduction as opposed to revenue growth).

Figure 9

Five-year service business profitability analysis.

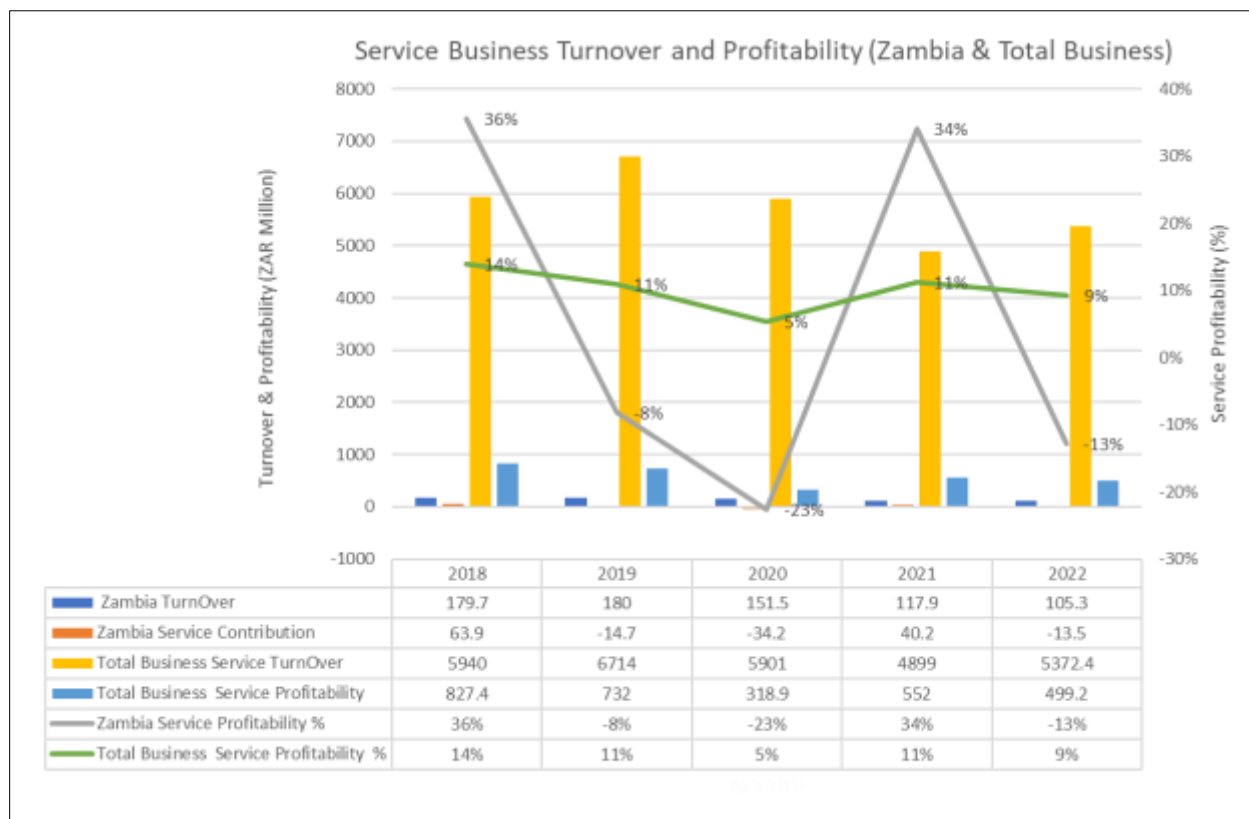


Source: (Confidential information of the organisation, 2022)

Figure 10 show that when compared to the rest of the service organisation, the Zambia service business profitability is trending below all the other territories of operation combined. The business needs to take measures to improve its customer net loyalty score which will automatically feed into an upward trend of its financial KIPs, provided that the market opportunity exists.

Figure 10

Zambia Five-year service business profitability analysis against rest of the business.



Source: (Confidential information of the organisation, 2022)

4.3. Analysis of primary qualitative data

To gain detailed insights behind the customer net loyalty score trends, one on one interviews were conducted with nine customers in the Zambia market. The nine customers operate a combined total of 193 earthmoving equipment supplied by the organisation. Of the nine customers, three are mining contractors operating their fleets across different operations in the country. Eight of the nine customers are do it myself

customers and only rely on the organisation's technical skills as and when needed. The conducted interviews focused on understanding customer experience on service quality, service turnaround time, and technician labour rate cost. It is critical for any earthmoving operation to ensure that its fleet is available to work and is maintained in that state at the lowest possible cost, hence the focus on quality, turnaround time, and cost. These three elements also served as categories for the net loyalty score components in Figure 8. The percentage figures in this section were calculate as a function of the total number of customers interviewed.

4.3.1. Quality of service

55% of the customers said that the organisation's service and repair quality was poor and has been deteriorating for the past five years, emphasising that repair jobs have been of a very poor standard. "Participant 8", a maintenance manager for one of the organisation's biggest mining contractors mentioned that "it just seems like [the organisation] does not have quality technicians who know what they are doing". "Participant 9" also expressed disappointment in the organisation's technical skills by saying that "the technician quality is not what it used to be some years back".

These customers raised concerns on the troubleshooting skills and time inconsistencies on completion of similar tasks by different technicians. According to them, the quality inconsistencies are due to differences in technician skills and experience, especially on complex/ nonstandard jobs that require technicians to troubleshoot and rectify root causes to ensure that the issues do not reoccur. Failure to identify and rectify root causes has resulted in reworks on the same jobs, costing customers more money on parts and service labour while also increasing machine downtime and reducing production.

The remaining 45% of the customers rated the machine service quality as being of a fair to good standard. Customers that gave a fair service rating also experienced inconsistencies in quality. "Participant 5" mentioned that "sometimes the quality is bad and sometimes it is good". They too argued that the skills of the technicians varied thus resulting in quality inconsistencies. Only one out of the nine customers gave the organisation an excellent service quality rating. This is a do it with me customer having a

labour agreement with the organisation. their quality experience is consistent due to the skills of the contracted technician. “Participant 3”, the maintenance manager at the underground mine with the dedicated technician, mentioned that “the dedicated technician based on [his] site is highly skilled.... the presence of the technician also makes it easier to get technical support.”

Overall, it can be concluded that the quality of service jobs is highly linked to the skills of the technicians. The dissatisfaction of 55% of the customers signals that the organisation needs to invest in putting quality technical skills in place to improve overall customer experience and reduce the financial impact of the cost of poor quality that customers are currently incurring.

4.3.2. Turnaround time

Any service and repair job requires both parts and labour to execute. The involvement of admin labour is also required to manage all admin related tasks as shown in figure 3. This section of the interview process aimed at understanding customer experience with the organisation’s turnaround time throughout the whole service value chain as shown in figure 3.

100% of the customers stated that the availability of parts was the biggest turnaround time challenge they experience. Customers say that they are most likely to wait for parts to be brought in from South Africa or any of the other country that the organisation sources parts from, including The United States, Europe, and China. The unavailability of parts in country can result in lead time of between 5 days to 3 months, depending on where the parts are being sourced from. “Participant 8” mentioned that “it takes 9 days to get parts from South Africa, this can even be between 18 to 20 days”. All the customers said that the unavailability of parts is the biggest cause of downtime on their equipment. this issue has had a negative financial impact on all the customers as their primary production equipment can get parked for months on end while waiting for parts. “Participant 1” went as far as saying that “there was no sense of urgency to resolve [his] equipment issues”. One of the organisation’s biggest customers said they recently had a breakdown on an excavator, resulting in a \$800k loss in production as there was no parts in country to

perform the required repairs on the machine. Customers are of the view that the organisation does not investment in providing aftermarket/ parts support for its massive installed base/population of equipment operating in the field. “Participant 5” also mentioned that “it's frustrating to call the OEM and hear them say they do not have parts and people.... all of these things reduce the level of confidence that [they] have on [the organisation]”. This unavailability of parts and people presents massive equipment downtime for customers, especially on unpredictable/ unplanned breakdowns that result in urgent parts requirements. Due to this parts availability issue, customers have, on several occasions, resorted to sourcing parts from other suppliers.

67% of the customers said that the availability of the organisation’s technicians is a massive challenge. it can take them 3 to 4 days to deploy a technician to site to resolve a customer issue or assess a breakdown. “Participant 2” mentioned that “there is poor availability of technicians when they are needed”. This was especially true for customers with relatively small fleets of equipment, thus creating the perception that the organisation does not prioritise their service needs due to level of revenue they bring in compared to customers with bigger fleets. 55% of the customers also raised issues with the amount of time it takes certain technicians to complete service and/ or repair jobs. This was also linked to quality issues and poor technician skills.

On the administration/ management side, 33% of the customers raised concerns on how the organisation communicates with its customers. Their biggest challenge was getting feedback on issues they have raised and what the organisation is doing to address them. This has resulted in mistrust in management and has created the perception that the organisation simply does not care about the issues that these customers face.

4.3.3. Cost of service

The management of earthmoving equipment service/maintenance costs is critical to any mining and construction operation given the contribution that maintenance costs have on the overall operating costs and financial bottom line. 50% of the customers that were able to provide pricing data stated that the organisation is 10% to 45% more expensive on their labour/ technician pricing relative to other equipment suppliers and small service

contractors that they are in business with. 33% of the biggest customers that were interviewed stated that the labour pricing was fair compared to the competition. Over 80% of the customers placed cost below quality and turnaround time when it came to selecting a service provider. They argued that it was critical for service jobs to be executed with quality and within reasonable downtime, to minimise equipment unavailability and ensure that their fleets can operate on an almost continuous basis. "Participant 5" mentioned that "pricing is not an issue.... the issue is availability and quality labour".

4.3.4. What the organisation needs to improve on to better serve customers

When asked to list key areas that the organisation needs to focus on to improve its service, 100% of customers stated that improving the availability of spare parts required to perform services and repairs on their fleets would significantly improve the overall availability of their equipment. This would translate to increased utilisation and production, thus positively impacting the customer financial bottom line.

78% of customers also stated that availability and quality of technical skills was one of the key challenges they face when doing business with the organisation. These customers emphasised on how critical the availability of technicians is to their business when it came to managing fleet downtime and increasing availability and utilisation. The quality/ skills of the technicians deployed by the organisation is also critical to minimise the need for reworks which have double cost implication for customers (fixing of equipment and loss of production due to added downtime). Over 50% of the customers who have been dealing with the organisation for over a decade stated that the organisation's technical skills have declined over the years and that there was a critical need to turn that around to retain their business.

Lastly, 33% of the customers said that they receive inconsistent communication from the organisation's management and admin teams on pending jobs and concerns raised. They stated that the organisation needs to improve on the flow of information between itself and customers when there is service work in progress.

Overall, customers listed the availability of parts, availability of technicians, skills of technicians, and a responsive management and admin team as the key areas that the

organisation needs to focus on to improve its service. These are the key customer challenges that the business venture addresses. The resulting impact will be improved customer service that will trigger an increase in customer loyalty. This will ultimately improve the financial performance of the organisation's service business.

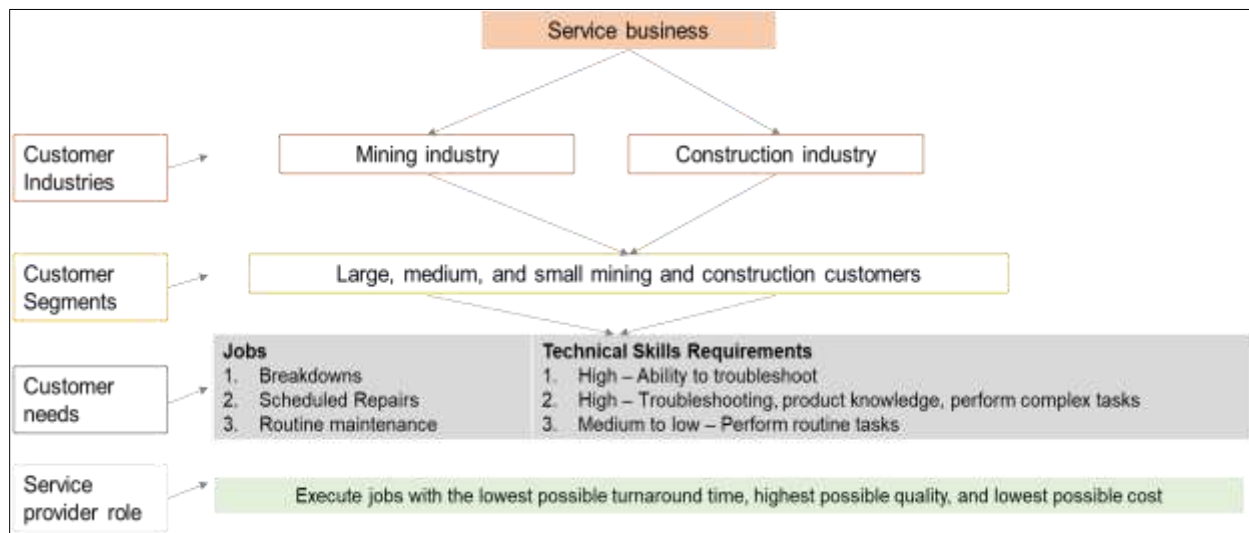
5. The business venture

Managing the unavailability of earthmoving equipment is critical for both mining and construction operations. When equipment is not available to work, these operations cease to generate revenue. It is therefore critical to ensure availability and quality of resources needed to effectively manage the equipment unavailability to maximise uptime and output. This need to effectively manage unavailability makes equipment suppliers that also offer maintenance and repair services, such as the organisation in question, key to the success of these mining and construction operations.

Figure 11 shows the mining and construction market segments that the organisation needs to serve, the customer challenges it needs to address and the required technical skills to address the challenges. The organisation needs to ensure the availability of parts and quality technical skills to address customer maintenance and repair needs at any given point in time. This can be challenging to achieve, especially when dealing with unplanned equipment breakdowns, where the demand for maintenance and repair services become unpredictable. This business venture seeks to put the organisation in a better position to address the customer needs by improving the way its service business currently functions. Apart from providing quality resources on demand, the venture also seeks to put forth a solution that will address the current manual processes and admin heavy structure to improve ease of doing business with customers. The goal is to find a way to better serve customers while ensuring business profitability.

Figure 11

Understanding customer challenges in different market segments



Source: (Author's own work, 2023)

5.1. Strategic business approach and solution offering

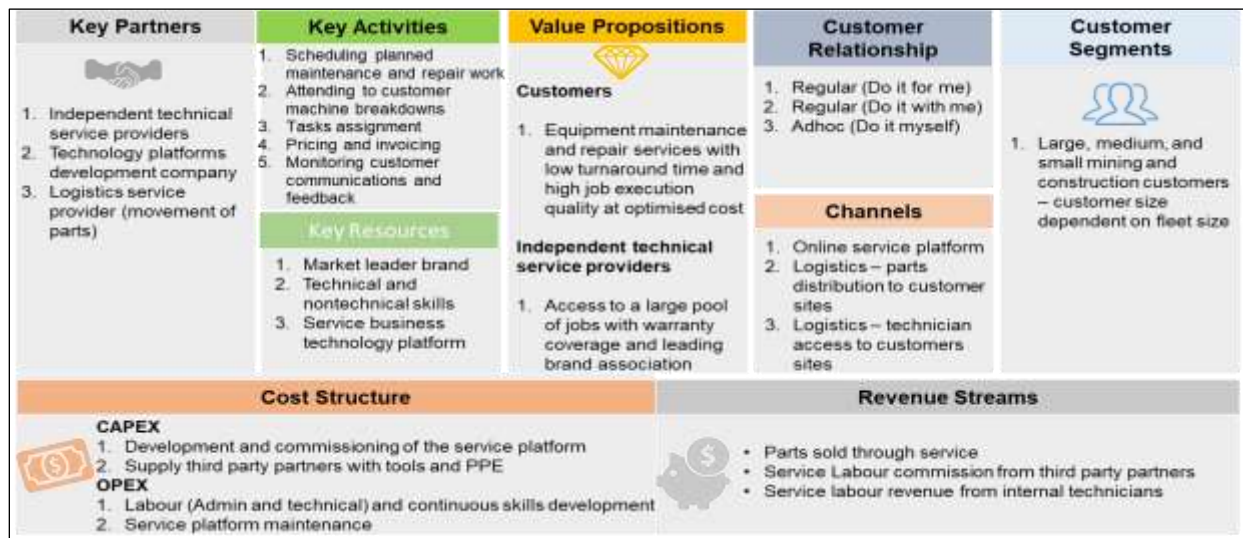
Successful business ventures are those that find a balance between solution application viability and financial viability. this section focuses on detailing how the proposed solution will address customer needs and how it will generate revenue for the business while also generating the target service contribution margin/ profitability margin of 18%. Entrepreneurship techniques were applied to detail the business model, what the minimal viable product will look like (application and financial viability), and how continued customer discovery and validation will be carried out to continuously improve the solution. Management theories were also integrated.

5.1.1. The strategic business model

Figure 12 shows the proposed business model to meet both customer needs and business performance improvement needs.

Figure 12

The proposed business model



Source: (Author's own work, 2023)

Below is a detailed breakdown on each of the nine elements:

1. Customer Segments

The business will continue to serve its existing customer segments. These are large, medium, and small mining and construction customers owning and operating fleets of equipment supplied by the organisation. these customers operate fleets as big as over seventy earthmoving equipment units to fleets as small as two to five units.

2. Value Proposition

The value proposition for customers is to address the challenges that are currently hindering possible maximum output of their equipment due to prolonged downtime. This will be done by providing equipment maintenance and repair services with low turnaround time and high job execution quality at optimised costs/ labour rates.

The independent service providers that the organisation will be partnering with will gain access to a large pool of jobs with warranty coverage and leading brand association. Warranty coverage for workmanship errors is critical in this environment where the equipment used is capital intensive. This can be a challenge for small businesses to cover

thus making it beneficial for them to partner with an organisation that has a large balance sheet to cater for such provisions.

The business itself also stands to derive value from the proposed business model, mainly due to the digitalisation of processes and partnering with independent service providers. Digitalisation will enable the organisation to spread its admin costs over an increased number of technical staff, reduce turnaround time, reduce human errors associated with the use of manual processes, and improve customer communication. Partnering with third party service providers will open up a wider pool of technician capacity and capability and will allow the organisation to manage the technician turnaround time and workmanship quality associated with its current technical workforce. Table 2 summaries the shared stakeholder value that will be unlocked by this business model.

Table 2:

Stakeholder shared value creation

Customer benefits	Third party service providers	Benefits for the organisation
• Receive the right technician skill for the required job at the required time. • One communication channel • Instantly raise concerns • 4 to 24hr response time depending on the required job	• Increased customer pool – access to the organisation's customers • Warranty coverage • Supply of tools and PPE • Brand association	• Increase service turnaround time and quality • Improve customer loyalty and retention • Hire labour on demand (cost saving) • Improved business performance

Source: (Author's own work, 2023)

3. Revenue Streams

The organisation will continue to generate revenue from selling the labour hours of its current technicians plus the sales of parts made through service. The additional stream of revenue that will come with this business model is the service labour commission from third party partners. This will be the percentage that the organisation takes from the revenue generated by the external service providers for every maintenance and repair job they complete.

4. Channels

Business activities will continue to require both digital and physical channels. The digital service platform will serve as place where the business can communicate and transact with its customers and third party service providers. This will be a single platform that consolidates all the service process steps in Figure 3.

The digital platform will also be used to optimise and manage the logistics/ distribution of parts and technicians to customer sites to meet their job complexity and turnaround time needs.

5. Customer Relationships

The organisation will continue to work with three different types of customers: these are 1) type one regular customers (Do it for me), 2) type two regular customers (Do it with me), and 3) Adhoc customers (Do it myself). Positioning the business to better understand the service needs of the different types of customers in a timely manner will enable it to react with solutions that will minimise customer equipment unavailability.

6. Key Activities

The business will focus on scheduling planned maintenance and repair work, attending to customer machine breakdowns, assigning tasks/ jobs to the best technically fit technicians, pricing and invoicing, and monitoring customer communications and feedback. The digital solution will enable the business to attend to these activities with improved efficiency and effectiveness.

7. Key Resources

The organisation has a market leading brand that is still highly valued by customers for its performance. Its technical and non-technical personnel are also key resources needed for the success of the business. An additional key resource that is brought by this business model is the service technology platform that will be used to manage the entire service business.

8. Key Partners

Several partners will be key to enable the organisation to better serve customer needs: 1) Independent technical service providers will open up a new pool of skills for the organisation to improve technician availability and skill quality. 2) Partnering with an application development company that will develop and assist in rolling out the service digital platform will be critical. 3) continued partnerships with existing logistics service providers for parts distribution to customer sites will also be critical.

9. Cost Structure

The organisation will need to incur both CAPEX and OPEX costs in implementing this business model. CAPEX will be needed for the development and commissioning of the service platform, marketing of the service platform, and to also supply third party partners with tools and PPE (ensure they have all the right tools and safety gear to execute on their assigned maintenance and repair jobs). OPEX will be needed to cover labour costs (Admin and technical), continuous skills development, marketing, and digital service platform maintenance.

5.1.2. Solution development and implementation: rollout initial product with minimal viability

By implementing digitalisation, this business venture seeks to create one digital platform to conduct business on with both customers and independent service providers. Successful platform business designs discussed in the literature review section were leveraged to identify critical functions that will be available on the service platform. Figure 13 below shows the solutions/ functions that will be available on the platform to serve various types of customer maintenance and repair needs.

A systems approach as detailed in the Systems Management Theory also served as a basis to ensure that functions needed to complete any type of service job are included in the platform to eliminate handling processes that are dependent on each other in silos. digitalising will ensure that the entire service business is conducted on the digital platform from the point where a customer requires a service to the point where the job is closed.

Digitalisation of the service process will enable the organisation to be more efficient and effective in dealing with customer requests and resolving their issues, however,

partnering with independent service providers will allow the organisation to improve on service executions in the field on both quality and turnaround time. The Fourteen Principles of Management Theory and the Bureaucratic Theory outline how critical it is to match jobs with skills required to fulfil them. Figure 13 shows that the platform will have different processes to handle routine/planned work and unplanned breakdowns. This is to ensure that the admin personnel attending to each of these customer needs has the required technical know-how to be able to assist customers efficiently and effectively. The same will be applied on the job execution end, where technicians will be assigned jobs based on their level of capability to complete them.

To better plan for parts inventory holding and to reduce equipment unavailability due to parts, the system will allow customers to onboard all their equipment and their application/use in order to have a better view of the population and also use the application data to estimate the hours of operation and severity of operation (impacting wear and tear). This will allow the organisation to hold the right parts and the right time.

Figure 13

minimal solution design to address customer issues and improve business performance.

Business Solution Structure			
Customer job requirements	Routine maintenance	Planned repairs (minor and major)	Unplanned breakdowns
Job solutions on digital platform	1. Job booking (parts, labour) 2. Customer receives and accepts quote 3. System triggers need for parts and labour when quote accepted 4. Technician deployed to site on job date 5. Invoicing and closing of jobs 6. System triggers customer feedback when quote rejected 7. System triggers customer feedback when the job is completed		1. Customer reports breakdown details 2. Deployment of suitable technician to site 3. Quote repair parts and labour once issue identified 4. Customer accepts quotes 5. Technician deployed to site 6. Invoicing and closing of jobs 7. Trigger customer feedback when job is closed
Applicable management theories	Scientific Management Theory, Fourteen Principles of Management, Bureaucratic Theory, Systems Thinking		

Source: (Author's own work, 2023)

One of the most critical functions that the system will make provision is continuous customer feedback (customer discovery and validation) on both the digital admin and job executing technical staff. This will allow the organisation to improve both the system and the skills of its workforce and on its standard operating procedures.

5.1.3. Determining financial viability of the solution

Section 5.1.3 above focuses on determining the application viability of the solution. While that is critical to meeting customer needs, it is also critical to understand how the business model will generate financial returns for the organisation. To quantify the potential returns, financial modelling was conducted to determine the viability of the proposed business model and to also compare it with the financial state of the current business.

Table 3 shows the financial model of the current service business under ideal conditions, where technicians operate at 80% productivity and all operating expenditure does not exceed plan. The model was also built using one technician to determine the maximum profitability that they can generate for the business. with the current business model and cost structure, the profitability of the business will reach its peak at 13% (in line with the current profitability performance of 14% to 9% for the entire organisation as shown in Figure 10).

Table 3

Financial modelling of current business model

Financial modelling of current service business		
Labour rate	R 935.00	considers overhead costs, service vehicle & travel costs, and technician salary
Monthly revenue per technician	R 137,133.33	at 80% labour productivity and 22 working days in a month for 8 hours/ day (excludes overtime)
Service vehicle monthly costs per technician	R 25,500.00	costs only incurred for field service technicians (currently 18 in total)
average monthly fuel costs	R 9,000.00	
Technician monthly cost to company	R 35,000.00	40% goes to allowances and pension fund

Technician monthly gross	R 21,000.00	Excludes allowances and pension fund
admin and other overhead costs	R 28,636.36	45% contribution to total labour costs
Total costs	R 119,136.36	
Profitability (service contribution)	R 17,996.97	monthly revenue per technician - total costs per month
Profitability (service contribution) in %	13%	under ideal conditions with no added travel costs, service warranty claims, and 80% productivity being achieved

Source: (Author's own work derived from the organisation's internal records, 2023)

Introducing the independent service providers and the service digital platform into the service business will significantly improve its profitability as shown in Table 4 below. the digital platform will enable the business to achieve economies of scale by sharing/ dedicating the same number of admin people to an increased number of technicians (internal technicians plus independent technicians). Eliminating manual processes and the use of multiple platforms to conduct business will significantly improve admin efficiency and effectiveness. In addition to having labour on demand, the business will also avoid additional technician employment costs associated with permanent employment. These costs include health insurance and retirement fund contributions.

The use of a digital platform and independent technicians can yield 39% business profitability as shown in Table 4 below (calculated by excluding permanent technicians) and an average of 26% profitability for the entire service business (calculated by including both independent and permanent technicians). The payback of 0.75 years on invested capital also makes this a feasible business model.

Table 4

Financial modelling of future service business

Financial modelling of future service business		
Labour rate	R 794.75	Considers overhead costs and technician salary. Reduced rate by 15% to be more in line with market pricing

Monthly revenue per technician	R 116,563.33	At 80% labour productivity 22 working days (excludes overtime) C8
Monthly payout to technician/ service contracting company	R 93,250.67	Organisations retains 20% of the revenue
Organisation's share per month	R 23,312.67	Organisations retains 20% of the revenue
Overhead costs	R 14,318.18	Assume that the organisation can double the number of field service technical staff by using external service providers while retaining the same number of admin staff. Current admin and overhead costs will be shared over double the technical staff
Profitability (service contribution)	R 8,994.48	Monthly revenue per technician less total costs per month
Profitability (service contribution) in %	39%	Under ideal conditions with no added travel costs, service warranty claims, 80% productivity being achieved
Total revenue per month	R 419,628.00	By partnering with external service providers that can provide 18 technicians, the organisation can make an additional revenue of R0.42M per month
Total revenue per annum	R 5,035,536.00	
Capital expenditure to develop and rollout digital platform		
Toolbox costs	R 1,224,000.00	Toolboxes for 18 technicians
Technology solution development	R 1,700,000.00	Market rate for developing applications of moderate to high complexity
Training of staff	R 700,000.00	Training admin and technical staff to use the technology platform
Marketing and promotion costs	R 151,066.08	Marketing costs take at 3% of total revenue (the organisation's best practice)
Total initial capex	R 3,775,066.08	Sum of all capital costs
Payback period	0.75	CAPEX/ Total revenue from external service contractors

Source: (Author's own work derived from the organisation's internal records, 2023)

5.1.4. Competitive advantages arising from the offering

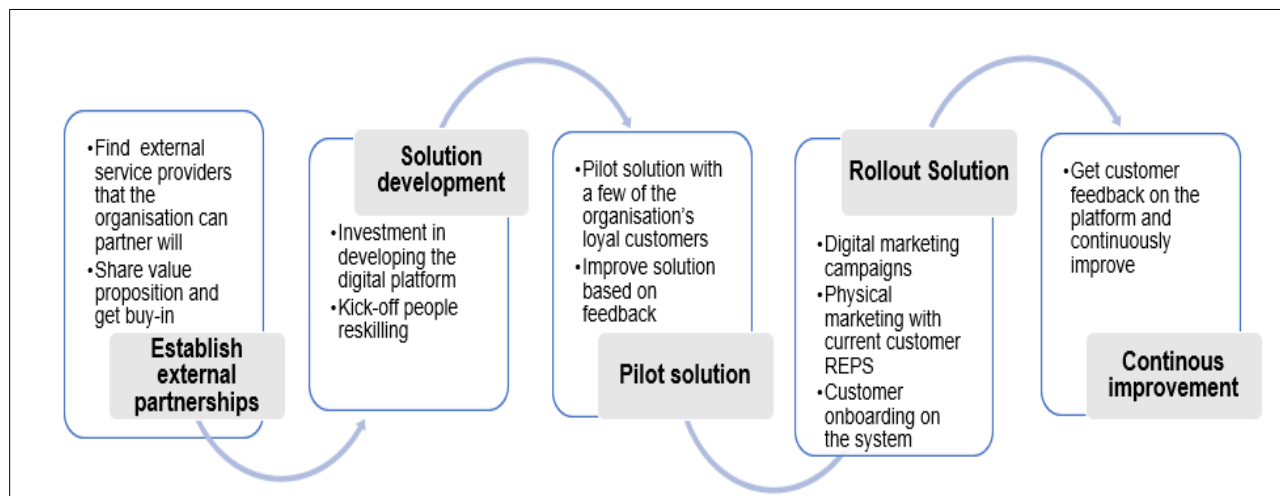
Several competitive advantages will arise from the implementation this business model. Firstly, the business can afford to vary its labour rates depending on the need and complexity of the job. The future financial business model shows that the business can achieve a profitability rate of 39% from the external services provider leg of the business, thus creating room for pricing flexibility to capitalise on market opportunities. The upside of this will be the ability to price higher on emergency/ breakdown jobs. Secondly, an improved pool of technical skills will allow the organisation to better improve on technician availability and quality. Lastly, proactive parts demand forecasting will improve parts sales and enable the organisation to regain the part of its market share that is currently captured by suppliers outside the country.

5.1.5. Execution plan

To successfully implement this business model, the organisation will require an execution plan that involves all relevant stakeholders and tasks that need to be fulfilled. Figure 14 shows how the business needs to execute the business model from starting with finding external service partners, to product development, rolling out, and providing room for continuous improvement.

Figure 14

Solution rollout plan



Source: (Author's own work, 2023)

5.2. Final Recommendations

The organisation cannot meet its target service profitability of 18% with the current business model and business size. Under ideal conditions, the current business can only yield 13% profitability returns. The organisation either needs to significantly increase revenue, reduce costs, or transform the way the business operates. Integrating independent service providers can yield 39% business profitability (looking only at the independent service provider leg) and an average of 26% profitability for the entire service business. the revenue that the organisation stands to benefit from working with independent service providers can result in a payback period of 0.75 years on invested capital. Even if the organisation was to partner half of the independent service provider technicians and double its payback period on invested capital, this business model would still be more financially viable compared to the current one.

The proposed business model creates shared stakeholder value between customers, independent service providers, and the organisation. It also allows the organisation to turn its competitors into complementors through shared provision of services in a way that makes partnering more beneficial than competing. The organisation can also gain

first mover advantage by being the first to implement the use of a shared platform technology to run the process of maintaining and repairing earthmoving equipment.

As such, the final recommendation is that the organisation implements this business model to improve customer service and loyalty, and ultimately improve the financial performance of its service business.

6. References

- Aghimien, D., Aigbavboa, C., Oke, A., & Koloko, N. (2018, December). Digitalisation in construction industry: Construction professionals' perspective. *In Proceedings of the Fourth Australasia and South-East Asia Structural Engineering and Construction Conference, Brisbane, Australia* (pp. 3-5).
- Aghimien, D., Aigbavboa, C., Oke, A., & Thwala, W. (2021). *Construction Digitalisation: A Capability Maturity Model for Construction Organisations*. Routledge.

- Ahmad, M. U., & Murray, J. (2019). Understanding the connect between digitalisation, sustainability, and performance of an organisation. *International Journal of Business Excellence*, 17(1), 83-96.
- Alaska Structures (2016, August 23). *The Importance of Reliable Mining Equipment, Storage, And Maintenance Facilities*. Retrieved from <https://alaskastructures.com/mining/importance-reliable-mining-equipment-storage-maintenance-facilities>
- (Alberdi, R. (2022). *The 9-Step Business Model Canvas Explained (2022 Update)*. Retrieved from <https://www.thepowermba.com/en/blog/business-model-canvas>
- Anwar, S. T. (2018). Growing global in the sharing economy: Lessons from Uber and Airbnb. *Global Business and Organizational Excellence*, 37(6), 59-68.
- Armstrong, B., & Lee, G. (2021). Digital Business. Silk Route Press; 2nd Edition.
- Aroh, V. (2014, September 5). Data Credibility – A Critical Dimension to Data Quality. Retrieved from Verdantis : <http://blogs.verdantis.com/data-credibility-critical-dimension-data-quality-2/>
- Arputharaj, M. E. M. (2015). Studies on Availability and Utilisation of Mining Equipment – An Overview. *International Journal of Advanced Research in Engineering and Technology*, 6(3), 14-20.
- Banik, N., & Padalkar, M. (2021). The spread of gig economy: trends and effects. *Форсајм*, 15(1 (eng)), 19-29.
- Barnewold, L., & Lottermoser, B. G. (2020). Identification of digital technologies and digitalisation trends in the mining industry. *International journal of mining science and technology*, 30(6), 747-757.
- Bashir, M., & Verma, R. (2016). Airbnb disruptive business model innovation: Assessing the impact on hotel industry. *International Journal of Applied Business and Economic Research*, 14(4), 2595-2604.
- Berger, R., *Digitization in the Construction Industry*, Think Act, 1-16, 2016.

- Birt, J. (2022 May 24). 7 Types of Workplace Management Theories. Retrieved from <https://www.indeed.com/career-advice/career-development/types-of-management-theories#:~:text=What%20are%20management%20theories%3F,perform%20at%20their%20highest%20ability.>
- Boudreau-Trudel, B., Nadeau, S., & Zaras, K. (2015). Innovative mining equipment: key factors for successful implementation. *American Journal of Industrial and Business Management*, 5(04), 161.
- Casey, J.P. (2018, October 8). *Five of the biggest new mines*. Retrieved from <https://www.mining-technology.com/features/five-biggest-new-mines/>
- Chaoudary, S. P. (2013), *The AirBnB advantage: how to avoid competition and become a multibillion-dollar start-up*. Retrieved from <http://thenextweb.com/insider/2013/03/10/the-airbnbadvantage- how-to-avoidcompetition-and-become-a-multi-billion-dollar-startup.>
- Chisholm, J. (2020, January 7). *The Tools and Techniques for Success in the Entrepreneurial Process*. [Video]. YouTube. <https://www.youtube.com/watch?v=ZmEjoqTzCAU>
- Christiansen, B. (2018, July 30). Exploring biggest maintenance challenges in the mining industry. Retrieved from <https://www.mining.com/web/exploring-biggest-maintenance-challenges-mining-industry/>
- Conlin, B. (2023, January 23). *Popular Management Theories Decoded*. Retrieved from <https://www.business.com/articles/popular-management-theories-decoded/>
- Cousins, J. (2018, May 9). *The tools and techniques of Entrepreneurship*. Retrieved from <https://johncousins-68418.medium.com/what-everyone-should-know-about-the-tools-and-techniques-of-entrepreneurship-bb46b86eeffe>
- Crash Course. (2019, September 19). *Minimum Viable Product and Pivoting: Crash Course Business Entrepreneurship #6*. [Video]. YouTube. <https://www.youtube.com/watch?v=kmfC-i9WgH0>

- Davenport, T.H., & Westerman, G. (2018, March 9). *Why So Many High-profile Digital Transformations Fail*. Retrieved from Google Scholar:
<https://www.nutanix.com/content/dam/nutanix->
- Devault, G. (2019, August 20). *Establishing Trustworthiness in Qualitative Research*. Retrieved from The Balance Small Business :
<https://www.thebalancesmb.com/establishing-trustworthiness-in-qualitative-research-2297042>
- Fernandes, P. (2023, January 23). *Management Theories Every Small Business Owner Should Know*. Retrieved from <https://www.businessnewsdaily.com/10626-management-theories-for-smbs.html>
- Fu, J. (2013, June). *Licentiate Thesis in Transport Science With specialization in Transport Systems*. Retrieved from KTH Royal Institute of Technology:
<http://www.diva-portal.org/smash/get/diva2:623911/FULLTEXT01.pdf>
- Gal, P., Nicoletti, G., Renault, T., Sorbe, S., & Timiliotis, C. (2019). Digitalisation and productivity: In search of the holy grail–Firm-level empirical evidence from EU countries.
- Gao, S., Hakanen, E., Töytäri, P., & Rajala, R. (2019, January). Digital transformation in asset-intensive businesses: Lessons learned from the metals and mining industry. *In Proceedings of the 52nd Hawaii international conference on system sciences*.
- Granderson, D. (2018, February 22). *6 Essential Questions for Evaluating Secondary Data Sources*. Retrieved from Packaged facts :
<https://www.packagedfacts.com/Content/Blog/2018/02/22/6-Essential-Questions-for-Evaluating-Secondary-Data-Sources>
- Green, D. D. (2018). Fueling the gig economy: a case study evaluation of Upwork. com. *Manag Econ Res J*, 4(2018), 3399.
- Grehl, S., Mischo, H., & Jung, B. (2017). Research perspective-mobile robots in underground mining. *AusIMM Bulletin*, (Feb 2017), 44-47.

- Hales, G., & Mclarney, C. (2017). Uber's Competitive Advantage vis-à-vis Porter's Generic Strategies. *IUP Journal of Management Research*, 16(4).
- Hamel, G. (2011). *First, Let's Fire All the Managers*. Retrieved from <https://hbr.org/2011/12/first-lets-fire-all-the-managers>
- Healy, J., Nicholson, D., & Pekarek, A. (2017). Should we take the gig economy seriously? *Labour & Industry: a journal of the social and economic relations of work*, 27(3), 232-248.
- Hemmer, M. (2016, May 23). *Why a business model canvas is important to organizational innovation*. Retrieved from <https://blog.onefire.com/archive/why-a-business-model-canvas-is-important-to-organizational-innovation>
- Ismail, Mariam H., Mohamed Khater, and Mohamed Zaki. Digital business transformation and strategy: What do we know so far. *Cambridge Service Alliance* 10.1 (2017): 1-35.
- Jacques Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A., & Subramaniam, A. (2018, May 23). *Skill shift: Automation and the future of the workforce*. Retrieved from <https://www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce>
- Janse van Rensburg, R. (2020, March 6). *The talent shortages in the South African labour market*. Retrieved from Solidarity: <https://solidariteit.co.za/en/the-talentshortages-in-the-south-african-labourmarket/#:~:text=The%202019%20report%20showed%20that,skill%20shortages%20have%20changed%20slightly>.
- Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2015). Strategy, not technology, drives digital transformation. *MIT Sloan Management Review and Deloitte University Press*, 14(1-25).
- Khan, L. M. (2019). The separation of platforms and commerce. *Columbia Law Review Association, Inc*, 119, 973-1098.

- Mahindara Contruction Equipment Admin. (2016, April 12). *Mining Applications of Earth Moving Equipment*. Retrieved from <https://www.mahindraconstructionequipment.com/blog/mining-applications-of-earth-moving-equipment>
- Mankins, M. (2017, March 01). *Great Companies Obsess Over Productivity, Not Efficiency*. Retrieved from <https://hbr.org/2017/03/great-companies-obsess-over-productivity-not-efficiency>
- McCombes, S. (2019, September 19). *Sampling Methods | Types and Techniques Explained*. Retrieved from Scribbr: <https://www.scribbr.com/methodology/sampling-methods/>
- McKeown, N. (2017, May 9). *What can happen to businesses who don't digitally transform?* Retrieved from <https://www.thedigitaltransformationpeople.com/channels/the-case-for-digital-transformation/what-can-happen-to-businesses-who-dont-digitally-transform/>
- Mining Technology Staff. (2022, March 1). *Mining capital expenditure to rise by 22% across leading miners in 2022*. Retrieved from <https://www.mining-technology.com/comment/mining-capital-expenditure/>
- Minnaar, J. (2016, November 14). *Morning Star's Success Story: No Bosses, No Titles, No Structural Hierarchy*. Retrieved from <https://www.corporate-rebels.com/blog/morning-star#:~:text=Morning%20Star%20permanently%20employs%20600,company%20is%20entirely%20self%2Dmanaging.>
- Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J. (2017) Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, 16, 1-13.
- Pandian, S. (2021, October 23). *Analytics Vidhya*. Retrieved from A Comprehensive Guide to Time Series Analysis: <https://www.analyticsvidhya.com/blog/2021/10/a-comprehensive-guide-to-time-series-analysis/>

- Poxleitner, G. 2016. *Operating Costs for Miners*. Retrieved from:
https://dxi97tvbmhbca.cloudfront.net/upload/user/image/GPoxleitner_OperatingCostEstimationForMiners_201620191128185443446.pdf
- Pratap, A. (2022, April 16). *A discussion of Porter's Generic and Intensive Strategies used by Uber*. Retrieved from notesmatic: <https://notesmatic.com/uber-genericintensive-strategies/>
- Robin, S. (2020, February 28). *What are digital business platforms?* Retrieved from Management innovation exchange :
<https://www.managementexchange.com/story/what-are-digital-business-platforms>
- RMMAAdmin. (2022, January 25). *The rise of the Gig Economy: The benefits of a short-term workforce*. Retrieved from Recruit my mom:
<https://www.recruitmymom.co.za/blog/rise-gig-economy-benefits-short-termworkforce>
- Sánchez, F., & Hartlieb, P. (2020). Innovation in the mining industry: Technological trends and a case study of the challenges of disruptive innovation. *Mining, Metallurgy & Exploration*, 37(5), 1385-1399.
- Self, S. (2019, October 3). *Trustworthiness and Validity in Qualitative Research Design*. Retrieved from YouTube : <https://www.youtube.com/watch?v=JXB-22GVbUA>
- Siachou, E., Vrontis, D., & Trichina, E. (2021). Can traditional organizations be digitally transformed by themselves? The moderating role of absorptive capacity and strategic interdependence. *Journal of Business Research*, 124, 408-421.
- Warren, K. (2020, May 1). *Qualitative Data Analysis Methods 101: The "Big 6" Methods + Examples*. Retrieved from GradCoach: <https://gradcoach.com/qualitative-data-analysis-methods/>
- Whiteside, J. (2022). *A Systems Thinking Approach to Digital Transformation*. Retrieved from <https://newdigitalage.co/programmatic/a-systems-thinking-approach-to-digital->

transformation/#.~:text=In%20a%20systems%20thinking%20focused,this%20time%20with%20converging%20departments.

Winkler, R., & Macmillan, D. (2015), *The secret math of airbnb's \$24 billion valuation*.

Retrieved from <http://www.wsj.com/articles/the-secret-math-of-airbnbs-24-billionvaluation-1434568517>

Wollam Construction Admin. (n.d). *What is excavation?* Retrieved from

<https://wollamconstruction.com/excavation-construction/>

Young, N. (2020, April 30). *Why the sharing economy will continue growing*. Retrieved

from Old Mutual: <https://www.oldmutual.co.za/corporate/resource-hub/all-articles/why-the-sharing-economy-will-continue-growing>

Zouari, G., & Abdelhedi, M. (2021). Customer satisfaction in the digital era: evidence from Islamic banking. *Journal of Innovation and Entrepreneurship*, 10(1), 1-18.