The Township Startup:

A Collaboration Platform That Bridges the Gap between Developed and Developing South Africa

by

Johannes Hendrik Heyns

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Supervisor: Prof. C.S.L. Schutte

Co-supervisor: Dr L. Louw

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Declaration

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December 2015

Abstract

There exists a massive gap between developed and developing South Africa. This study introduces The Township Startup which explains how this gap can be breached through enterprise engineering and how a platform was developed to do exactly that. The work superimposes human behavioural sciences, a culture of Ubuntu, exponential technologies and transforming entrepreneurial practices to determine how the source of the gap can addressed. A collaborative approach is proposed through which these challenges can be addressed together and highlights the competitive advantages which can be leveraged to do so. BioTRIZ methodology is used to develop a platform which facilitates collaboration through mutually beneficial partnerships between individuals, organisations and educational institutions. The finer details of the platform and how it is prepared for further development and implementation, are explained. An action learning validation process is used to experimentally test whether the platform would work as it is designed to and whether the platform might serve as a potential solution to help breach the gap between developed and developing South Africa.

Opsomming

Daar is 'n enorme gaping tussen ontwikkelde en ontwikkelende Suid-Afrika. Hierdie studie stel *The Township Startup* bekend wat verduidelik hoe hierdie gaping oorbrug kan word deur middel van Onderneming Ingenieurswese en hoe 'n platform ontwikkel is om presies dit te doen. Die werk superponeer menslike gedragswetenskappe, 'n kultuur van Ubuntu, eksponensiële tegnologieë en die transformasie van entrepreneuriese praktyke om te bepaal hoe die bron van die gaping aangespreek kan word. 'n Gesamentlike benadering word voorgestel waardeur hierdie uitdagings angespreek kan word en beklemtoon die mededingende voordele wat hierdie benadering aantreklik maak. BioTRIZ metodologie word gebruik om 'n platform te ontwikkel wat samewerking fasiliteer deur wedersydse voordelige vennootskappe tussen individue, organisasies en opvoedkundige instellings. Die fynere besonderhede van die platform en hoe dit voorberei is vir verdere ontwikkeling en implementering word verduidelik. 'n Aksie-leer validerings proses is gebruik om eksperimenteel te toets of die platform sal werk soos dit ontwerp is om te doen en of die platform mag dien as 'n potensiële oplossing om die gaping tussen ontwikkelde en ontwikkelende Suid-Afrika te oorbrug.

Acknowledgements

This research was largely inspired by the work of Professor Johan Adam Heyns and Professor Johannes Hendrik Jooste. The author wishes to take this opportunity to express his sincere appreciation for their encouragement and determination to make South Africa a better place.

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Terminology

Base/bottom of the pyramid(BOP)   *Largest and poorest socio-economic group*

Developed South Africa   *The economy in South Africa's affluent markets which consist of the country's richer citizens*

Developing South Africa   *The economy in South Africa's emerging markets which consist of the country's BOP*

Limited resourced communities   *The communities where most of South Africa's BOP citizens are based, also known as Townships*

Individual   *The single person who is part of a greater community*

Organisation   *Entity made up of multiple individuals with a collective goal, such as company, enterprise, NGO or governmental body*

Society   *Aggregation of the individuals and organisations within a specific environment*

Platform   *A foundation which serves as a support base for individuals and organisations interested in breaching the gap between developed and developing South Africa*
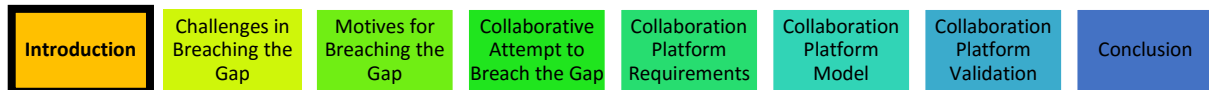
1   Introduction

The Lean Startup (Ries 2011) suggests that startups do not exist to make money or even serve customers. The main reason a startup exist is first and foremost for entrepreneurs to learn how to build a sustainable organisation. The Lean Startup proposes that people can be taught how to do this and continues to explain how it can be done without an abundance of resources. *The Township Startup*, the term which the author use to refer to this study, are grounded on these same principles. The Township Startup focuses on both, individuals living in limited resourced communities who are desperate to pull themselves out of poverty and organisations who are interested in exploring the potential which is locked up at the base of the pyramid (Prahalad 2009; London et al. 2014).

1.1   The Township Startup's Individual

Every individual goes through a process in which he tries to establish his own self-worth and determine his role in society. A process through which he aims to learn how to build a sustainable living (Robinson 2011). Conventional wisdom suggests that this process is expensive and confusing. The Township Startup proposes a new way through which the individual can be taught to do this without formal education, experience or other resources. The Township Startup continues to explain how organisations can help the individual within South Africa's BOP to do this.

1.2   The Township Startup's Organisation

Many organisations are currently shifting their focus towards emerging markets or the rising billions (Diamandis & Kotler 2012) where there lies potential to add much needed value to the many underserved members of society. Nevertheless, these markets operate under different rules than those of developed markets and the same solutions can therefore not simply be plugged-and-played in these communities. Entering these markets naively can be a very expensive and even destructive process (Mahajan 2011). The Township Startup suggest that the organisation can be taught how to do this without excessive experience or resources. The Townships Startup highlights the parallels between the process through which an organisation can and should enter emerging markets and how individuals in limited resourced communities can be taught to build sustainable livings for themselves. This suggests that both these goals can and should be met simultaneously.

1.3   Gap between Developed and Developing South Africa

According to Prahalad (2009) there are billions of individuals in the global BOP, living from less than 2USD per day. Presently this number is believed to fluctuate somewhere between 4 and 5 billion people, with a total world population of 7,3 billion people (Worldmeters 2015). In South Africa 21.7% of their citizens live below the food poverty line which means they cannot satisfy basic nutritional requirements. 37% live below the lower bound poverty line,

which means that they cannot acquire both necessary food and non-food items and has to compromise on one or the other. 53.8% fall under the upper bound poverty line, the widest definition of poverty in South Africa, which implies that they are living on ZAR25/USD2 or less per day (Nicolson 2015) as can be seen in Figure 1.
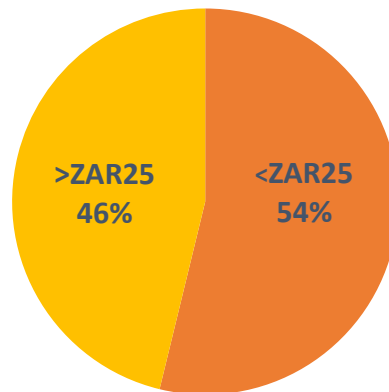
Figure 1 - South African citizens living above and below upper poverty line

Most of South Africa's BOP citizens are based in limited resourced communities where they live isolated from South Africa's better developed markets. It is therefore no surprise that South Africa, together with the neighbouring Lesotho, Botswana and Namibia, currently have the world's highest GINI coefficients (The World Bank 2013). This does not only suggests that the difference between Southern Africa's rich and poor are the greatest in the world, but also that the gap between developed and developing markets in these countries are also the largest (Marais 2011).

1.4 Township Background

It is often suggested (Morris & Pitt 1995) that South African Townships are vibrant and full of entrepreneurial spirit with individuals wheeling-and-dealing in whatever way possible. Nevertheless skills, knowledge and resources are not always traded out of interest, but as a matter of survival. Individuals come up with amazing, creative, cost effective and breathtakingly simple ideas to solve everyday challenges. Every now and again true innovations are born from within South African townships. Some of which has the potential to really induce positive change and even to be scaled into sustainable enterprises (Woodward et al. 2011).

Nevertheless, regardless of how glamourous this might seem there are still very real challenges (Wood & Jewkes 1997; Govender & Killian 2001; Eaton et al. 2014; Mbonyane & Ladzani 2013) in modern townships which prohibits efficient collaboration between developed and these developing markets.

1.5   Problem Statement

There exist a huge gap between developed and developing South Africa. This gap affects everyone in South Africa, but mostly the majority individuals which make up the nation's BOP who struggles to sufficiently sustain themselves on a daily basis. These individuals are mostly based in limited resourced communities where they are isolated from the privileges experienced by developed South Africa, privileges such as high quality education, modern infrastructure and top class goods and services. While these limited resourced communities are underserved and presents a lot of potential, organisations struggle to successfully enter and grow their initiatives in these markets. This makes it very difficult for them to add true value to the members of South Africa's BOP.

1.6   Research Proposition

Individuals in limited resourced communities and organisations who wishes to enter emerging markets should enter into mutually beneficial partnerships if South Africa aims to breach the gap between their developed and developing markets.

1.7   Research Objectives

The objective for this study is to better understand what results in the gap between developed and developing South Africa. Once this is better understood the nature of the solution which might help breach this gap can be defined. Finally developing a proposed business platform which can be implemented to facilitate the formulation of effective partnerships between these market segments and help breach of the gap between developed and developing South Africa.

1.8   Research Questions

The following research questions have been defined for this study:

- What are the main challenges which contributes towards the gap between developed and developing South Africa?
- Define the nature of the solution which might help breach this gap between developed and developing South Africa?
- How can individuals in limited resourced communities and organisations who wishes to enter South Africa's emerging markets work together to breach the gap between developed and developing South Africa?

1.9   Research Design and Methodology

Due to the nature of the problem which is addressed in this study an exploratory and inductive research design was followed. The research done for this study relied significantly on the author's observations of life in South Africa's limited resourced communities while working from Hubspace Khayelitsha. Furthermore the author allowed himself to be guided by modern
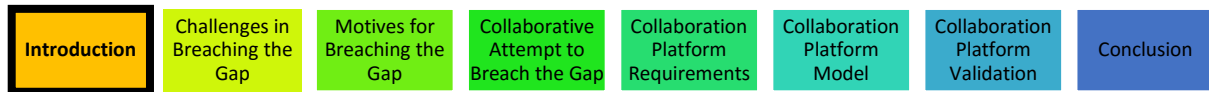
entrepreneurial practices in an attempt to deliver work which is relevant and authentic to the challenges currently experienced in the South African Enterprise Engineering landscape.

The nature of the challenge required extensive knowledge on human behaviour and the forces which drives modern societies, since this study aimed to obtain a better understanding of the developing world and how a platform can be designed through which increased human performance in the BOP markets can be pursued. Therefore a qualitative and design science research methodology was found most fitting. The research method which was followed is summarised in Figure 2 below.

Literature Research

Structured Interviews

Experimental Learning

Deductive Logic

Develop and Test Prototype

Obtain Feedback via Interviews
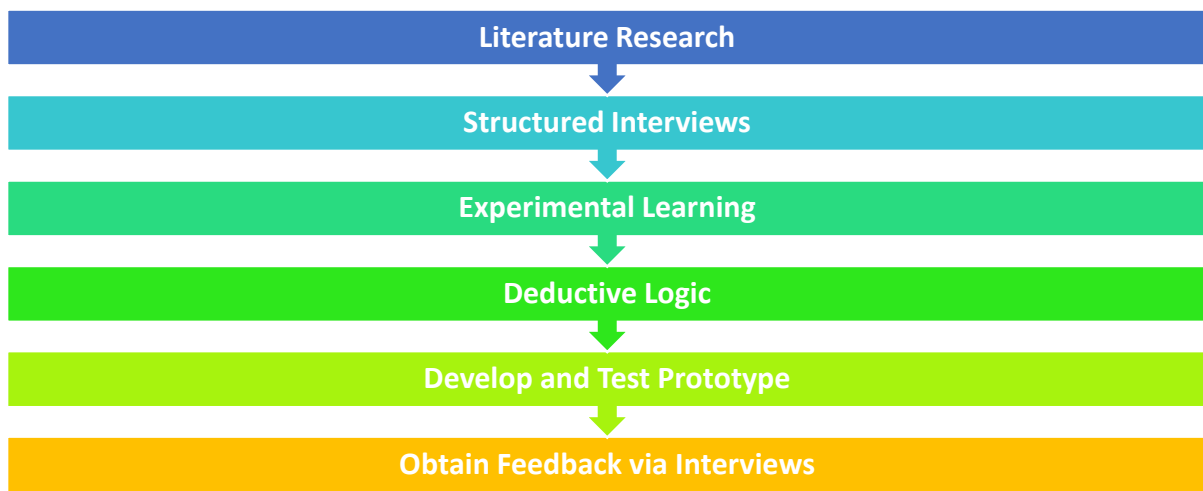
Figure 2 - Research method

1.9.1 Literature Research

The author spent a lot of time studying the dynamics currently being experienced in the global entrepreneurial market. It was found that these dynamics can only fully be understood when the enormity of the impact technology and especially exponentially growing technologies have in the entrepreneurial world is better understood. Among other things technology is driving entrepreneurial practices towards a much more customer centric business approach which required a scientific and very realistic understanding of human behaviour and the forces which motivates individuals to interact with organisations. Due to the nature of this study the author also spent a lot of time studying African economics, politics and culture. Further researching phenomena such as the technological leapfrogging taking place in Africa and the opportunities which are consequently opening up potential for new initiatives which have never been possible in rural Africa before.

1.9.2 Structured Interviews

The author spent five months working from Hubspace Khayelitsha, a communal office space for entrepreneurs. He constantly interacted with local individuals and organisations from Khayelitsha. He interviewed anyone and everyone willing to share their insights. Throughout this time the author was also in contact with various organisations who were supporting the

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| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | Collaboration Platform Validation | Conclusion |
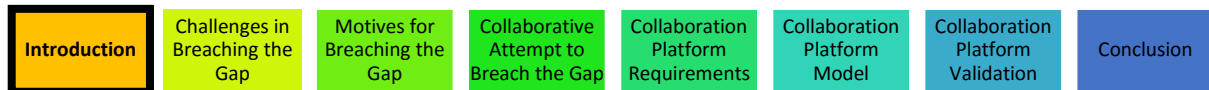
entrepreneurs in Hubspace or busy with their own initiatives in Khayelitsha. He learned a lot about the challenges which these organisations face in their daily endeavours in South African Townships. As the author started to get a better feel for the environment, more structured interviews could be held with potential customers as a means to obtain data which could be used as evidence for this study.

1.9.3 Experimental Learning

During the time at Hubspace the author also started his own entrepreneurial initiative to experience firsthand what some of the challenges operating from a limited resourced community involves. A startup was launched which developed cost efficient, durable and easy maintainable motorised bicycles as a transportation medium for individuals and local organisations. A first pilot run was completed through which one batch of these bicycles were designed, manufactured and sold in collaboration with a handful of the entrepreneurs working from Hubspace Khayelitsha.

1.9.4 Deductive Logic

With a better understanding of the challenges which are faced in limited resourced communities, the author could better define the scope of the research which was required to address the most important challenges faced in these communities. BioTRIZ, a top down holistic problem solving methodology was used to incrementally define the platform requirements on which the platform could be built. These requirements where constantly designed, applied, tested and refined to bind them all together into a well-defined whole.

1.9.5 Develop and Test Prototype

Once the requirements were defined, the platform functionalities could be further defined and prepared for implementation in limited resourced communities. The finer details of the platform were shaped, specifying exactly how the platform would work, how users would interact with it and what the real value proposition of the platform would be. The platform functionalities were summarised into a potential business model which was used to identify the main assumptions on which the platform were based. Different prototypes were developed to test important assumptions, experimentally validating whether the platform would work as it was designed to work.

1.9.6 Obtain Feedback via Interviews

Once a potentially viable solution was developed and all the characteristics could be properly defined, the author interviewed various potential customers to obtain data which were used to substantiate whether or not the final platform could realistically help breach the gap between developed and developing South Africa.

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	Collaboration Platform Model	Collaboration Platform Validation	Conclusion
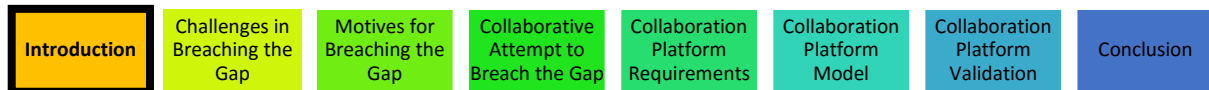
1.10 Research Structure

The research for this study was structured as illustrated in Figure 3 below.

Chapter 1: Introduction

Chapter 2: Challenges in Breaching the Gap

Chapter 3: Motives for Breaching the Gap

Chapter 4: Collaborative Attempt to Breach the Gap

Chapter 5: Collaboration Platform Requirements and Design

Chapter 6: Collaboration Platform Business Model Summary

Chapter 7: Collaboration Platform Validation

Chapter 8: Conclusion
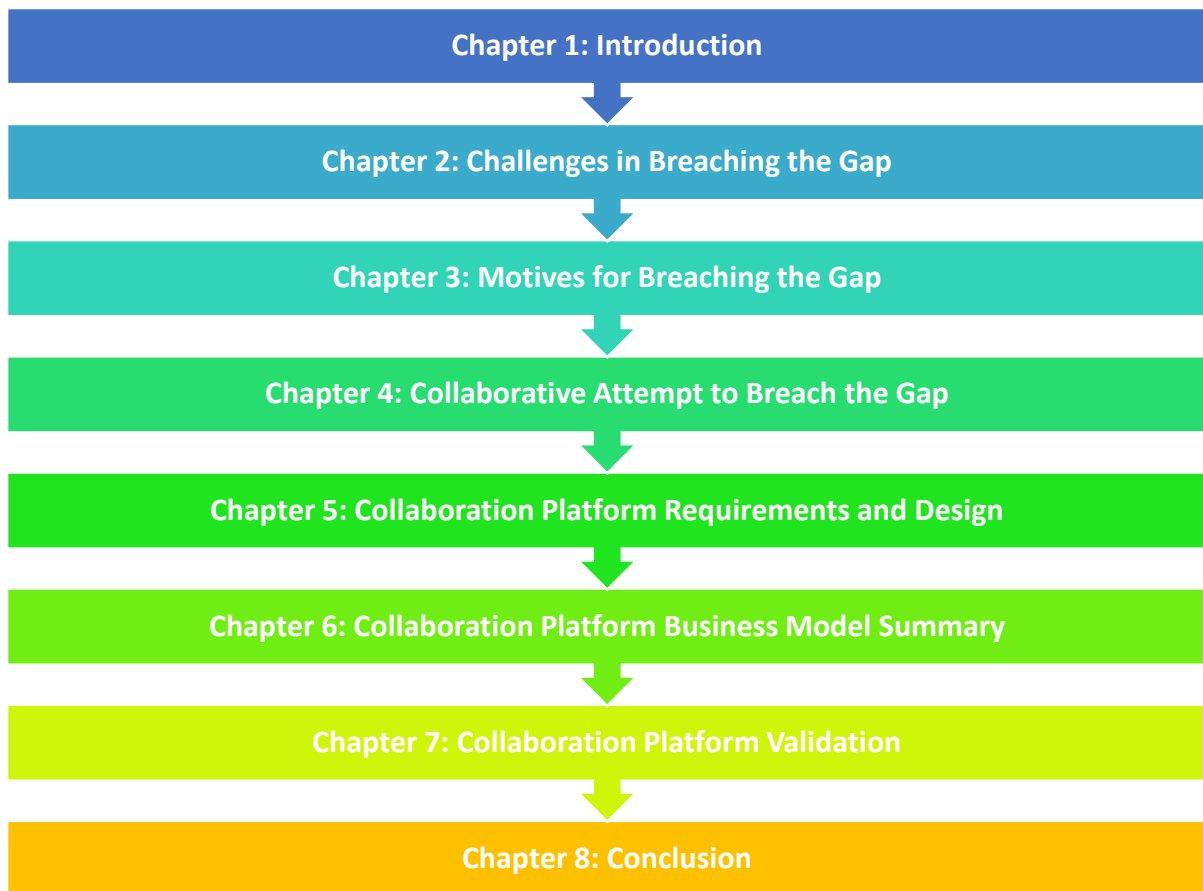
Figure 3 - Research structure

The following diagram explains the research objectives and questions which were addressed in each chapter and the corresponding relationship between each chapter and the research methodology as explained in section 1.9 above.

Chapter 1: Introduction

Objective: Defining the nature of this study.

Question: What is the purpose for this study?

Methodology: This chapter is based on the research methodology as explained in section 1.9.1 and 1.9.2 and serves as the introduction for this study. It explains why the topic for this study was chosen, what was addressed and briefly summarises how this was done.

Chapter 2: Challenges in Breaching the Gap

Objective: Identifying the greatest challenges which prevent South Africa from breaching the gap between developed and developing markets.

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| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | Collaboration Platform Validation | Conclusion |

Question: What are the different challenges that makes it difficult for individuals in South Africa's BOP to sustain themselves and for organisations to enter South Africa's emerging markets? Can these challenges be traced back to a central underlying problem?

Methodology: This chapter is based on the research methodology as explained in sections 1.9.2 and 1.9.3. It highlights the greatest challenges which results in the gap between developed and developing South Africa, identifying lacking education as the most important underlying challenge which results in this gap.

Chapter 3: Motives for Breaching the Gap

Objective: Investigating the nature of human interaction to determine the motives why South Africans might be interested in breaching the gap between developed and developing markets. Establishing which resources are available to help do so.

Question: What are the motives which would drive South Africa to breach the gap between developed and developing South Africa?

Methodology: This chapter is based on the research methodology as explained in sections 1.9.1, 1.9.2 and 1.9.4. It highlights the necessity for collaboration which is presented through the superposition of human behavioural sciences, the South African culture of Ubuntu, exponential technology and transforming entrepreneurial practices.

Chapter 4: Collaborative Attempt to Breach the Gap

Objective: Aligning the goals of the individual with those of organisations and educational institutions in an attempt to design mutually beneficial partnerships through which the challenges as defined in chapter 2 can be addressed and the gap between developed and developing South Africa can be breached accordingly.

Question: Is it possible to align the goals of the individual with those of organisations and educational institutes to motivate a collaborative attempt in breaching the gap between developed and developing South Africa and will such an attempt prove beneficial to each of the three parties?

Methodology: This chapter is based on the research methodology as explained in sections 1.9.1, 1.9.2 and 1.9.4. It highlights the potential for creating strategic partnerships between individuals, organisations and educational institutions to help breach the gap between developed and developing South Africa.

• Chapter 5: Collaboration Platform Requirements and Design

Objective: Developing a platform which will facilitate mutually beneficial partnerships between individuals in limited resourced communities and outside organisations.

Question: How can a collaboration platform be developed which would effectively breach the gap between developed and developing South Africa?

Methodology: This chapter is based on the research methodology as explained in sections 1.9.2, 1.9.3, 1.9.4, 1.9.5 and 1.9.6. It explains how BioTRIZ methodology was used to develop and define the requirements which the platform had to meet to breach the gap between develop and developing South Africa.

Chapter 6: Collaboration Platform Business Model Summary

Objective: Defining the specifications of the collaboration platform which was developed in Chapter 5.

Question: How does the collaboration platform work, interact with its users, what drives users to participate in such a platform and what is the business model behind the platform?

Methodology: This chapter is based on the research methodology as explained in sections 1.9.2, 1.9.3, 1.9.4, 1.9.5 and 1.9.6. It defines the business model behind the collaboration platform, how it works and how users would interact with the platform.

Chapter 7: Collaboration Platform Validation

Objective: Validating the collaboration platform to determine whether it will help breach the gap between developed and developing South Africa.

Question: Will the collaboration platform work as it was designed to and will it help breach the gap between developed and developing South Africa?

Methodology: This chapter is based on the research methodology as explained in sections 1.9.3, 1.9.4, 1.9.5 and 1.9.6. It explains how an action learning validation approach was followed to validate whether the collaboration platform would work as it was designed to work and whether it would help breach the gap between developed and developing South Africa.

Chapter 8: Conclusion

Objective: Drawing a conclusion on regards to the proposed collaboration platform which was developed and the potential environmental impact such a platform might have in developing South Africa.

Table 1 - Research summary
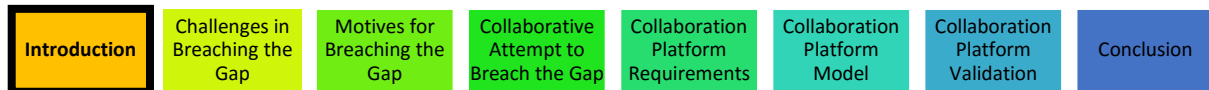
1.11 Research Method Chapter Cross Reference

The relationship between the research method and the research chapters is visualised in Figure 4 below.
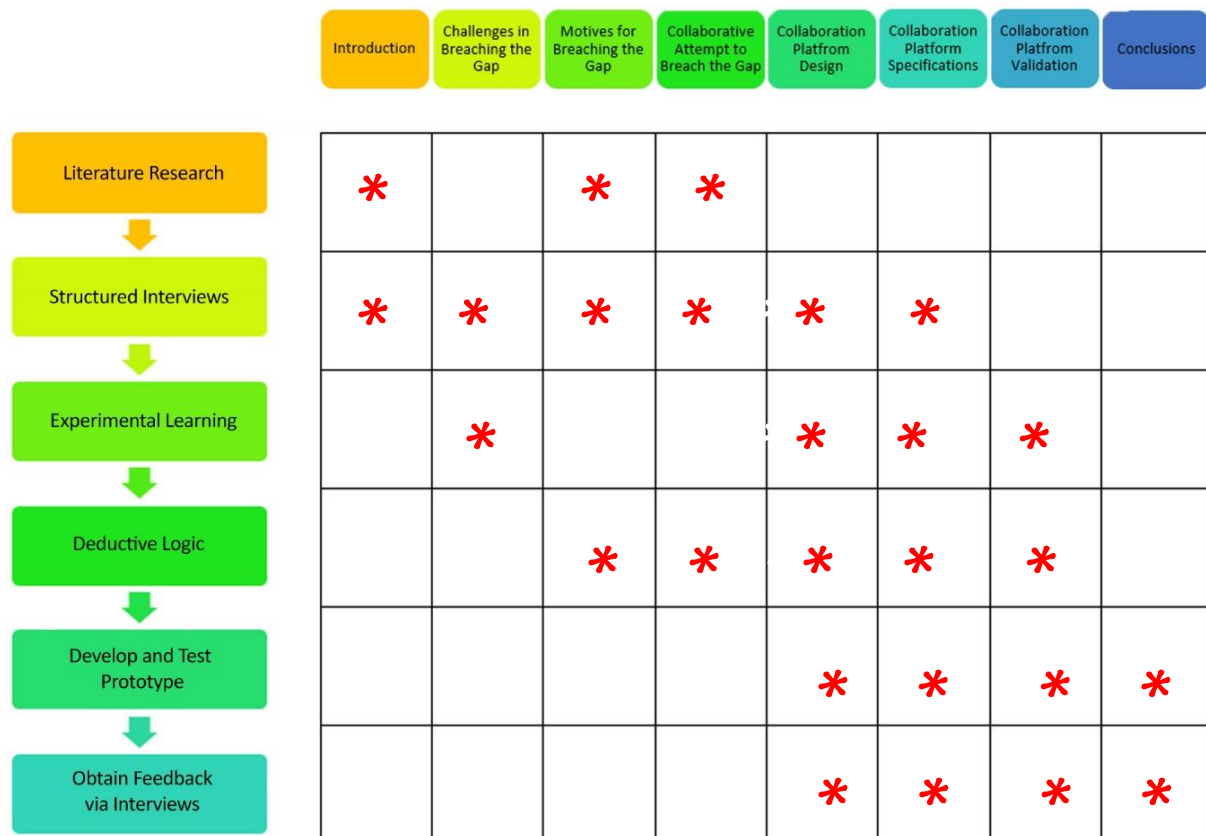
Figure 4 - Research method and chapter cross reference

1.12 Research Partnerships

This study was done in partnership with Timu Technologies, a company which the author founded in 2014 which is currently working on the commercialisation of the collaboration platform as was developed for this study. As well as with Hubspace Khayelitsha, a communal office space in South Africa's fastest growing township. Hubspace had around twenty local entrepreneurs that worked from their office in Khayelitsha until they had to close their doors in May 2015 due to a lack of funding. The author spent five months working from Hubspace. Working with the members on their business initiatives, researching township entrepreneurship and conducting various experiments in support of this research.
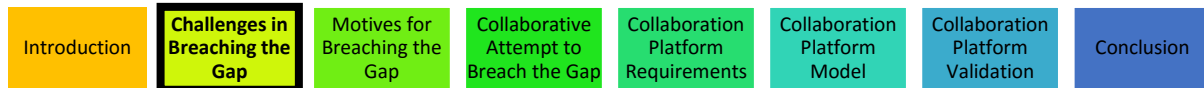
2   Challenges in Breaching the Gap

South Africa faces many different challenges which makes it difficult for individuals in limited resourced communities to lift themselves out of poverty. These same challenges makes it difficult for outside organisations to enter and grow their initiatives in emerging markets in an attempt to provide much needed goods and services. It is these challenges which directly result in the gap between developed and developing South Africa.

This chapter investigates these challenges and how they influence both the individual and the organisation. The chapter is concluded with a basic root-cause analysis which highlights the single underlying problem to which most of these challenges can be traced back to. This was done in accordance to the research methodology as described in section 1.9.2 and 1.9.3.

2.1   Limited Access to Funding

As explained in Chapter 1 more than half of South Africa's citizens live in complete poverty. If an individual struggles to sustain himself, there remains limited finances which can be allocated to growing his own entrepreneurial initiatives. Lindile Ndlazilwana (2015, pers. comm., May 25) from Redemption Finance Solutions and Hubspace member says *I have worked in financial services in townships for many years and I have seen how often people make uneducated financial decisions. They will make decisions in five minutes that will impact the rest of their lives. People are getting into debt without even knowing what debt is. They struggle to understand that once they are in debt, they can't run away from it. Interest keeps on growing. It is not only individuals who need to be educated, but also startup companies in townships.*

Nthuthuzelo Jokwana (2015, pers. comm., May 25) from KC Key Holdings and Hubspace member *says it would be nice if we could grow our companies, but it is difficult to do this with the limited resources we can access. We have to use our income to do this, but at the same time we need that income to sustain ourselves as well*. Furthermore there are very limited alternatives to obtain funding. Nkumbuzo Nkonyana (2015, pers. comm., May 25) from Heavenly Quartez and Hubspace member says *banks do not trust us, because we do not have a sufficient track record.* Banks consider debt in townships as too great a risk due to the absence of wealth generation (Thulo 2015).

This leaves organisations in a very difficult spot as it is becoming widely understood that charity is unsustainable. Despite the good intentions behind many charitable organisations, it has actually been shown that the negative consequences of charity often outweighs the benefits achieved (Elumelu 2013). Throwing money at a problem, does not solve the problem, it often complicates matters (Ries 2011). This is obviously a challenge for organisations who takes their social responsibility serious, but have little knowledge on how they can positively
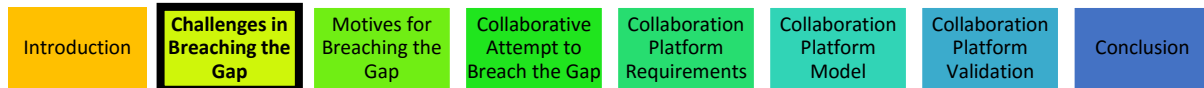
contribute to the individuals in limited resourced communities through non-charitable initiatives.

2.2   High Unemployment Rates and Boredom

Melilizwe Gqobo (2015, pers. comm., May 25), co-founder of Hubspace Khayelitsha says that *statistics show that townships such as Khayelitsha have unemployment rates of up to 60%* (Sekhampu 2013)*, but the chances are good that these figures are actually too conservative.* Townships are far from formal job opportunities. Traveling between townships and cities where most opportunities lie is not only expensive, but also very dangerous. The few jobs that are available are often menial and involves long working hours with small salaries and little to no benefits. Resultantly many young South Africans rather decide not to work and stay at home (CityPress 2013).

This leads to township youth with too much time on their hands. A resident of Khayelitsha (2015, pers. Comm., April 22) says *I am so bored, I will do anything you give me to do. I spend every day doing nothing. Please give me something to do?* Nkumbuzo Nkonyana (2015, pers. comm., May 25) from Heavenly Quartez and Hubspace member says *we have too many young people who have nothing productive to do with their time*.

Due to all the national labour legislation making it difficult for organisations to get rid of employees, many organisation simply refrain from employing any new staff, since the only way an organisation can justify to employ an individual under such regulations is if that individual can effectively help that organisation to add value to their final customers (Ries 2011; Diamandis & Kotler 2015; Ismail et al. 2014; Sutherland 2014; Robinson 2011). Resultantly, these rules and regulations which are meant to protect the individual actually ends up causing them harm. Nthuthuzelo Jokwana (2015, pers. comm., May 25) from KC Key Holdings and Hubspace member says o*ur Rent-a-Granny initiative has the potential to help many retired domestic workers earn an additional income, but according to our constitution we have to pay them at least ZAR2000 a month and it is really difficult for us to do this. This cuts of our hands when we try to help retired domestic workers who really need and wants our help.*

2.3   Entrepreneurial Shortage

Clem Sunter (2014) suggests that one of the solutions to South Africa's various challenges is to change the strategy from creating jobs, to building enterprises. These enterprises will have to be engineered from both a developed and developing market perspective. Despite the limited resources in these communities, BOP entrepreneurs are often credited for their very creative ideas and problem solving. Nevertheless, the process of idea generation and changing those ideas into sustainable enterprises are two completely different things. An organisation's success does not lie in its ideas, but rather in the successful implementation

and execution of those ideas to add real value to the beneficiaries of that idea. This is an area where South Africa falls very short (Thulo 2015).

Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express and Hubspace member says *entrepreneurship is challenging, especially in townships. It is challenging to get initiatives started, innovating as you go along, trying to get people excited about what you are doing, while daily fighting the realities of township life*.

2.4   Limited Working and Industrial Space

Due to a lack of finances, very few individuals can afford accommodation with enough room for a productive working space which would include a chair, desk, computer and internet access. Jason Woolf (2015, pers. comm., May 25) from Umbiyozo and Hubspace member says *there are limited office spaces for entrepreneurs to work from in Khayelitsha. Spaces that are created for the community are all taken up by churches or other NGO's. If you need a spot to sit and work from, you will be charged and unfortunately many of the entrepreneurs that are already busy adding a lot of value to many people's lives, can't afford to work from these spaces*.

Lindile Ndlazilwana (2015, pers. comm., May 25) from Redemption Finance Solutions and Hubspace member says *before Hubspace I was working from home, which was a major challenge. I did not have internet access or a printer which I really needed. Every day I would have to go to an internet café, where there is a long queue. This was costly because it wasted a lot of time, I had to pay to get there and back by taxi and pay to use the computers at the internet café. At that stage I could not afford to pay a lot for rent. It was difficult because I did not feel comfortable to take my customers to my home. People do not always believe you when you say you are handling their finances and you are working from your garage. It's not professional. Customers also did not really know where they could get a hold of me*. Zolile Nonzaba (2015, pers. comm., May 25) from MLK Computer Consulting and Hubspace member says *I would not have trusted you if you say you want to do business with me and you take me to your home. I would be sceptical in supporting your business*.

This is not only a challenge for local entrepreneurs, but also for outside organisations who would like to start new initiatives in townships and require a physical location from where they can operate. Until end of May 2015, Hubspace was the only office space in Khayelitsha from where the author could conduct his research. The Bandwidth Barn, a new government subsidised office space, opened their doors around the same time Hubspace closed down and is currently the only communal office space from where entrepreneurs can work in Khayelitsha.

2.5   Gangsterism and Crime

Nthuthuzelo Jokwana (2015, pers. comm., May 25) from KC Key Holdings and Hubspace member says *due to the scarcity of jobs, children in townships often get involved in social ills such as gangsterism and crime in an attempt to help support their families.* Wandisile Nqeketo (2015, pers. comm., May 25) of 18 Gangster Museum and Hubspace member says *gangsterism is a big problem in townships. Kids join gangs because they only see the glitz and glamour, not really knowing the realities of being a gang member and how all of it will have a negative effect on them.*

Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express and Hubspace member says *there is a high rate of crime in South African townships and it effects many, if not all, organisations operating in these communities. It sometimes get really bad.* This does not only make it difficult for entrepreneurs within the township, who are most vulnerable, to grow their own business initiatives, but also keeps many other organisations out of the townships. Simply, because very few organisations are willing to accept the risk involved in operating in these communities (SBP 2008).

2.6   Lacking Trust

Raymond Vicani (2015, pers. comm., May 25) from Raymond's Landscape and Gardening Services and Hubspace member says that *due to all the crime in townships it is very difficult to determine who is trustworthy and who is not. People do not always have references who can vouch for them and even if they do it is just as difficult to trust their references. It is therefore difficult to find people with the right skills and who you can trust to help you with your entrepreneurial initiatives.*

Despite it being difficult to find, trust is a very important thing in townships. Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express and Hubspace member says that *trust is very important if you want to operate within the townships, whether you come from that community or if you are an outsider. You have to form part of the community. You have to involve the people in that community. That is the only way you will win their support. For this reason organisations have to be present in townships and actually interact meaningfully with their customers. Trust is earned through interaction and takes time to establish. It requires getting in rank and help fighting the battle on the ground.*

At the same time trust goes two ways. Organisations want to know that they can trust the parties with whom they interact. Accurately determining whether an individual can be trusted as an outsider is even more challenging for an organisation and there is no reliable system which can be accessed by the general public to do this. Melilizwe Gqobo (2015, pers. comm., May 25), co-founder of Hubspace Khayelitsha says *it is difficult for entrepreneurs operating in limited resource communities to build credibility through their endeavours since there is no*
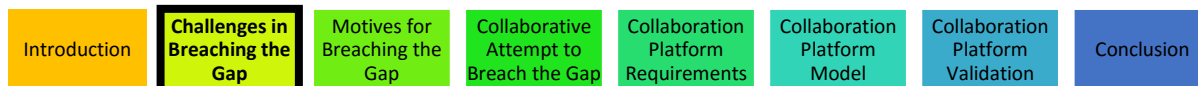
effective way for them to record their initiatives, making it difficult for them to effectively trade their products and services outside their own communities.

2.7   Collaboration Challenges

The only way an individual will be able to flourish within a township is if the community allows them to do so. Lindile Ndlazilwana (2015, pers. comm., May 25) from Redemption Finance Solutions and Hubspace member says *before I joined Hubspace and people knew about me and my business, I had to do everything in my business myself. It was very difficult for me. I had to pay people to help me and I could not really afford it. Only once I joined Hubspace and I started collaborating with the other members could I really start getting my initiatives off the ground. Unfortunately there are not many places such as Hubspace in Khayelitsha where people can collaborate, and even fewer in other townships.*

Nthuthuzelo Jokwana (2015, pers. comm., May 25) from KC Key Holdings and Hubspace member says *there is very limited access to knowledge and information if you work in isolation. Unfortunately efficient collaboration is sometimes difficult due to the limited infrastructure in townships.* Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express says *entrepreneurship is a lonely journey and if you work alone you can easily decide to give up. Especially in townships where it is difficult to find spaces where like-minded entrepreneurs can all work together.*

Melilizwe Gqobo (2015, pers. comm., May 25), co-founder of Hubspace Khayelitsha says *even the members in Hubspace, who do it better than most other entrepreneurs in Khayelitsha, struggle to efficiently and deliberately collaborate with each other since they lack systems and technological solutions specifically designed for townships to do so.* Due to the challenge of effectively collaborating with other individuals and organisations within South African townships, it is understandable that collaboration with outside organisations are even more challenging.

2.8   Language and Communication Barrier

Communication is very important for entrepreneurs who want to build communities which can and want to support them in their entrepreneurial endeavours. It is important that organisations can communicate their goals and motives to the individuals forming those communities and in return that individuals can provide sufficient feedback to these organisations. Melilizwe Gqobo (2015, pers. comm., May 25), Co-Founder of Hubspace Khayelitsha says that *most of the residents of Khayelitsha speaks isiXhosa and although many are fluent in English, there are definitely citizens who only speak their native tongues, especially among the older folks.*

And although drastically increasing, very few citizens in Khayelitsha have reliable internet access and this prohibits them to communicate via emails and other online tools.

Furthermore, the author found that very few of the individuals with whom he interacted in Khayelitsha are willing to pay for expensive mobile services associated with calling and messaging. Making productive communication between organisations and individuals extremely difficult. And in effect isolating townships from the rest of the world.

Melilizwe Gqobo (2015, pers. comm., May 25), co-founder of Hubspace Khayelitsha says *when I'm in town and I mention business opportunities for the base of the pyramid I immediately have everyone's attention. It is the best topic to network around and it makes for great stories at fancy dinner parties. But despite the fact that people love to talk about this topic, it is still very challenging to actually develop partnerships through which we can really collaborate.*

2.9   Wrong Perceptions

Melilizwe Gqobo (2015, pers. comm., May 25), co-founder of Hubspace Khayelitsha says as *a social entrepreneur who helped bring the first communal office space to Khayelitsha, I have experienced the difficulties in trying to convince developed South Africa that spaces and interventions such as Hubspace are needed in limited resources communities. Hubspace has inspired many people to consider moving into this market and to start playing around with new business models which can work here. We are busy changing perceptions. But there are definitely still many wrong perceptions about South African townships. We still have a lot of work to do before people will realise that incubators and shared office spaces are as much needed here, perhaps even more, than it is in more affluent parts of the world.*

For members of society who do not go to townships often, it becomes easy to stereotype BOP members with some of the less appealing stories of South Africa which are constantly exploited by international media.

At the same time the author has also experienced firsthand that many individuals within Khayelitsha live under the false impression that developed South Africa is at war with developing South Africa and that organisations deliberately refrain from entering these markets. Without them understanding the challenges organisations face under strict national legislation and the hard realities of business.

2.10 Lacking Motivation

Staying motivated in an already unideal environment is another great challenge for many individuals living in limited resourced communities. Nthuthuzelo Jokwana (2015, pers. comm., May 25) from KC Key Holdings and Hubspace member says *people in townships are generally less motivated. It is not common to see people that are actively involved in economic upliftment. The community has a shortage of role models. They need to see people who are from the same community who are devoted to transform their communities for the better.*

Lindile Ndlazilwana (2015, pers. comm., May 25) from Redemption Finance Solutions and Hubspace member says *it is very sad that Hubspace is closing down. I don't know what to say.*

It will mean that most of the entrepreneurs working from Hubspace, who has the potential to boost the economy, fight poverty and unemployment and most importantly, serve as an inspiration to many in their communities, will have to go back working from their homes. It will be back to queuing at internet cafes and taking customers to their homes. It is a pity, because if such a place can close, what is the hope for entrepreneurs in our country? The entrepreneurs working from Hubspace are serious. They wake up early to work on their visions and dreams. But now those passionate guys who work tirelessly, often working day and night with very little or no sleep, might lose their office space and has no idea what is going to happen next.

Mellly Ndabeni (2015, pers. comm., May 25) from Heavenly Quartez and Hubspace member says *if Hubspace, an initiative which served as a spark of hope for many, closes down at a time where many entrepreneurs are starting to get their initiatives of the ground and needs this space more than ever, it is killing our spirit.*

2.11 Lacking Basic Services

Furthermore South African townships lack other basic services which are taken for granted in more developed communities. To name just two examples, Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express and Hubspace member says *most of the residents in Khayelitsha rely on public health services. And these systems are overloaded with too many people. This puts a huge burden on the department of health and they resultantly struggle to cope with the high demand. Resultantly, people have to queue for 5-8 hours at the clinics to get medicine.* T*he slightest health issues often become heavy burdens for entrepreneurs in townships.*

Furthermore, navigating in townships are also a huge burden, especially for organisations that is not based within the community. This complicates logistics for many organisations who are interested in serving BOP markets. Sizwe continues to say that *not even Google knows how to navigate the streets of Khayelitsha. If you rely on a GPS you will often be taken to the wrong street in the wrong section. This makes is very difficult for outsiders to effectively deliver goods and services to customers who are based in townships*.

2.12 Lacking Knowledge and Relevant Information

As the author spent more time with the entrepreneurs at Hubspace and had more opportunity to interact with the general public in Khayelitsha, he learnt that many of the challenges explained above originates from lacking knowledge and access to relevant information. A false understanding of the role each and every individual has to play within society and insufficient information and knowledge of how they can and should trade their contribution to ensure a better quality of living for themselves.

Asanda Rasmeni (2015, pers. comm., May 25) a member of Hubspace says *as an aspiring entrepreneur setting out to start my own thing I'm not always sure what I should do next; whether I should raise funds, just start out or perhaps do some more research.* Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express and Hubspace member says *it is challenging from a business point of view to determine what and where the best opportunities lie and where we should focus to ensure long term success. To be able to do this you require knowledge about your industry and understand how business work.*

Due to a lack of knowledge, individuals falsely believe that they require money before they can start adding value in their communities. Nkumbuzo Nkonyana (2015, pers. comm., May 25) form Heavenly Quartez and Hubspace member says *when we are asked what we need to succeed as entrepreneurs, the first thing people think of is money. Yes definitely, we need funding to grow our businesses. But I believe the most important thing entrepreneurs need is education and access to the knowledge that is out there. Without it access to money does not help. Sometimes people will get money, but they do not know how to spend it wisely, so they'll go out and buy a BMW and have nothing left to invest in themselves.*

The same argument can be made for organisations who are interested in entering emerging markets. In the end there are various different challenges which make business difficult in South Africa's emerging market, but any challenge is surmountable with the right information and supporting knowledge.

2.13 Root-Cause Analysis

In the search for the underlying problem to which most of the above challenges can be traced, it is important to distinguish between correlation and causation (Heyns & Vlok 2014). Authors such as Card (2006) suggested that causation can only be proven if there exist a correlation between the cause and effect, the cause precede the effect and a linking mechanism between the cause and effect can be identified. Accordingly the author investigated the potential for causation between these challenges and the order in which they occur.

Firstly all the identified challenges were analysed to determine whether or not there exist a correlation between some of these challenges in accordance to the methods proposed by Lee & Nicewander (2014). Thereafter the author analysed all correlating challenges in an attempt to establish which challenges might be a result of others, trying to determine the most logical cause and effect relationship between the different challenges. The findings is summarised in a causal tree (Bossche 1991) as can be seen in Figure 5 below. The tree suggest that most of these challenges are correlated to each other in some way or another and that lacking education is the challenge which precedes almost all these challenges. Therefore suggesting that lacking education would serve as the most logic cause for most of the challenges currently being experienced by individuals and organisations in limited resourced communities. The author did not continue to further identify the linking mechanisms which

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would have been needed to scientifically prove causality, but did find other studies which also confirmed that lacking education serves as one of the greatest, if not the greatest, challenges to breach the gap between developed and developing South Africa as is explained in the next section.
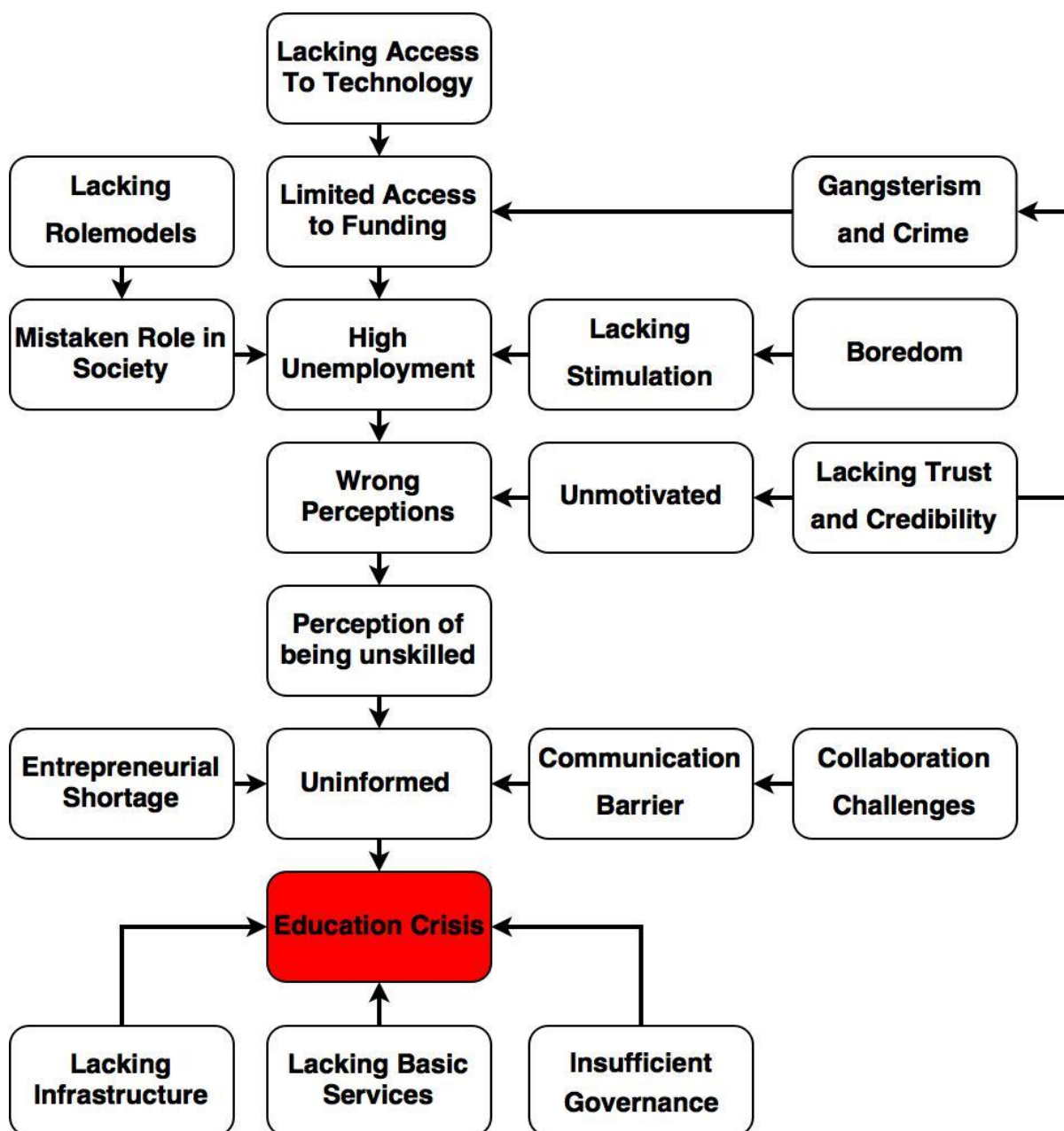
Figure 5 - Causal tree for challenges experienced in limited resourced communities

2.14 Education Crisis

According to various different sources, South Africa's biggest challenge at the moment is *deteriorating education and the sustained high level of unemployment.* The *Survey of the Global Agenda* also revealed that the biggest challenge facing Africa in 2015 is a lack in skills development and education. At the same time UNESCO predicts that Africa will be home to 50% of the world's illiterate in the near future (Ifebi 2015; Spaull 2013; Mobius 2012; Ramos 2014).

2.15 Valuable Contributions

Despite the various challenges faced by individuals in limited resourced communities, there are still many individuals that try their best to positively impact their communities. Individuals who are committed to improve the circumstances they live in. These individuals are motivated by the impact they have on the people around them, often without even being able to provide financial security for themselves. Jason Woolf (2015, pers. comm., May 25) from Umbiyozo and Hubspace member says *I have seen how many of the entrepreneurs at Hubspace struggle to pay their own rent, but still they endure the struggle and continue adding value to their community*.

Regardless of their circumstances, there are individuals who decided that they will do whatever necessary to ensure a brighter future for South Africa's BOP. Sizwe Nzima (2015, pers. comm., May 25) from Iyeza Express and Hubspace member says *I feel delighted. I feel very honoured. I still remember the first time I was listed on Forbes, the headline read 'History being set in Khayelitsha'. I was the first person in Khayelitsha to be listed on Forbes. Being listed as one of the most promising thirty under thirty year old entrepreneurs in Africa gave me a lot of confidence. It also convinced me that I have to deliver and that I have to show that I really am a promising entrepreneur.*

Nthuthuzelo Jokwana (2015, pers. comm., May 25) from KC Key Holdings and Hubspace member says *I believe that all children are talented, they just need a platform to work from and the opportunity to realise their potential.* Suggesting that individuals in South Africa's BOP is just as hungry to learn and to develop their skills and knowledge. And that many of the challenges which are currently being faced in South Africa can potentially be overcome through efficient education. A responsibility which many individuals are taking into their own hands.

2.16 Chapter Summary

This chapter confirms that there are various different challenges which make operating in townships as an individual and as an organisation very difficult. For all practical purposes there are too many challenges to deal with all at once. Therefore a basic root cause analysis was preformed through which the single most important underlying problem to most of these challenges were highlighted; lacking education and skills development. Without education individuals do not know how to access the necessary information and knowledge required to play their needed role within their community, nor do they know how they can and should trade their skills to contribute towards society. In turn this leads to all kinds of other social challenges within limited resourced communities. This suggested that the biggest challenge in breaching the gap between developed and developing South Africa is resolving the major shortages and insufficiencies in South Africa's educational system.

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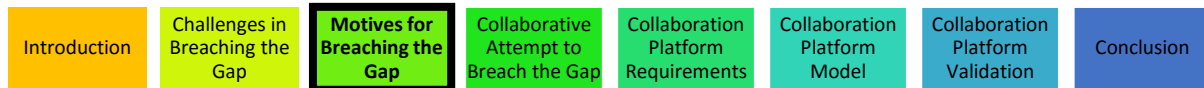
3   Motives for Breaching the Gap

Despite the many challenges faced in South Africa, there are no lack of business opportunities. South Africa has the opportunity to rethink the role which individuals and organisations have to play in South African society. Sir Winston Churchill said a *pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty.*

This chapter investigates the nature of human interaction to determine the motives why South Africans might be interested in breaching the gap between developed and developing markets. The role which human behaviour, a culture of Ubuntu, technology and transforming entrepreneurial practices have on these interactions are examined and used to identify some of the resources which are available to help breach the gap. This was done in accordance to the research methodology as described in section 1.9.1, 1.9.2 and 1.9.4.

3.1   Human Behavioural Sciences

In an attempt to understand the formal interactions between individuals and organisations, human behavioural sciences were studied. Before attempting a solution for the gap between developed and developing South Africa it was important to understand why individuals and organisations want to interact with each other at all. This question can only be answered by understanding the workings of the human mind. Something which organisations often neglect to do, to their own loss (Hill & Andelman 2012). The human mind is an extraordinary thing. It is so flawlessly simple, but exasperatingly complex at the same time (Kurzweil 2012). And although modern technology still only allows for a partial understanding of the human brain, many astounding discoveries have already being made which led to a better understanding of the individual's behaviour (Mlodinow 2013).

3.1.1 Happiness Origin

The first idea which was studied was the idea of happiness. Mentally healthy people have a desire to be happy. They try to live as best they can under the circumstances they find themselves in (Fischer 2013). Blaise Pascal said *all people do things with the intent to make themselves happy.* If this is true it is essential to understand what makes the individual happy, or at least what the individual presumes will make him happy, since it is the individual's perception of happiness which directly influences human behaviour.

Interestingly enough it has been found that people spend the most of their time building relationships, securing finances, bonding with family and keeping themselves healthy in the pursuit of happiness. Nevertheless, as visualised in Figure 6, studies have found that only 10% of an individual's happiness is determined by life circumstances such as those mentioned above. On the other hand, 50% of an individual's happiness depends on genetic makeup. But most importantly, it is suggested that 40% of the happiness an individual experiences is a direct result of his intentional behaviour (The Great Courses 2013).
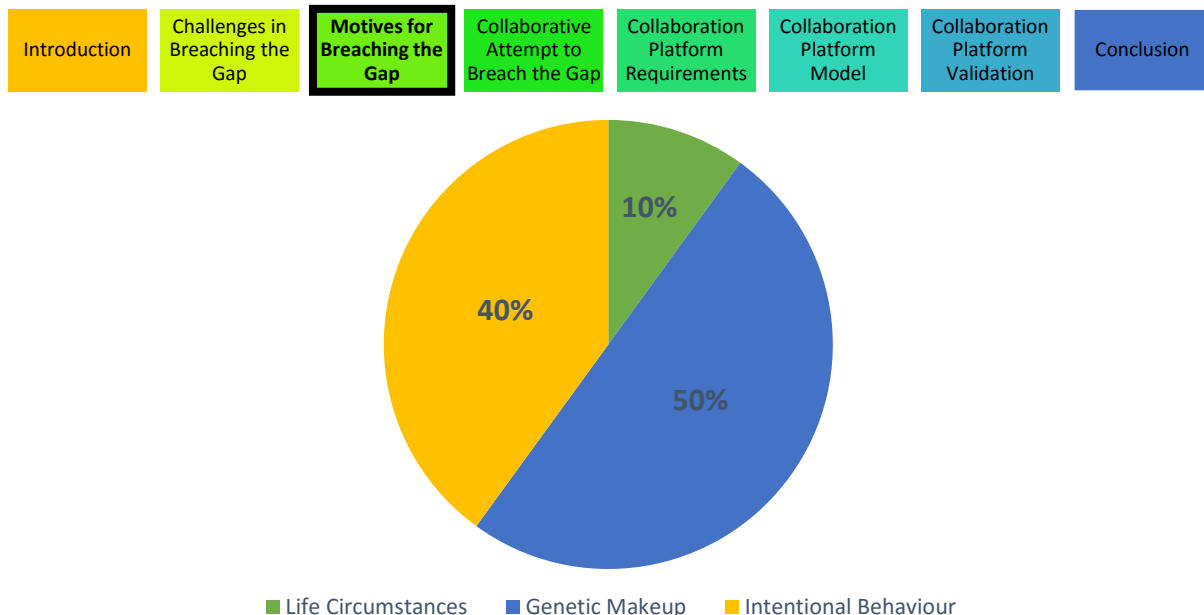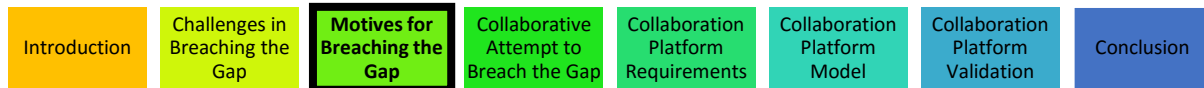
Figure 6 - The origin of human happiness (The Great Courses 2013)

This suggests that many individuals, worldwide, live under the impression that their life's circumstances will produce happiness, while it is actually their intentional decisions on how they respond to these circumstances which have the greatest impact. And since an individual's genetic makeup is passed on to him by his parents, for the purposes of this study the remaining 50% carries no significant meaning.

US research (The Great Courses 2013) suggest that below a certain income level, people are less happy, a direct result of hunger, being cold and potential health conditions. But a higher income only increase happiness up to a point where an individual earns an estimate USD5000 or ZAR60 000 per month, which is considered enough to allow an individual to achieve a high quality of living, reducing certain problems which cause stresses. Thereafter no correlation between an individual's income and happiness has been found. Studies have also found that there is no correlation between physically attractiveness and happiness.

Hedonic Adaptation (The Great Courses 2013) is the process through which humans adapt emotionally to changes in their lives and allows for emotions to wear of. People in fact underestimate how easily they can and will adapt and tend to give their living conditions more merit than they deserve in determining their happiness. People have the ability to make the best out of pretty bad situations. Their coping mechanisms work very effectively in reducing negative emotions. Unfortunately the poor ability individuals have to estimate the impact a specific event would have on them, leads to bad decision making (Veenhoven 2012).

How the individual behave and think, on the other hand, plays a very important role in personal happiness. For a person to be happy, it is important to live life in a way that focuses on things that are intrinsically important for human wellbeing. Some goals are more intrinsically important than others and are pursued for the goal itself and not as a means to an end. Research shows that happier people are committed to certain long term and often even lifetime goals which are actively pursued (Pink 2009).

These concepts are very important to consider in an attempt to breach the gap between developed and developing South Africa. If humans make decisions based on what they think will make them happy, and their perception of what really makes them happy are skewed, it has a huge effect on the way in which humans interact with each other and how organisations structure their initiatives in an attempt to accommodate the individuals with whom they interact.

3.1.2 Self Esteem Measuring

Self-esteem measures how positive an individual feels about himself. It has been found that a low self-esteem is associated with undesirable behaviour, whereas a high self-esteem is associated with desirable behaviour. Individuals with higher self-esteems tend to perform better in their jobs, are usually better educated and often have higher incomes, whereas individuals with lower self-esteem tend to be more dishonest, are often involved in criminal activities and are more prone to join gangs (Baumeister 2013).

Interestingly enough, it is suggested that high or low self-esteem is not the cause of negative or positive outcomes, but are rather the result of the individual's behaviour. Self-esteem in itself has no causal effect. It serves merely as an internal psychological meter which monitors the degree to which a person feels valued or accepted by other. People use their self-esteem to help them decide how to respond in particular social situations (The Great Courses 2013).

It can be argued that an individual's self-esteem is the system which measures the intentional behaviour which leads to personal happiness as discussed in the previous section and therefore plays an integral part in motivating human behaviour. It is also important to notice that an individual's self-esteem is directly related to the extent to an individual feels valued by others. Suggesting that personal happiness and the opinion of others have of a specific individual might also be related.

3.1.3 Peer Judgement Impact

Normal people are concerned about what others think of them. When individuals interact with each other, they interact with the impressions they have formed of one another, whether accurate or not. To a great extent, an individual's success in life depends on the impressions others form of them. Individuals portray different images of themselves. Images which they think will make a specific impression in any particular situation. Individuals cannot reveal everything there is to know about themselves and therefore choose the information that will help them achieve their current goals (The Great Courses 2013).

Resultantly, individuals have the ability to compromise their own personality to a great extent to confirm to the will, or at least their perception, of others. This is an important idea when it comes to business initiatives in emerging markets, since it relates back to many of the challenges which were identified in Chapter 2.

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3.1.4 Group Animals Traits

Understanding human behaviour, requires a better understanding of prehistoric times during which humans were required to fight to ensure their survival (Erken et al. 2013). Humans had to fight, not only to protect themselves against predators and other dangers, but also for reproductive purposes. Individuals who were best at protecting themselves, finding food and managing social relationships had the greatest chances of producing offspring.

Despite the tendency to deny this, humans are motivated by a need of social acceptance, a deep desire to belong to groups, a need to influence others, a tendency to protect themselves against harm and an inclination to establish intimate relationships. It can be argued that these traits made it possible for human beings to have survived as well as they have (The Great Courses 2013).

Although much has changed from prehistoric times, these traits still run deep in human beings. Traits which can and should be understood when structuring modern organisations.

3.1.5 Categorisation and Prejudice

Individuals have the tendency to categorise almost every piece of information they come across. This is done as a survival mechanism to aid quick decision making (Mlodinow 2013; Kahneman 2013). Individuals also do this with other individuals. A phenomena called *in-group favouritism,* leads to people identifying with groups of people as soon as they become a member of that group. The opposite is also true. *Realistic conflict theory* suggests that discrimination and conflict arises when different groups start competing for the same scarce resource (The Great Courses 2013).

Individuals benefit by belonging to a group (Noceti & Odone 2014). Members receive help from each other, cooperation occurs, members can pool resources together, realise social interaction, companionship and support. At the same time a group is only beneficial to the individual if the rest of the group cooperates and reciprocates. Therefore partnerships between different groups, first requires a sense of trust in one another. Individuals want the advantages of being part of a group, while minimising their risk as a member. Individuals therefore join groups very selectively.

Studies have shown that people usually trust the average member of the groups to which they belong, more than they trust and rely on members of other groups (The Great Courses 2013). The safest bet for an individual is therefore to assume that anyone outside their group cannot be trusted. Nevertheless, when a group are less cooperative and more competitive inside their groups, people often become more suspicious of the group than of the individuals who forms the group. This is called the *interindividual-intergroup discontinuity effect*. This might lead to individuals generalising other members outside their group as being more similar than they really are. This is called the o*ut-group homogeneity effect*.

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3.1.6 Subliminal Activity

Many studies have been done to determine the impact which subliminal messaging have on human behaviour. Humans have a peripheral memory and often remember what they want to remember. In essence a person's mind can create its own reality (Mlodinow 2013). A subliminal stimulus cannot consciously be perceived by the mind. The stimuli can induce emotions in people and can also affect how they evaluate themselves. Very importantly, actions can be encouraged through subliminal messaging, but not induced. It has been found that subliminal priming will only affect behaviour if it is aligned with a relevant and already existing goal. And although subliminal effects are real, they are probably not strong enough to influence people's evaluations of things they already have a strong opinion.

3.1.7 Impact of Emotions

Other research has focussed on the impact emotions have on human behaviour. The best argued reason for emotions is that they are fundamentally for the individual's physical and social safety and wellbeing. Emotions are interconnected systems of thoughts, feelings, motives and bodily reactions which does three basic things. It notifies the individual about important events, good and bad, it focus the individual's attention on potentially important situations or events, positive or negative and it motivates the individual to behave in specific ways in an attempt to deal with a situation at hand. It can therefore be argued that emotions have action tendencies. It produces changes in the body to prepare the individual to respond to specific situations or warn others of that same situation (Shahrestani et al. 2013).

Emotions therefore play a very important role in Enterprise Engineering. The individual's emotions are determined by his interpretation of specific events rather than the event itself. *Cognitive appraisal theory* suggests that human emotions are extracted from cognitive appraisals, an assessment of an event's impact on the individual's wellbeing and personal concerns. It is therefore possible to change a person's emotions if you can change their appraisal of a specific situation. It has be seen that humans can even induce emotions on themselves by thinking of things that aren't really real (The Great Courses 2013).

3.1.8 Influence of Stress

Stress is no unfamiliar concept in modern societies. Anxiety, depression and suicide can all be related back to stress. Therefore, another concept which potentially influences human behaviour (Brady & Sinha 2005). Research shows that there are two main types of stress: acute and chronic. Acute stress is a result of an immediate threat to an individual's well-being. Chronic stress is the stress that an individual experience much more often. It is suggested that chronic stress is a result of the completely new environment in which people live today, which is significantly different from the environment in which their brains evolved. It is believed that chronic stress is a recent development in humans and developed due to ever changing culture and rapidly increasing technologies (The Great Courses 2013).
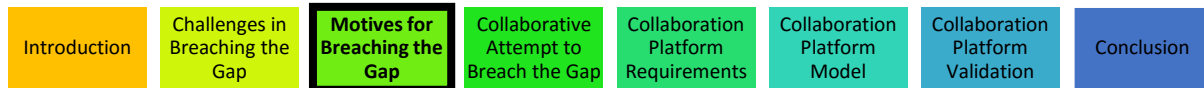
The second reason for chronic stress is blamed on the fact that people live with a lot of uncertainty about whether or not they are doing well in life. Humans have changed their environments from an *immediate return* to a *delayed return environment.* Modern society suggest that people should invest a lot time and effort each day in tasks that do not have any immediate reward and for all practical purposes without knowing whether they will ever see any reward at all. This results in a constant worrying about the future, while today's issues are still at hand (The Great Courses 2013).

The third reason for chronic stress is the fact that most people feel very helpless in solving the problems that cause the stress in the first place. When things that create stress lie in the future the threat is only experienced in an individual's mind, rather than in his physical environment. This means there are very few external things that can be done to reduce this stress. Most common sources of chronic stress involve money, personal relationships, studies, work, health problems and other hassles and irritations which are experienced daily (The Great Courses 2013).

3.1.9 Self-Serving Biases

Most people believe they are better than average on most positive characteristics. They have *self-serving biases*. People also believe that physical things associated with them are better than average and is called the *mere ownership effect.* People excuse their shortcomings and failures, while claiming responsibility for their success. If someone performs well it is due to their efforts and intellect, while they usually claim little to no responsibility for failure. This is a very important concept in modern business. To some extent it is healthy and it helps people stay motivated after setbacks (The Great Courses 2013).

Nevertheless, these *self-serving biases* also have large costs for the individual and the people around him. In general people manage their lives better if they see their abilities and characteristics accurately. Overestimating personal ability can lead to people pursuing goals beyond their capability and set themselves up for failure. If an individual constantly think they are right it can also hurt personal relationships (The Great Courses 2013).

3.1.10 Human Incentives

Authors such as Levitt & Dubner (2009) suggest that incentives are the cornerstones of modern society. They suggest there are three main incentives which drive human behaviour namely, economic, social and moral incentives. They continue to say that sometimes certain incentives are so irresistible that people are driven to attain them through unscrupulous behaviour. *Something worth having is something worth cheating for*.

This is important to notice since many organisations focus primarily on financial incentives as motivation for human behaviour. Perhaps because it is very difficult to quantify an individual's

social and moral contributions in society. Something which might have been difficult to do in the past, but might become ever more possible in the future.

3.1.11 Irrational Behaviour

Economic models are often built on the assumption that people make decisions by constantly weighing different factors. Physiological research rather suggest that humans react, more often than not, on a basis of simple, unconscious rules that can sometimes produce completely irrational results (Mlodinow 2013; Kahneman 2013). Since organisations and societies consist out of individuals it is important to understand that human behaviour cannot and should not be simplified merely due to the extreme complexities. Simplifications which might lead to negative and even harmful results.

3.2 Culture of Ubuntu

The previous section proposed that individuals are group animals and that they want to interact with others. They want to belong to a group and want to be a part of something bigger than themselves. This suggests that humans will more often than not position themselves in a community consisting out of other similar individuals. A community which will most likely have their own culture and dynamics. Therefore the following section investigates how communities interact with each other and the presence of a strong South African culture of Ubuntu (Chaplin 2014).

3.2.1 Individuals and Culture

Culture is often defined as a group of people coming together around a common set of values and beliefs. Due to the shared ideologies, cultures form trust between individuals. Culture is a dynamic and continuously developing concept. Any culture, although weird to an outsider, is considered the norm for the individual exposed to that specific culture (Fischer 2013) Language, verbal and nonverbal, plays a major role in governing culture, while human behaviour builds and shapes culture .

3.2.2 Ubuntu Definition

According to Nelson Mandela (Mandela 1995), the culture of Ubuntu is considered a *universal truth*, *a way of life* and it underpins the concept of an *open society*. It is based on principles such as respect, helpfulness, sharing, community, caring, trust and unselfishness. The culture of Ubuntu does not expect the individual to not personally enrich themselves, quite the contrary. The culture of Ubuntu expect that *each and every individual will enrich themselves in a way which allows them to positively contribute towards their community*.

Michael Onyebuchi Eze (2010) continues by saying that *a person is a person through other people. This idea strikes an affirmation of an individuals' humanity through the recognition of 'others' and their uniqueness and difference. It is a demand for a creative intersubjective formation in which 'others' become a mirror, but only a mirror, for the individual's own*

subjectivity. This idealism suggests that humanity is not embedded in the individual alone. Rather their humanity is co-substantively bestowed upon them by other. Humanity is a quality individuals owe to each other. Individuals create each other and need to sustain this 'otherness' creation. And if individuals belong to each other, they participate in their own creations. Individuals are because other individuals are, and since other individuals are, definitely the individual is too. The 'individualism' is not a rigid subject, but a dynamic self-constitution dependent on this otherness creation of relation and distance".

Suggesting that the culture of Ubuntu has embraced many of the principles which was discussed in the previous sections regarding individual behaviour and acknowledges that an individual's happiness and wellbeing is directly related to those of others.

3.2.3 Interdependency and Vulnerability

As discussed in Chapter 2, South Africa's BOP is currently facing many different, often life threatening, challenges. But however bad the situation might be, according to Mandela individuals in limited resources communities are embracing Ubuntu and revert back to collaboration and community. Acknowledging the fact that they are more dependent on each other than many individuals in more developed nations are often willing to except. A phenomenon which might be unexplained by western culture who reasons that vulnerability is a weakness (Brown 2010).

Actually quite the opposite is true. As was discussed earlier, in prehistoric time humans were able to out survive most other species due to their ability to adapt and their desire to belong to a group and to be accepted by that group. Similarly, Ubuntu acknowledge this same principle which implies that interdependencies between individuals make a community stronger. Interdependencies which can only be realised when individuals admit that they are vulnerable in isolation and therefore can and want to work together as a team. A yearning which is embedded deep into the human's genetic makeup. And an idea which is supported by many studies showing that productive teamwork out win efforts of a single individual and results in achievements of up to fifty times better (Sutherland 2014). The weakness of vulnerability therefore does not lie within the vulnerability itself, but rather in the rationalisation that the individual can achieve more in isolation.

The culture of Ubuntu is therefore a very important resource in breaching the gap between developed and developing South Africa. A culture which suggest that individuals are interested in working together with others in an attempt to resolve the issues of the day.

3.2.4 Challenges of Ubuntu

Nevertheless, modern South Africa is a host to many different individuals with different cultures. Often resulting in conflicting interest and ideologies between citizens. The author believes this might also be one of the greatest challenges for Ubuntu in modern society.

Ubuntu is built on trust, helpfulness and reciprocity. A foundation which is difficult to maintain as soon as other members with different backgrounds and ideologies enter the equation.

In a culture where every individual is encouraged to contribute towards their community in their own unique way and where each and every contribution is valued, it is much easier for the individual to shy away from the real challenges which is faced today. In ancient Africa, communities would assign a chief, or a higher order, supported by a group of elders, who would ensure that each and every individual positively contribute to the community's wellbeing in accordance to their immediate needs. For this role the community would then ensure that their chief is taken care of, while keeping him accountable for his actions (Young 2012). In modern South Africa, and especially in limited resourced communities, there are no formal higher order which fulfil this responsibility. It can also be reasoned that in modern times, individuals do not want a single person or even governmental bodies to serve as such traditional higher order who would fulfil such responsibility (Ismail et al. 2014).

Conflicting interest between governments, legislation and cultures have made it extremely complex to keep each and every individual accountable for their role in society. Resultantly many of the positive attributes of a culture of Ubuntu have been pushed to the background and some of the less attractive attributes are taking the forefront. One of the most recognised weaknesses of a culture of Ubuntu is a habit of sitting back and demanding change, without the willingness to contribute in the realisation of that very change that is demanded (Louw 2010).

3.3   Exponentially Growing Technologies

Modern technology is currently advancing at a mind-blowing rate, reshaping the world faster than most can imagine. Technology is changing every single aspect of human life. How individuals interact with others, how organisations do business today and how they will do business tomorrow (Diamandis & Kotler 2015; Ismail et al. 2014; Jeff 2013; Jordan 2012; Brynjolfsson & McAfee 2013; Surowiecki 2004). This section therefore investigates the technologies through which individuals and organisations interact in the modern world.

3.3.1 Exponential Growth

In the last century technological abilities have sky rocketed. Moore's law is already holding up for more than four decades and instead of slowing down, other technologies have started following the same exponential curves (Jordan 2012). Diamandis & Kotler (2012) suggest that there is a technological revolution taking place at this very moment. A revolution which will result in increased human longevity, improved quality of life, eradication of poverty and ultimately moving towards an age of *abundance*. The following technologies are currently all following Moore's law of exponential growth and are currently going from deceptive to

disruptive: 3D printing, robotics, infinite computing, synthetic biology, artificial intelligence and networks and sensors (Diamandis & Kotler 2012).

3.3.2 Abundance

Authors such as Diamandis & Kotler (2012) suggest the rapid improvement in technology might lead to a technological utopia, which they call *abundance*, in the not so distant future. Abundance entails *a world of nine billion people with clean water, nutritious food, affordable housing, personalised education, top-tier medical care, non-polluting and ubiquitous energy with the freedom to pursue personal goals and aspirations, unhindered by political repression.* They believe that with the aid of exponential technologies abundance is achievable within 25 years.

It is believed that abundance is spurred on by three particular forces. Firstly due to the rise in the bottom billions. The world's poorest people are starting to participate in the global economy in a very substantial way as consumers and producer of goods, which is mostly due to the communications revolution which is currently underway. Secondly, the rising phenomenon of the tech philanthropist, a new breed of wealthy individuals who are more philanthropic than ever. Thirdly, due to the rising phenomenon of the do-it-yourself (DIY) innovator, which includes the ability of individuals and small organisations to make huge contributions, even in the most advanced technological domains (Diamandis & Kotler 2012).

3.3.3 Crowdsourcing and Crowdfunding

It is estimated that by 2020 five billion of the world's population will be connected to the internet. This opens up all kind of new possibilities for enterprises to source the latest ideas, products and solutions to a hyperconnected crowd. Simultaneously changing the way in which individuals and organisations can access funding through online crowd based initiatives in ways which was nether possible before. It is estimated that the year 2020 will see more than USD100 billion of capital being transferred online through crowdfunding (Diamandis & Kotler 2015). Completely changing the rules on how organisations can raise funding for their initiatives and for all practical purposes making an enormous amount of funding available to the online individual in rural Africa for the first time ever.

3.3.4 Building Communities

Online communities are also busy changing the way in which modern organisations interact with individuals. Communities are becoming ever more popular to obtain feedback regarding an organisation's operations and to keep their customers up to date. Online communities are also making it possible for organisations to design products, provide services, share and test ideas against millions of individuals in ways which has never been possible before (Diamandis & Kotler 2015). Similarly, online communities are becoming ever more accessible to online

individuals in rural Africa. Providing every individual with the means to freely test his ideas and initiatives with the rest of the world for the first time ever.

3.3.5 Incentive Prizes

Incentive prizes or –competitions are based on the concept where any and every individual can advertise rewards to any individual or group in the world who can and want to help them solve a specific problem or overcome a specific challenge. An online tool which literally provides each and every individual access to the world's smartest people on any given topic, at any time, at any location. This would give them the means to get help in solving the world's biggest and meanest challenges. Individuals participate in incentive prizes, since they usually provide great publicity for the participant. Individuals are eager to share their talents with the world (Diamandis & Kotler 2015). Incentive prizes are just as valuable to the online individual in rural Africa who wants to grow his initiative beyond his community.

3.3.6 Internet and Smartphone Access

One of the most exciting aspects of all of this is that most of the tools and technologies explained above are accessible through smartphones and internet. And Africa is currently seeing the greatest technological leapfrogging ever, jumping landlines directly to wireless internet solutions. This would provide individuals in rural Africa with rapidly growing access to internet (Mahajan 2011), suggesting that in the near future the world's most advanced technology and tools will be available to the individual in rural Africa. Therefore, the author believes that access to internet and smartphones and the corresponding technologies which are made available through them, will serve as a very valuable resource in breaching the gap between developed and developing South Africa.

Zolile Nonzaba (2015, pers. comm., May 25) from MLK Computer Consulting and Hubspace member says. *The most interesting thing happening in Khayelitsha at the moment is the governmental installation of Wi-Fi hotspots in public spaces. During weekends you'll see up to a thousand people going to some of these spots. A lot of people use smartphone these days, no one wants to buy a desktop computer and everyone wants to use a tablet or a smartphone.*

3.4   Transforming Entrepreneurial Practices

The last century has seen very interesting entrepreneurial transformations (Kaufman 2012). Transforming practices which are changing the way in which organisations structure and manages their endeavours and how they interact with employees and customers (Sutherland 2014; Ries 2011). This section focus on the practices which governs the interactions between individuals and organisations.

3.4.1 Starting with Why

Authors such as Sinek suggest that true leaders create a following of people who act, not because they were swayed but because they are inspired. Inspiration leads to people

experiencing purpose or belonging and has very little to do with any other incentives or benefits gained. Inspiration and motivation is deeply personal and are less likely to sway with incentives. Studies have found that people are willing to pay a premium and even endure inconvenience and personal suffering for true inspiration. In the end individuals base their decisions on information which they have access to and their perception of reality (Sinek 2011).

Sinek (2011) suggests that there are only two ways to influence human behaviour, namely manipulation and inspiration. Manipulation relies on fear, pressure and brute force, whereas inspiration relies on loyalty and trust. Sinek's Golden Circle, as can be seen in Figure 7, suggests that people do not buy *what* organisations do, but rather *why* they do it. This does not mean that that people care less about the quality of a product or service than previously believed, quite the contrary. The golden circle should be perfectly in balance, but the underlying foundation of an organisation's existence should be built on a *clear essence of why*. Business always remains a reflection of what you consider ethical and right (Masterson 2008).
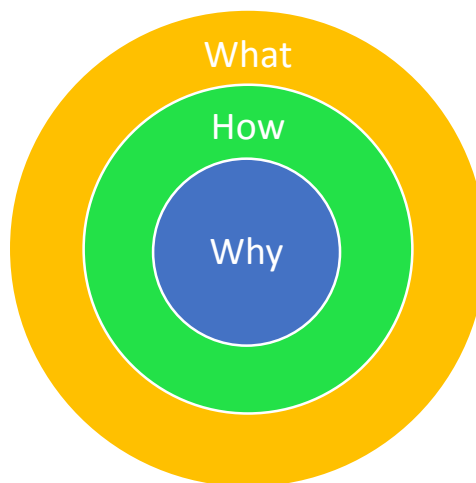
Figure 7 - The Golden Circle (Adapted from Sinek 2011)

An organisation's *why* is the reason people will support them, while the *what* is the tangible proof of their beliefs. This is why individuals are drawn to organisations who are good in communicating what they believe. It allows individuals to easily distinguish whether or not they share the same values and beliefs. Successful organisations wins their customers' hearts before they win their minds. They aim to make fans, instead of finding customers(Hill & Andelman 2012).

The *discipline of how* is the values and principles that guide an organisation to bring their cause to life. This discipline manifests in the systems and processes of an organisation and their culture. It is then through a *consistency of what* that an organisation can and should prove that everything they do and say are aligned with what they believe (Collins & Hansen

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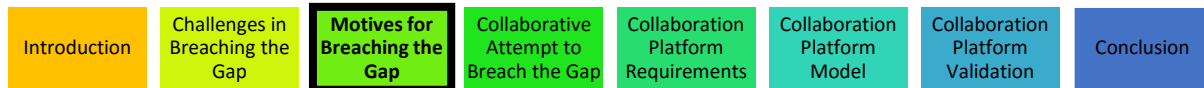
2011). Loyalty and real emotional value exist only in the brain of the buyer and not the seller, and therefore it is important for the individual to know when an organisation is driven by other things than merely self-gain. Only when all three elements, *why* and *how* and *what*, is in balance can trust be built and value perceived (Sinek 2011).

3.4.2   Scrum Methodology

Once an organisation understands why balancing Sinek's Golden Circle is crucial, the obvious next question is how this can be done. Scrum Methodology was developed by Jeff Sutherland as a management tool to efficiently manage teams to do *twice the work in half the time*.

Scrum methodology is based on many of Ohno & Setsuo's (1988) *just-in-time* principles. Sutherland (2014) argues that the modern world changes so quickly that organisations who want to survive and grow, have no other choice than to learn how to adapt quickly and effectively, to be able to keep up with the ever varying global changes. He continues to argue that conventional wisdom on how companies should be structured and managed does not allow for such rapid and much needed adjustments.

The Scrum process as illustrated in Figure 8 entails breaking down a project into the essential task which needs to be completed and then prioritising these tasks. The Scrum team then decides on a specific goal which they want to accomplish in their next sprint. The goal should include a tangible product or service which can be presented to potential customers to obtain real feedback. Collaboratively the team start working towards this goal, constantly interacting and evaluating their progression as they go along through specifically designed Scrum meetings. Everyone helping when and where other team members might require help. Finishing up every sprint with a team discussion to determine what has been learnt and how the team can improve their next sprint (Sutherland 2014).

Product Backlog → Sprint Planning Meeting → Sprint Backlog → Sprint(Daily SCRUM) → Potentially Shippable Product → Reflective Meeting
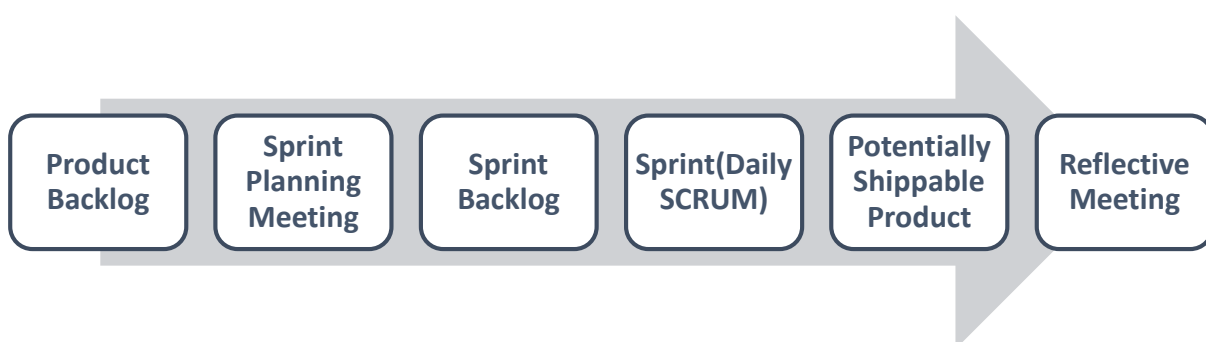
Figure 8 - Scrum process visualisation (Sutherland 2014)

Scrum methodology is based on the idea that a collaborative approach is the most productive and produces the greatest results. The process focuses on the end result and not how or who accomplished them. Scrum rules stipulate that there is no organisational hierarchy. Each member is part of the same team and the team's goals are the individual's goals. Members are encouraged to forget role-thinking and do whatever they can to help their team meet

their goals. There is no individual failure or success, either the entire team fails or the entire team succeeds. A Scrum team is self-organising and the only authority is to meet set goals (Sutherland 2014).

Scrum methodology therefore puts high emphasis on finding people who can and want the organisations to meet their goals and has no room for bureaucracy or egocentrism. Scrum methodology is also built on the understanding that individuals flourish when they are given the opportunity to contribute in accordance to their own unique skills and interest (Sutherland 2014). Scrum methodology is therefore not a hierarchical structure which tries to manage groups of people in a way which an organisation sees fit, but rather a strategy which allows individuals to align their own goals and ideals with those of the organisations they belong to.

3.4.3 Lean Startup

The lean startup movement, which is globally acknowledged today, suggest that a*ny expenditure of resources within an organisation, not directly allocated to add value to the end customer is wasteful* (Ries 2011)*.* Lean Startup methodology therefore greatly focuses on an organisation's interaction with the individuals they serve. Ries argues that a startup does not exist to make money or even to serve customers, but firstly and foremost, to learn how to build a sustainable company. Learning as quickly as possible what a market values and what they are willing to trade for it.

An individual who wants to launch a new initiative have many untested assumptions. Assumptions on how specific skills, knowledge and resources can be utilised to add value to someone else. Conventional wisdom suggest that an entrepreneur at this stage should develop a lengthy business plan, which proposes how the individual will be able to add value. The lean startup ideology suggests that at this stage this process is wasteful. It takes up a lot of time, produces business plans that are worthless and often ends up killing potentially viable ideas before they have even seen daylight. Instead of packaging these hypothesis in a formal document, they should be tested (Ries 2011).

Making assumptions are very important, but it is important to know which assumptions are made when and where. When starting a new organisation it is unknown who the specific individuals are with whom will be interacted. It is unknown what the exact value addition will be. Somewhere a leap of faith will be required. But it is important to know what is known and what is not. The assumptions made about things that are unknown can be defined as hypotheses. As soon as a hypothesis is identified a Minimum Viable Product (MVP) can be build. A MVP is the smallest product or service that can be created to start generating learning. In other words, it is the cheapest and simplest way to test a specific hypothesis (Ries 2011).

One of the core elements of the Lean Startup is the build-measure-learn feedback loop as illustrated in Figure 9. The iterative process through which a startup should go to learn as quickly as possible how they can add real value and accordingly build a sustainable business.
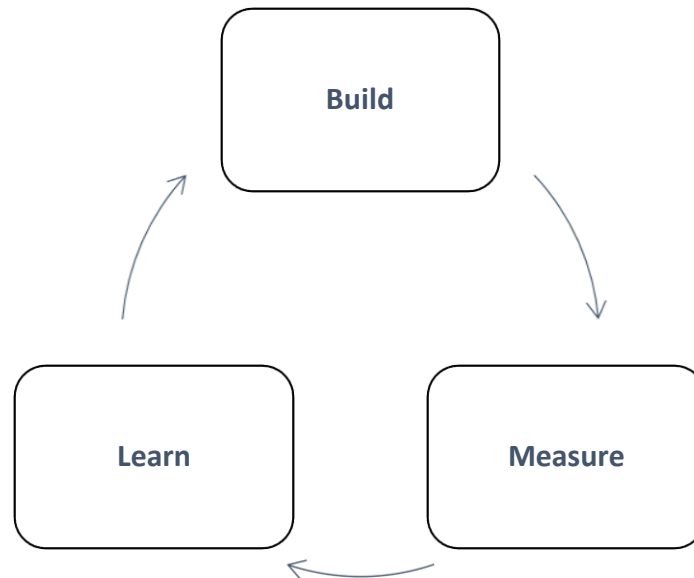
Figure 9 – Build-measure-learn feedback loop (Adapted from Ries 2011)

This methodology can be summarised as *firing bullets into the most obvious direction to see what will be hit, improving the aim of the shots taken every step along the way and as the shot get closer to the target, increasing the size of the bullets fired until perfectly calibrated and calculated cannon balls can be shot with ease* (Masterson 2008). Smaller bullets means faster recovery and lower risk, but still allows for accurate and reliable feedback. Observing what worked, figuring out why it worked and building on proven foundations are fundamental for success (Collins & Hansen 2011).

Ries (2011) also puts great emphasis on failure. Failure often has a negative connotation, but in fact is one of the most important elements in a startup. Failures provides an opportunity to learn, adapt and improve. Failure only becomes negative when an organisation deliberately chooses not to learn from a failure. An organisation should learn how to *fail forward*. The risk of a specific failure can and should obviously also be managed if an organisation is prepared for failure. Decisions equal success. *Never let a good crisis go to waste. When things are at their worst, there is an opportunity to push solutions which would usually be rejected outright. Counter intuitive strategy is often the best* (Harnish 2013).

3.4.4 Fans, Not Customer

Authors such as Hill & Andelman (2012) put great emphasis on the importance of organisations treating their customers as royalty, even though it might be expensive at first. The principle is clear, organisations should build fans instead of acquiring customers. This might require an organisation to endure inconveniences while ensuring their customers are

happy. Nevertheless, it builds trust and shows customers that the organisation really have your interest at heart (Heyns 1981). An organisation's job is to make sure that they do everything they can to make their customer's lives better, even if it might sometimes include things outside their field of expertise. In the process building fans who won't only support organisations in the good times, but also in the bad times. Fans who will potentially continue their support for the rest of their lives.

If an organisation can accomplish this, they will not have to worry about marketing ever again. They will have full time ambassadors who would most likely tell all their friends and family about the value which they received from the organisation (Gladwell 2002). It is for this reason why organisations are finding that real value addition to their customers are actually way more profitable and sustainable (Hill & Andelman 2012).

3.4.5 Exponential Organisations

Sinek (2011) suggest that organisations who are really interested in adding value to their customers are not busy competing against other organisations but rather against themselves, constantly busy evaluating how they can add more value to their customers. They keep their clarity of why, day in day out, because that is where real authenticity lies (Sinek 2011).

Exponential or 10X organisations outperforms their industries by at least ten times. They achieve this by keeping a steady pace, moving forward every day, one step at a time. They focus on consistent long term performance and have concrete, clear, intelligent and rigorously pursued performance mechanisms in place. 10X organisations are constantly innovating, but even more importantly, they manage to scale innovation and blend creativity with discipline. They are not constantly moving full speed ahead, but rather find out when to go fast and when not (Kahneman 2013).

10Xers understand it is not whether luck plays in their favour, but rather how they will use the luck that comes their way. They understand that they cannot predict the future and therefore take full responsibility for the decisions they take and how they play out (Collins & Hansen 2011). Big decisions are counterintuitive, they go against conventional wisdom (Harnish 2013).

3.4.6 Attributes off 10Xers

Ismail et al. (2014) continue to argue that exponential organisations have very distinct attributes. Attributes which allow them to have an impact at least ten fold that of the market average and are achieved by using new organisational techniques which leverage exponential technologies. These attributes include; having a massive transformative purpose (MTP), using staff on demand, building community and crowds, using algorithms, leveraging assets, ensuring customer engagement, using interfaces, using dashboards, relying on experimentation, ensuring autonomy and making use of social technology.

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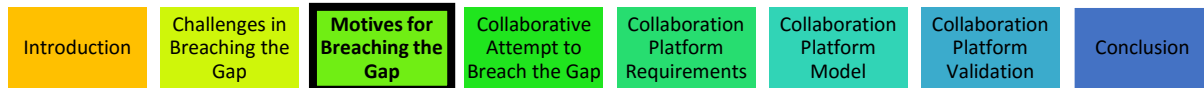
The interesting thing to notice is how many of these attributes involve focusing on involving customers and communities to participate in the organsation's endeavours and the tools which allow them to effectively do this.

3.4.7 Innovation and Success Principles

Parallel to the flawless persistence these 10Xers show, they are also busy innovating every step along the way (Collins & Hansen 2011). Google went as far as to define the eight pillars on which their innovation is based. According to Google the most important ingredients for innovation are: having a mission that matters, focusing on the user, thinking big but starting small, striving for continual innovation instead of instant perfection, looking for ideas everywhere, sharing everything, sparking with imagination and fuelling with data, being a platform and never failing to fail.

Four of the modern world's most successful entrepreneurs shared eight insights on how they ensure business success. Virgin Group founder Richard Branson, Amazon CEO Jeff Bezos, Tesla Motors CEO Elon Musk and Google CEO Larry Page agree that the following are important to ensure business success: mitigated risk taking, iterative and experimental approach, passion and purpose, a long term perspective, being customer-centric, being rationally optimistic, using probabilities to quantify potential success, relying on fundamental truths (Kotler 2015).

The important thing to notice is that both innovation and success are believed to be customer-centric and revolves around a massive transformative purpose (MTP). Forget about everything else other than making people's lives easier while using all tools, resources and information available. Constantly learn what user's value and in accordance iterative improving one's value proposition and confirming how transforming entrepreneurial practices are allowing individuals and organisations to address many of the challenges which are currently being experienced in South Africa and can and should therefore serve as an important resource in breaching the gap between developed and developing South Africa.

3.5   Importance of Collaboration

In the previous sections the science behind human behaviour, the philosophies behind South Africa's Ubuntu, how smartphones and internet provide the individual within rural Africa access to exponentially growing technologies and transforming entrepreneurial practices which allows for a customer-centric approach by involving communities to participate through the use of technology, were investigated. The author believes all four of these can and will play a major role in breaching the gap between developed and developing South Africa. Each of these concepts are resourceful in themselves, but more importantly all four these concepts share a fundamental underlying characteristic: An emphasis on collaboration between individuals and organisations.

From a behavioural science perspective it was seen that an individual's behaviour is largely influenced through their interaction with other and that individuals inherently have a deep yearning to be part of a group and form part of a greater purpose. South Africa's culture of Ubuntu and the ideology behind an open society was further discussed. Africa's rapid growth in internet access allows individuals to connect with others and access new opportunities which have never been possible before, all due to exponentially growing technologies. Entrepreneurial practices are transforming in accordance to technological growth and a strong customer-centric focus evolves which can only be achieved by involving customers to participate in an organisation's endeavours. All these phenomena lead to a renewed emphasis on collaboration between individuals and organisations as illustrated in Figure 10. Collaboration which might perhaps be the best strategic approach in breaching the gap between developed and developing South Africa.
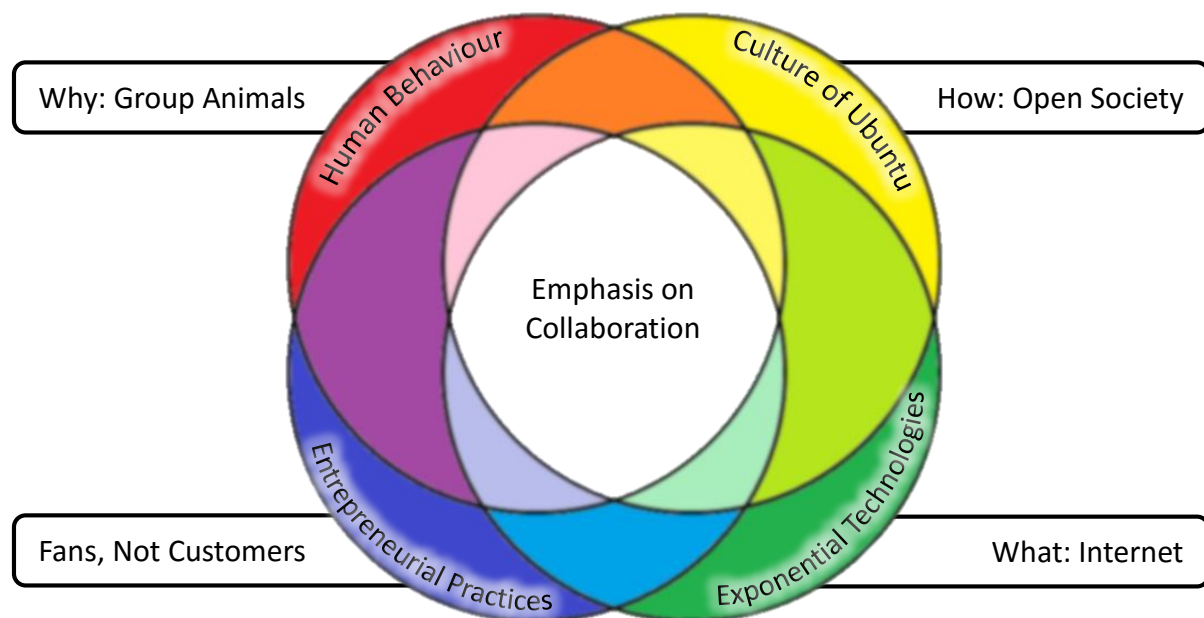
Figure 10 - Superposition of resources

3.6 Chapter Summary

This chapter found that individuals want to interact with others, they want to be a part of something bigger than themselves. In South Africa many individuals interact with each other in accordance to the strong presence of a culture of Ubuntu, a culture which also governs the relationships between individuals and organisations operating in emerging markets. Growing access to smartphones and internet is changing the way individuals and organisation can and will interact with each other in the future. This advancement should prove very resourceful for both individuals and organisations in emerging markets. Transforming entrepreneurial practices provide a solid foundation through which these interactions between individuals and organisations can and should be governed to ensure success. Most significantly the chapter highlights the importance of a collaborative attempt between individuals in the BOP and organisations to breach the gap between developed and developing South Africa.
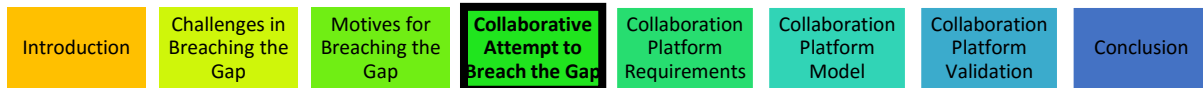
4 Collaborative Attempt to Breach the Gap

As suggested in the previous chapters, a lack of education is considered as one of the greatest challenges which need to be overcome to breach the gap between developed and developing South Africa. A renewed emphasis on collaboration between individuals in BOP markets and organisations has also been proposed to be able to do so.

This chapter investigates how the individual's goals can be aligned with those of organisations and educational institutions' in an attempt to design mutually beneficial partnerships through which the challenges which result in the gap between developed and developing South Africa can be addressed. This was done in accordance to the research methodology as described in section 1.9.1, 1.9.2 and 1.9.4.

4.1 Role of Organisations in Society

According to the Oxford English Dictionary (2010) an *organisation* is defined as *an organised body of people with a particular purpose, such as a business, government department, charity, etc.* It is believed that the idea behind organisations emerged parallel with those of formal trading, which can be traced back to the Stone Age (Curtin 1984). These ideas are important to consider when defining the real value an organisation provides to the individuals out of whom they exist.

4.1.1 Trading between Humans

The concept of trade is embedded deeply within modern societies. People spend a lot of time and effort developing their skills and knowledge so that they can trade them for other resources they might require. Trading happens between individuals who might negotiate and trade on behalf of an organisation, but remain individuals nevertheless. The individuals are therefore constantly pursuing a state in which they would be seen as resourceful, allowing them to trade on their own or on other's behalf.

The author also believes that resourcefulness of an individual is a dynamic concept which changes depending on the time, place and state in which an individual finds himself. The expectations a community have of its members vary. It is also suggested that human intelligence is diverse and dynamic (Robinson 2011), emphasising the importance of the trading mechanisms which are used to facilitate trade between individuals and organisations.

4.1.2 Top-Down Organisations

Conventional wisdom suggests that top down hierarchical organisations are the most efficient to manage and yield the greatest return on investment (Kaufman 2012). To various degrees many of the organisations in modern South Africa still function on the principles of these pyramidal structures in which all individuals have "equal rights", but only if you work
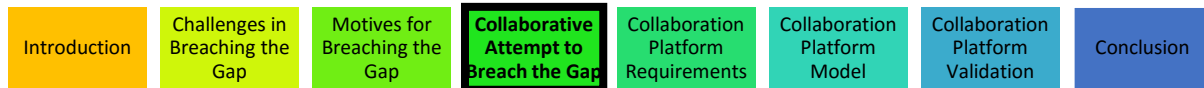
according to the system. *All animals are equal, some are just more equal than others* (Orwell 1966)*.*

4.1.3 Bottom-Up Organisations

Nevertheless, the technological trends and entrepreneurial practices which have been explained suggest that a bottom-up structure is way more productive. Such structures allow individuals to form part of something bigger, but still make them feel valued for who they are and what they contribute towards the greater goal. This motivates individuals to contribute according to their capabilities and not according to rank (Sutherland 2014), and encourage them to find their passions and align them with their work. Bottom-up organisations tend to inspire behaviour through motivation, rather than manipulation (Sinek 2011), resulting in greater profitability and therefore sustainability.

4.1.4 Relationships between Individuals and Organisations
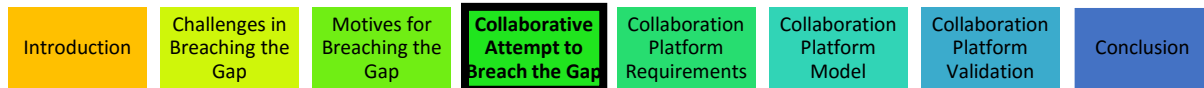
For this reason organisations should not partner with individuals who do not share the same beliefs as they do. This stands for employees, suppliers and even customers. If individuals do not believe in what an organisation is doing, the chances are high that they will not be able to align their own interests with those of the organisation, since these interests could contradict each other.

If an organisation's goal is truly to add value to their final customers, their customers would realise their value on their own and would want to support them. The same can be said for employees and suppliers. Organisations want to invest in employees and suppliers who are devoted to helping them succeed (Hill & Andelman 2012; Ries 2011). Customers can therefore be redefined as any individual or other party with whom an organisation interact, or for that matter transact, through their entrepreneurial endeavours. Anyone with whom they trade information, feedback, finances or whatever it might be to help them reach their goals.

4.1.5 Organisations depend on Customers, not Vice Versa

The importance for an organisation to communicate a clear purpose of *why* has therefore never been as important (Sinek 2011). This allows customers to understand the organisation's massive transformative purpose (Ismail et al. 2014). A purpose which customers need to understand to decide whether or not their interests resonates with those of the organisation and would therefore like to support them.

This is a fundamental idea in terms of enterprise engineering. It suggests that organisations would not and should not be allowed to survive if they cannot convince customers of the importance of their transformative purpose and actually realise the corresponding value addition to their customers. And this is not only a proposal, but a reality which modern society is busy enforcing ever more ruthlessly worldwide through the use of technology (Diamandis & Kotler 2015; Ismail et al. 2014; Jordan 2012; Surowiecki 2004; Jeff 2013).

4.1.6 Sustainability of an Organisation

Sustainability of an organisation is measured in terms of its triple bottom line, requiring that the organisation can continue its endeavours economically, socially and environmentally without external interference (Firer et al. 2012). Satisfying the triple bottom line is absolutely crucial for an organisation, but it can only be done effectively if it correctly understands what the three pillars entail.
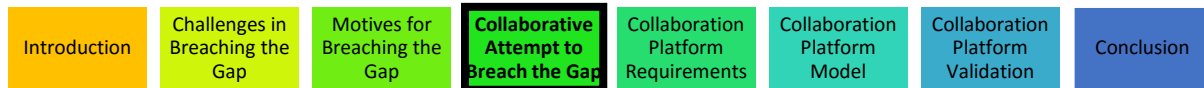
Social sustainability requires that organisation focus on their relationships with each and every customer with whom they transact. This is valid for the broader definition of customers as defined before, even customers who might not be satisfied with the organisation's results. Every individual who resonates with an organisation's transformative purpose might have valuable feedback to offer. Such feedback is greatly needed for an organisation to learn how it should further continue its endeavours. The organisation should therefore be able to manage and maintain each and every customer relationship which it requires to continue its initiatives.

Environmental sustainability entails that an organisation can uphold all interactions between it and its environment. In other words, organisations should be able to keep on doing what they have been doing for thousands of years, without negatively impacting the environment. This should also be true for all other parties with whom the organisation interacts, upstream and downstream, an important consideration during the current environmental crisis (Diamandis & Kotler 2012).

Economic sustainability is the pillar which usually enjoys the greatest emphasis. Although this is very important, it is only one of three pillars. It is also the pillar which the author believes is most commonly misunderstood. An organisation definitely has to be profitable. Nevertheless, conventional wisdom says profitability shows itself in monetary value and that an organisation needs money to keep on doing what it does. This is not true, since economic sustainability is not concerned about monetary inflow itself, but rather the functionality (Bogatyrev et al. 2014) which it produces. If an organisation's customers support them by supplying them with all the required goods and services which each individual within that organisation requires to live the lifestyle they choose and will keep on doing so as long as they continue their endeavours, then that organisation too is economically sustainable. Even if there is not one cent's worth of monetary flow in their entire lifespan. This is a very important principle, especially when operating in South Africa's BOT, where there is often not as much money in circulation, but that does not mean that there is no value which can be traded.

4.1.7 Author's Definition of an Organisation

Based on the suggestions above the author proposed what the role of an organisation can and should be if they are interested in operating in South Africa's emerging markets in a

sustainable manner and helping to solve the gap between developed and developing South Africa.

An organisation is an initiative which inspires people from different backgrounds to come together and work on something bigger than themselves, something in which they believe, something with a transformative purpose. Every individual should contribute in their own unique way according to their personal skills and knowledge in a way which is aligned with their interest and preferences. The cumulative result of the effort should add value in such a way that it motivates people, customers, to support the organisation. The resultant support should help them to sustain their efforts and allow them to continue their value addition in their own unique way.

4.2   Role of Education in Society

Chapter 2 suggests that a lack of education and skills development is the single greatest challenge which is currently resulting in the massive gap between developed and developing South Africa. According to the Oxford English Dictionary (2010) *education* is defined as *the culture or development of personal knowledge or understanding, growth of character, moral and social qualities, etc.* While this definition might be partially right, it does not paint the full picture.

4.2.1 Importance of Education

Education is important because it should teach an individual how he can develop his personal skills, knowledge and character, so that he can trade these competencies for other resources which he might need to ensure a good and healthy quality of life (Robinson 2011). Due to the persistent high unemployment rate in South Africa's BOP, it can be argued that the educational system serving these markets are not busy addressing the full educational need which would allow South Africa to breach the gap between developed and developing South Africa.

4.2.2 Conventional Educational Systems

To a large extent the educational methodology which is still followed in South Africa today is based on the educational principles which were developed during the industrial revolution, when disciplines such as science and mathematics were considered more important than, for example, the arts. Although it might have been good at the time, this model is no longer necessarily applicable in modern society where creativity is of utmost importance. Not only are modern schools not teaching students how to use their creative capabilities to solve the grand challenges of today, they are often killing the creativity of students (Robinson 2011).

4.2.3 Education Equals Employment

The conventional educational system still actively encourages students to attend school with the hope of guaranteeing fulfilling, high paying jobs for every educated individual.
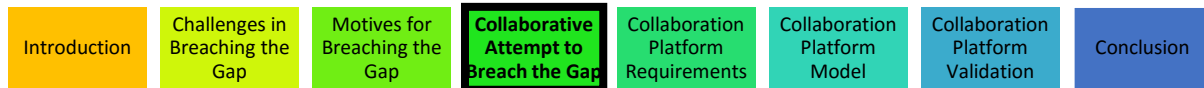
Realistically, as can be seen in South Africa and the rest of Africa with their high unemployment rates and low quality of living, merely having matric behind one's name does not guarantee an individual a job. Much less a job through which an individuals can pursue their interest and meaningfully contribute towards society. In 2014 only 42% of the students who started school twelve years earlier passed matric to receive a National Senior Certificate. Also worth noting is the fact that in many cases pass rates were lowered to 40% and even 30% (Writer 2015).

4.2.4 Inadequate Education can be Harmful to the Individual

If South Africa's educational system does not teach the individual how they can and should apply their skills and knowledge to contribute towards society and resultantly how they can trade their contributions for resources which they might need to survive, education becomes harmful instead of beneficial. Education is expensive and takes a lot of time. In an environment where there are limited financial resources, education might force families to have to decide between paying school fees or buying much needed food, healthcare or other products and services. Students will also have to spend long hours in class, while they might be needed elsewhere. In the end students may spend between twelve to twenty years of their lives in school, without being trained to help solve the grand challenges around them. This leaves the individual ill equipped to fill full the true role communities requires from their members

4.2.5 Value of the Individual

The author believes that each and every individual has the potential to meaningfully contribute towards their community, even if they do not have any education. Even if they do not know how they can do it or even that they are capable of it. Any individual who is willing to participate should be allowed to do so and when they do, they should be rewarded for their effort. Before this will happen, society will have to change their perception of what it means to contribute and therefore who they allow to contribute.

4.2.6 Life Divided into Three Sections

Carnegie (1901) suggested that human life is divided into three stages. The first third of an individual's life is spent learning everything needed to be known. The second third is spent working to obtain funds. The last third is used to apply those funds to worthwhile causes which benefits society. This trend can still be seen in many places across the globe and is often encouraged. It can be argued that many conventional models see education as the tool which connects individuals with organisations as illustrated in Figure 11 below.
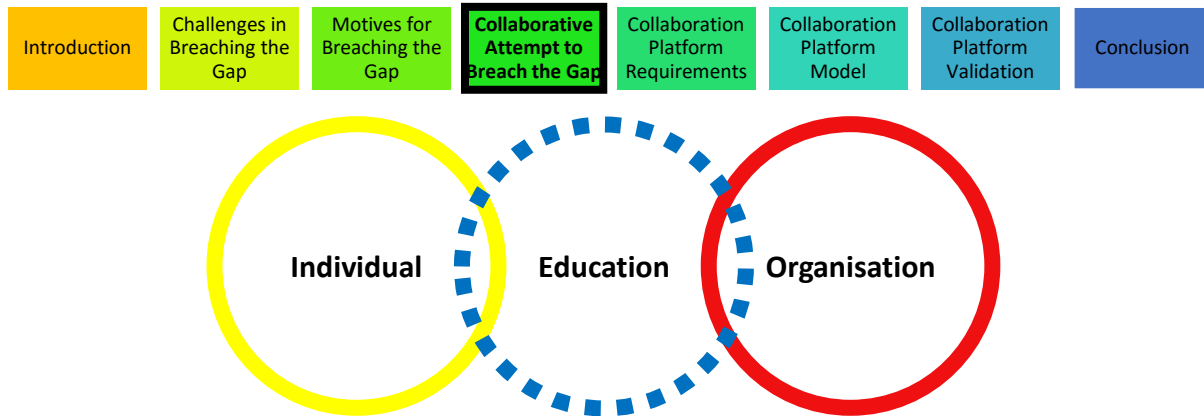
Figure 11 - Education linking the Individual with an Organisation

Unfortunately the majority of the world's population, four billion people who forms part of the global BOP, does not have an education which match the standards of those of the developed world. Many individuals in the BOP might not have learnt everything which society requires from an individual to allow them to contribute. And in accordance to Carnegie's stages, these four billion individuals are denied the right to work and contribute towards society. This phenomena is not aiding the breaching of the gap between the developed and developing world, since it disqualifies individuals according to their wealth instead of their willingness to participate. The author witnessed entrepreneurs at Hubspace who does not necessarily have the highest level of education, who cannot necessarily even sustain themselves financially, but are busy adding tremendous value to the members of their community.

4.2.7 Children Should Also Not Be Excluded

Parallel to Carnegie's stages, South Africa's educational system often fails to recognise the value which children can and should have in society. They are forced to attend school for the first ten years of their lives, where they are told that they need to be educated before they will be of any worth to society. Children's potential to contribute should not be disregarded and should rather be encouraged. Children are young, talented and full of life. They are extremely creative and of very innovative. They are inspiring (Robinson 2011). They are also tomorrow's customers, the very individuals around which future organisations will revolve.

An individual's youth, educational levels, skills and knowledge does not influence the individual's capacity to positively contribute towards society, neither should an educational system derive children to do exactly that. The Canadian Ryan Hreljac was six years old when he founded Ryan's Well Foundation. Since 1998 they have supplied more than 714 000 people, in 16 countries across Africa, with clean water and sanitation (Hreljac 2015). *Hole-in-the-wall* studies done in India's slums have also shown that children can learn themselves how to effectively use computers, surf the net and start developing their own skills, regardless of age and education (Mitra 2003).
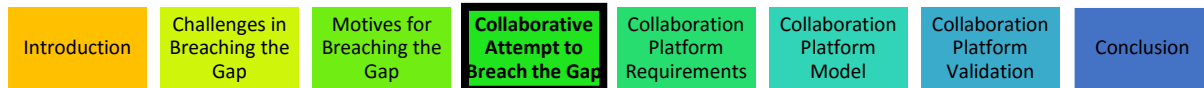
4.2.8 Personalised Exponential Education

If it is true that children can in fact, at least to some extent, learn themselves how to use computers and surf the web in this age of rising exponential technologies, there is no place on earth where it makes sense any more to keep on educating students in ways which do not complement their interest and skills (Robinson 2011). Education does not have to require an individual to make trade-offs, such as choosing between paying school fees or healthcare for loved ones or other resources which might be needed elsewhere. Investing time when an individual's help might be required elsewhere and learning things that has no benefit to the individual.

Education should be tailored to the individual (Jooste 1983). An individual who is part of a specific community, with a specific culture and who has specific needs and preferences. Education should equip every individual to be able to contribute towards society and show them how they can trade their efforts for other resources which might be needed to ensure a high quality of life. If this can be achieved, every student who learns to do this would be able to show their friends and families how to do the same, at no expense. Allowing education to reach Africa's rising billions at an exponential pace.

4.2.9 Author's Definition of Education

The author suggested a revised role which education can and should play in South Africa's emerging markets to be able to breach the gap between developed and developing markets.

Education is the process through which individuals are taught how they can develop their personal skills and knowledge and showing them how they can align their personal interests with their skills and knowledge to positively contribute towards society. In doing so allowing individuals to trade their efforts for other resources which might be required to ensure a high quality of life.

4.3   Individuals, Organisations and Education

It has been discussed that inadequate educational systems can be harmful for the individual. But they can also be harmful to a nation's economy. Each individual unequipped to contribute towards the needs of society, puts a larger burden on the remaining individuals. Directly and indirectly taking the responsibility of ensuring a healthy economy. A responsibility which many are willing to take on themselves, but simply cannot keep up if the number of individuals sitting around becomes too high. Causing all kind of unnecessary and unwanted problems for organisations through the introduction of tax and legislative regulations.

4.3.1 Taking Education into Their Own Hands

If the deficiency of South Africa's educational system has harmful implications to organisations and there are no sufficient action to fix these problems, organisations who wants to prosper would have to start addressing these challenges themselves, engineering

their enterprises in a way that their endeavours will help overcome these challenges. South African organisations have no other choice than to start focusing on education if they are interested in breaching the gap between developed and developing South Africa. This is a responsibility which does not have to be a burden to an organisation, but can and should actually be extremely profitable to the organisation.

4.3.2 Societal Harmony

If there is any merit in the author's definitions for the organisation and education, it is worth noticing the parallels between the idea behind education and organisations. While education should focus on teaching the individual to learn how they can develop their skills and knowledge, organisations should do exactly the same for their employees. While education should motivate individuals to contribute towards society, organisations should allow their customers to form part of a transformative purpose and collaboratively work towards that purpose. While education should teach individuals how they can trade their skills and knowledge, organisations should show them how this is done. While education should motivate individuals to align their skills and knowledge with their own interest, organisations should do exactly the same to ensure that all employees work productively (Griffin-EL 2011). And while education should equip individuals to ensure a high quality life, organisations should make sure they positively contribute in ensuring that quality.

The important distinction to make here is to realise that individuals go through different phases throughout their life. Phases in which their interest and needs may vary. Therefore, education cannot be confined to the schools, colleges and universities which students attend before they search for a job. And organisations cannot be confined to these places where individuals go to search for jobs. The relationship between individuals, organisations and education should rather be illustrated as in Figure 12, suggesting that education serves as a tool which binds individuals and organisations in societal harmony.
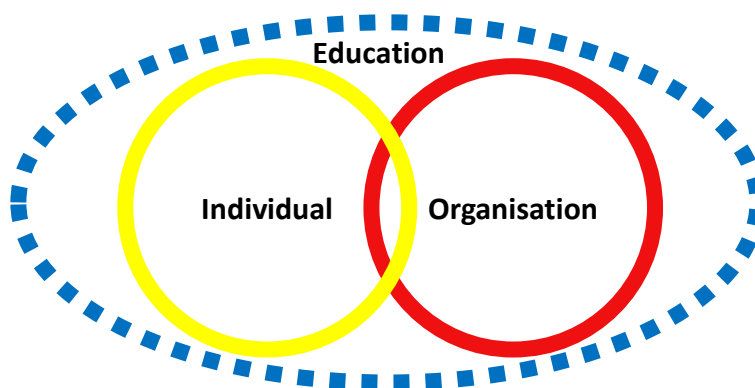
Figure 12 –Education binds individuals and organisations in societal harmony
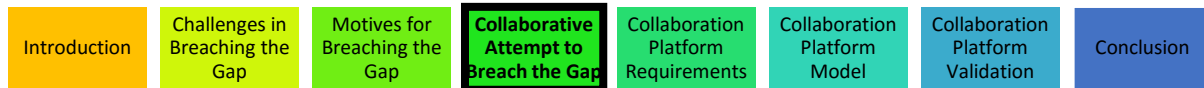
4.3.3 Old, But New Way of Trading

As discussed earlier, sustainability of an organisation requires a community of individuals who buys into their transformative purpose and is willing to support the organisation in realising that purpose. Support which can be provided without actually being a fulltime employee or even a conventional customer. Organisations might have problems which they need solved, work that needs doing or tasks that have to be completed, but does not necessarily have staff who can take care of everything. Despite the fact that they might not have staff for such occasions, it does not mean that these tasks are not important. It is still in their interest to effectively complete them and would therefore most likely be willing to put in the required energy to do so. Energy which might be well spent if the task is outsourced, but overseen by the organisation to ensure successful completion.

Regardless of the nature of the job, completion of these tasks would require one or more individuals to apply certain skills and knowledge, however low it may be. And by actually completing the task these individuals would not only help the organisation, but might very well improve their own skills and knowledge. Learning for the experience and gaining valuable exposure. This leaves organisations with the opportunity to open up these task to the public, finding candidates willing to help and instead of reimbursing them financially, teaching the individual how to complete the task and acknowledging them for the skills they needed to demonstrate as well as the experience they gained through the transaction. In the end trading an individual's willingness to help for education and skills development. Something which would have cost the individual a lot of money if they had to do it through an external party and labour which are similarly expensive.

4.3.4 Logistical Nightmare

Logistically it might seem very complicated to effectively manage thousands of random individuals who do not have any relationship with an organisations whatsoever, but technology is busy making this easier by the day. Companies such as Airbnb and Uber are living examples where they have done exactly that. Most entrepreneurs argue that modern technology can do basically anything. The question is not whether it can be done, but rather should it be done and how will it be done so that it makes sense (Ries 2011).

4.4   Competitive Advantages Which Motivate Collaboration

South Africa has never been known as pioneers of social enterprises. Nevertheless, South Africa actually holds various competitive advantages which might allow it to improve its standing. Competitive advantages which the author believes will prove valuable for solving the education crisis which is faced and even more valuable in uniting South Africa under a united cause. Working together to breach the gap between developed and developing South Africa.

4.4.1 Desperate for Change

South Africa is currently facing many challenges. Challenges which cannot be addressed in isolation. Challenges which might perhaps be negative on their own terms, but also encourages people to look for new solutions. Opening them up for new initiatives. In essence the challenges which the people in South Africa are facing can be and should be used to inspire people, of all shapes and sizes, to work together to in breaching the gap between developed and developing South Africa. A goal which would not only benefit the BOP markets, but just as much the more affluent market.

4.4.2 Human Capital Abundance

South Africa has an extremely high unemployment rate (Sekhampu 2013). There are literally millions of people sitting around, all with the potential to add value in one way or another. South Africa has an abundance of human capital which is not used at all. Human capital which is ripe to be applied in ways which would contribute towards society.

4.4.3 Rising Middle Class

Africa is currently experiencing the fastest economic growth globally (Rosling 2006). Resultantly, there is an ever faster emerging middle class. Individuals who is entering the economic world with all the same needs and preferences as in the developed world, without enough organisations actually serving those needs at the moment (Mahajan 2011). South Africa is obviously not excluded from this occurrence and is desperately in need for new organisations which can serve their people.

4.4.4 Increased Connectivity

Africa has seen *leap frogging* of landlines, directly to wireless internet solutions (Mahajan 2011). Initiatives such as Project Isizwe are currently aiming at supplying the whole of South Africa with free Wi-Fi. Furthermore, the rates at which access to smarts phones and affordable internet are supplied are dropping rapidly. If an individual has access to a smartphone and is connected to the internet, he literally has access to more information than the president of the USA had twenty years ago for free as well as access the latest breakthroughs in technology (Diamandis & Kotler 2012). Opening all kinds of new opportunities which were not possible five years ago.

4.4.5 Technological Leap Frogging

Similar to the leapfrogging of landlines to wireless internet solutions in Africa, technology is also making leapfrogging in other industries possible. Instead of building expensive infrastructures, such as roads, which were necessary in the past to enable product delivery, initiatives such as *The Flying Donkey Challenge* (2015) are working on cargo drones which can be used for transportation anywhere in rural Africa. Something which might prove difficult in more developed nations. There is also still ample space to expand and the large cities in Africa

are not as overly congested as can be seen in Europe (Friedman 2015). Suggesting that a lack of alternatives in limited resourced communities, can serve as major competitive advantage to develop and implement new solutions.

4.4.6 Exponential Technology Access

Perhaps the most exciting competitive advantage limited resourced communities permits is the provision of exponential technologies to the world's rising billions. The most advanced technologies are available to each and every individual through smartphones and internet. Which is not only important from a product and services perspective, but also for the opportunities in engineering the exponential organisations which would serve South Africa in the future.

4.4.7 Dynamic Creativity

As already explained, individuals in limited resourced communities have shown to be extremely creative. Such creativity can be harnessed through collaborative partnerships between individuals in emerging markets and organisations interested in operating in these markets. Something which would serve as a great competitive advantage in high dynamic society.

4.4.8 Established Culture of Ubuntu

The already established culture of Ubuntu in South Africa serves as a great competitive advantage to introduce modern technology and the corresponding entrepreneurial best practices which is emerging with these technologies. Without having to waste the time which might be needed to ease other cultures into such a collaborative approach. Directly applying the principles of an open society in these communities, only with the added efficiency which is made possible through technology.

4.4.9 Motivated Young Population

As Africa's young people are connecting online, they are seeing how things might be different for them. These young people, the African cheetahs, believe things can change and they are demanding change. Furthermore the African continent, which includes South Africa, currently holds the world's youngest populations. This means that there are not only young people with the energy to solve the present challenges, there are also a lot of them (Mahajan 2011). Another scenario which might serve as a valuable competitive advantage. One which countries in Europe for instance does not have (Friedman 2015).

4.4.10 Non-Monetary Trading

A culture of Ubuntu allows individuals in South Africa's BOP to successfully trade by other means than purely monetary terms. Individuals are willing to trade their skills, knowledge and resources directly for other skills, knowledge, resources and do not necessarily rely on money to facilitate this process. This is a situation which provides a stable competitive advantage to

organisations who can develop better solutions to facilitate and quantify such trade: better ways to quantify human behaviour. Solutions such as these have already been proven possible to develop with modern technology.

4.4.11 Defrauding and Decentralising

Another important competitive advantage which technology allows around the world, but worth taking note of in South Africa, is the potential to develop solutions which would not necessarily have to follow national legislation. South African legislation cannot really do anything to services and products which are made available online to individual. As individuals are being educated and better informed it becomes increasingly difficult for organisations, including governments, to make promises without delivering on these promises. They will definitely fight as long as they can as was seen with the Uber operating licences in Cape Town, but in the end technology are shifting the power towards the individual and no government will be able to hold off the demand of the masses (Shapshak 2015).

4.5   Chapter Summary

This chapter highlighted the role which organisations and education can and should play within society. It showed how organisations can and should build education into their initiatives if they want to help South Africa breach the gap between developed and developing markets. It continued to show how this can be done in a collaborative attempt between individuals and organisations and illustrating that instead of being a hassle, such an approach would not only be beneficial to the individual, but should also be highly profitable to organisations. The chapter finishes off with some of the competitive advantages which opens up for organisations that are willing to structure their endeavours accordingly. This shows potential not only to simultaneously help many individuals and organisations, but also to reimage how individuals and organisations should interact within societies.
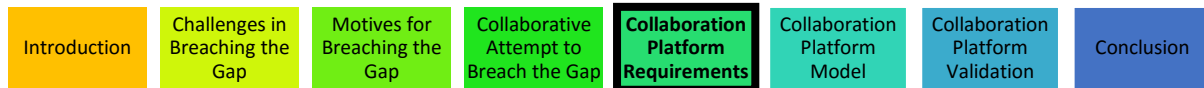
5   Collaboration Platform Requirements and Design

The previous chapter explained how individuals and organisations can work together, to the benefit of both, to help breach the gap between developed and developing South Africa. It also showed how education can be used to accomplish this.

This chapter focuses on the development of a platform which binds the needs of individuals and organisations together through the aid of education, and facilitate mutually beneficial partnerships between these parties in an attempt to breach the gap between developed and developing South Africa. This was done in accordance to the research methodology as described in section 1.9.2, 1.9.3, 1.9.4, 1.9.5 and 1.9.6.

5.1   Platform Design Tools

Due to the enormity of the problem which is addressed in this study it was important to find a problem solving methodology and design tool which could be used to sufficiently address all the necessary challenges which results in the gap between developed and developing South Africa. All of the different underlying complications had to be bound into a coherent structure which could be shaped and sized into a solution which would help breach the gap between developed and developing South Africa.

BioTRIZ, a mixture between the theory of invention (TRIZ) and bio-inspired design were found to be suitable to do this due to the holistic and systematic problem solving approach which it suggest.

5.2   BioTRIZ Methodology

BioTRIZ Methodology uses various problem solving methods and combine them all into one unifying logic (Bogatyrev et al. 2014). Where other methods focus on specific aspects of a problem, BioTRIZ focuses on the holistic problem and was designed to allow other methods to work together to ensure maximum efficiency. Please refer to Figure 13 below for a visualisation of the interaction between TRIZ and other prediction, prevention, detection and reaction methods. While all of these methods surrounding TRIZ was designed to address a specific element or process of a design, TRIZ or BioTRIZ focuses on the interactions between these methods and how all of them can be used in unison with each other to develop the ideal holistic solution.

Figure 13 - TRIZ in respect to other problem solving methods (Bogatyrev et al. 2014)

BioTRIZ methodology is a problem solving tool which originated from a fusion of the fields of biology and TRIZ, which was later extrapolated to various other fields, including entrepreneurship (Azevedo et al. 2014). This makes it directly applicable for the challenges addressed in this study (Bogatyrev & Bogatyreva 2013; Bogatyrev & Bogatyreva).

As explained by Olga Bogatyreva (2014, pers. comm., September 26), co-founder of BioTRIZ methodology, *BioTRIZ complements other specialised methods. It has tools to develop efficient local actions with a positive global effect. It is a systems approach which allows all existing local tools and decision support methods into a single unit and should therefore be used first to solve complex problems from a holistic point of view. Thereafter it might make sense to zoom in on specific details of a particular stage of the problem solving process.*
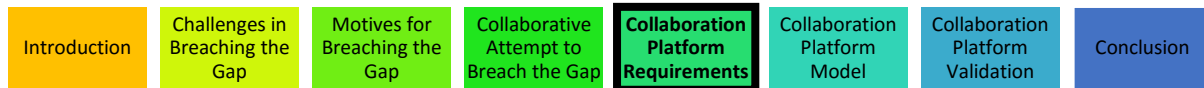
5.3   BioTRIZ Algorithm

The founders of BioTRIZ developed an algorithm, illustrated in Figure 14 below and in Appendix A in greater detail, which can be used to effectively apply the BioTRIZ problem solving methodology to a specific set of challenges. The algorithm includes seven steps which should be followed to derive the final solution; defining the challenge, constructing the ideal final solution, providing the appropriate context, identifying the resources which is available, highlighting the contradictions which presented itself, describing the solution which was developed and revising the solutions to make sure that all challenges are addressed.
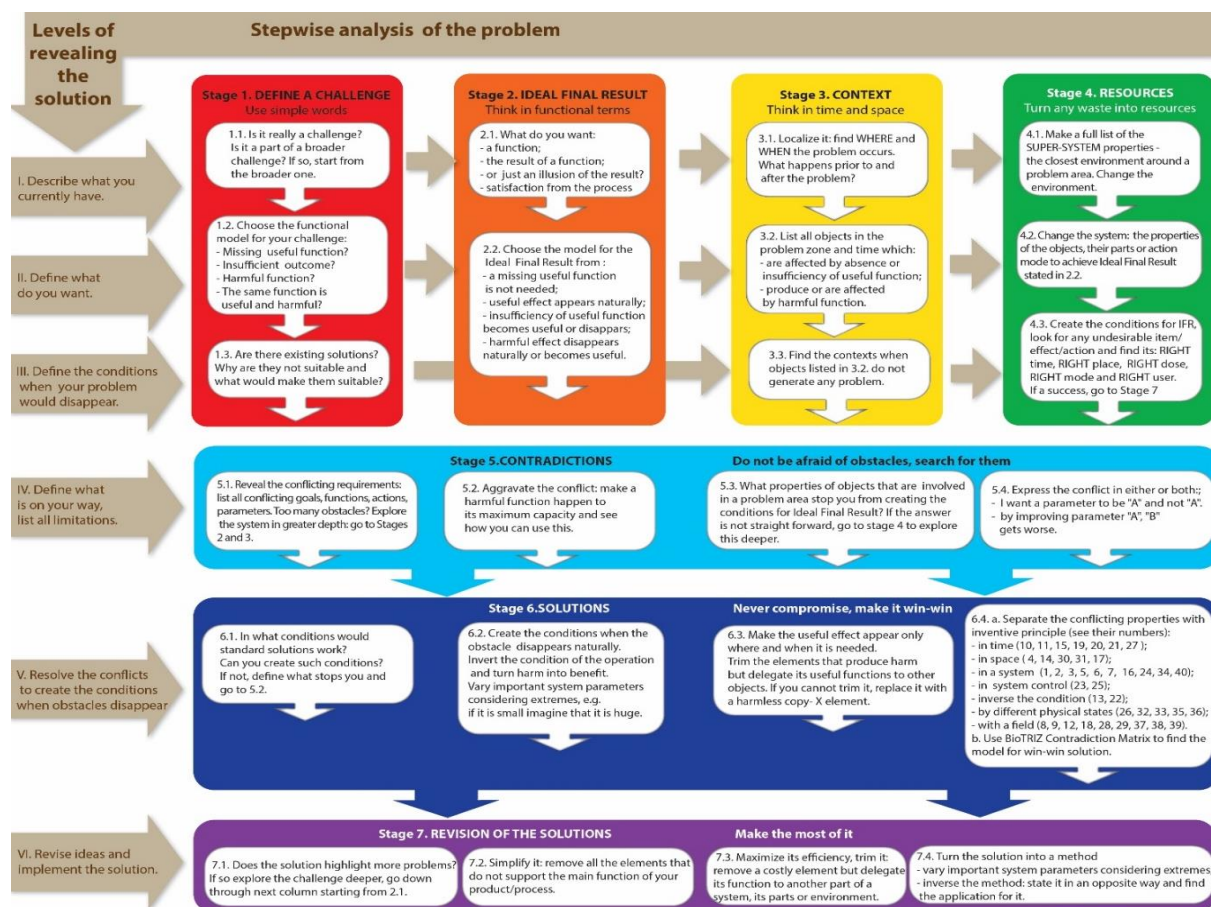
Figure 14 - BioTRIZ problem solving algorithm (Bogatyrev et al. 2014)

After seeing the success's which BioTRIZ have delivered on other projects and successfully testing and implementing this theory on other similarly complicated problems, the author decided to apply BioTRIZ methodology, as proposed by authors Bogatyrev et al. (2014), to help design and define the platform requirements which had to be met to help breach the gap between developed and developing South Africa. All seven steps were performed in direct accordance to BioTRIZ methodology. The finer detail of how this algorithm was applied to the challenges which is addressed in this study is explained in greater detail in the following sections.
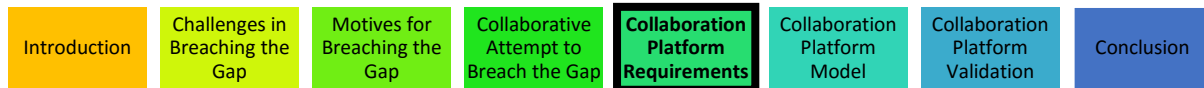
5.4   Stage 1: Defining the Challenge the Platform Needs to Overcome

The main goal behind this study is to develop a collaboration platform, which will facilitate mutually beneficial partnerships between individuals operating in South Africa's BOP and organisations interested in BOP markets, in an attempt to breach the gap between developed and developing South Africa. As described in chapter 4, this is something which can be done through improved education and skills development initiatives. Education which, as have been discussed in chapter 2, is currently one of the greatest challenges preventing South Africa from breaching the gap between developed and developing markets. This would therefore be the greatest challenge which needed to be addressed through the platform. Nethertheless, as explained in chapter 2, the implication of the nation's lacking education and skills development initiatives, stretches beyond the challenge itself. It is creating other challenges in its wake which would definitely impact the design of the platform and would therefore also have to be addressed. These challenges are summarised in Figure 15 below.

Limited access to funding: Individuals in limited resourced communities do not have access to a lot of funding and would not really be able to afford the platfrom [Ch 2].

High Unemployment rates: Most individauls in limited resourced communities are unemployed and have very little to keep themselves productively busy with. [Ch 2].

Crime: The crime level in limited resourced communites are very high, which could potentially leave the platfrom vulnerable [Ch 2].

Lacking Trust: Due to the high crime level and no official system through which individuals can be held accountable for their actions, trust is a real issue [Ch 2].

Limited access to technology: Despite the initiatives on the horizon to provide free Wi-Fi to members in limited resourced communities, these communities still have very llimited access to technology through which the platfrom can be deployed [Ch 2].

Communication barriers: Due to the limited technology, it is still difficult to communicate with individuals in limited resourced communities other than physically meeting them on a regular basis [Ch 2].

Coalboration challenges: Due to the communication barriers it is also difficult to ensure effective collaboration between individuals and organisations [Ch 2] .

Lacking motivation: Due to the high unemployment rate, crime and poverty the platform would have to be proven to the individuals in limited resourced communities before they will be motivated to use the platform on a daily basis [Ch 2]

Lacking infrastructure: There are very limited infrastucture through or from which the platform can be deployed [Ch 2].

Lacking knowledge: Individuals would have to be educated on how the platfrom can be used and why it would make sense for them to do so. All information to do this would have to be made available [Ch2].

Figure 15 - Challenges other than education which the platform also needed to address

Although the platform focused mostly on the underlying educational challenge, these challenges also had to be considered to ensure that a sustainable solution was developed, which could actually be used by the individuals in limited resourced communities, as well as the organisations who are interested in entering these markets.

5.4.1 Functional Models

According to BioTRIZ methodology, there are different functional models (Bogatyrev et al. 2014) for different challenges.

The challenges which the platform was designed to address have a *missing useful function.* Education is simply too expensive or too difficult for many individuals in South Africa's BOP to access (Centre for Education Development Policy 2009). Therefore, although there might be an educational system which should be working, the reality is that many South African's do not have access to this system. This leads to boredom and students having too much time on their hands to be counterproductive, as well as a very limited understanding of the role the individual has to play within society. There are also no formal system which holds individuals accountable for their actions and there are very little physical and technological infrastructure which enables individuals to develop these systems on their own, especially when considering the absence of efficient education which would serve as the building blocks to allow for this to happen [Ch 2].
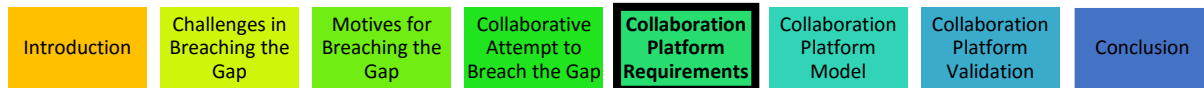
The challenges which the platform was designed to address also have an *insufficient outcome* since education does not lead to guaranteed employment for the individual. Many individuals who do have education are still unemployed and have no idea how they can apply their skills and knowledge in a meaningful way. This also makes it difficult for organisations to meet individuals in limited resourced communities halfway in an attempt to realise much needed initiatives in these communities. The initiatives by local government to address these challenges is also not succeeding in their efforts [Ch 2].

Furthermore, the challenges also have *useful and harmful function* since education might help individuals to develop their skills and knowledge in a way which will allow them to earn a better living for themselves and their family members, but at the same time South Africa's BOP often have to use already limited resources to pay expensive school fees. The resources which is used for inefficient education could be applied with greater impact elsewhere, helping to care for hungry or sick family members [Ch 2].

5.4.2 Existing Solutions

There exist a few existing solutions to these challenges, but none addressing the entire scope of the problem. Conventional educational systems include schools, colleges and universities. All three these entities are trying to reach South Africa's BOP, but faces various challenges in doing so. Schools require students to invest at least twelve years of their life and a lot of school fees to obtain a matric certificate, which can be argued is the lowest level of formally acknowledged education in South Africa. Unfortunately having matric does not necessarily guarantee an individual a job anywhere and the job opportunities which matric might open for the individual are often not very stimulating work [Ch 2].

After obtaining matric an individual can continue with further education in an attempt to obtain a diploma or a degree. This would require another three or more years to obtain and is much more expensive to obtain than matric. According to the statistics mentioned in

section 1.3 only wealthy citizens can really afford further tertiary education and is therefore not a viable solution for BOP citizens who cannot obtain bursaries to do so [Ch2].

There are also other initiatives by NGOs and governmental bodies who aims to educate individuals in South Africa's BO. These courses too are expensive, are very limited, happens on an ad hoc basis and is not necessarily aligned with an individual's interest.

There are various opportunities for individuals to obtain online education for free, but during the time the author spent in Khayelitsha, he experienced that individuals have little knowledge about the existence of such initiatives and do not necessarily understand the workings behind these systems. Online education can also be very isolating and is not necessarily tailored to fit the circumstances of the individual's specific environment.

5.5   Stage 2: Ideal Final Platform

The fundamental idea behind BioTRIZ methodology is that the challenges which needs to be addressed are properly defined and that an ideal final solution is then defined as to set the standard of what would be desirable to achieve in the ideal world. Once there is a clear picture of the ideal final result it serves as guideline in developing the final solution.

5.5.1 Platform Functional Purposes

According to BioTRIZ methodology the ideal result can serve different functional purposes (Bogatyrev et al. 2014).

The *function* of the ideal platform is to connect individuals, organisations and educational institutions in accordance to their preferences as discussed in chapters 3 and 4. These connections should be designed in a manner which allows the three parties to collaboratively address the challenges as defined in Figure 15. It should also help educate individuals in South Africa's BOP, while simultaneously helping organisations to enter emerging markets. The platform need to accommodate the individual's prior education and experience and show them how they can use their already established abilities to further develop their competencies in accordance to their interest.

The *result of this function* is important since the platform should quantify individuals' contribution towards society to show them the value of their participation [Ch 3]. The platform should reward individuals for their contribution and encourage them to continue their participation, allowing them to continuously improve their quality of living. The platform should also gather enough data to be able to provide users with enough evidence to why an individual or organisation could be trusted. The platform should also be freely accessible for the individual in South Africa's BOP and the barrier- to-entry should be negligible [Ch 2]. All of this should be done in a way which allows organisations to directly access potential customers in South Africa's BOP and allow individuals to understand and support the

organisations' transformative purpose, since doing so would determine whether or not an organisation would be able to successfully enter emerging markets [Ch 4].

The *illusion of the result* is also important since people highly value what others think of them [Ch 3]. The platform should therefore also allow individuals the opportunity to prove their competencies and contribution to their community. Unlocking more rewarding opportunities for individuals who prove themselves capable of handling the corresponding responsibility.

The ideal final platform should also provide *satisfaction* to the individual [Ch 3]. Providing them with the opportunity to grow and actually showing them their progress. To ensure the greatest satisfaction, the platform should also base opportunities on the individual's own personal interest and allow them a completely personalised experience. This would inspire individuals to take full responsibility of their own behaviour instead of giving others the blame.

5.5.2 Platform Model
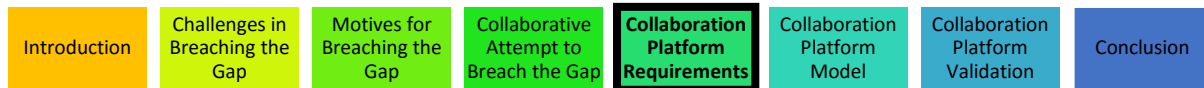
BioTRIZ methodology suggests that there are different models for the ideal final result (Bogatyrev et al. 2014).

The *missing useful function* of schools as primary educational institution would *not be needed* anymore, since schools would not have to take sole responsibility of the nation's education anymore, but would rather work together in partnership with other organisations who can provide specific services which schools struggle to supply.

The ideal final result should allow the *useful effect* of education to *appear naturally* [Ch 4] by providing an individual with the opportunity to develop their skills and knowledge according to their own interest. This should inspire them to continue doing so by rewarding them as they progress in their capabilities. It will also motivate them to contribute towards their communities in their own unique ways [Ch 3].

The ideal final result should also allow the *insufficiency* of education through unqualified teachers to *become useful* as the platform should take away the responsibility of teachers to transfer all required information and knowledge which an individual might have the capacity to absorb. Rather allowing teachers, or any other individual whom have access to the platform, to facilitate this process of education and helping the individuals grasp and process this information into knowledge [Ch 4].

The *harmful effect of* education *disappears* when the ideal final results allows individuals to obtain education for much cheaper [Ch 2], when and where required, while directly ensuring that the individual has the opportunity to actually apply their skills and knowledge in a way which would contribute towards society.

5.6   Stage 3: Context for Platform

The context within which the challenges of this study is being addressed has already been set in previous chapters, but was summarised in the following sections through the use of BioTRIZ tools (Bogatyrev et al. 2014).

5.6.1 Localising the Problem

As discussed in Chapter 2, the main challenge in breaching the gap between developed and developing South Africa is grounded in the inadequate education. The main problem, but not the only problem which is addressed, therefore occurs with each and every individual who cannot obtain the adequate education which would allow them to ensure a high quality living for themselves. As discussed in chapter 4, education is also not something which should only take place during childhood, but is a continuous and dynamic process which should take place throughout a person's entire life. The problem therefore takes place at the individual themselves and continues throughout their lives. The same could be said for the most of the other challenges which was also considered during the platform development.

5.6.2 Nine Windows Context Summary

The BioTRIZ Nine Windows diagram as proposed by Bogatyrev et al. (2014) was used to provide a good overview of the context in which the problem is experienced as can be seen in Figure 16. The diagram divides the system into three sections; *sub-system*, *system* and *super-system*. The individual in South Africa's BOT, the organisation and the South African society. Further contextualising the relationship between individuals, organisations and the greater society in the past, present and future. The main goal for this diagram was to distinguish how things were in the past, how it is now and how it can be in the future through the help of the collaboration platform, on an individual, an organisational and a national level. It provided a clearer image of the context against which the challenges as defined in Figure 15 are addressed and what the platform's intent is.

The majority of the individuals who can be founded in South Africa's limited resourced communities suffered the influence of a political system in which they were deliberately isolated and did not enjoy the opportunity to obtain access to reasonable resources or education. Despite the changing landscapes and a lot of new hope and energy among younger individuals hungry for change, these individuals are to some extent still experiencing this same isolation, without much increased opportunity or resources today. The platform therefore aims to leverage rising access to internet and smartphones [Ch 4] to provide individuals in limited resourced communities with the same opportunities as can be found in more developed part of the country, personalised education, the opportunity to contribute towards society and deliberate involvement in the nation's greater economy.

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | Collaboration Platform Validation | Conclusion |

SOUTH AFRICAN SOCIETY

Past discrimination [Ch1]

Violent struggle [Ch1]

Conservatism [Ch1]

Nationalised services [Ch1]

Governmental mismanagement [Ch2]

Unsustainable solutions for BOP [Ch2]

Forcing western solution [Ch2]

Monopolies [Ch2]

High GINI Index [Ch1]

Potential privatisation [Ch4]

Full integration [Ch4]

Advanced technology [Ch3]

Potential world leaders [Ch4]

ORGANISATIONS

Not valuable in BOP [Ch1]

Serve affluent market [Ch1]

Legislation prohibit integration [Ch1]

BOP education unimportant [Ch1]

Interest in emerging markets [Ch1]

Challenging labour legislation [Ch2]

Limited work force [Ch2]

Top-down hierarchy [Ch4]

Cultural tension [Ch2]

Considering collaborate [Ch3]

Bottom-up hierarchy [Ch4]

Exponential organisations [Ch3]

Customer centric [Ch3]

Emphasis on education [Ch4]

Free economy [Ch3]

Willing to collaborate [Ch3]

INDIVIDUAL

BOP deliberately isolated [Ch1]

Limited opportunity [Ch2]

Limited access to resources [Ch2]

Limited focus on education [Ch2]

Impossible to contribute [Ch4]

Isolated BOP[Ch2]

Limited opportunity [Ch2]

Limited access to resources [Ch2]

Limited access to education [Ch2]

Hungry for change [Ch3]

Increased access to internet [Ch3]

Willing to collaborate [Ch3]

Difficult to contribute [Ch4]

Abundant opportunity [Ch3]

Free to contribute [Ch4]

Free Education [Ch4]

Participation valued [Ch4]

Negligible barrier-to-entry [Ch4]

Individuals take full responsibly [Ch4]

Willing to collaborate [Ch3]

PAST | **PRESENT** | **FUTURE**

Figure 16 - Nine windows context diagram

As discussed in chapters 2 and 4 organisations in South Africa have always and are still struggling to enter emerging markets to effectively server BOP markets. The platform aims to allow organisations to start collaborating with individuals in limited resourced communities through these initiatives enter these markets. The platform is designed to help organisations effectively communicate with and learn from their customers to ensure a more customer centric approach. Such a customer centric approach would require organisations to help individuals in limited resourced communities to educate themselves and should encourage a free economy in which limited resourced communities can start addressing the challenges they experience from within their communities.

The rising technology in limited resourced communities in South Africa poses great opportunities for the South African society, but can also have devastating consequences if not managed correctly. Technology is shifting the power which was always held by governments and organisations, to the individual. It is therefore important that the collaboration platform should encourage organisations and individuals to work closer together instead of working against each other. The platform should also encourage and reward individuals in limited resourced communities to positively contribute towards society and ensure that each individual plays their needed role to ensure a bright future.

5.7   Stage 4: Resources Available

There are various important resources which can be leveraged through the platform to address the challenges as mentioned before. Most of these resources were identified and discussed in chapters 3 and 4, but are effectively summarised in the following section through the use of BioTRIZ tools (Bogatyrev et al. 2014).

5.7.1 System Properties

The following *super-system properties,* in regards to limited resourced communities in South Africa, were identified during the time the author worked from Hubspace Khayelitsha.

- Many individuals operate as entrepreneurs and are busy with their own initiatives
- There is a huge drive behind community and collaborative initiatives
- Individuals are less willing to plan and invest in the future, due to pressing daily challenges
- Access to free Wi-Fi is on the horizon and people are open for technology
- Access to smartphones and computers are growing rapidly
- Individuals are very hungry for work or to do something productively with their time
- Individuals are more than willing to share personal information with organisations
- Individuals understand the concept of trade and business
- Individuals are brand conscious
- Individuals are very fine attuned to the image they portray to others
- Individuals prefer being unemployed than being mistreated by employees
- Expectation management is an important aspect in relationships building
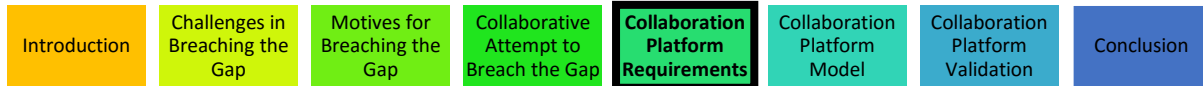
- Local organisations need help to grow their initiatives
- An individuals' reputation within his community is very important
- Individuals have a high regard for fairness and justice

5.7.2 Nine Windows Resource Summary

The BioTRIZ Nine Windows diagram as proposed by Bogatyrev et al. (2014) was used to provide an overview of the resources which are available to help breach the gap between developed and developing South Africa and can be seen in Figure 17 below. It contains a detailed summary of all the resources, which the individual, the organisation and the South African society had in the past, currently has and would have access to if the collaboration platform can be implemented successfully.

Where the individual had, and to a great extent still have very limited resources which they can use to address the immediate challenges which the face in their daily lives, they are bound to gain access to more resources through the implementation of the collaboration platform. The platform would provide individuals access to personalised education anywhere in South Africa. Through this education the platform also connects individuals to opportunities which they could never have accessed before. For the first time ever individuals would be able to choose from an abundance of possibilities available and tailored specifically just for them. This in turn would open up newly available financial resources, with the opportunity to build track records and the opportunity to prove credibility for the first time ever.

While there is currently still limited resources available which might aid organisation to enter emerging markets, the collaboration platform would allow successful market penetration and sustainable cross border partnerships for the first time ever. This in itself would provide various valuable resources which can be used to start and grow initiatives in South Africa's emerging markets and would open up huge pools of untapped human capital.

From a societal point of view such a platform can set the path to further development in South Africa. It would help drive an open society with a free economy in which all individuals will experience abundance. All of which would set the stage for South Africa to breach the gap between developed and developing South Africa for once and for all.

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SOUTH AFRICAN SOCIETY

Various resources, but none really available to BOP [Ch1]

International partnerships [Ch1]

Democracy [Ch1]

Entry point in Africa [Ch1]

Young population [Ch1]

Open society [Ch3]

Free economy [Ch3]

Abundance [Ch3]

Decentralisation [Ch4]

Valuable legislation [Ch4]

Technological Leapfrogging [Ch4]

Strategic position [Ch4]

Cultural differentiation [Ch4]

ORGANISATIONS

Partial media coverage of BOP [Ch1]

Access to internet [Ch1]

Access to outside world [Ch1]

Understanding of human behaviour [Ch3]

Exponential technology [Ch3]

Online communities [Ch3]

Crowdfunding and -sourcing [Ch3]

Incentive prices [Ch3]

Data analysis tools [Ch3]

Modern entrepreneurial practice [Ch3]

Advanced technology [Ch3]

Improved understanding of business [Ch3]

Collaboration [Ch3]

Valuable human capital [Ch4]

Valuable data [Ch4]

INDIVIDUAL

Culture of Ubuntu [Ch3]

Open Society [Ch3]

Free trading in BOP [Ch3]

Community [Ch3]

Time [Ch2]

Skills [Ch2]

Community [Ch3]

Mobile phone access [Ch3]

Energy [Ch2]

Creativity [Ch4]

Community [Ch3]

Internet access [Ch3]

Personalised education [Ch4]

Finances [Ch4]

Opportunity information [Ch4]

Track record [Ch4]

Trust [Ch4]

Motivation [Ch4]

Office space [Ch4]

PAST   **PRESENT**   **FUTURE**

Figure 17 - Nine windows resource diagram
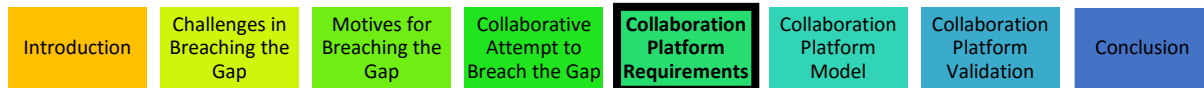
5.7.3 Freely Available Resources

The BioTRIZ FISSST diagram (Bogatyrev et al. 2014) as can be seen in Table 2 below, was used to summarise the freely available resources which can be used in the platform. These resources are resources which are freely available and can be used to help overcome the challenges which the platform is addressing. These resources are often forgotten due to it being freely available, nethertheless they are often the ones that prove most valuable in modern platforms (Jordan 2012).

Field/Energy	The energy of personal motivation and intrinsic human nature to can be used to drive skills development and productive societal participation. Social, moral and economic incentives are important [Ch 3].
Information	Transaction and interaction data of Individuals in limited resourced communities can be used to establish the needs and potential within these communities. Information can also help drive much needed transparency in informal settlements [Ch 3].
Substance	All required information which needs to be communicated can be transferred online which does not require the construction of any other infrastructure [Ch 3].
Structure	An online platform should allow individuals to trade expertise and participation for education and experience at no cost [Ch 3].
Space	Online communication makes it possible for individuals to access the platform from anywhere in the world for free and does not require special infrastructures to operate efficiently [Ch 3].
Time	The platform should allow an individual and organisation to interact with each other when and where they find the need to do so. It is therefore not necessary to develop other systems which governs the timespan of specific interactions, which would rather be based on real time supply and demand [Ch 4].

Table 2 - FISSST diagram of free resources

5.8   Stage 5: Contradictions

Contradictions are a reality in any design project. They can be very annoying when identified, but are usually more annoying when not found. BioTRIZ tools (Bogatyrev et al. 2014) were used to identify the contradictions which presented itself during the platform development.

5.8.1 Conflicting Requirements, Goals, Functions and Actions

There are various conflicting requirements, goals, functions and actions which would have to be met to realise the ideal final platform solution. Many individuals in South Africa's BOP are

uneducated and are resultantly not considered fit to be employed. Nevertheless they need to pay expensive school fees to obtain education, fees which they can most likely not afford since they are most likely unemployed and therefore have no means of any income [Ch 2].

Individuals are encouraged to invest a lot of time and money into their own education and are promised that if they do they will have a guaranteed job and income. Unfortunately South Africa are home to thousands of individuals who do have formal education, but can still not find a job through which they can sustain themselves [Ch 4].

As suggested in chapter 2, despite the encouragement of an education which would allow individuals to improve their living quality for themselves and their loved ones, many individuals in limited resources communities have to leave their home and family members behind to obtain education elsewhere.

As suggested in chapter 2 the quality of education in South Africa's BOP are often of such a low level, that instead of teaching students how to develop and apply their skills in accordance to their interest, students are discouraged and loose hope in themselves.

Organisations operating in developed South Africa are struggling under new rules and legislation which forces integration. A noble cause, but nevertheless extremely difficult for organisations who struggle to find individuals fit for the job which needs doing. Often giving up hope completely and subsequently having fewer organisations to supply the same demand [Ch 4].

5.8.2 Aggravating the Conflict

According to BioTRIZ methodology (Bogatyrev et al. 2014) it is sometimes useful to enforce a harmful function of the problem to its maximum capacity to see what the result would be and if there could be any use for it in other circumstances.

As discussed before, education can be harmful to individuals due the huge investment it requires without any real guaranteed return on the investment. At the same time insufficient education can also be harmful to organisations who have to carry the heavy burden of training unemployed employees [Ch 4].

The harmful functions can be exaggerated by suggesting that individuals completely stop attending schools and totally discarding the conventional school curriculum as it exists today. Instead individuals can directly partner with organisation before any prior education. The organisations can then train these individuals, with less risk, to help them in their endeavours. The would resultant in organisations having more time to teach individuals from an early age, before they might already have learnt bad habits or fallen too far behind [Ch 4]. All in all resulting in less risk for the organisation.

Such a system might show an inclination towards communism where each individual is assigned a trade without taking their personal interest into consideration (Skousen 2009).
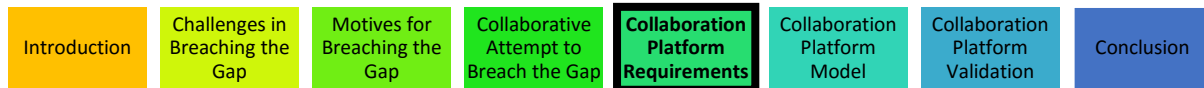
This is definitely not the aim here due to the importance for individuals to operate in accordance to their own personal interest and preference as has already been explained [Ch 3]. The answer might therefore lie in a system which effectively allows individuals to jump between organisations, learn what they can from them and then continuing to the next opportunity, while helping the organisations meet their goals along the way. Something which might have proved to be a logistical nightmare if it were not for modern technology [Ch 3].

5.9   Stage 6: BioTRIZ Platform Solution

BioTRIZ tools (Bogatyrev et al. 2014) was used to start define the solution for a collaboration platform which would help breach the gap between developed and developing South Africa.

5.9.1 Conditions in Which Conventional Education Will Be Satisfactory

It was seen that schools, colleges and universities would be a sufficient way to educate individuals in limited resourced communities if they could effectively teach individuals how they can develop their own skills and knowledge in accordance to their interest so that they would be fit to join and add real value in any organisation they might choose.

This would require education to be financially obtainable by all South African individuals. The individual should also be allowed to trade their already acquired skills and knowledge during any period of education. In other words, students should not have to be bound by a full year long educational period. Education should encourage active participation and incentivise individuals to positively contribute towards their communities. Education should be personalised for the individual and tailored according to their interest and preferences [Ch 2 & 4]. An individual who can prove that a specific skill or knowledge is already mastered should be exempted to the next level.

A strong partnership between educational institutions and outside organisations would be required to ensure that individuals are well equipped to help solve the grand challenges which the 21ste century provides [Ch 4]. A smart system would also be required to effectively quantify and track the individual's performance. These entities should also build their education on the fundamental principle that an individual would immediately unlock greater opportunities and rewards, as they progress in their education.

5.9.2 Conditions in Which the Obstacles Disappear Naturally

The obstacle of expensive education disappears naturally if an individual can add value to the educational institution in other ways than purely financially. Individuals can do this by helping their educational institutions to meet their goals in the same way as they can do for any other organisation as discussed in chapter 4. Students should therefore be allowed to trade their educational success and the corresponding skills and knowledge they obtained, in accordance to their interest, to help the educational institution in any way they might require help and

leaving the educational institution free to design their education in a self-helping way and rewarding their students for their efforts and participation.

Without a strict school curriculum which forces all students to obtain education at the same time and in the same way, individuals would be free to apply their skills and knowledge outside their educational environment as they prefer. Similarly, if individuals have a platform which provides healthy guidance and facilitates the required information and knowledge transfer, it would leave the individual free to automatically tailor their education according to their own preferences.

If the platform can ensure that individuals are well educated, organisations would be naturally inclined to request access to students who perform well in their areas of expertise. And if individuals' educational progress can be sufficiently tracked and communicated, both individuals and organisations would be provided with new opportunities to collaborate.

5.9.3 Making Useful Effect Appear When and Where Needed

Education is needed when an individual needs to do something which they do not know how to do, or does not have the required skills and knowledge to do so sufficiently. As long as an individual has the capacity to add value to society and they are happy, they should be allowed to fully participate in the formal economy regardless of their age, sex, gender or race. Obviously individuals should be encouraged to improve their abilities, showing them what opportunities awaits them if they do, with education readily available when and wherever the individual might want it.

5.10 Platform Requirements

Through the implementation of the BioTRIZ algorithm the platform requirements could be properly defined and the first conceptual outlining of how the platform would be able to help breach the gap between developed and developing South Africa could be expressed and is summarised as shown in Table 3 below.

Req Nr	Requirements	Motives	Ref
1	The platform would connect three different customer segment with each other to motivate collaboration; individuals, organisations and educational institutions.	It is believed that education would serve as the greatest medium to connect individuals in limited resourced communities with outside organisations	4.3 5.5

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Req Nr	Requirements	Motives	Ref
2	Due to the environment in which the platform need to function, the final product would be cloud based which would make it accessible anywhere in rural South Africa through internet and smartphones or computers.	Due to insufficient national infrastructure It would be logistically impossible to serve South Africa's BOP in any other way.	3.3 5.7
3	The platform would cater for each customer segment personally and would provide different value propositions to each according to their needs.	The only way in which all three customer segments would continuously participate on the platform would be when such participation is of value to them.	4.4 5.5
4	The platform focuses on education, job creation, incentive prizes, building a track record and financial reimbursement for individuals.	It is believed that these services would serve as the most valuable value propositions which the collaboration platform can deliver to the individual in limited resourced communities.	3.1 5.5
5	The platform focuses on job outsourcing, problem solving, recruitment and advertising for organisations.	It is believed that these services would serve as the most valuable value propositions which the collaboration platform can deliver to organisations.	3.5 4.1
6	The platform focuses on advertisement, student acquisition, improved education and value orientated feedback for educational institutions.	It is believed that these services would serve as the most valuable value propositions which the collaboration platform can deliver to educational institutions.	4.2 4.3

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	**Collaboration Platform Requirements**	Collaboration Platform Model	Collaboration Platform Validation	Conclusion

Req Nr	Requirements	Motives	Ref
7	The platforms' first, but definitely not only, focus would be to add value to the masses of underserved individuals in limited resourced communities.	It is these members of society who enjoys the least value adding services and therefore endures the most suffering due to the lack thereof.	3.1 4.3
8	The barrier to entry for the platform would be as low as possible and the initial registration on the platform would be free for all users with no other requirements.	The platform should accommodate any and every individual, irregardless of their background or financial status.	2.1 3.3 3.4
9	The platform's only prerequisite is the user's participation.	All other requirements can be addressed along the way.	3.4
10	The platform would assess every user in accordance to various predefined specifications to establish the user's role in and privileges on the platform.	Each user comes from a different backgrounds and will be subject to life's variables. For the greatest value addition, the platform should therefore tailor all services to fit the user's preferences.	5.5
11	The platform would create an online identity for each and every user as they register and would be used throughout the platform's life to quantify and track the user's progress.	The user's online identity would be used to match all data that is captured through the platform against, ensuring that the transaction data would not be mixed up between users.	3.3 3.4
12	Data of all transactions between users will be gathered which would be used to mine specific trends, identify behaviour, needs, preferences and market potential.	A better understanding of how users would interact and where their preferences lies, would make it possible to better define the services which would be recommended to a specific user.	3.3 5.5

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	**Collaboration Platform Requirements**	Collaboration Platform Model	Collaboration Platform Validation	Conclusion

Req Nr	Requirements	Motives	Ref
13	The platform would link individuals with organisations who are looking for people with the ability to help them in their own initiatives.	This is one channel through which the value proposition would be realised for individuals and organisations.	4.3
14	The platform would link individuals who might be interested in helping organisations solve some of their challenges or compete in their competitions.	This is another channel through which the value proposition would be realised for individuals and organisations.	4.3
15	The platform would link the individual with opportunities to obtain further education, depending on the individual's educational level, which in return would help the organisation meet their own personal goals.	This is one channel through which the value proposition would be realised for individuals and educational institutions.	4.3
16	The platform would be built on the concept of a free online marketspace in which users can post tasks and opportunities or recruit other users to help with these same tasks/opportunities.	The platform would only serve as the skeleton within which users can freely collaborate according to their own interest and preferences.	3.2 3.3 4.3
17	The platform would provide a base on which the users can meet on equal terms to collaborate.	The platform sets the foundation on which all interactions between users will be grounded to ensure a secure a pleasant experience.	5.5

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | Collaboration Platform Validation | Conclusion |

Req Nr	Requirements	Motives	Ref
18	The platform would facilitate interactions between users and acknowledges the exposure which would be obtained and the skills which would be developed through such an interaction.	The progress which is made through every interaction between users, would be quantified to firstly illustrate the value of collaboration, but also to show them that trust is earned and with greater responsibility come greater opportunities.	4.3 5.5
19	The platform would allow individuals to simultaneously develop skills, obtain education, gain exposure, while being rewarded for their efforts.	Education is helpful when it takes place when and where necessary and should not have to get in the way of other responsibilities a user might have.	4.2 4.3 5.5
20	For every task completed, the user's contribution towards society would be quantified, rewarding users who contribute most.	Users who actively work towards the improved welfare of their communities should be rewarded.	3.1 3.3
21	The platform would be gamified and should allow users to unlock more and better opportunities as they improve their competencies and build a reliable track record for themselves.	Users are naturally inclined to react positively to certain game elements. It keeps things fresh and exciting, increasing the likelihood that customers will be retained.	3.1 4.3 5.5
22	The platform would facilitate financial reimbursement between users.	Most individuals in limited resourced communities do not have access to banking services.	2.1 5.5
23	The platform would give users freedom to choose how, when and where they want to interact with others.	The platform is based on the principles of a free and open economy.	3.2 5.5

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | Collaboration Platform Validation | Conclusion |

Req Nr	Requirements	Motives	Ref
24	Feedback would be obtained after all interactions and the different users would be allowed to rate their interactions with other users.	It is important that users would be able to provide feedback in regards to all transactions, since they will be the ones in the middle of the entire interaction.	3.3 3.4
25	The platform would encourage individuals to follow their interest and develop their skills and knowledge to the best of their capabilities while positively contributing towards society.	It is believed that individuals work most productively when they pursue activities in which they personally experience purpose and therefore have intrinsic motives to reach their desired outcomes.	3.1 3.2 4.3 5.5
26	The platform would match users with others based on their behaviour and would make recommendations on how individuals and organisations can obtain the greatest return on their investment.	Due to the large number of people for whom this platform was developed it will be important to make use of sophisticate matching algorithms to make sure that the recommended connections would be valuable to users.	3.1 3.3 5.5
27	The platform would provide an individual with information on how they can effectively reach their financial and vocational goals.	In an environment where lacking education and resultantly limited access to information is a reality, it is important to inform users how they can and should use the platform to their greatest advantage.	2.12 2.14
28	Educational institutions should be able to use the platform to determine how and where they should educate their students to effectively equip them to help solve the challenges of tomorrow.	The platform puts a large emphasis on education and it would therefore be important to use the data which the platform would generate to establish needs and potential for improvements in the national educational system.	2.14 4.4 5.5

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Req Nr	Requirements	Motives	Ref
29	The platform would allow members to see where society might be hiding untapped opportunities or have unanswered needs.	Although the platform would always keep all user information private, the generic results of that data can be made public to help organisations make more informed decisions when entering emerging markets.	4.3 4.4 5.5
30	The platform should encourage collaboration between the three mentioned customer segments. It is not supposed to replace any authority, body, institution or organisation. It should rather complement them in their endeavours.	The platform promotes collaboration and not competition.	3.1 3.2 3.3 3.4 3.5 4.3 4.4 5.5

Table 3 - Platform requirements

5.11 Platform Mechanisms and Architecture

The final solution consists out of different mechanisms which collectively makes up the greater platform. At this stage it was still unclear what these different mechanisms were. The finer details of these mechanisms would be determined by the design requirements as described above. These requirements were therefore carefully studied to determine to which mechanisms they pointed. The design requirements were categorised according to the nature of the need which had to be met for every requirement. To aid this process the 5 W's and 1 H (Buttry 2011) were used as guiding questions to determine *who* the platform should cater for, *what* the platform should do for them, *when* the platform should to this, *where* the platform would do this, *why* the platform would do this and *how* the platform would do this?

Through an iterative approach each design requirement were carefully matched to the one question (Buttry 2011) which best described the need which the platform had to meet. The resultant six categories which were defined throughout this process, were then further used as the architecture within which the finer details and specifications of the platform were defined in greater depth in the next chapter. The final architecture with the six different categories, the question which would be addressed in this category and the requirements which needed to be met are summarised in Table 4 below.

Mechanism	Question	Requirements
Who	Who does the platform cater for?	1, 4, 5, 6
What	What should the platform do for them?	4, 5, 6, 10, 11, 13, 14, 15, 18, 19, 22, 24, 26, 27, 28
When	When should the platform do this for them?	21, 23
Where	Where would this platform do this for them?	2, 23
Why	Why would the platform do this for them?	1, 7, 30
How	How would the platform do this?	3, 8, 9, 12, 16, 17, 20, 25, 29

Table 4 - Platform mechanisms and architecture

5.12 Chapter Summary

This chapter showed how BioTRIZ methodology was used to conceptually design the collaboration platform and define the corresponding platform requirements which the platform had to meet to breach the gap between developed and developing South Africa. The platform requirements were further categorised into six platform mechanisms which collectively made up the platform architecture. This architecture was used as a guideline in the next chapter to further explain the finer details of how the design requirements were met.
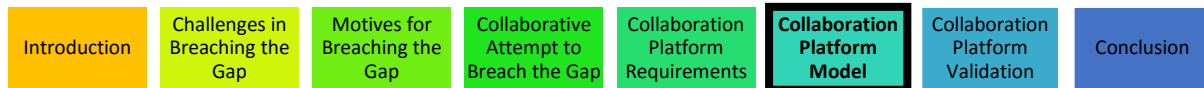
6 Collaboration Platform Business Model Summary

The previous chapter explained how BioTRIZ methodology were used to design and define the requirements which the platform needed to meet to successfully breach the gap between developed and developing South Africa.

This chapter focuses more on how the platform would meet these requirements. The platform architecture was used as a framework within which the platform's details were defined, explaining why the platform exist, who it caters for, how it works, where it can be used, when it can be used and what exactly it does. All of these questions were answered by focusing on specific platform functionalities and was done in accordance to the research methodology as described in section 1.9.2, 1.9.3, 1.9.4, 1.9.5 and 1.9.6.

6.1 Platform Visualisation

The design requirements were addressed in accordance to Sinek's (2011) golden circle as explained in Figure 7; starting with *why*, then *how* and then *what* [Ch 3.4], but within the structure of the requirement architecture as defined in Table 4. Sections 6.2 to 6.10 explains the different platform functionalities and how the mechanisms as explained in Table 4 were addressed to satisfy all the design requirements. Figure 18 below describes the relationship between the platform's functionalities and the requirement architecture. It also visualises the final platform as the sum of the different parts as were further discussed throughout this chapter.

The different platform functionalities where defined through an iterative approach in which the author continuously went through the build-measure-learn feedback loop (Ries 2011), considering each and every design requirement in accordance to the background and context within which the platform requirements were defined as explained in chapters 3 to 5. Ideas were tested against potential customers at Hubspace as is explained in greater depth in chapter 7, pivoting in accordance to the feedback which were obtained and fine tuning the final results to accommodate all requirements as good as possible.

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	**Collaboration Platform Model**	Collaboration Platform Validation	Conclusion

Why	**Facilitate effective collaboration** Section 6.2 (Req: 1, 7, 30)

Who	**Individual** Section 6.3 (Req: 1, 4, 5, 6)	**Organisation** Section 6.3 (Req: 1, 4, 5, 6)	**Educational Institution** Section 6.3 (Req: 1, 4, 5, 6)

How

Platform Connections
Section 6.4
(Req: 3, 8, 9, 12, 16, 17, 20, 25, 29)

Figure 19

Platform Components
Section 6.6
(Req: 4, 5, 6, 10, 11, 13, 14, 15, 18, 19, 22, 24, 26, 27, 28)

Figure 20

Gamification
Section 6.7
(Req: 20, 21)

What

Measuring Progress
Section 6.8 & 6.9
Req: 10, 23, 26
Figure 22 & 22

Where

Online Access
Section 6.5
(Req: 1, 2)

When

-Anywhere
-Anytime

Figure 18 - Platform mechanisms, functionalities and requirements

6.2   Starting with Why?

The collaboration platform is grounded on the fundamental believe that individuals in limited resourced communities, organisations interested in emerging markets and educational institutions would have to work together [Req 1] effectively to breach the gap between developed and developing South Africa and that it should be highly beneficial to all three parties if they decide to do so. The platform therefore needed to show all three these parties how they can work together to their own benefit [Req 30] and at the same time breach the gap between developed and developing South Africa, which would in turn help solve many of the challenges currently faced in South Africa [Req 7].

6.3   Customer Segments

As prescribed by the design requirements, the collaboration platform serves three main customer segments [Req 1]. Firstly the individual operating within South Africa's BOP [Req 4]. Secondly, the organisation who is interested in starting or growing initiatives in South Africa's emerging markets [Req 5]. Thirdly, educational institutions interested in educating South
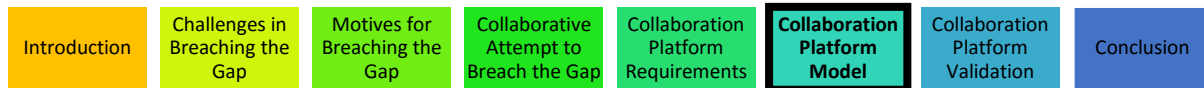
Africa's BOP [Req 6]. The platform connects these three customer segments to allow them to effectively collaborate to help the other customer segments achieve their goals while meeting their own needs.

6.4   Platform Connections

The platform connections are vital to the success of the platform. Without the efficient realisations of the connections between the three customer segments it would be impossible to encourage the needed collaboration which would allow bridging the gap between developed and developing South Africa [Req 1]. The interdependencies which needed to exist between the users on the platform were defined in accordance to the design requirements (Table 3). After an iterative examination of these requirements the platform connections which were believed would prove most valuable to the users were constructed as illustrated in Figure 19 below. These connections would allow users to form strategic partnerships through which both parties could help the other satisfy their needs, while meeting their own personal goals [Req 3].
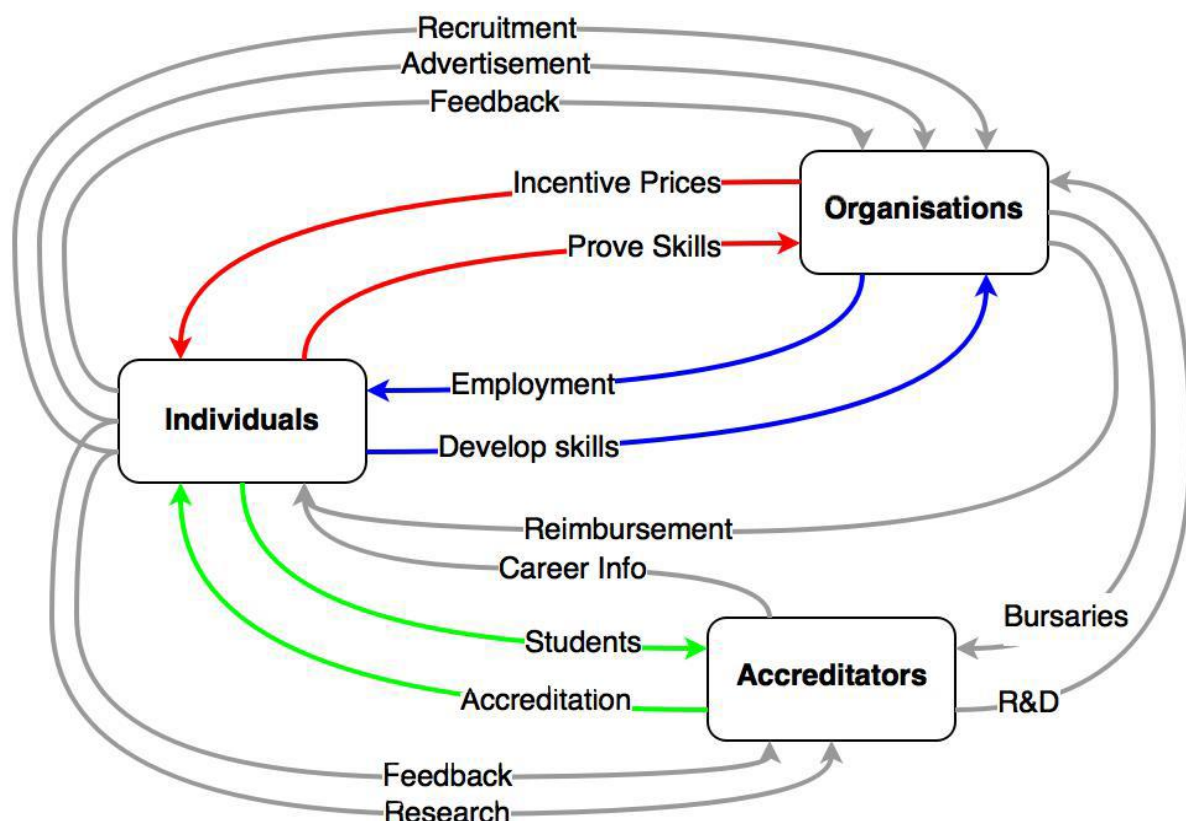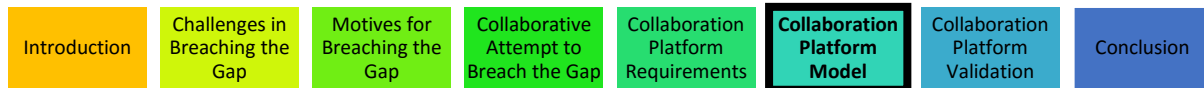
Figure 19 - Platform connections (Timu Technologies 2015)

6.4.1 Red Channel: Proving Skills

In accordance to the design requirements the first main channel, illustrated in red in Figure 19, connects individuals with organisations [Req 4 & 14]. This connection allows organisations to advertise incentive prizes to individuals, while allowing individuals to search for

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competitions or challenges which might be aligned with their interests and personal preferences. An incentive prize would typically be a competition or a challenge which an organisation might have in a specific area on a specific topic. Through this channel organisations can basically open up any problem or challenge which they need solved to the online platform community. Any individual who might be able to help solve these problems would be allowed to participate and the individual whose solution is chosen would be rewarded with an incentive prize. No previous skills or experience is required to participate through this channel and is completely outcome based [Req 8 & 9].

Through the completion of one of these challenges or competitions, the individual would have demonstrated specific skills and knowledge required to address the problem. The platform acknowledges and endorses the individual for the successful demonstration of these skills and knowledge, allowing them to prove and accredit their abilities [Req 19]. The platform also facilitates the interaction between the two parties, including any financial reimbursement which might be involved [Req 18].

The red channel allows the individual to apply their skills and knowledge to help solve the problems organisations might experience. In return they are rewarded with reliable accreditation for the experience, expertise demonstrated, societal contribution which was demonstrated through the encounter, together with a financial reimbursement depending on the nature of the problem solved [Req 22]

6.4.2 Blue Channel: Developing Skills

In accordance to the design requirements the second channel, illustrated in blue in Figure 19, is another connection between organisations and individuals [Req 5 & 17]. This channels allows organisations to advertise temporary employment, while allowing individuals to look for temporary job opportunities which might be aligned with their interest and personal preferences [Req 13]. Temporary employment would include internships, job outsourcing, staff-on-demand, odd-jobs or any task which organisations might need help with. Only individuals who meets the prerequisites for the job will have access to these opportunities [Req 10]. The better qualified an individual becomes, the more opportunities will be unlocked for them [Req 21]. The individual will be free to pursue opportunities which aligns with their personal interests [Req 16].

Through the completion of each task, an individual should further develop skills, gain experience and obtain feedback on their progress from the organisations with whom they interacted [Req 24]. All of this is acknowledged by the platform. The first level of opportunities is free-for-all and requires no previous experience or skills [Req 8]. These tasks would be low risk tasks which organisations would be willing to outsource to literally any individual. As an individual develop their abilities and build a reliable track record for themselves, they will be granted access to more challenging and better rewarding opportunities [Req 21]. The
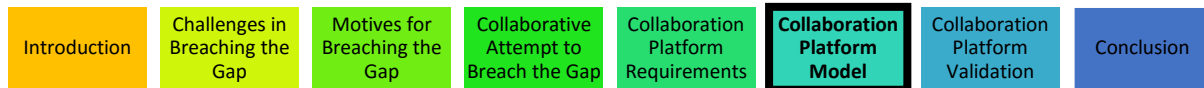
platform facilitates the complete interaction between the two involved parties, including any financial reimbursement which might be involved [Req 18 & 22].

The blue channel allows the individual to trade their current skills, knowledge and participation for further skills and knowledge development, experience, a contribution score and financial reimbursement depending on the nature of the task.

6.4.3 Green Channel: Smart Education

In accordance to the design requirements the third channel, illustrated in green in Figure 19, connects the individual with educational institutions or external accreditors [Req 6 & 14]. This includes any institution who formally accredits skills or education. This connection provides the individual with information on the education they can access at their current state, as well as information on how they can achieve their desired level of education [Req 27]. This will allow the individual to obtain education when and where they might want, in whichever direction they might find interesting, opening up more opportunities to the individual as they progress in their studies [Req 21].

The platform facilitates the interaction between the two parties involved, taking care of all accreditation issues and any financial transactions which might be involved [Req 18]. The platform provides the individual with relevant information on the required investment they need to make to reach their goals [27]. It guides them towards personal success. The platform provides accreditors with valuable information and feedback in regards to the educational preferences, needs and potential of the participating individuals, which would allow accreditors to tailor their approach accordingly [Req 28].

The platform accommodates the fact that an individual's intelligence and interests are dynamic and, would not only but should, mature throughout time. The platform therefore allows individuals to revise their own personal goals [Req 23], while making sure that the platform continues to capture the important information which would serve as the foundation for career changes an individual would like to make along the way. The platform would therefore try to inspire an individual to develop organically, following their immediate interest, learning along the way while always contributing towards society [Req 25].

6.4.4 Grey Channels: Feedback Loops

In accordance to the design requirements the other channels, illustrated in grey in Figure 19, serve as feedback connections between all three customer segments and it is these channels which keeps the system in balance. Due to the fact that interaction between the different customer segments lies at the heart of the collaboration platform, the platform opens up various other opportunities through which organisations and educational institutions can obtain feedback on their endeavours [Req 24], advertise their goods and services and recruit individuals who might be eligible to help them realise their goals. The platform also allows
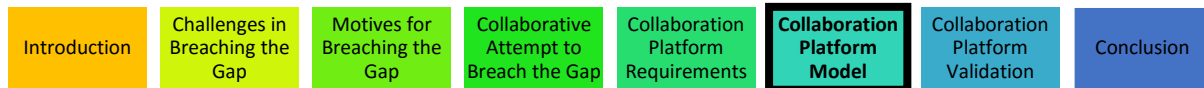
users to continuously revise their partnerships with other users based on real time data analysis which would provide feedback on specific interactions [Req 26].

6.5   Online Access

In accordance to the design requirements the platform would be a semi-automated online system which can be accessed by individuals via internet on any computer or smartphone [Req 2]. The platform would be operated digitally, since it would be logistically impossible to serve South Africa's BOP in any other way. The platform would create its own online community though which all three customer segments can collaborate to help solve their own personal goals [Req 1]. The platform would be based on algorithms, interfaces, dashboards and social technology. All of which are attributes which defines an exponential organisation (Ismail et al. 2014). This allows users to access this platform from any place in the world, leaving them scope to decide how, when and where they would like to use the platform.

6.6   Platform Components

The platform is designed to serve as an ecosystem through which users can collaborate effectively and organically in accordance to their on preferences. The platform therefore only functions as a shell which structures the way in which users can interact effortlessly and harmlessly with other users, but further leaving full discretion to the users to decide how they would like to do so themselves [Req 16 & 17]. The platform therefore only consists out of the four components illustrated in Figure 20 below.
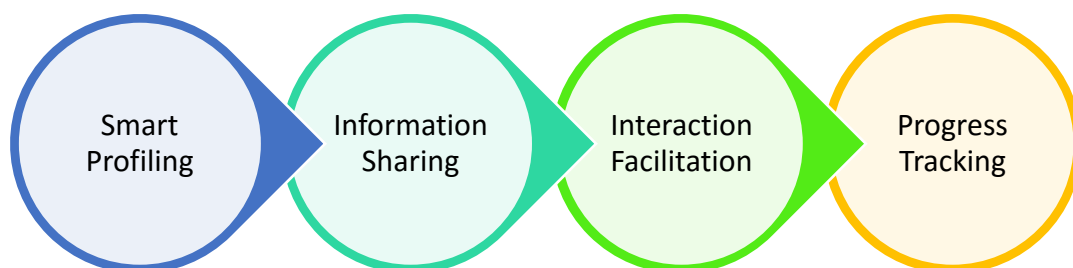
Figure 20 - Platform components (Timu Technologies 2015)

6.6.1 Smart Profiling

All parties who want to participate in the collaboration platform have to register to on the platform before they will be allowed access [Req 10]. For individuals this process would be automated and online, whereas organisations and accreditors will be able to register online or manually with the platform facilitators, depending on the nature of the partnership. Registration includes capturing all relevant information from the specific party which would
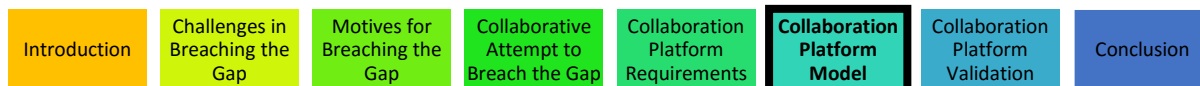
be needed to successfully facilitate and track interactions between users [Req 12]. This information would obviously be protected in accordance to national legislation (Act 4 2013; Act 25 2002).

A user profile will be created, providing an interface through which all required user information would be communicated [Req 11]. Depending on the nature of the user, their profile will include information about their proven and developed skills, education, experience, exposure, ratings, feedback, interactions, contributions, reimbursement, participation and status as illustrated in Figure 21 below. The platform facilitators will also open a free third party mobile bank account for each user who does not already have an active bank account at a licenced and registered credit and authorised financial services provider (FSP5865; NCRCP6). These bank accounts would then be used to safely transfer financial reimbursements to users who did not have a bank account before [Req 22].
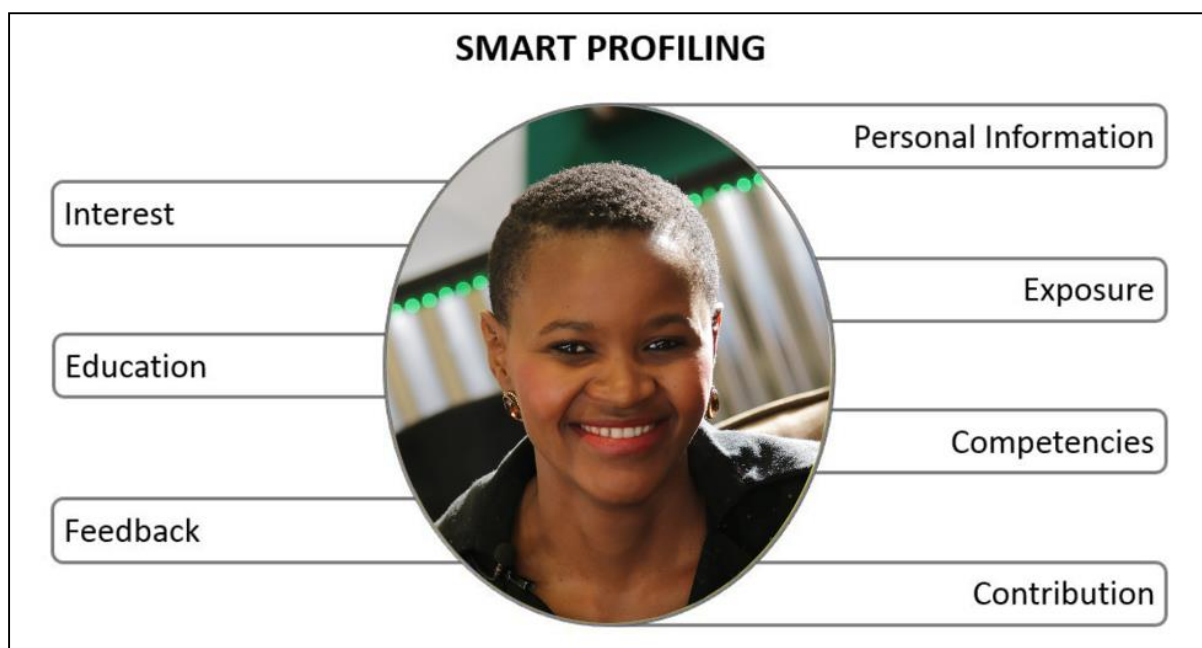
Figure 21 - Smart profiling elements (Timu Technologies 2015)

6.6.2 Information Sharing

After registration the platform gives users access to a free-for-all marketspace in which they can freely share all opportunities and requests [Req 5, 6 & 7]. A matching algorithm would match users to the opportunities and request which would best suits their needs, interest and preferences [Req 26]. All information in regards to the opportunities and request and how to participate in them would be made available through the platform [Req 27]. All matching criteria and prerequisites would be handled in the platform backend, making the connection process as simple as possible for the users. The platform would also allow a user to see
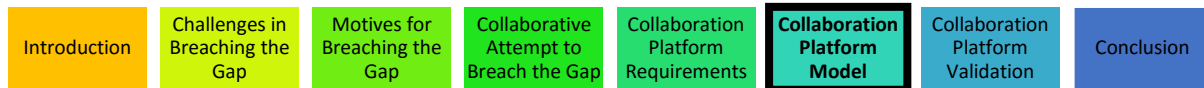
opportunities which they might unlock when they reach a higher educational level, together with information on how they can do so [Req 21 & 29].

6.6.3 Interaction Facilitation

When a user identifies an opportunity on the platform in which they want to participate, the platform would allow the user to apply via the platform. The user on the other end will then be allowed to use their own discretion to decide whether or not they would like to work with the applicant based on their level of expertise and their prior interactions [Req 23]. If accepted the two parties would be allowed to effectively communicate and make further arrangements for the awaiting job [Req 17]. After job completion the platform requires both parties to provide feedback on the other user and rate the experience [Req 24]. Additionally an in-house rating system would also capture data on the interaction to validate whether the interaction took place as planned and to ensure that both parties keep up their end of the deal [Req 12].

All skill endorsements, contribution scoring, information capturing and financial reimbursements are facilitated through the platform and should make the interactions as pleasant as possible for both parties [Req 18].

6.6.4 Progress Tracking

The sustainability of this platform depends largely on the platform's ability to realise meaningful interactions between parties and to track the corresponding user progression. The behaviour of users during these interactions will play a determining role in the future opportunities and rewards which would be accessible to a specific user. The platform is designed to reward active participation and positive behaviour [Req 20]. The more an individual puts in, the more they will be able to get back [Req 9]. Simultaneously, users who misbehaves can also be penalised.

6.7   Gamification

The entire platform is gamified, with typical *game playing* elements built into the system (Stevenson 2010) to encourage user engagement. There are different levels that can be reached on the platform [Req 10]. Reaching the more advanced levels will require greater effort and mastery from the users [Req 21]. Users will also be awarded points for their contribution within their communities [Req 20]. The more competent a user proves himself to be and the higher their contribution, the more opportunities with greater rewards becomes accessible to the user.

6.8   Measuring Competencies

The way in which the platform measures user's competencies are very important [Req 10]. Authors such as Adler (2013) suggest that there are only four different types of work according to which all jobs can be classified. In accordance to these four work types, the author proposed a new way through which a user's competencies can be measured. Each and

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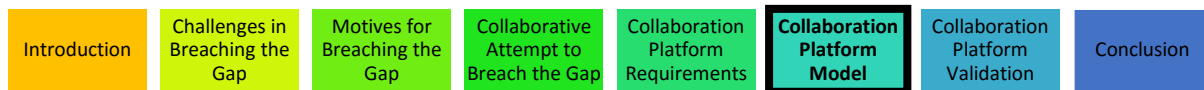
every competency is linked to an achievable status which holds different levels of mastery as demonstrated in Figure 22 below.
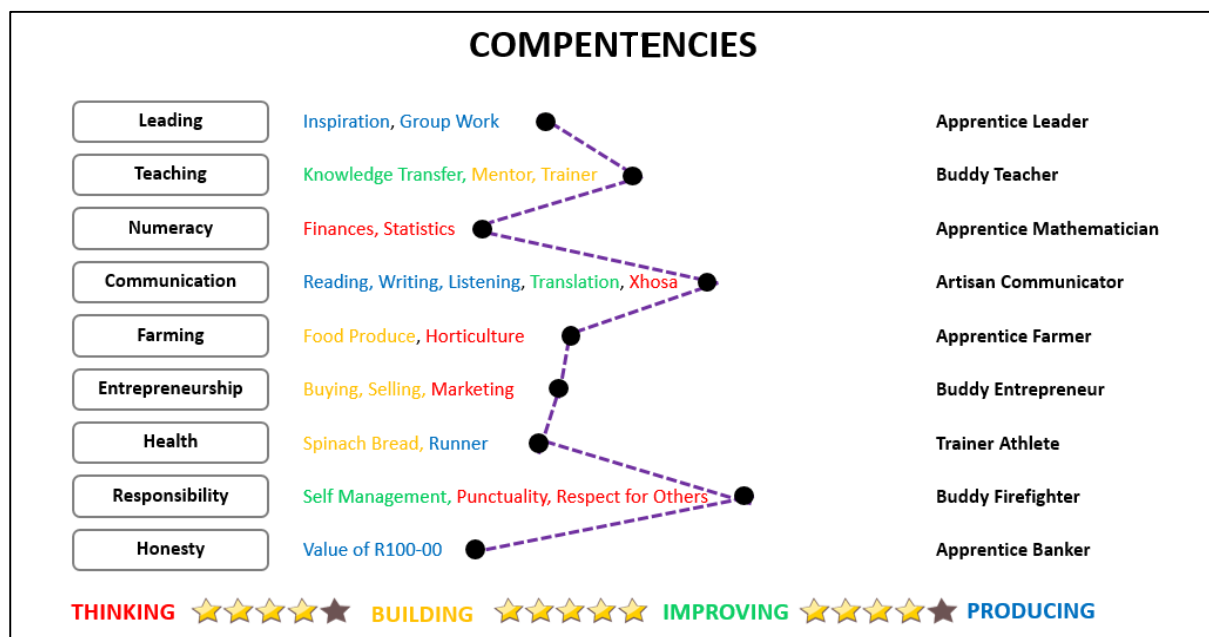
Figure 22 - User competency measuring (Timu Technologies 2015)

This information would be used to accurately match individuals to tasks which requires a specific level of expertise. The goal is to move away from the conventional way of defining an individual's competencies according to their educational level, but rather according to their true abilities and interest [Req 23], which would provide a much more efficient way to match users with each other and increases the likelihood for successful collaboration [Req 26].

6.9   Measuring Contribution

The key participation driver for the platform lies in a unique way which was developed to measure an individual's contribution towards their community [Req 20]. For each task a user completes on the platform, the impact of their efforts is calculated through a dynamic algorithm which is based on information of a specific community's economics. This algorithm calculates a user's contribution score in different fields which is presumed important to the community's welfare at a specific point in time. Please refer to Figure 23 below for a visualisation of a potential contribution score card.

The platform uses this information to calibrate the user's contribution to those of others' to show them the value of their efforts. This platform also uses this scoring system to motivate further participation between users by linking the rewards which an individual obtains through participation, to their ability to positively impact their community, with positive contributions leading to more opportunities [Req 21].
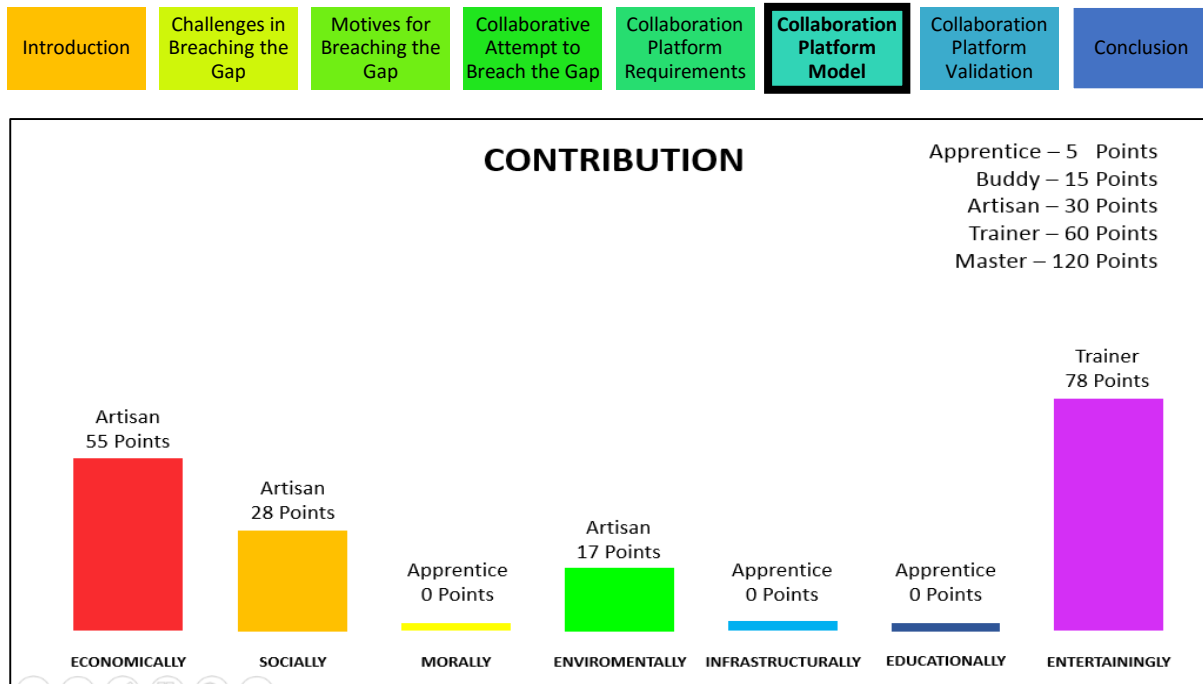
Figure 23 – Potential platform contribution score (Timu Technologies 2015)

6.10 Personalised Experience

The platform is developed to allow each member to tailor their own partnerships, opportunities and education according to their own needs, without any compromises [Req 3, 4, 5 & 6]. Please refer to Figure 24 below. The platform was not developed to replace existing educational institutes, but to operate parallel with their initiatives [Req 23 & 30]. The entire idea behind the platform is that individuals will take full responsibility for their own education and the platform will only show them how they can do this by collaborating with others. The platform encourages them to do so with their peers and through schools, colleges and universities. Fully capitalising on the benefits of working in a collaborative environment, without any of the logistical difficulties.
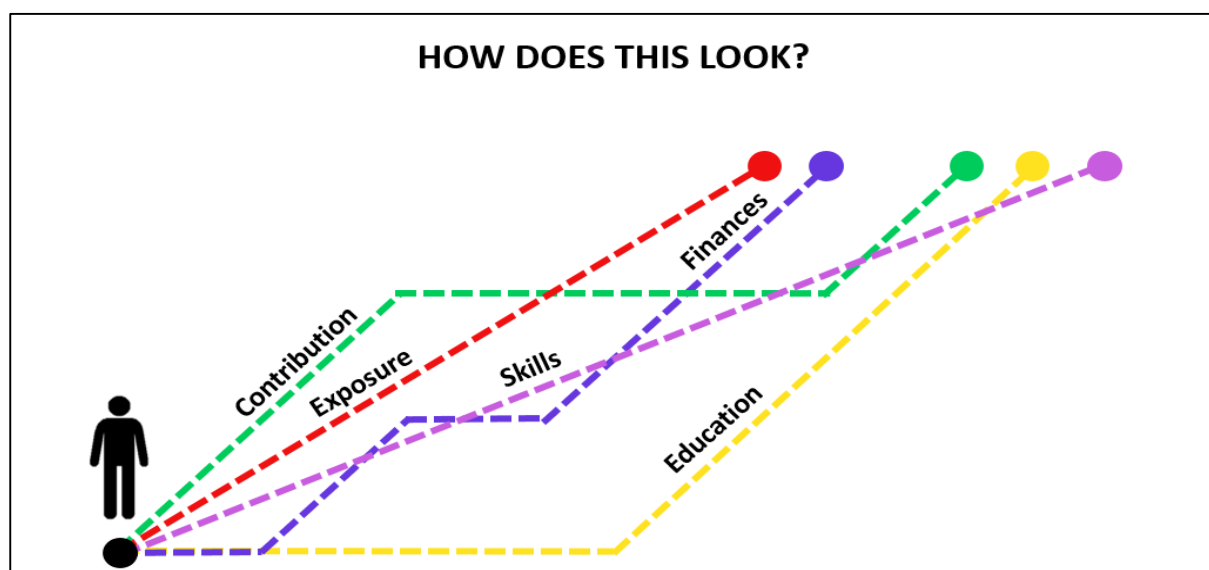
Figure 24 - Potential path of a platform user (Timu Technologies 2015)

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6.11 Business Model Canvas

In an attempt to summarise the platform functionalities as described in sections 6.2 to 6.10, an Osterwalder analysis or business model canvas (Osterwalder & Pigneur 2010), was used to concentrate all the platform variables into a potential business model as can be seen in Figure 25 below. The different colours indicate the different customer segments involved in the platform; the individual in red, organisations in blue and educational institutions in green. Purple was used for entries which overlaps between all three customer segments.
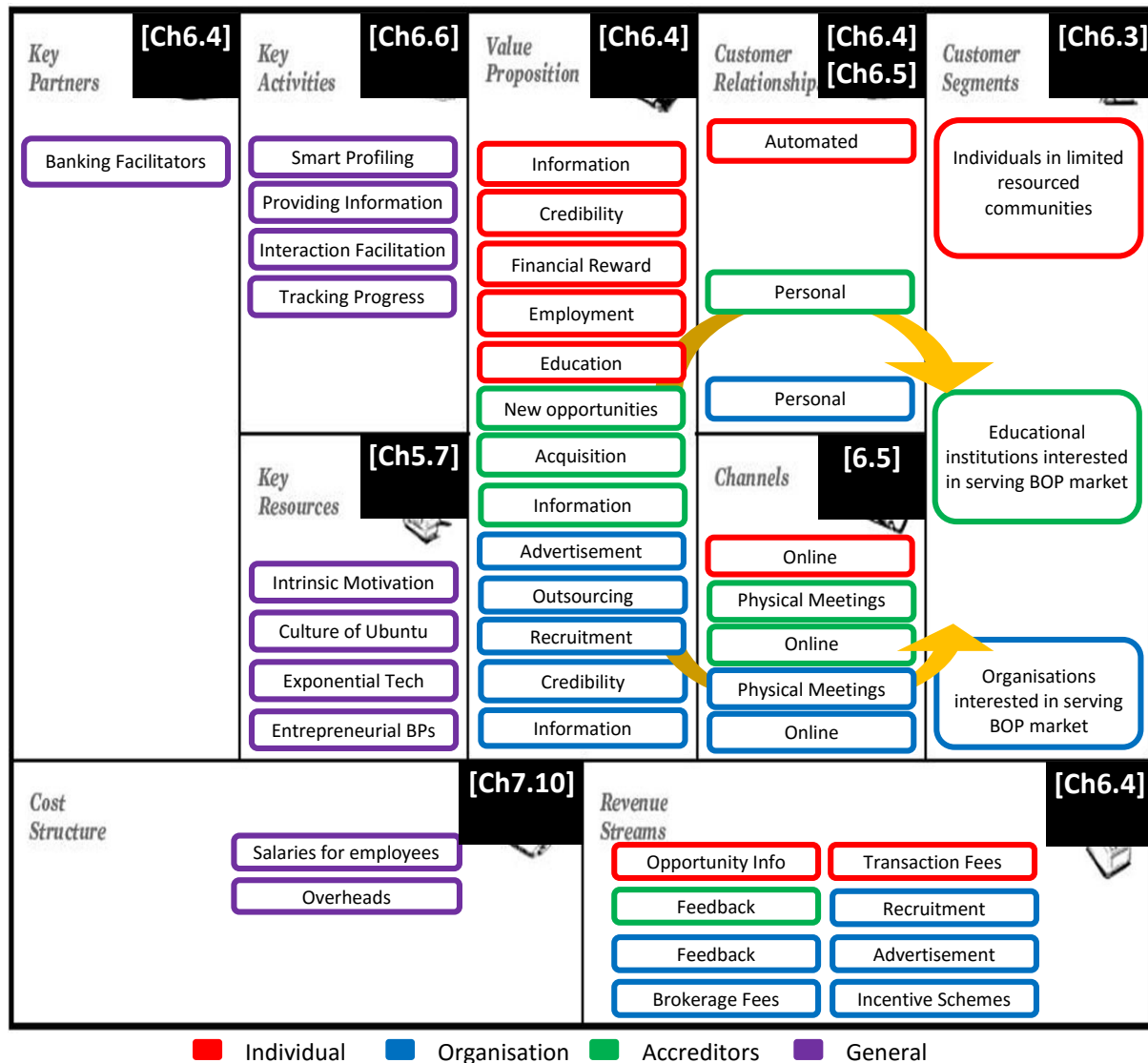
Figure 25 - Business Model Canvas summarising core hypothesis (Osterwalder & Pigneur 2010)

Due to the fact that the platform was developed with plans for real life implementation, this analysis did not only serve as a good tool to summarise the platform functionalities, but also to identify and address some of the finer details and requirements which might have been overlooked throughout the platform design and was not included in the 30 design requirements. The business model canvas was therefore fully completed, summarising the

customer segments who are being addressed, what the value proposition is, the channels through which the value proposition would be delivered, what the relationship with each customer would be, who the key partners are, what the key activities involve, what the key resources are, the platform's cost structure and its potential revenue streams.

The business model could therefore efficiently summarise the workings of the collaboration platform and also summarised the assumptions (Ries 2011) on which the collaboration platform was designed. These assumptions would form the underlying basis on which the platform's validity depended and would therefore be the main focus during further platform validation as explained in greater depth in the following chapter.

6.12 Requirement Verification

Throughout the previous sections the different platform functionalities were summarised, explaining how the design requirements were addressed. Where Figure 18 indicated which design requirements had to be addressed and suggested which functionality would most likely be most suitable to do so, Table 5 illustrates which requirements were actually addressed by every functionality. It also shows that from the 30 design requirements which were defined, all 30 could be successfully addressed in the final product.

Section	Functionality	Requirements Addressed	Comments
6.2	Starting with Why	1, 7, 30	The connections between the three customer segments suggest that effective collaboration can be achieved.
6.3	Customer Segments	1, 4, 5, 6	All three customer segments were completely integrated into the platform design.
6.4	Platform Connections	1, 3, 4, 5, 6, 8, 9, 10, 13, 14, 15, 16 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28	The precise connections which the platform performs between the different customer segments could be explained, together with their real life benefits.

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Section	Functionality	Requirements Addressed	Comments
6.5	Online Access	1, 2	The platform's online existence will make it possible for users to access the platform from anywhere in the world, whenever they want.
6.6	Platform Components	5, 6, 7, 9, 10, 11, 12, 16, 17, 18, 20, 21, 22, 23, 24, 26, 27, 29	It was possible to address the platform requirements by dividing the platform into different process components which would be performed during every connection between different parties.
6.7	Gamification	20, 21	Through the use of gamification it was possible to reduce the barrier to entry to almost zero, while still adding value to every user in accordance to their own abilities.
6.8	Measuring Competencies	10, 23, 26	The ability to measure user progress allowed game elements to be designed into the platform.
6.9	Measuring Contribution	20, 21	
6.10	Personalised Experience	2, 4, 5, 6, 23, 30	The entire platform allows for a personal user experience, catering exactly for the needs and preferences of every user.
Total Requirements Successful addressed			**30/30**

Table 5 - Design requirements successfully addressed

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	**Collaboration Platform Model**	Collaboration Platform Validation	Conclusion
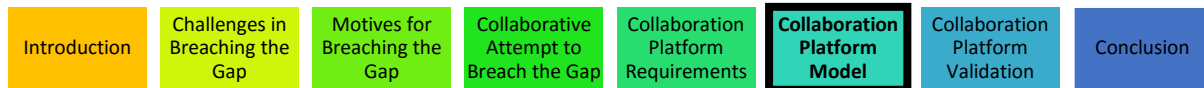
6.13 Chapter Summary

This chapter explained the finer details of the collaboration platform's functionalities and how the different design requirements were met. The platform serves three different customer segments; individuals, organisations and educational institutions. The platform connects all three customer segments with each other in accordance to their specific needs and preferences, facilitating collaboration through mutually beneficial partnerships. The platform is based in the cloud and is accessible to users anywhere in South Africa via internet and smartphones. The platform consists out of four different components; smart profiling, information sharing, interaction facilitation and progress tracking and encourages users to participate on the platform through the incorporation of game elements. A new way was defined to measure user progression which could be used to provide a fully personalised experience to each and every user. The platform details were summarised in a business model canvas to address any last requirements which might have been missed throughout the design process and also summarising the important assumptions which needed to be tested to validate the platform as explained in chapter 7.

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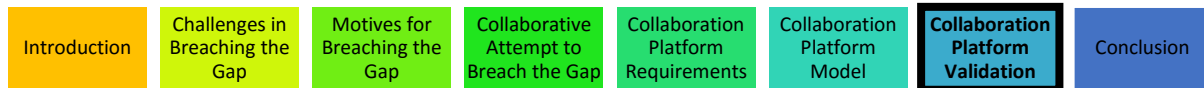
7   Collaboration Platform Validation

The previous chapter summarised the business model behind the collaboration platform, explaining how all the design requirements which needed to be met to help breach the gap between developed and developing South Africa were addressed. The main assumptions on which the platform were developed were also summarised in a Business Model Canvas.

This chapter focuses on validating these assumptions, ensuring that the platform would work as it was designed to work and that it would help breach the gap between developed and developing South Africa. The platform's riskiest assumptions were identified and experimentally tested to determine whether it would meet the minimum success criteria which would prove that the platform can indeed do what it was designed to do. This was done in accordance to the research methodology as described in section 1.9.3, 1.9.4, 1.9.5 and 1.9.6.

7.1   Platform Validation Requirements

The collaboration platform which was developed had to be validated to determine whether or not the platform would work as it was designed to work and whether the platform might serve as a plausible solution to help breach the gap between developed and developing South Africa. Therefore the main assumptions on which the dynamics of the platform is based had to be validated to make sure that all users can be connected as required and that users would be willing to participate once the platform is ready. Furthermore the platform would have to be validated to determine whether it could be sustainably implemented to help individuals in limited resourced communities and outside organisations to effectively collaborate and therefore help breaching the gap between developed and developing South Africa.

7.2   Validation Process

It is understood that there are four types of process validation (Kneat Software 2012); prospective, retrospective, concurrent and revalidation (Figure 26). For prospective validation data is gathered to prove that a specific process would work as it was designed to do prior to the actual implementation. This kind of validation would typically be static in nature and are often used to test new processes or inventions.

| **Prospective validation** | **Retrospective validation** | **Concurrent validation** | **Revalidation** |

Figure 26 - Four types of validation (Kneat Software 2012)

Retrospective validation usually relies on the analysis of historical data to provide sufficient evidence that a process worked as it was supposed to work. This kind of validation would
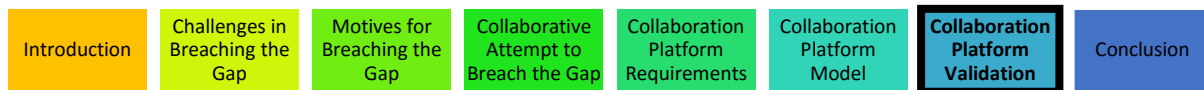
typically also be static in nature and would be performed after the completion of a specific process.

Concurrent validation are used in currently active processes where evidence should be obtained to confirm that everything in a specific process is working as it should be working. This type of validation would therefore be dynamic in nature, since it have to acknowledge the environment in which the process is actively taking place.

Revalidation is the repetition of previous validation test to ensure that the previous results were correct or are still the same. This type of validation would therefor combine a string of static validation tests to indirectly form a dynamic process.

7.2.1 Dynamic Environment

As already explained the platform contains various of the same elements which Ismail et al. (2014) describes as the attributes which make up an exponential organisation. These attributes are made possible through the direct use of ever changing exponentially growing technologies. The platform would therefore be based in a dynamic environment with literally millions of variables changing on a daily basis.

It was therefore extremely important to validate the platform in a way which would provide a realistic and holistic view of how the platform might perform in real life. Evaluating whether the platform might be a plausible solution for breaching the gap between developed and developing South Africa over a longer period of time and in accordance to the author's definition for sustainability in section 4.1.6. Figure 27 illustrates this in terms of *vertical* versus *horizontal* validation, where vertical validation is based on a specific snapshot in time after the platform development versus horizontal validation which tries to incorporate the processes following development into the validation as well.
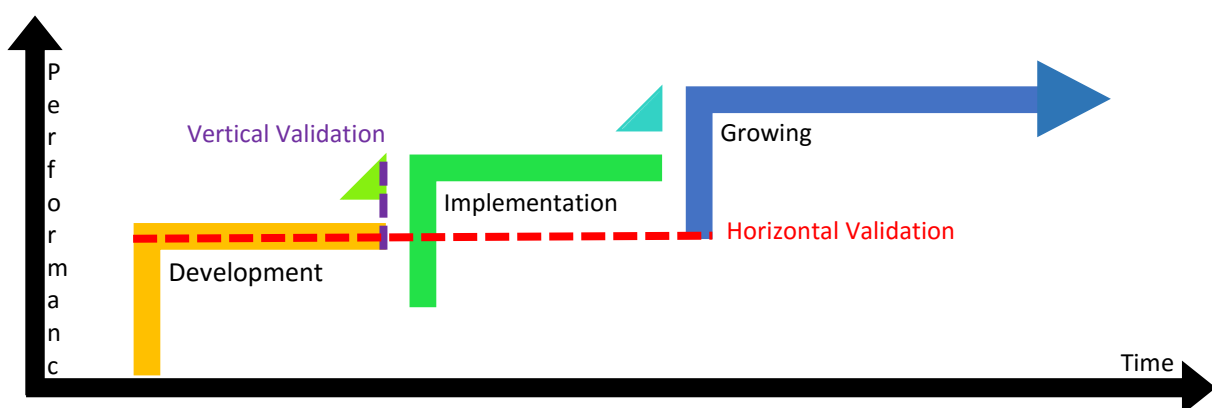
Figure 27 - Validation types

7.2.2 Mixture of Validation Types

Once the validation process needs to accommodate time changes and dynamic progression, the process is drastically complicated. It is exactly for these scenarios which Eisenmann et al.
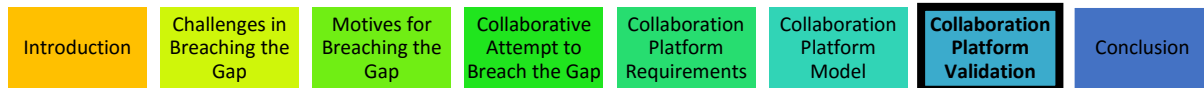
(2012) developed their hypothesis driven testing approach. An approach which can be used for the validation of complicated dynamic systems such as startup companies. It is based on the same principles as those of action learning (Revans 2011), a problem solving methodology which recommends a learning-by-doing approach. This type of validation tends to be more concurrent in nature, with an added element of revalidation. This type of validation is exactly what was needed to evaluate whether or not the collaboration platform would work as it was designed to work in real life, as well as evaluating whether the platform might help breach the gap between developed and developing South Africa.

The action learning validation approach would often be used in a startup environment where ideas have no theoretical backbone on which to lean on. In this case extensive prior research has been done and served as the foundation on which the collaboration platform was founded as explained throughout chapters 3 to 6. This allowed the author to combine and apply all four different types of validation in an attempt to validate the platform.

7.2.3 Validated Learning and Confirmation of Assumptions from Literature

As explained in chapter 3 Ries (2011) suggest that all new initiatives should go through a continuous build-measure-learn feedback loop as illustrated in Figure 9, to ensure the greatest return on investment. This process relies on action learning based validation and are heavily focussed on the quantification of metrics which can be used to effectively measure the progress of a new initiative. The term *validated learning* was coined by Ries to define this process in which learning takes place through the experimental testing of an idea, quantifying the results for validation purposes and using the obtained results to decide what should be done next.

The Validation Board (leanstartupmachine 2012), as can be seen in Figure 28 below, is a tool which was developed to facilitate the process of validated learning in a structured and orderly manner, testing new initiatives as quickly and cost efficiently as possible. Ries (2011), the architect behind The Lean Startup movement, said the *Validation Board is a great tool to help entrepreneurs stay focused on taking action while implementing the Lean Startup process.*

Figure 28 - Validation board used to test startup ideas (leanstartupmachine 2012)

It was therefore decided to combine the methods suggested in the validation board with a retrospective and revalidation approach to confirm some of the important platform assumptions which were derived from previous studies in literature.

7.2.4 Experimental Testing

Eisenmann et al. (2012) and Ries (2011) suggest that a new initiative's riskiest assumptions or hypotheses should be tested as quickly and cost effectively as possible. They suggest using a minimum viable product (MVP) to do this. A MVP is a simple yet efficient version or element of a product or service which can be used to experimentally test a specific hypothesis. These test can be done through three different types of experiments as illustrated in Figure 29 below.

Exploration
- Interviews
- Surveys
- Etc.

Pitching
- Negotiate trading a product/service to a potential customer

Concierge
- Delivering a first version of a product/service to a potential customer
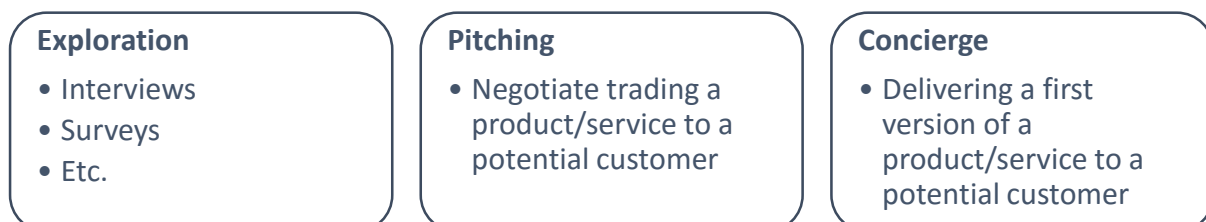
Figure 29 - Types of experimental test used for validated learning (Ries 2011)

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | **Collaboration Platform Validation** | Conclusion |
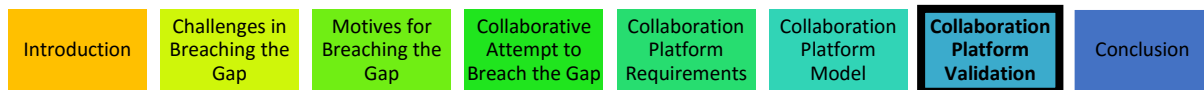
7.3 Customer Hypothesis

In accordance to the Business Model Canvas as summarised in Figure 25, the collaboration platform targets three different customer segments, the individual, the organisation and the educational institution as shown in Figure 30 below. The participation of each of these three customer segments are important for the platform to operate as designed. The platform was developed on the hypothesis that they would. A hypothesis which was based on the theoretical principles discussed in chapter 3 and 4, but still needed to be tested. This hypothesis could only be proven true if evidence suggested that the platform can really add real value to all three these customer segments.

7.4 Problem Hypothesis

In accordance to the Business Model Canvas as summarised in Figure 25, the platform was designed to help solve unique problems for all three customer segments. It introduced various hypotheses in regards to how the author interpreted the needs of these segments and what problems should be solved for each user to realise value addition. Figure 30 below summarises some of the important problems the platform was designed (Figure 15) to solve for the different customer segments.

Individual
- Education
- Financial reward
- Employment
- Credibility
- Information

Organisation
- Advertisement
- Outsourcing
- Recruitment
- Credibility
- Information

Educational Institution
- Student acquisition
- More oppertunities
- Information

Figure 30 – Assumed problems which would be solved for each customer segment

7.5 Riskiest Assumptions

Together with the customer and problem hypothesis, the Business Model Canvas in Figure 25 also highlighted other assumptions on which the platform was based. Four of the most important assumptions, which would determine whether or not the platform would meet the validation requirements as previously defined, were identified.

These assumptions were prioritised from the riskiest assumption to less risky and were tested accordingly. If the riskiest assumption proved invalid the entire platform would be flawed and a pivot (Ries 2011) would be required before the collaboration could be approved as a valid solution to help breach the gap between developed and developing South Africa. The four riskiest assumptions on which the platform were based is summarised in Figure 31 below.

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	Collaboration Platform Model	**Collaboration Platform Validation**	Conclusion

All customer segments are eager to collaborate with other customer segments[Ch 6.3]

The platform can effectively communicate with all customer segments[Ch 6.4 & 6.5]

The platform can help all three customers segments solve their personal problems[Ch 6.4]

The platform can be sustainably implemented[Ch 6.11]

Figure 31 – Riskiest platform assumptions

It had to be proven that all customer segments would be eager to collaborate with the other customer segments. The entire existence of the platform were based on this assumption. If this could be effectively proven, it had to be proven that the platform can effectively communicate with all customer segments. Without being able to communicate to all segments it would not be possible to realise collaboration between any of the parties. Once it was proven that the platform would be able to effectively communicate, it had to be proven that the platform can address the problems of each customer segment and add value to their endeavours. Thereafter it had to be determined whether or not the platform could be sustainably implemented.

7.6   Minimum Success Criteria

In accordance to the testing methods as defined in Figure 29, different experiments where designed to chronologically test the riskiest assumptions on which the platform was based. These assumptions where identified as the make or break assumptions on which the platform were based and proving these assumptions correct would serve as sufficient confirmation that the platform would work as it was designed to work and that the platform would be confrimed as a potential solution to breach the gap between developed and developing South Africa.

Before any assumption would be accepted as valid, it had to be proven that it succeeded the minimum success (leanstartupmachine 2012) criteria which were defined for the assumption. The minimum success criteria was therefore the authorising benchmark according to which the assumptions where examined. The minimum success criteria for the collaboration platform were defined in accordance to the platform requirements as defined in chapter 5 and is summarised in Figure 32 below.
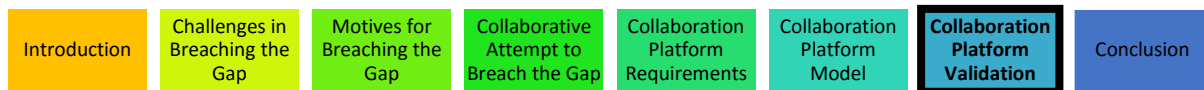
Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	Collaboration Platform Model	**Collaboration Platform Validation**	Conclusion

All customer segments are eager to collaborate with the other customer segments

- Individuals in limited resourced communities have to show willingness to participate [Ch 6.3].
- Organisations have to show willingness to participate [Ch 6.3].
- Educational Institutions have to show willingness to participate [Ch 6.3].

The platform can effectively communicate with all customer segments

- The platform could effectively communicate with individauls in limited resourced communities and inspire them to action [Ch 6.4 & 6.5].

The platform can help all three customers segments solve their personal problems

- The platform would immediately help solve problems individuals in limited resourced communities face [Ch 6.4].
- The platform would immediately help solve problems faced by organisations who are interested in expanding their initiatives to emerging markets [Ch 6.4].
- The platform would immediately help solve challenges faced by educational institutions interested educationing inidividual's in BOP markets [Ch 6.4].

The platform can be sustainably implemented

- The platform would be self sustaining [Ch 6.11].

Figure 32 - Minimum success criteria to validate core assumptions

7.7 Assumption Testing: Eager to Collaborate

The riskiest assumption which needed to be tested was to determine whether or not all three customer segments (Figure 30) would be eager to collaborate with the other customer segments. This was done in accordance to the methods used for the validation board (leanstartupmachine 2012) and the validated learning principles discussed before (Ries 2011)

7.7.1 Individual Participation

The first tests were conducted on potential platform users in Harare, Khayelitsha which comprised of 20 of the entrepreneurs working from Hubspace and 45 more random individuals passing by Hubspace. The test were structured as illustrated in Figure 33 below.

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | **Collaboration Platform Validation** | Conclusion |

Introduction: Questioning potential customers what the most challenging aspects of living in a limited resourced community is for them as an individual [Ch 2].

Exploration: Interviewing potential customers to determine wether or not they would be willing to work with outside organisations and educational institutions to help solve the challenges which were highlithed above [Ch 6.3 & 6.4].

Pitching: The workings of the collaboration platfrom was explained to the 65 interviewees, elaborating on how the platfrom facilitates collaboration between individuals organisaitons and educational institutions [Ch 6.4]. Concluding by asking whether or not the individual would be willing to register and actively participate on the platform.

Concierge: A minimum viable product of the collaboration platform was developed and made avialable to all 65 interviewees. Urging all of them to register and participate on the platform.

Figure 33 – Experimental approach used to test the individual's willingness to participate

The challenges which was identified through the interviews were used for the research explained in Chapter2. Furthermore, all 65 potential customers who were interviewed said they would not mind working with outside organisations and educational institutions. Most of them indicated that they think it might even be highly beneficial for them to do so. All 65 potential customers to whom the platfrom was pitched said they would like to register and would actively participate in the platform. 24% of the users who were invited to the full MVP completed the full cycle.

The minimum viable product which was developed contained elements of all four platform components as explained in Figure 18. The idea was to simulate the collaboration facilitation process by taking potential customers through the complete interaction cycle as illustrated in Figure 34.

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	Collaboration Platform Model	**Collaboration Platform Validation**	Conclusion

Registration via Google form colleccting personal and vocational information from users

Invite registered users to an information meeting via bulk SMS

Informing registerd users of the task oppertunities available on the platfrom

Allowing users to freely decide when and how they would like to complete these tasks

Instructing potential users to respond electronically once they completed a task

Obtaining feedback from the potential users after task completion

Inviting users to collect payment via bulk SMS

Figure 34 – MVP cycle for testing the individual's willingness to participate

The MVP user registration were done via a Google form (screenshot in Figure 35 below) which prompted an individual for personal, vocational and other relevant information in a survey which took an estimated 12 minutes to complete. The 65 potential customers who were approached all registered on the author's laptop at Hubspace or at a nearby internet café.

timu technologies | connecting you

Register

Hey, you're at the start of something new. We're ready to welcome you to the Timu family, let's get to know you a little better.

* Required

Figure 35 - Print screen of Google form accessible from https://docs.google.com/forms/d/1mAT5Hu3gnv2vtubCvWLOaTUY37sOUHYDtRbby7bxGk8/viewform?usp=send_form (Timu Technologies 2015)

As already explained, from the sample size of 65 potential customers who were approached all 65 ended up actually completing the Google form as registration, providing the author with all their personal and vocational information.

100%

■ Completed registrations
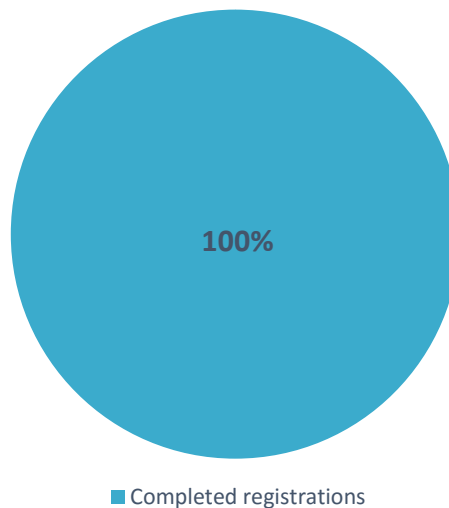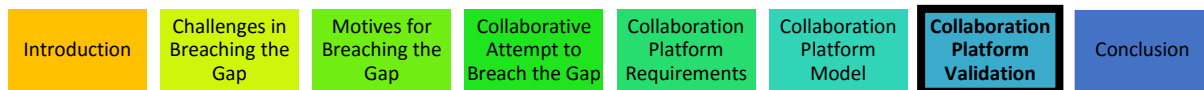
Figure 36 – Completed user registrations from sample size of 65 individuals

After the 65 potential users where registered 5 different tasks were designed which were presented to the users. Each task focussed on a different area of interest and were tailored according to the information gathered from the sample size. The tasks were designed to have virtually no entry barrier and could be completed by any individual. A small financial reimbursement were promised for the completion of any of the following five tasks illustrated in Figure 37 below.

Customer acquisition	• Facilitating the registration process of any new members from a nearby internet cafe
Library membership	• Signing up at Harare library which would allow users free internet access
Pamflet distribution	• Distributing advertisment pamflets around Harare, Khayelitsha
English to Xhosa translation	• Translating a 200 words Wikipedia article from English to Xhosa
News articles	• Writing a wiki article about any interesting event taking place in Khayelitsha

Figure 37 - Job tasks presented to potential customers

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | Collaboration Platform Validation | Conclusion |

These tasks were developed in accordance to the red channel as discussed in Figure 19 and represented the likes of tasks which other organisations might want to outsource. They were designed to cater for the most interviewees' job preferences as indicated during the registration process and was aligned to the interest of 34 of the 65 registered users. Therefore bulk SMS invitations were sent out to these 34 candidates, asking them to meet at Hubspace to discuss the available task opportunities.

The tasks were presented in the form of a slideshow presentation as illustrated in Figure 38 below. Each slide contained a brief description of the task, defining the skills which were required to complete the task and the skills which would be demonstrated though the completion of the task. Also showing the financial reimbursement which the user would be entitled to on completion.
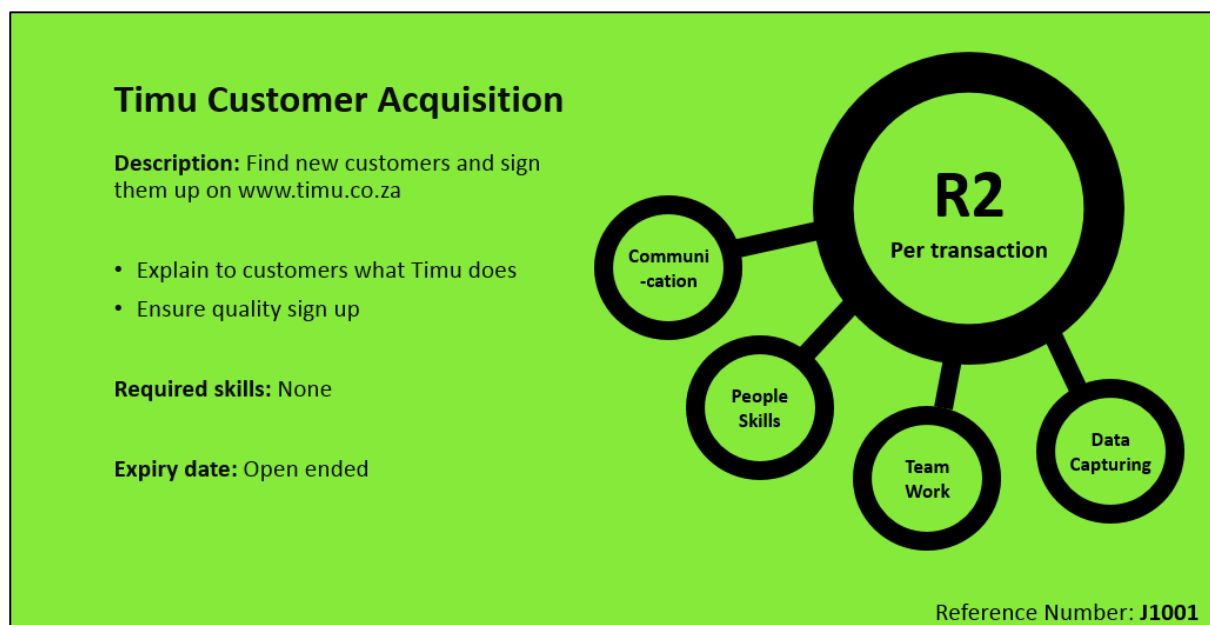
Figure 38 - Platform tasks example (Timu Technologies 2015)

As illustrated in Figure 39 from the 34 individuals who were invited, 26 candidates pitched for their meetings on time and eager to find out more.
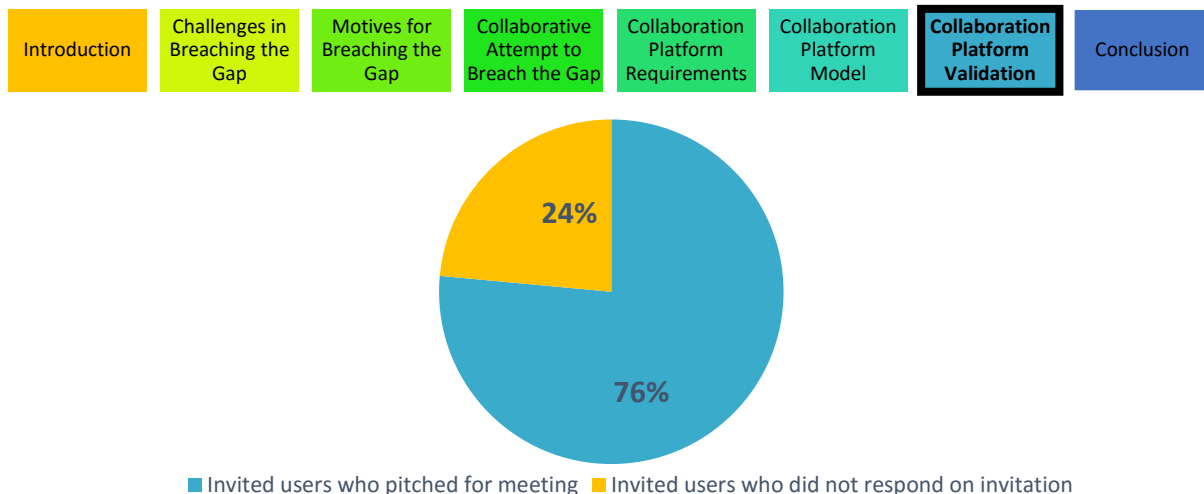
Figure 39 – Response to invitations to meet at Hubspace

As can be seen in Figure 40 below, from the 26 users who pitched for their scheduled meeting, 19 indicated that there is at least one of the five tasks as illustrated in Figure 37 which they find interesting and would like to pursue further.
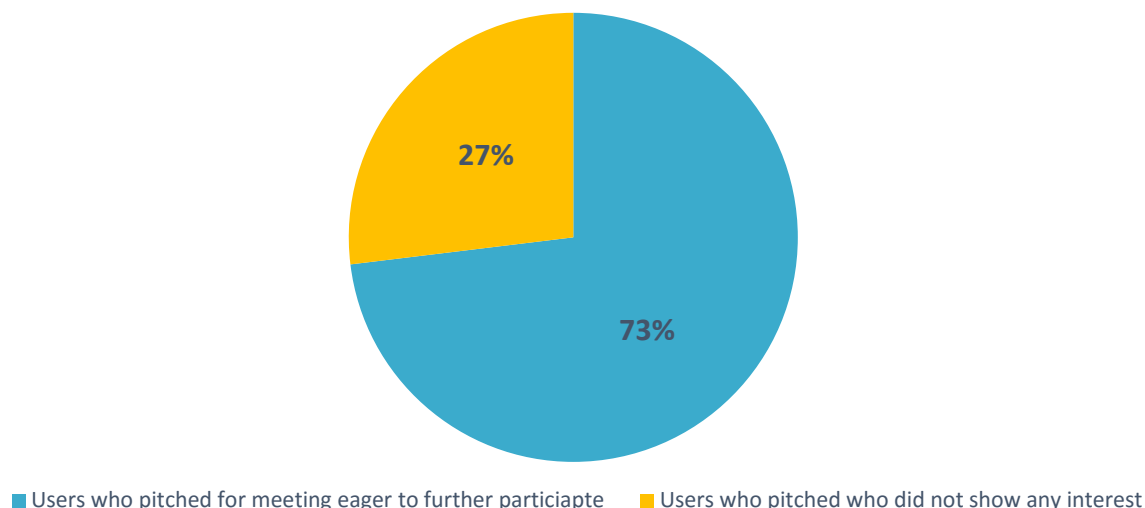
Figure 40 – Eagerness of users to further participate

The users were then left to continue on their own discretion and without any further interaction. They were left to choose which tasks they would like to complete and after completion they could simply respond via SMS or email to initiate the evaluation and reimbursement process. As illustrated in Figure 41 below from the 19 members who showed interest in further participation, 8 completed at least one task and provided feedback for the experience, receiving payment for their efforts.

| Introduction | Challenges in Breaching the Gap | Motives for Breaching the Gap | Collaborative Attempt to Breach the Gap | Collaboration Platform Requirements | Collaboration Platform Model | **Collaboration Platform Validation** | Conclusion |
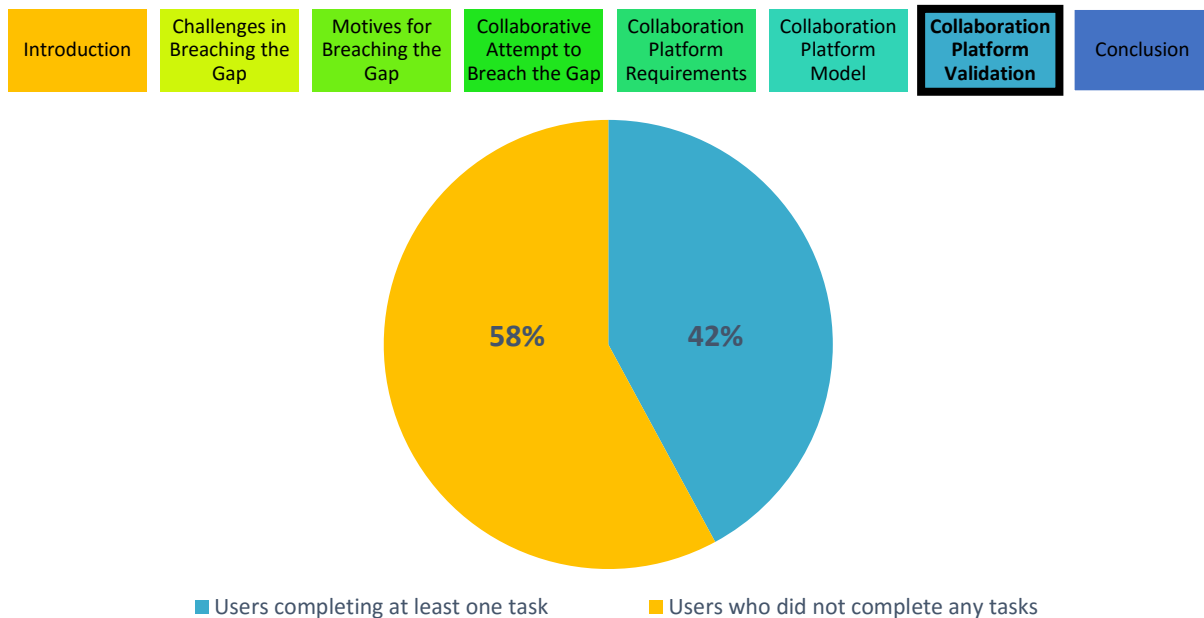
Figure 41 –Candidates completing at least one task

Overall 24% of the users who were invited to participate in the full MVP ended up completing the full cycle as depicted in Figure 34. Due to the nature of the experiment and the limited rewards promised to potential customers participating in the MVP, these results proved to be very satisfactory.
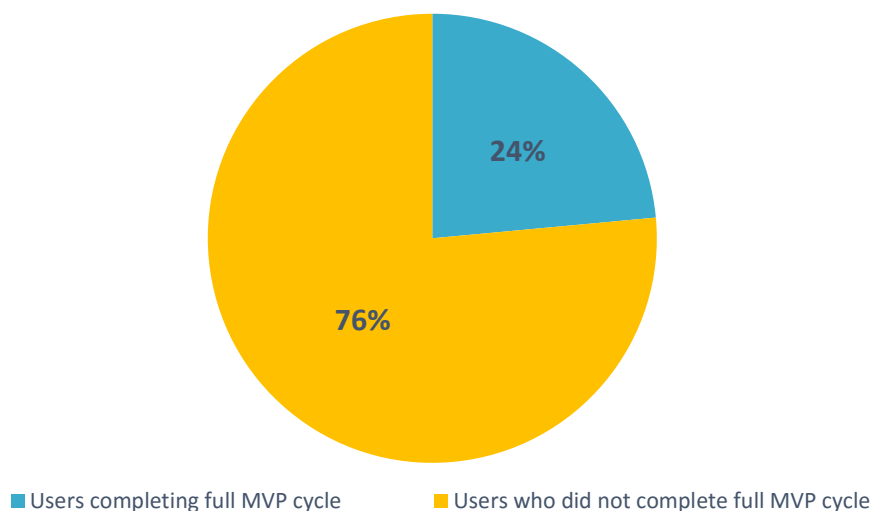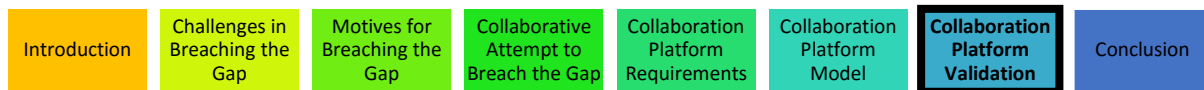
Figure 42 – Candidates completing full MVP cycle

The assumption that individuals within limited resourced communities would be willing to collaborate with the other two customer segments via the proposed platform was therefore successfully validated. These results enforced the notion that people want to be a part of a group and help achieve something bigger than themselves as discussed in chapter 3.

7.7.2 Organisational Participation

The tests to determine whether or not organisations would be willing to collaborate with the other two customer segments were conducted on two different sample sizes. The 20 entrepreneurs working from Hubspace was once again involved, but this time as

representatives of their different organisations. A further 10 organisations operating outside of Khayelitsha were also included to ensure unbiased results.

The test which was done with the organisations operating from Hubspace was performed in accordance to the same principles as those performed to test whether individuals would be willing to collaborate with the other two customer segments and is illustrated in Figure 43.

Introduction: Questioning potential customers what the most challenging aspects of operating as an organisation in a limited resourced community is [Ch2].

Exploration: Interviewing potential customers to determine wether or not they would be willing to work with individuals in their community and educational institutions to help solve the challenges which was highlithed above [Ch 6.3].

Pitching: The workings of the collaboration platfrom was explaining to the 20 potential customers, elaborating how the platfrom would add value to their organisations [Ch 6.4]. Concluding by asking whether or not they would like to test the platform.

Concierge: A minimum viable product of the collaboration platform was developed and delivered. Inviting all interviewees to form part of the platfrom.

Figure 43 - Experimental approach to test Hubspace organisations' willingness to collaborate

The challenges which was identified through the interviews were used for the research explained in Chapter 2. Furthermore, all 20 potential customers who were interviewed said they would not mind working with individuals if there was a system which would decrease the risk involved working with people whom they do not have any previous knowledge. All 20 potential customers to whom the platform was pitched said they would like to form part of the experiment which was conducted. This part of the experiment was cut short after Hubspace expectantly closed down in the end of May 2015 due to a lack of funding.

The minimum viable product which was developed to test the organisation's willingness to collaborate with other customer segments, simulated the collaboration facilitation process of the platform as is illustrated in Figure 44. This process involves a simplified version of what the organisation would experience on the platform when outsourcing a task or completing a task which have been outsourced by someone else. This was done internally between the Hubspace members through the use of a physical blackboard, called the collaboration board, in Hubspace which was used as the medium through which all communication was done. This setup allowed for a unique situation in which the Hubspace members who took part in this experiment could participate as an organisation or an individual according to their own preference.

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	Collaboration Platform Model	**Collaboration Platform Validation**	Conclusion

Registration to the platfrom as an organisation on Hubspace's colloboration board

Exchanging information about potential oursourcing task on collaboration board

Allowing organisations to use the board in any way they wanted to

Obtaining feedback from organisations after task completion

Collecting transaction infromation along the way

Figure 44 – MVP cycle for testing organisation's willingness to collaborate

The registration process simply required an organisation to physically write their organisation's information on the blackboard, through which they were assigned a unique user identification number as can be seen in Figure 45. After registration the users could freely post tasks which they would like to outsource, or tasks which they would be willing to help others with.
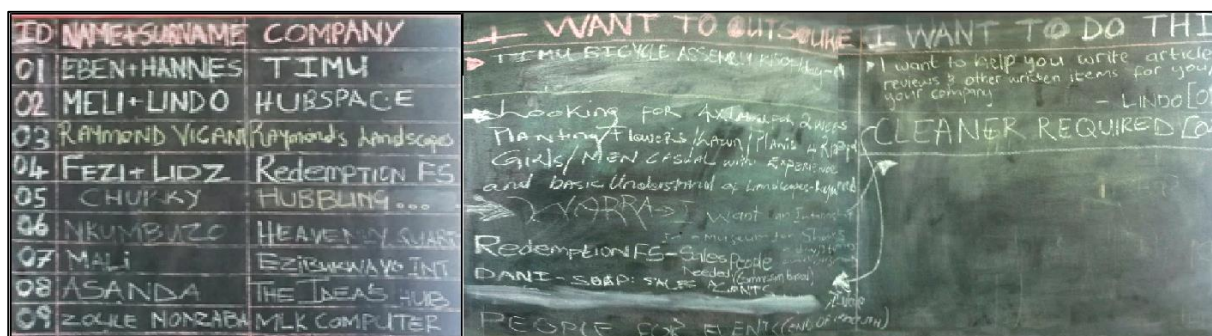
Figure 45 – Photos of Hubspace collaboration black board
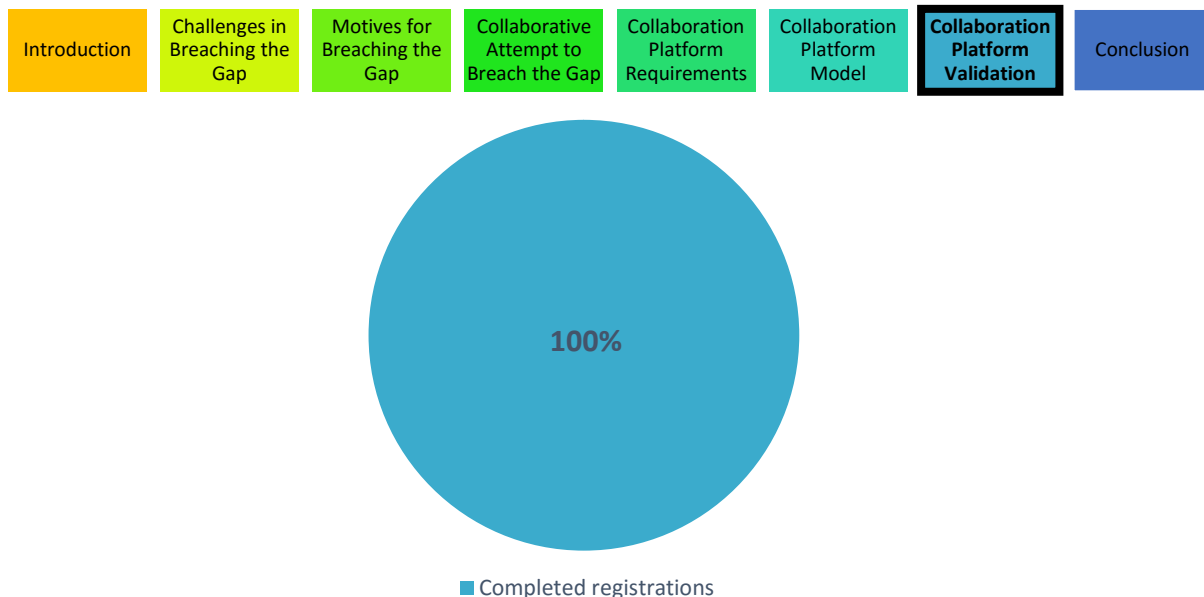
Figure 46 – Hubspace organisations registering on the collaboration board within first week

All 20 of the invited entrepreneurs registered their organisations within the first week (Figure 46) and from the 20 registered organisations there were 12 posts made within the first two weeks by 9 different organisations as can be seen in Figure 47 below.

■ Organisations who posted a task within the first two weeks   ■ Organisations who did not post a task
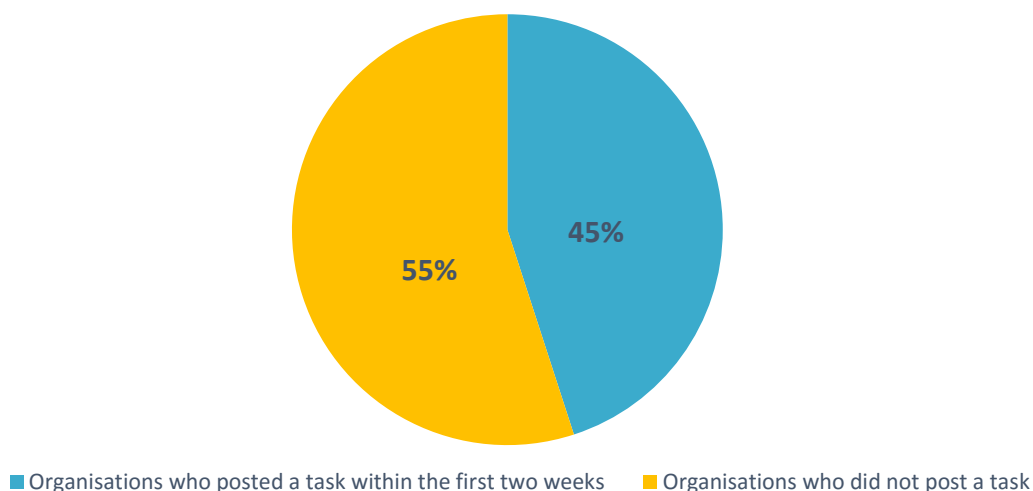
Figure 47 – Percentage of organisations who posted a task to the collaboration board in Hubspace

After two weeks into the collaboration board's existence, the entrepreneurs in Hubspace expectantly heard that Hubspace had to close down due to a lack of funding and the experiment was cut short. Nethertheless, the entrepreneurs in Hubspace were all excited about the concept and indicated that they would like to continue on a digital version. The feedback obtained served as enough evidence that the organisations within Hubspace would be eager to collaborate with the other two customer segments via the collaboration platform which was developed for this study.

Furthermore, 10 organisations operating outside of Khayelitsha were also included in the test to ensure unbiased results. Among these organisations where NGO's, private companies and governmental bodies operating in mining, manufacturing, banking, retailing, agriculture,
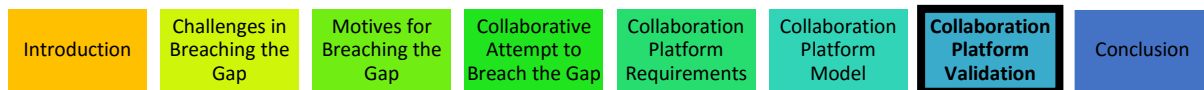
telecommunications and educational industries. The test done with the outside organisations did not include a concierge part and were structured as illustrated in Figure 48.

> **Introduction:** Questioning potential customers what they see as the greatest challenges which are preventing them from operating in South Africa's BOP [Ch2].

> **Exploration:** Interviewing potential customers to determine wether or not they would be willing to work with individuals in limited resourced communities and educational institutions to help solve the challenges which was highlithed above [Ch 6.3].

> **Pitching:** The workings of the collaboration platfrom was explaining to the 10 potential customers, elaborating on how the platfrom could add value to their organisations [Ch 6.4]. Concluding by asking whether or not they would like to test the platform.

Figure 48 - Experimental approach used to test willingness of outside organisations to collaborate

The challenges which was identified through the interviews were used for the research explained in Chapter 2. 70% of the potential customers who were interviewed indicated that they are interested in emerging markets and under the right circumstances they would consider working with individuals. From these 70% all of them agreed that it would be very important to do this within a system which would allow them to effectively manage the risk which would be involved in such an experiment. All 10 potential customers to whom the platform were pitched said they would like to form part of the collaboration platform's pilot run.

From the 10 organisations who were interviewed 7 indicated that they are interested in expanding their endeavours into emerging markets in some way or another (Figure 49), all of whom are still figuring out how to do so.

■ Organisations interested in entering emerging markets
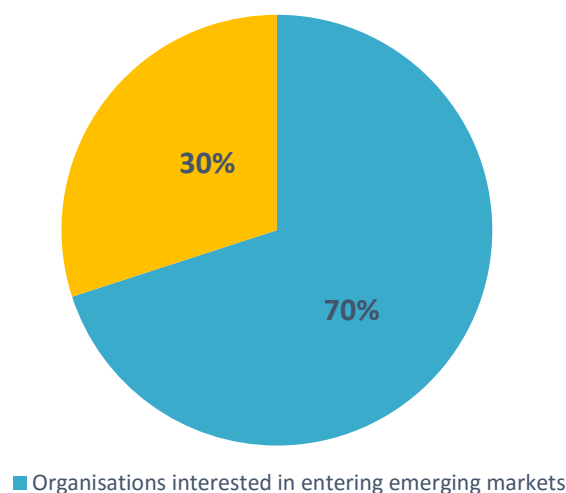
Figure 49 - Outside organisations interested in emerging markets
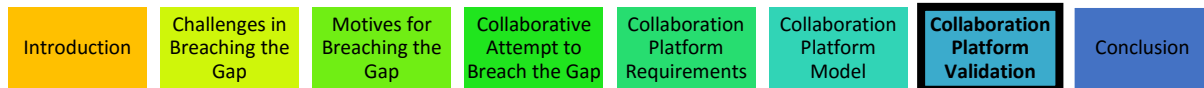
From the 7 organisations who showed interest in emerging market all agreed that they would be interested in registering on the platform to see how it would work so that they might be able to test how it would be able to add value to their organisation.

From the mining and manufacturing side the organisations were especially interested in the staff-on-demand and smart recruitment side. From a banking perspective it was suggested that there are ample opportunity for new banking solutions in South Africa's BOP which might integrate well with this platform. Also suggesting that the retail industry might be especially interested in the market analysis which can be done through the interpretation of the platform data.

Furthermore, all 10 outside organisations agreed that a platform which would allow them to effectively collaborate with individuals in limited resourced communities would open up various new opportunities and they would therefore definitely want to be a part of such a platform. This provided enough evidence to confirm that both local and outside organisations are eager to collaborate with the other two customer segments. Further confirming the notion that organisations are interested in emerging markets as discussed in Chapter 3.

7.7.3 Accreditors Participation

The tests to determine whether or not educational institutions would be willing to collaborate with the other two customer segments were conducted with 10 different educational institutions. Among these educational institutions where universities, colleges, schools and skills development centres. These tests also did not include a concierge part and were structured as illustrated in Figure 50 below.

Introduction: Questioning potential customers what they see as the greatest challenges which are preventing them from operating in South Africa's BOP [Ch 2].

Exploration: Interviewing potential customers to determine whether or not they would be willing to work together with other organisations and individuals in limited resourced communities to overcome the challenges as defined above [Ch 6.3].

Pitching: The workings of the collaboration platform was explained to the 10 potential customers, elaborating on how the platform could add value to their edducational systems [Ch 6.4]. Concluding by asking whether or not they would like to test the platform .

Figure 50 - Experimental approach testing educational institution's willingness to collaborate

The challenges which were identified through the interviews were used for the research explained in Chapter 2. The potential customers who were interviewed confirmed that they are looking for sustainable ways in which they can cater for individuals in South Africa's BOP

and that they are willing to experiment with any potential solutions which might help address the national educational problem. And If that means working with other organisations and individuals then they are willing to do so. All 10 potential customers to whom the platform was pitched said they would like to form part of the collaboration's pilot run.

From the 10 educational institutes who were included in the test all 10 indicated that they are interested to use the platform as a long term tool to ensure effective collaboration between themselves, other organisations and individuals in limited resourced communities to collaboratively address the national educational challenges (Figure 51).

100%

■ Educational institutions willing to collaborate with individuals and organisations to address the national education challenges
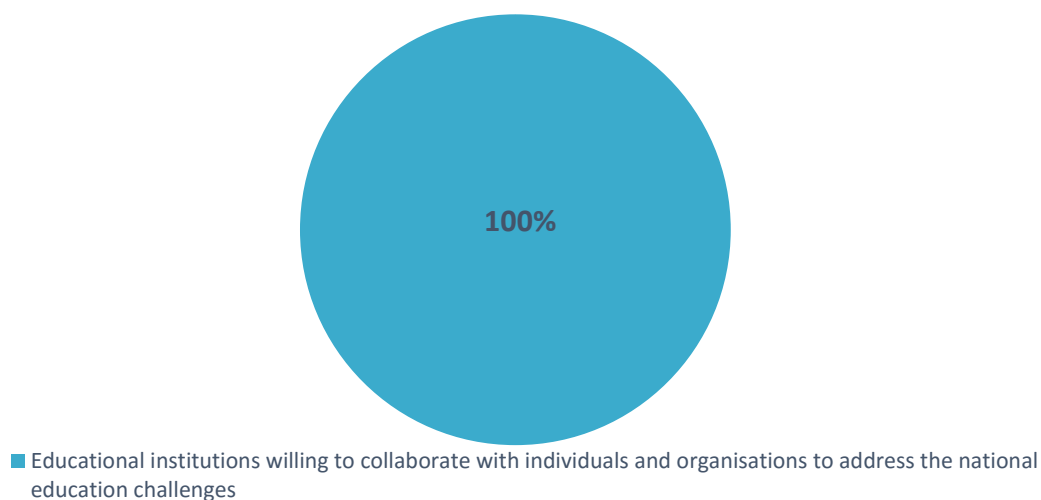
Figure 51 - Outside organisations interested in the collaboration platform

This served as good enough evidence that educational institutions would be willing to collaborate with the other customers and participate on the collaboration platform once further developed.

7.8   Assumption Testing: Effective Communication

After confirming that all three customer segments would be willing to participate on this platform by collaboratively addressing their challenges, it was important to validate the assumption that the platform would be able to effectively communicate with all three the customer segments. The emphasis of this concern laid more towards effective communication within South Africa's BOP, since it was assumed with full confidence that organisations and educational institutions operating within developed markets would all be able to communicate effectively via email or telephone.

The author designed an experiment to test Khayelitsha's resident's ability to communicate via mobile phones and internet. This experiment was conducted parallel to the experiments as explained in the previous section and is explained in Figure 52.
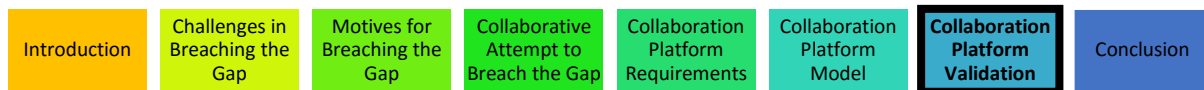
Bulk SMS: Bulk SMSs were sent out to 34 individidauls in Khayelitsha with an invitation to a scheduled meeting to determine whether individuals recieve SMS messages and would be willing to act on these messages.

Email: Emails were sent out to 45 individuals in Khayelitsha with an offer to collect a price if they replied to the email with their name and contact details within 48 hours.

World Wide Web: An arrangement was made with the owner of an internet cafe neighbouring Hubspace that any individual who would like to register online to the collaboration platform would be sponsored 15 minutes of internet access to be able to do so and had to send a message via the built in mailling feature to be able to get that 15 minutes for free.

Figure 52 - Experimental approach to test efficiency of different communication channels

As already explained, from the 34 SMS invitations which were sent out 26 of the recipients pitched for their meetings at the right time and on the right place (Figure 39). This provided enough evidence to confirm that SMS communication would be a very efficient communication medium for the platform and that it is indeed possible to effectively communicate with individuals in limited resourced communities.

From the emails which were sent to 45 different individuals only 2 replied (Figure 53), suggesting that email is definitely not a reliable communication medium in limited resourced communities.

■ Individuals who replied on eMails   ■ Individuals who did not reply on eMails
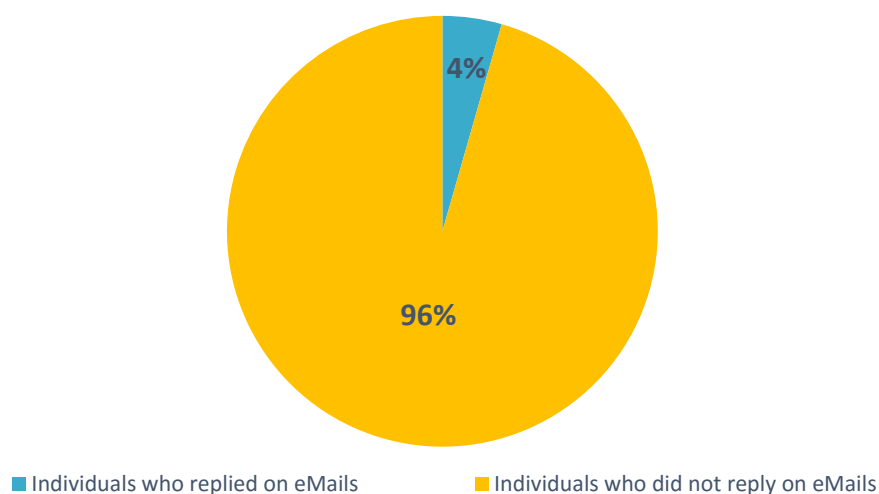
Figure 53 – Individuals who responded to the emails

Furthermore 8 individuals heard about the 15 minute sponsor at the internet café via word-of-mouth and registered to the platform without any assistance. Suggesting that the general public might already be capable of accessing the platform online. But as discussed in chapter 3 this is something which is believed would only improve from here on onwards.

Furthermore, the registration process of the 65 individuals as explained in the previous section showed that more or less every individual in this sample size either had their own mobile phone or had access to a family member or friend's phone.

These test showed that while South Africa is waiting for initiatives such as Project Isizwe [Ch 3] to install free Wi-Fi in limited resourced communities, SMSs would serve as a sufficient substitute to effectively communicate with individuals in limited resourced communities. And if the platform would only be able to allow organisations to effectively communicate with individuals the platform would already make collaboration between developed and developing South Africa easier.

7.9   Assumption Testing: Solving Problems

The most important goal for this platform is to help all three customer segments overcome the challenges they face through their endeavours in South Africa's emerging markets collaboratively. Adding real value to their initiatives by taking care of the problems which keep them from reaching their full potential. And although this might not have been identified as the riskiest assumption on which the platform's functionality was based, it is the most important assumption in terms of addressing the platform's potential to help breach the gap between developed and developing South Africa. It was therefore important to validate whether or not potential customers believed the platform might add real value to their endeavours. Something which was difficult to do in any other way than via interviews with potential customers due to the budget and time constraints on this study.

The interviews which were held to test whether or not potential customers believed the collaboration platform would be able to add real value to their endeavours were done parallel to those discussed in section 7.7 and included 85 interviews with potential customers from all three customers segments as illustrated in Figure 53.

Individuals	**Organisations**	**Educational institutions**
• 20 individauls in Hubspace • 45 random individuals in Khayelitsha	• 20 organisations operating from Hubspace • 10 outside organisations	• 10 educational institutions

Figure 54 – Different potential customers interviewed

As already explained more than 90% of the interviewees agreed that it is important to start working on tools which would allow developed and developing South Africa collaborate in an attempt to address the challenges currently faced in South Africa. All agreeing that the collaboration platform which was developed might be one of the first tools which could

potentially help do this on a national scale. This suggested that the platform addresses challenges which resonated with those experienced in the interviewees' daily endeavours

The author could also see how excited many of the interviewees were when they started to realise what new opportunities such a platform might open up in the future. And although it cannot be scientifically proven, the author received enough positive response on the idea of the platform which suggested that there are definitely a need for a platforms such as the one developed for this study and that the changes are good that the platform would be able to add real value to its prospective users.

7.10 Assumption Testing: Platform Sustainability

It was important to validate whether or not the platform could be sustainably implemented. In accordance to the author's definition of sustainability as explained in section 4.1.6, the platform would only be sustainable if it is valued by its users to an extent that they would be willing to support the platform in a way which would allow the team behind the platform to develop and improve the final product in accordance to the users' needs and preferences.

This assumption was tested parallel to the test conducted as explained in sections 7.7, 7.8, and 7.9. Al 85 potential customers as explained in Figure 54 above were interviewed to roughly estimate what they would be willing to pay to be able to participate on the platform. There were three different payment options which were proposed by the potential customers who were interviewed which is summarised in Figure 55.

Registration fee	**Monthly subscription fee**	**Facilitation fee**
• Paying a once of registration fee to gain access to the platform	• Paying a monthy installment which would allow unlimited access for the month	• Depending on the nature of the interaction between the two different parties a transacction fee would be charged

Figure 55 - Proposed payment methods

From the 85 interviewees the vast majority preferred paying a facilitation fee which would be based on the nature of the specific interaction or transaction taking place between different users. The voting count for the different payment methods is summarised in Figure 56 below.
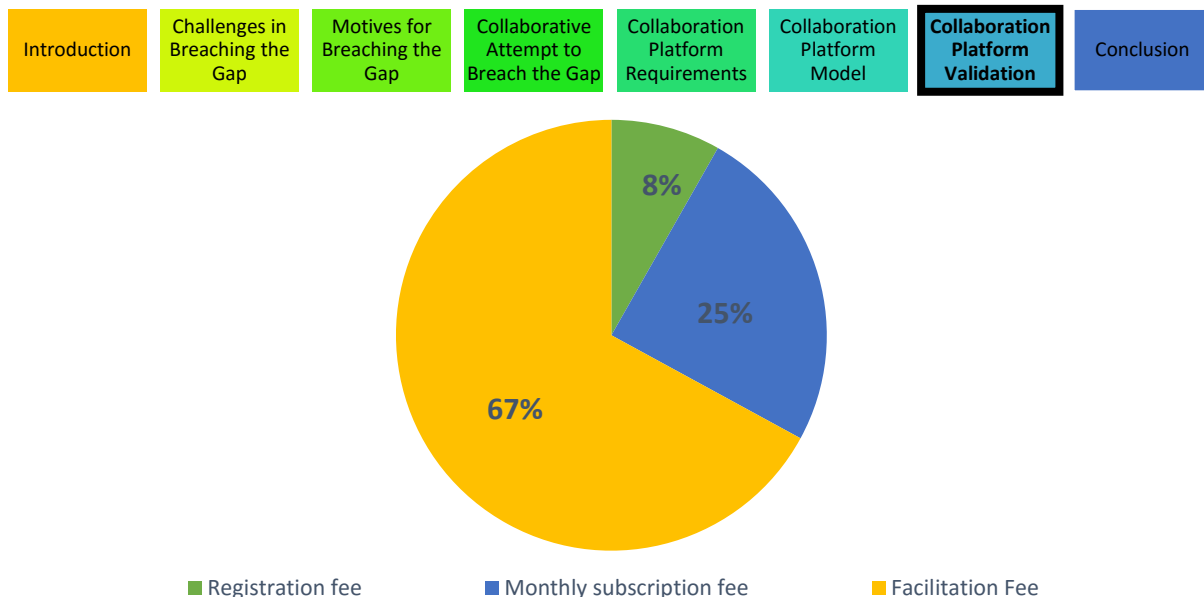
Figure 56 - Voting count for different payment options

The feedback from the 85 interviews suggested that a varying transaction cost would be preferred. Leaving scope to tailor the payment options in a way which would accommodate the user the best and allowing the barrier to entry to be almost negligible to individuals joining the platform. As users improve their skills, build better track records and open up more opportunities, which should lead to higher participation, the transaction costs can be adjusted, always taking into consideration what would work best for the customer. The typical services for which a transaction cost would be charged includes recruiting, advertising, feedback, job outsourcing, task completion, problem solving, research, information providing, data capturing and social development.

The author interviewed the 20 entrepreneurs working from Hubspace (Figure 54) what percentage transaction fee they would be comfortable paying for the service which is provided. The average transaction fee between the 20 members were 18,3% for service such as job recruitment, job outsourcing and per transaction advertising.

Due to the sheer size of the audience for whom this platform was developed these results proved as good enough evidence that it would be possible to implement the platform sustainably. Furthermore as also discussed in chapter 4, sustainability is not solely measured in terms of financial profitability and the platform should also be sustainable if it adds enough value to the South African BOP that there is a large enough community willing to support the platform and its existence. This provided enough support to continue developing and implementing of the first versions of the platform with confidence.

7.11 Literature Based Assumptions Confirmed

Through the experimental testing which was conducted as described above, it was possible to revalidate many of the literature based assumptions which have been used throughout this study. Just as a reaffirmation these proven assumptions were summarised in Figure 57 below.

Individuals in Khayelitsha have limited access to financial resources[Ch 2]

There are early adopters in Khayelitsha[Ch 3]

There is a huge motivation to realise community[Ch 3]

Organisations and individuals in Khayelitsha struggle to manage cash flow[Ch 2]

There is access to free Wi-Fi in parts of Khayelitsha, although it is still sporadic[Ch 3]

There are nine internet cafes in Khayelitsha[Ch 3]

Many individuals are computer literate, especially younger citizens[Ch 3]

Individuals are hungry for job opportunities[Ch 2]

Individuals are open to new business models, innovations and technologies[Ch 3]

Individuals are willing to share their personal information[Ch 4]

Individuals are brand aware and image orientated[Ch 4]

Most internet café visitors are looking for work[Ch 2]

Khayelitsha has a very high unemployment rate[Ch 2]

Managing expectations is very important[Ch 2]

There is still a large language barrier in Khayelitsha[Ch 2]

Hubspace members are having trouble finding paying customers[Ch 2]

Reputation plays a big role in the way the community treats the individual[Ch 2]

There is a subtle jealously among individuals who are singled out without reason[Ch 2]

Many individuals and organisations positively contributes towards South Africa society, but still struggle to sustain themselves and their initiatives[Ch 2]

Figure 57 - Revalidated assumptions
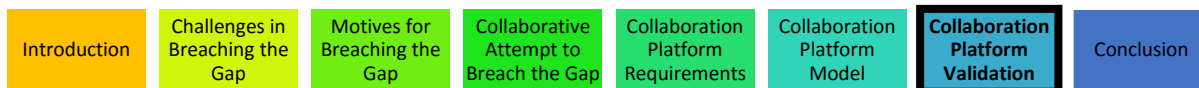
7.12 Platform Confirmation

The four riskiest assumptions on which the collaboration platform were based were chronologically tested. The first tests which were conducted confirmed that that all three customer segments are willing and eager to collaborate with the other two customer segments. Thereafter the second test were conducted and confirmed that the platform would effectively be able to communicate with all three customer segments. Thereafter the third test were conducted and confirmed that the platform would be able to help each costumer segment solve some of the problems they face in their daily endeavours. Thereafter the forth test were conducted and confirmed that the platform can be sustainably implemented. Through the confirmation of the four riskiest hypotheses if was further confirmed that the collaboration platform could indeed work as it was designed to work and that in doing so it could effectively help breach the gap between developed and developing South Africa (Figure 58).

Riskiest assumption validated

Second riskiest assumption validated

Thrid riskiest assumption validated

Forth riskiest assumption validated

Confirmed that platform could work as designed

Confirmed that platform could help breach gap between developed and developing South Africa
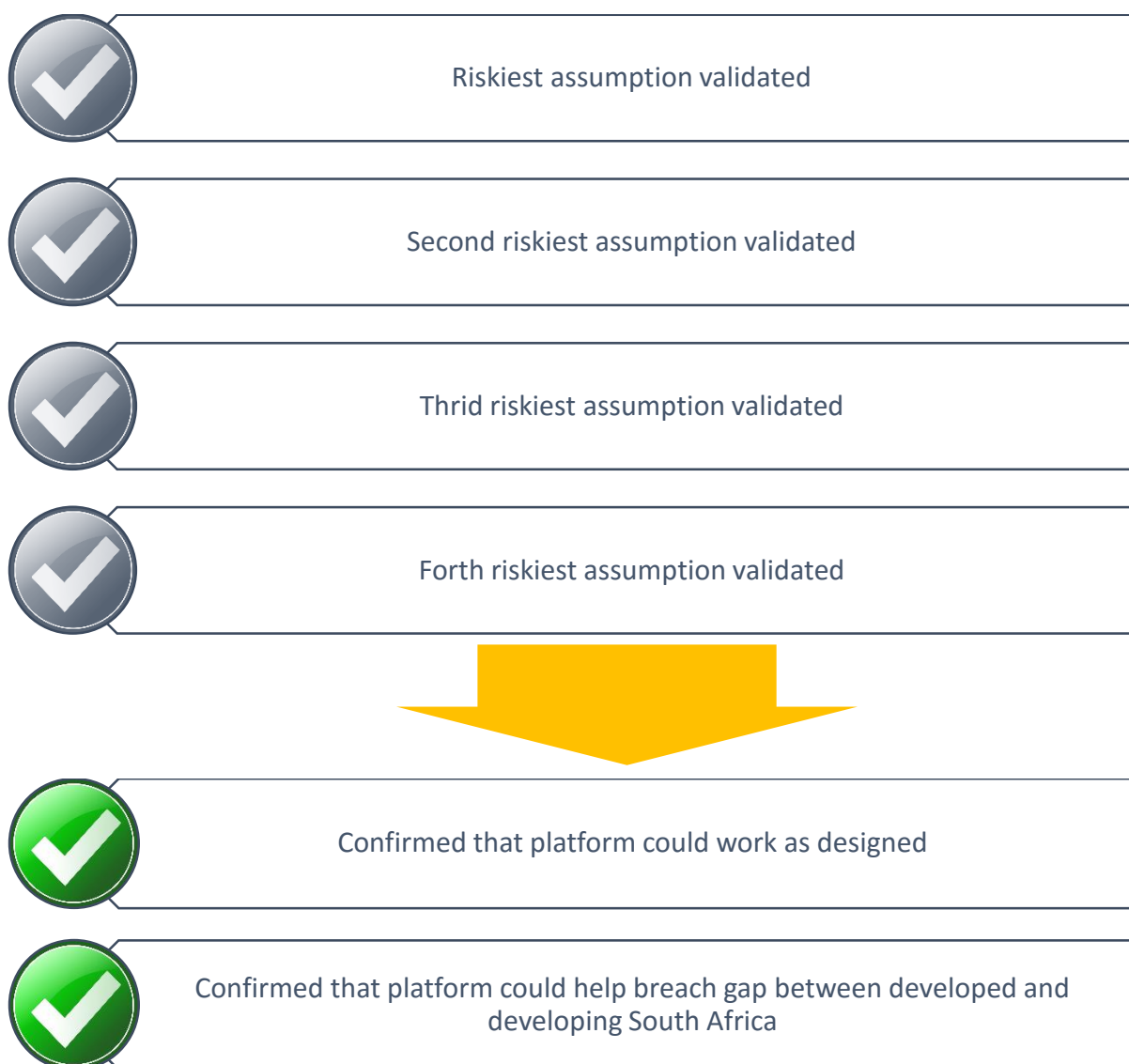
Figure 58 – Platform confirmation
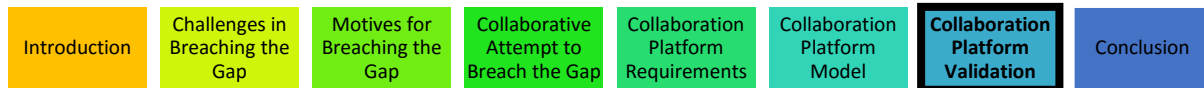
7.13 Chapter Summary

The collaboration platform had to be validated to determine whether it would work as it was designed to work and whether the platform might serve as a potential solution to help breach the gap between developed and developing South Africa. Due to the nature of these requirements it was important to validate the platform's performance in a dynamic environment similar to the one in which it would be implemented. To do this an action learning validation approach was used in accordance to the methods proposed in the validation board. The four riskiest assumptions on which the platform's success were based, were identified and experimentally tested to prove the platform's validity. Enough evidence were gathered from the test to confirm that the assumptions are valid and therefore confirmed that the platform could operate as it was designed to do and that it could serve as a good solution to breach the gap between developed and developing South Africa.

8 Conclusion

There is a massive gap between developed and developing South Africa. A gap which exist due to the high inequality between affluent and emerging South Africa and the consequent compartmentalisation which drives poorer citizens to limited resourced communities.

The Township Startup focussed on breaching this gap through the development of a platform which facilitates mutually beneficial partnerships between, individuals in limited resourced communities who struggle to sustain themselves, organisations who wish to enter South Africa's emerging markets and educational institutions focussing on education for South Africa's BOP. This was done in partnership with Hubspace Khayelitsha and Timu Technologies.

This study identified the main challenges which results in the gap between developed and developing South Africa. It was founded that inadequate education and skills development is the single most significant challenge of all and serves as the source for most of the other challenges which is experienced in modern townships. This addressed the first research question for this study as defined in section 1.8.

The greatest motive to attempt breaching the gap between developed and developing South Africa was human nature itself. Individuals want to interact with others, they want to be a part of something bigger. This is a phenomenon which is deeply imbedded in the South African culture of Ubuntu. It was therefore proposed that the already existent culture of Ubuntu should simplify the integration of modern technology and transforming entrepreneurial practices into South Africa's emerging markets. Resources which would undoubtedly make effective collaboration between developed and developing South Africa easier and perhaps even plausible for the first time ever.

The interests which individuals in South Africa's BOP share with organisations and educational institutions were identified and further analysed. These interest suggested that all three these parties can and should work together to help each other reach their own personal goals. It was suggested that organisations can and should help educate individuals in South Africa's BOP to their own advantage and that individuals can and should help organisations achieve their goals to their own advantage. The study also advised how such mutually beneficial partnerships can be achieved and highlighted the strategic competitive advantages which can be leveraged when doing so. This addressed the second research question for this study as defined in section 1.8.

BioTRIZ methodology was used to further develop the platform which would help breach the gap between developed and developing South Africa. The platform facilitates collaboration through mutually beneficial partnerships between individuals, organisations and educational institutions. The finer details of the platform were explained, illustrating how the platform would work, how it interacts with its users and the business model behind the platform.

Introduction	Challenges in Breaching the Gap	Motives for Breaching the Gap	Collaborative Attempt to Breach the Gap	Collaboration Platform Requirements	Collaboration Platform Model	Collaboration Platform Validation	Conclusion

The platform was validated to determine whether it would work as it was designed to work and whether the platform might serve as a potential solution to help breach the gap between developed and developing South Africa. An action learning validation approach was used to accommodate the dynamic environment in which the platform would be implemented. Four of the most important assumptions on the platform's success were based were experimentally tested. These test provided enough evidence to confirm that the assumptions have strong merit to be accepted and therefore suggested the platform would operate as it was designed to do and that it might serve as a good solution to breach the gap between developed and developing South Africa. This addressed the third and final research question for this study as defined in section 1.8, confirming that all three research questions were successfully addressed through this study (Table 6).

	Research Question	Chapters
✓	What are the main challenges which contributes towards the gap between developed and developing South Africa?	Ch 2
✓	Define the nature of the solution which might help breach this gap between developed and developing South Africa?	Ch 3 Ch 4
✓	How can individuals in limited resourced communities and organisations who wishes to enter South Africa's emerging markets work together to breach the gap between developed and developing South Africa?	Ch 5 Ch 6 Ch 7

Table 6 - Research questions and chapter cross reference

Due to the success in developing a collaboration platform which could potentially help breach the gap between developed and developing South Africa and the resulting interest of interviewees, it was decided to further continue researching this field. The author is currently working on the commercialisation of this platform with Timu Technologies (Pty) Ltd.

8.1   Research Method Reflection

Due to the nature of this study and the complexity of the challenges which were addressed, an unorthodox research methodology was followed. Due to a personal interest in the topic, the author was dedicated to conduct this research in a way which would deliver a real solution to the challenges currently being experienced in South Africa. The author therefore let himself be guided by modern entrepreneurial practices and approached this study in accordance to Ries' (2011) build, measure, learn feedback loop.

Although very confusing at times, this approach produced very successful results. It forced the author to test and try out various ideas and concepts and then learn from it as quickly as possible. It also forced the author to approach the challenges holistically, without ever isolating any part of the challenge into an unrealistically simple scenario in which the full dynamics of the environment in which these challenges are observed could be forgotten.

The time spent working from Hubspace Khayelitsha, constantly interacting with potential platform users and having the opportunity experience first handily what the challenges are which is experienced in modern townships also added a lot of value to this study. It provided the necessary foundation and information which was needed to develop a platform which might really help breach the gap between developed and developing South Africa.

Furthermore, the platform which was developed focuses on bringing people together and enabling them to collaboratively address the very real challenges currently being faced in South Africa. And although it was important to prove all the findings in this study scientifically, the platform revolved around people who are irrational beings and behave in ways which cannot easily be scientifically defined or predicted. For this reason the author do not think that it would have been possible to obtain the same results or better through a better structured or previously defined research method.

8.2   Research Reflection

The creation of the Township Startup served as a very valuable learning experience to the author. It provided him with the opportunity to study the field of African focused Enterprise Engineering from both a developed and developing world perspective. The time spent at Hubspace Khayelitsha allowed the author to experience the day to day battles of township entrepreneurship. This helped him realise how big the gap between life in the developed versus developing South Africa is, together with the false perceptions both sides foster of how things work on the other side.

This study allowed the author to see how important it is to address real life challenges when engineering new enterprises. Since the real value which an organisation can add to their final customers will always be their greatest competitive advantage. Therefore, from a strategic point of view, it simply does not make sense to structure an organisation in a way which prohibit them from adding as much value to their final customers as possible and therefore competition amongst different organisations should be considered less, while the search for real value addition should be very prominent.

This changed way of thought allowed the author to realise how vast the business opportunity in South Africa and Africa's BOP is, due to the scope and the nature of the challenges which exist in these areas. And that there are various completive advantages which can only be leveraged in emerging markets which makes business in Africa very attractive. These competitive advantages allows entrepreneurs to do things which cannot be done in more
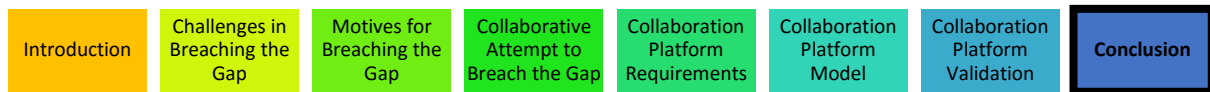
developed parts of the world which is often seen as the only places from where world changing startups can be born.

The author realised that, due to the huge educational challenges which are faced in South Africa and throughout the African continent, the field of education is one of the areas where the most value can be added to individuals in limited resourced communities. And the growing access to smartphones and internet makes it possible to reach and supply individuals in rural communities with the world's newest and most innovative educational solutions ever, making this an industry ready for disruption. The combination of these two aspects makes education a very attractive industry to consider for new startups.

In summary the Township Startup inspired the author to continue researching entrepreneurial opportunities in Africa's emerging markets and opened his eyes to the often neglected business potential which exist in the these markets.

8.3   Research Novelty

The Townships Startup introduced various new ideas to the field of African focused Enterprise Engineering. The most important novelties which were born during this study is summarised in Figure 59 below.

Superposition of human behavioural science, culture of Ubuntu, exponential technologies and entrepreneurial practices to stress the importance behind collaboration [Ch 3].

Highlighting the similarities between the interest of the individual, organisations and educational institutions and showing how these parties can work together to collaboratively address the educational challenges experienced in South Africa [Ch 4].

Identification of competitive advantages which can be leveraged when doing business in South Africa's emerging markets [Ch 4].

Illustrating how BioTRIZ methodology can be applied to design business solutions which focuses on emerging markets [Ch 5].

A proposed platform which facilitates collaboration between individuals, organisations and educational institutions which shows potential to help breach the gap between developed and developing South Africa [Ch 5].

Figure 59 - Research novelty

8.4   Research Extension

The collaboration platform which was developed for this study shows promise to help breach the gap between developed and developing South Africa. All experiments showed positive results and the interviews attracted a lot of attention. Nevertheless, the only way to really

prove that the platform can and will do what it was designed for, would be through further development and implementation. Something for which this study did not allow adequate time or resources.

The author will continue to do this in partnership with Timu Technologies, who is currently preparing the platform for commercialisation. A process which might yield sufficient data for further validation of the platform.

8.5   Additional Research

This study opened up various opportunities for further research. Research with which Timu Technologies will continue and are willing to do so in collaboration with anyone interested.

8.5.1 BioTRIZ for Exponential Organisations

BioTRIZ methodology proved to be a very helpful tool which for enterprise engineering. Timu Technologies therefore wants to further investigate how BioTRIZ methodology can be incorporated with the entrepreneurial practices which governs exponential organisations.

8.5.2 South African Competitive Advantages

There are various competitive advantages which can be leveraged to aid South African entrepreneurial endeavours. Timu Technologies therefore wants to further investigate where these advantages might be found and how they can be used.

8.5.3 Defining User Competencies

The method which was developed to quantify a user's competencies should improve the way in which individuals can be matched to specific opportunities. Timu Technologies therefore wants to further investigate this topic.

8.5.4 Contribution Algorithm

The method which was developed to quantify an individual's contribution towards society shows promise to serve as a powerful incentive tool. Timu Technologies therefore wants to further develop the contribution algorithm and calibrate it against real-time economic models.

8.5.5 Transactional Data Analysis

The platform will generate a lot of transactional data which would be very useful. Timu Technologies therefore wants to further investigate how exactly this data can be used to track trends, identifying market's needs, opportunities, improve education and detect criminal behaviour.

8.5.6 Financial Instruments and Loans

The platform facilitates all financial transactions between parties. Timu Technologies therefore wants to further investigate the financial instruments which can be used to do so.

Also looking at the possibility of using platform data to develop new models to do financial risk assessments of an individual.

8.5.7 BOP Crowd Funding

With the success crowdfunding has enjoyed in the developed world, it should not be long before crowdfunding can and will take to BOP markets. Timu Technologies therefore wants to further investigate how crowdfunding initiatives should be managed to really cater for initiatives born in limited resourced communities.

8.5.8 BOP Crowd Sourcing

Similarly, with the successes of crowdsourcing in developed markets, it should not be long before other co-creation platforms will be developed for BOP markets. Timu Technologies therefore wants to further investigate how co-creation tools can and should be implemented to effectively serve BOP markets.

8.5.9 Startup Incubation

The collaboration platform serves as an ecosystem which provides a strong foundation from which new initiatives can be developed. Timu Technologies therefore wants to further investigate how the platform can be used to as an incubation tool to aid entrepreneurs in limited resourced communities in their entrepreneurial endeavours.

8.5.10 Townships Development

The collaboration platform was developed to effectively motivate individuals in limited resourced communities to action. Once this can be done, individuals can and should be allowed to apply their skills and knowledge to further development of their own communities. Timu Technologies therefore wants to further investigate how processes such as infrastructure development, architecture, energy generation and water sanitation can be co-created within these communities to speed up the process. And also to allow individuals to reimage what these limited resourced communities can become in the future.

8.5.11 Extrapolation to Developed Markets

The platform might also be valuable to individuals in developed markets. Timu Technologies therefore wants to further investigate the potential for doing so and how it should be done.

8.6   Concluding remarks

In conclusion this study provided a fresh perspective on African focussed Enterprise Engineering. It explained why solutions should be tailored to meet the requirements of the African context in which it would be deployed, instead of forcefully plug-and-playing existing solutions from the west or the east in an environment for which these solutions where not designed. And that the future of South Africa and the African continent now depends on the young leaders who are willing to go the distance to carve a better and brighter future.

Bibliography

Adler, L., 2013. *The Essential Guide for Hiring & Getting Hired*, Workbench Media. Available at: http://www.amazon.com/Essential-Guide-Hiring-Getting-Hired-ebook/dp/B00B9JZMKE [Accessed July 2, 2015].

Anon, 2015. The Flying Donkey Challenge. *La Fondation Bundi*. Available at: http://www.flyingdonkey.org/ [Accessed July 18, 2015].

Anon, 2012. The Four Types of Process Validation. *Kneat Software*. Available at: http://www.kneat.com/2012/03/29/the-four-types-of-process-validation/ [Accessed August 18, 2015].

Anon, 2013. The World Bank. Available at: http://data.worldbank.org/country/south-africa [Accessed September 14, 2014].

Azevedo, S.G. et al., 2014. *Eco-Innovation and the Development of Business Models* S. G. Azevedo et al., eds., Cham: Springer International Publishing. Available at: http://link.springer.com/10.1007/978-3-319-05077-5 [Accessed February 24, 2015].

Baumeister, R.F., 2013. *Self-Esteem: The Puzzle of Low Self-Regard*, Springer Science & Business Media. Available at: https://books.google.com/books?hl=en&lr=&id=4ZeyBwAAQBAJ&pgis=1 [Accessed August 31, 2015].

Bogatyrev, N., Bogatyrev, M. & Bogatyrev, O., 2014. Inventor's Manual: BioTriz. Available at: http://www.amazon.com/Inventors-Manual-Dr-Nikolay-Bogatyrev/dp/150045365X [Accessed October 8, 2014].

Bogatyrev, N. & Bogatyreva, O., 2013. Permaculture and TRIZ – methodologies for cross-pollination between biology and engineering. *Elsevier*. Available at: http://www.biotriz.com/sites/default/files/TRIZ and permaculture.pdf [Accessed June 22, 2015].

Bogatyrev, N. & Bogatyreva, O., TRIZ Evolutionary Trends in Biology and Technology: Two Opposites. Available at: http://www.biotriz.com/sites/default/files/BIOTRIZ.pdf [Accessed June 22, 2015].

Bossche, A., 1991. Computer-aided fault tree synthesis I (system modeling and causal trees). *Reliability Engineering & System Safety*, 32(3), pp.217–241. Available at: http://www.sciencedirect.com/science/article/pii/095183209190001N [Accessed June 18, 2015].

Brady, K.T. & Sinha, R., 2005. Co-occurring mental and substance use disorders: the neurobiological effects of chronic stress. *The American journal of psychiatry*, 162(8), pp.1483–93. Available at:

http://ajp.psychiatryonline.org/doi/10.1176/appi.ajp.162.8.1483 [Accessed August 31, 2015].

Brown, B., 2010. *The power of vulnerability*, Texas: TEDxHouston. Available at: http://www.ted.com/talks/brene_brown_on_vulnerability?language=en [Accessed July 15, 2015].

Brynjolfsson, E. & McAfee, A., 2013. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, Brilliance Audio. Available at: http://www.audible.com/pd/Science-Technology/The-Second-Machine-Age-Audiobook/B00HFXCS96 [Accessed June 15, 2015].

Buttry, S., 2011. The 5 W's (and How) are even more important to business than to journalism. *The Buttry Diary*. Available at: https://stevebuttry.wordpress.com/2011/04/27/the-5-w%E2%80%99s-and-how-are-even-more-important-to-business-than-to-journalism/ [Accessed September 2, 2015].

Card, D.N., 2006. Myths and Strategies of Defect Causal Analysis. In *Proceedings of the Pacific northwest software quality conference*.

Carnegie, A., 1901. *The Gospel of Wealth and Other Timely Essays*, Century. Available at: https://books.google.co.za/books/about/The_gospel_of_Wealth_Essays_and_Other_Wr.html?id=_cmxMJ6pcl8C&pgis=1 [Accessed June 4, 2015].

CentreforEducationDevelopmentPolicy, 2009. *Challenges facing education in South Africa*, Available at: http://www.cepd.org.za/files/pictures/The Challenges Facing Education Interview Nov 09.pdf [Accessed July 20, 2015].

Chaplin, K., 2014. The Ubuntu spirit in African communities. *Ubuntu Foundation*. Available at: http://www.coe.int/t/dg4/cultureheritage/culture/Cities/Publication/BookCoE20-Chaplin.pdf [Accessed July 15, 2015].

CityPress, 2013. How lack of jobs affects SA youth. Available at: http://www.news24.com/Archives/City-Press/How-lack-of-jobs-affects-SA-youth-20150430 [Accessed June 17, 2015].

Collins, J. & Hansen, M.T., 2011. *Great by Choice: Uncertainty, Chaos and Luck - Why Some Thrive Despite Them All*, Random House. Available at: http://books.google.com/books?id=mQrNwkQkeGEC&pgis=1 [Accessed August 8, 2014].

Curtin, P.D., 1984. *Cross-Cultural Trade in World History*, Cambridge University Press. Available at: https://books.google.com/books?id=R4IiYFhliv4C&pgis=1 [Accessed June 19, 2015].

Diamandis, P. & Kotler, S., 2012. *Abundance: The Future Is Better Than You Think*, Simon and Schuster. Available at:

http://books.google.com/books?hl=en&lr=&id=3b6LvlWObYUC&pgis=1 [Accessed August 8, 2014].

Diamandis, P. & Kotler, S., 2015. *Bold: How to Go Big, Make Bank, and Better the World*, Simon and Schuster.

Eaton, L.A. et al., 2014. Exploring the relationships among food insecurity, alcohol use, and sexual risk taking among men and women living in South African townships. *The journal of primary prevention*, 35(4), pp.255–65. Available at: http://www.ncbi.nlm.nih.gov/pubmed/24806889 [Accessed June 24, 2015].

Eisenmann, T.R., Ries, E. & Dillard, S., 2012. Hypothesis-Driven Entrepreneurship: The Lean Startup. Available at: http://papers.ssrn.com/abstract=2037237 [Accessed June 24, 2015].

Elumelu, T., 2013. Africa needs sustainable change, not aid dependency. *Business Day Live*. Available at: http://www.bdlive.co.za/opinion/2013/06/03/africa-needs-sustainable-change-not-aid-dependency [Accessed June 17, 2015].

Erken, M., Lutz, C. & McDougald, D., 2013. The rise of pathogens: predation as a factor driving the evolution of human pathogens in the environment. *Microbial ecology*, 65(4), pp.860–8. Available at: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3637895&tool=pmcentrez&rendertype=abstract [Accessed August 31, 2015].

Firer, C. et al., 2012. *The Fundamentals of Corporate Finance* 05 ed., McGraw-Hill Education. Available at: https://www.mheducation.co.uk/html/0077134524.html [Accessed August 8, 2014].

Fischer, E., 2013. *Peoples and Cultures of the World Audiobook | The Great Courses | Audible.com*, Available at: http://www.audible.com/pd/Nonfiction/Peoples-and-Cultures-of-the-World-Audiobook/B00DMOB2TO/ref=a_search_c4_1_2_srTtl?qid=1407497881&sr=1-2 [Accessed August 8, 2014].

Friedman, G., 2015a. Flashpoints: The Emerging Crisis in Europe. *Doubleday*. Available at: http://www.amazon.com/Flashpoints-The-Emerging-Crisis-Europe/dp/038553633X [Accessed June 10, 2015].

Friedman, G., 2015b. *Flashpoints: The Emerging Crisis in Europe*, Random House Audio. Available at: http://www.audible.com/pd/Nonfiction/Flashpoints-Audiobook/B00RC65BV8 [Accessed June 15, 2015].

Gladwell, 2002. *The Tipping Point: How Little Things Can Make a Big Difference*, Back Bay Books. Available at: http://www.amazon.com/The-Tipping-Point-Little-Difference/dp/0316346624 [Accessed June 16, 2015].

Govender, K. & Killian, B.J., 2001. The psychological effects of chronic violence on children living in South African townships. *South African Journal of Psychology*, 31(02), pp.1–11. Available at: http://reference.sabinet.co.za/sa_epublication_article/sapsyc_v31_n2_a1 [Accessed June 24, 2015].

Griffin-EL, N.A.J., 2011. The Dialectics of the Blueberry Muffin: Towards a Philosophy of Love. Available at: http://d-scholarship.pitt.edu/8393/1/Nosakhere_Griffin%2DEL_dissertation_etd_last_7_21_11_2.pdf [Accessed July 20, 2015].

Harnish, V., 2013. *The Greatest Business Decisions of All Time*, Time Home Entertainment, Incorporated. Available at: http://books.google.com/books?id=YRAzlwEACAAJ&pgis=1 [Accessed August 8, 2014].

Heyns, J.A., 1981. *Dogmatiek*, NG Kerkboekhandel Transvaal.

Heyns, J.H., 2015. Timu Technologies (Pty) Ltd.

Heyns, J.H. & Vlok, P.J., 2014. Correlation and Causation: A Potential Pitfall for Efficient Asset Management. In Magaliesburg: SAIIE26.

Hill, V. & Andelman, B., 2012. Fans, Not Customers: How to Create Growth Companies in a No Growth World. Available at: http://www.amazon.com/Fans-Not-Customers-Create-Companies/dp/1781251118 [Accessed October 8, 2014].

Hreljac, R., 2015. Ryan's Story. *Ryan's Well Foundation*. Available at: https://www.ryanswell.ca/about-ryans-well/ryans-story/ [Accessed July 17, 2015].

Ifebi, E., 2015. Education, skills development emerge to as Africa's greatest challenge in 2015. *Business Day*. Available at: http://businessdayonline.com/2015/01/education-skills-development-emerge-to-as-africas-greatest-challenge-in-2015-wef-global-outlook/#.VYKYuPmqqko [Accessed June 18, 2015].

Ismail, S. et al., 2014. *Exponential Organizations: Why new organizations are ten times better, faster, and cheaper than yours*, Diversion Books. Available at: http://www.amazon.com/Exponential-Organizations-organizations-better-cheaper-ebook/dp/B00OO8ZGC6 [Accessed June 4, 2015].

Jeff, S., 2013. *Breakpoint: Why the Web will Implode, Search will be Obsolete, and Everything Else you Need to Know about Technology is in Your Brain*, Audible Inc. Available at: http://www.amazon.com/Breakpoint-Implode-Obsolete-Everything-Technology/dp/1137278781 [Accessed November 25, 2014].

Jooste, J.H., 1983. *Die samestelling en standaardisering van 'n meetinstrument vir die evaluering van skoolgereedheid, met inagneming van die kognitiewe vermoeýý en die sosio-ekonomiese en kultuuragtergrond van skoolbeginners*. Universiteit van die Oranje-Vrystaat.

Jordan, J.M., 2012. *Information, Technology, and Innovation: Resources for Growth in a Connected World*, Audible, Inc. Available at: http://www.audible.com/pd/Business/Information-Technology-and-Innovation-Audiobook/B008SEGQK8 [Accessed June 15, 2015].

Kahneman, D., 2013. *Thinking, Fast and Slow*, Farrar, Straus and Giroux. Available at: http://www.amazon.com/Thinking-Fast-Slow-Daniel-Kahneman/dp/0374533555 [Accessed June 15, 2015].

Kaufman, J., 2012. *The Personal MBA: Master the Art of Business*, Portfolio/Penguin. Available at: http://books.google.com/books?id=NzUMuAAACAAJ&pgis=1 [Accessed August 8, 2014].

Kotler, S., 2015. Billionaire Wisdom: 8 Insights From a Quartet of the World's Most Effective Entrepreneurs. Available at: http://www.entrepreneur.com/article/242458 [Accessed June 4, 2015].

Kurzweil, R., 2012. *How to Create a Mind: The Secret of Human Thought Revealed*, Brilliance Audio, Inc. Available at: http://www.audible.com/pd/Science-Technology/How-to-Create-a-Mind-Audiobook/B009S7OKJS [Accessed June 15, 2015].

leanstartupmachine, 2012. Validation Board: Tool for testing startup ideas. Available at: https://www.leanstartupmachine.com/validationboard/#slide1 [Accessed June 25, 2015].

Lee, J. & Nicewander, W.A., 2014. Thirteen Ways to Look at the Correlation Coefficient. , 42(1), pp.59–66.

Levitt, S.D. & Dubner, S.J., 2009. *Freakonomics*, HarperCollins. Available at: http://books.google.com/books?id=2pphyRUF3eoC&pgis=1 [Accessed August 8, 2014].

London, T., Sheth, S. & Hart, S., 2014. A Roadmap for the Base of the Pyramid Domain: Re-energizing for the Next Decade. *William Davidson Institute*. Available at: http://wdi.umich.edu/bop-roadmap/BoP-Roadmap.pdf [Accessed July 23, 2015].

Louw, D., 2010. Power sharing and the challenge of ubuntu ethics. *Centre for Applied Ethics, University of Stellenbosch*. Available at: http://uir.unisa.ac.za/bitstream/handle/10500/4316/Louw.pdf [Accessed July 15, 2015].

Mahajan, V., 2011. *Africa Rising: How 900 Million African Consumers Offer More Than You Think*, Pearson Prentice Hall. Available at: http://books.google.com/books?id=6V1wB4mze5QC&pgis=1 [Accessed August 8, 2014].

Mandela, N., 1995. *Long Walk to Freedom: The Autobiography of Nelson Mandela*, Back Bay Books. Available at: http://www.amazon.com/Long-Walk-Freedom-Autobiography-Mandela/dp/0316548189 [Accessed June 15, 2015].

Marais, H., 2011. South Africa pushed to the limit: The political economy of change. *UCT Press*. Available at: http://sds.ukzn.ac.za/files/Marais_Mar_ 2011.PDF [Accessed July 13, 2015].

Masterson, M., 2008. *Ready, Fire, Aim: Zero to $100 Million in No Time Flat*, John Wiley & Sons. Available at: http://books.google.com/books?id=G9YgAZc65UYC&pgis=1 [Accessed August 8, 2014].

Mbonyane, B. & Ladzani, W., 2013. Factors that hinder the growth of small businesses in South African townships. *European Business Review*. Available at: http://www.emeraldinsight.com/doi/abs/10.1108/09555341111175390 [Accessed June 24, 2015].

Mitra, S., 2003. Minimally invasive education: a progress report on the "hole-in-the-wall" experiments. *British Journal of Educational Technology*, 34(3), pp.367–371. Available at: http://doi.wiley.com/10.1111/1467-8535.00333 [Accessed June 21, 2015].

Mlodinow, L., 2013. *Subliminal: How Your Unconscious Mind Rules Your Behavior*, Vintage Books. Available at: http://books.google.com/books?id=V7wt3Sqj_X8C&pgis=1 [Accessed August 8, 2014].

Mobius, M., 2012. The biggest challenges facing SA. *Money Web*. Available at: http://www.moneyweb.co.za/archive/the-biggest-challenges-facing-sa/ [Accessed June 18, 2015].

Morris, M.H. & Pitt, L.F., 1995. Informal sector activity as entrepreneurship: Insights from a South African Township. *Journal of Small Business Management*, 33(01), p.78. Available at: http://search.proquest.com/openview/0b9ea479fdb7d7df16a54be561c24599/1?pq-origsite=gscholar [Accessed June 24, 2015].

Nicolson, G., 2015. South Africa: Where 12 million live in extreme poverty. *Daily Maverick*. Available at: http://www.dailymaverick.co.za/article/2015-02-03-south-africa-where-12-million-live-in-extreme-poverty/#.VYErG_mqqko [Accessed June 17, 2015].

Noceti, N. & Odone, F., 2014. Humans in groups: The importance of contextual information for understanding collective activities. *Pattern Recognition*, 47(11), pp.3535–3551. Available at: http://www.sciencedirect.com/science/article/pii/S0031320314001939 [Accessed August 31, 2015].

Ohno, T. & Setsuo, M., 1988. Just-in-time for today and tomorrow. In Productivity Press.

Onyebuchi Eze, M., 2010. *Intellectual History in Contemporary South Africa*, Palgrave Macmillan. Available at: http://www.palgrave.com/page/detail/intellectual-history-in-contemporary-south-africa-michael-onyebuchi-eze/?isb=9780230622999 [Accessed July 24, 2015].

Orwell, G., 1966. *Animal Farm: A Fairy Story*, Penguin Books. Available at: https://books.google.co.za/books?id=pSVxBAAAQBAJ&dq=animal+farm+george+orwell&hl=en&sa=X&ei=CjGFVdL9JtDg7QbR04C4DA&ved=0CCcQ6AEwAg [Accessed June 20, 2015].

Osterwalder, A. & Pigneur, Y., 2010. *Business Model Generation*, Available at: http://www.businessmodelgeneration.com/book [Accessed June 11, 2015].

Pink, D.H., 2009. *Drive: The Surprising Truth About What Motivates Us*, Penguin. Available at: http://www.audible.com/pd/Business/Drive-Audiobook/B002ZF14MG/ref=a_search_c4_1_1_srTtl?qid=1435742344&sr=1-1 [Accessed July 1, 2015].

Prahalad, C.K., 2009. *The Fortune at the Bottom of the Pyramid, Revised and Updated 5th Anniversary Edition: Eradicating Poverty Through Profits*, FT Press. Available at: http://books.google.com/books?id=RPSG4JxAZzYC&pgis=1 [Accessed August 8, 2014].

Presidency, 2002. *Act 25-2002 - Electronic Communications and Transactions Act*, South Africa: Government Gazette.

Presidency, 2013. *Act No. 4 of 2013: Protection of Personal Information Act*, Cape Town, South Africa: Government Gazette.

Ramos, M., 2014. *2015 major economic challenges in Africa*, Available at: http://www.biznisafrica.co.za/2015-major-economic-challenges-in-africa/ [Accessed June 18, 2015].

Revans, R.W., 2011. *ABC of Action Learning*, Gower Publishing, Ltd. Available at: https://books.google.com/books?hl=en&lr=&id=Q9dAHf03ysIC&pgis=1 [Accessed August 16, 2015].

Ries, E., 2011. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business. Available at: http://books.google.com/books?id=r9x-OXdzpPcC&pgis=1 [Accessed August 8, 2014].

Robinson, K., 2011. Out of Our Minds: Learning to be Creative. Available at: http://www.amazon.com/Out-Our-Minds-Learning-Creative/dp/1907312471 [Accessed April 2, 2015].

Rosling, H., 2006. *The best stats you've ever seen*, Ted Talks. Available at: http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen [Accessed October 2, 2014].

SBP, 2008. *The Impact of Crime ons Small Businesses in South Africa*, Johannesburg. Available at: http://www.thepresidency.gov.za/docs/jcps/small_businesses.pdf [Accessed June 17, 2015].

Sekhampu, T.J., 2013. Determinants of Poverty in a South African Township. Available at: http://www.krepublishers.com/02-Journals/JSS/JSS-34-0-000-13-Web/JSS-34-2-000-13-Abst-PDF/JSS-34-2-145-13-1393-Sekhampu-T-J/JSS-34-2-145-13-1393-Sekhampu-T-J-Tx[6].pmd.pdf [Accessed June 24, 2015].

Shahrestani, S., Kemp, A.H. & Guastella, A.J., 2013. The impact of a single administration of intranasal oxytocin on the recognition of basic emotions in humans: a meta-analysis. *Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology*, 38(10), pp.1929–36. Available at: http://dx.doi.org/10.1038/npp.2013.86 [Accessed August 14, 2015].

Shapshak, T., 2015. Uber's disruption of stagnant taxi industry is needed. *Rand Daily Mail*. Available at: http://www.rdm.co.za/technology/2015/07/16/uber-s-disruption-of-stagnant-taxi-industry-is-needed [Accessed July 18, 2015].

Sinek, S., 2011. *Start With Why: How Great Leaders Inspire Everyone To Take Action*, Penguin Books Limited. Available at: http://books.google.com/books?id=r2yCRUxo0EYC&pgis=1 [Accessed August 8, 2014].

Skousen, M., 2009. *The Making of Modern Economics: The Lives and Ideas of the Great Thinkers* Unabridged., Blackstone Audio, Inc. Available at: http://www.amazon.com/Making-Modern-Economics-SECOND-Edition/dp/1433293994 [Accessed July 20, 2015].

Spaull, N., 2013. *South Africa's Education Crisis: The quality of education in South Africa 1994-2011*, Available at: http://www.section27.org.za/wp-content/uploads/2013/10/Spaull-2013-CDE-report-South-Africas-Education-Crisis.pdf [Accessed June 18, 2015].

Stevenson, A. ed., 2010. *Oxford Dictionary of English* 3rd ed., Oxford University Press. Available at: http://www.oed.com/ [Accessed June 19, 2015].

Sunter, C., 2014. Clem Sunter at SAIIE26.

Surowiecki, J., 2004. *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*, Books on Tape. Available at: http://www.amazon.com/The-Wisdom-Crowds-Many-Smarter/dp/B0002P0CHY [Accessed November 25, 2014].

Sutherland, J., 2014. *Scrum: The Art of Doing Twice the Work in Half the Time*, Random House Audio. Available at: http://www.audible.com/pd/Business/Scrum-Audiobook/B00NJ3WS9G/ref=a_search_c4_1_1_srTtl?qid=1415022661&sr=1-1 [Accessed November 3, 2014].

TheGreatCourses, 2013. *Understanding the Mysteries of Human Behavior*, The Great Courses. Available at: http://www.audible.com/pd/Science-Technology/Understanding-the-Mysteries-of-Human-Behavior-

Audiobook/B00DDTGKBI/ref=a_search_c4_1_1_srTtl?qid=1407497609&sr=1-1 [Accessed August 8, 2014].

Thulo, L., 2015. The state of SA's township entrepreneurship. *SME South Africa*. Available at: http://www.smesouthafrica.co.za/15427/The-state-of-SAs-township-entrepreneurship/ [Accessed June 17, 2015].

Veenhoven, R., 2012. Social Development and Happiness in Nations. Available at: http://repub.eur.nl/pub/50509/ [Accessed August 31, 2015].

Wood, K. & Jewkes, R., 1997. Violence, rape, and sexual coercion: Ever yday love in a South African township. *Gender & Development*, 5(2), pp.41–46. Available at: http://www.tandfonline.com/doi/abs/10.1080/741922353 [Accessed June 24, 2015].

Woodward, D. et al., 2011. The Viability of Informal Microenterprises in South Africa. *Journal of Developmental Entrepreneurship*, 16(01), pp.65–86. Available at: http://www.worldscientific.com/doi/abs/10.1142/S1084946711001719 [Accessed June 11, 2015].

Worldmeters, 2015. World Population Clock. *Current World Population*. Available at: http://www.worldometers.info/world-population/ [Accessed June 17, 2015].

Writer, S., 2015. SA's "real" matric pass rate: 42%. *Business Tech*. Available at: http://businesstech.co.za/news/general/76561/sas-real-matric-pass-rate-41/ [Accessed July 17, 2015].

Young, T., 2012. *Africa: Bolinda Beginner Guides*, Bolinda Publishing Pty Ltd. Available at: http://www.audible.com/pd/Nonfiction/Africa-Bolinda-Beginner-Guides-Audiobook/B007QWG9NC [Accessed June 15, 2015].

Appendix A: BioTRIZ Algorithm

Stepwise analysis of the problem

Levels of revealing the solution

Stage 1. DEFINE A CHALLENGE
Use simple words

1.1. Is it really a challenge? Is it a part of a broader challenge? If so, start from the broader one.

1.2. Choose the functional model for your challenge:
- Missing useful function?
- Insufficient outcome?
- Harmful function?
- The same function is useful and harmful?

1.3. Are there existing solutions? Why are they not suitable and what would make them suitable?

Stage 2. IDEAL FINAL RESULT
Think in functional terms

2.1. What do you want:
- a function;
- the result of a function;
- or just an illusion of the result? - satisfaction from the process

2.2. Choose the model for the Ideal Final Result from :
- a missing useful function is not needed;
- useful effect appears naturally;
- insufficiency of useful function becomes useful or disappears;
- harmful effect disappears naturally or becomes useful.

Stage 3. CONTEXT
Think in time and space

3.1. Localize it: find WHERE and WHEN the problem occurs. What happens prior to and after the problem?

3.2. List all objects in the problem zone and time which:
- are affected by absence or insufficiency of useful function;
- produce or are affected by harmful function.

3.3. Find the contexts when objects listed in 3.2. do not generate any problem.

Stage 4. RESOURCES
Turn any waste into resources

4.1. Make a full list of the SUPER-SYSTEM properties - the closest environment around a problem area. Change the environment.

4.2. Change the system: the properties of the objects, their parts or action mode to achieve Ideal Final Result stated in 2.2.

4.3. Create the conditions for IFR, look for any undesirable item/ effect/action and find its: RIGHT time, RIGHT place, RIGHT dose, RIGHT mode and RIGHT user. If a success, go to Stage 7

Stage 5.CONTRADICTIONS
Do not be afraid of obstacles, search for them

5.1. Reveal the conflicting requirements: list all conflicting goals, functions, actions, parameters. Too many obstacles? Explore the system in greater depth: go to Stages 2 and 3.

5.2. Aggravate the conflict: make a harmful function happen to its maximum capacity and see how you can use this.

5.3. What properties of objects that are involved in a problem area stop you from creating the conditions for Ideal Final Result? If the answer is not straight forward, go to stage 4 to explore this deeper.

5.4. Express the conflict in either or both;
- I want a parameter to be "A" and not "A".
- by improving parameter "A", "B" gets worse.

Stage 6.SOLUTIONS
Never compromise, make it win-win

6.1. In what conditions would standard solutions work? Can you create such conditions? If not, define what stops you and go to 5.2.

6.2. Create the conditions when the obstacle disappears naturally. Invert the condition of the operation and turn harm into benefit. Vary important system parameters considering extremes, e.g. if it is small imagine that it is huge.

6.3. Make the useful effect appear only where and when it is needed. Trim the elements that produce harm but delegate its useful functions to other objects. If you cannot trim it, replace it with a harmless copy- X element.

6.4. a. Separate the conflicting properties with inventive principle (see their numbers):
- in time (10, 11, 15, 19, 20, 21, 27);
- in space (4, 14, 30, 31, 17);
- in a system (1, 2, 3, 5, 6, 7, 16, 24, 34, 40);
- in system control (23, 25);
- inverse the condition (13, 22);
- by different physical states (26, 32, 33, 35, 36);
- with a field (8, 9, 12, 18, 28, 29, 37, 38, 39).
b. Use BioTRIZ Contradiction Matrix to find the model for win-win solution.

Stage 7. REVISION OF THE SOLUTIONS
Make the most of it

7.1. Does the solution highlight more problems? If so explore the challenge deeper, go down through next column starting from 2.1.

7.2. Simplify it: remove all the elements that do not support the main function of your product/process.

7.3. Maximize its efficiency, trim it: remove a costly element but delegate its function to another part of a system, its parts or environment.

7.4. Turn the solution into a method
- vary important system parameters considering extremes;
- inverse the method: state it in an opposite way and find the application for it.

I. Describe what you currently have.

II. Define what do you want.

III. Define the conditions when your problem would disappear.

IV. Define what is on your way, list all limitations.

V. Resolve the conflicts to create the conditions when obstacles disappear

VI. Revise ideas and implement the solution.