Customer Driven Network Transformation

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Abstract – In the traditional sense, the telecommunication industry of South Africa was predominantly segmented between fixed and mobile service providers with very few service providers retaining the entire monopoly. Service providers were driven by government legislation, internal objectives and competitive rivalry between themselves, which often resulted in high production cost and poor service delivery to customers.

In recent years, however, the lines have become blurred with traditional fixed service providers moving into mobile networks and mobile service providers moving into the fixed network space. This shift has been driven by a global reduction in fixed line voice subscribers with mobile network services and more specifically data consumption growing exponentially. The SA Regulator has also amended the laws and has issued more operator licences and spectrum to promote self-provisioning, virtual network operators, wholesale models and have enabled telecommunication resellers.

Technological advances broadly summarized under the "4th industrial revolution" and the growing adoption of these technologiesby consumers has accelerated the demand for bandwidth, speed and reliability at a fraction of traditional costs. The customerhasoptions and can choose between a host of operators, both fixed and mobile and has now become the driving force for accelerated network operator transformation, a transformation that is necessaryfor an telecommunications operator who wishes to grow and retain a future market share.

The purpose of this research was to do an evaluation of the telecommunication landscape of South Africa, then evaluate a telecommunications "fixed line" giant using well know business modelling tools and finally to develop a strategy in the form of business model canvas which the operator can use to prepare for the predicted and necessary customer driven transformation.

Keywords: Broadband, Customer, Data-Services, Regulator, Voice-Services

1. Introduction

In the telecommunications landscape of South Africa, one operator with the SA government as its biggest shareholder, held the ICT monopoly for several years.They claim however to have revolutionised their business model from a traditional PSTN or Public Switched Telephone Network, (The Connection, 2019) to a Next Generation converged Data and Voice product offering, with Fiber Broadband being one of their flagship consumer products.

Based on a study conducted by "Research ICT Africa.net" in 2013, it was found that mobile connections in South Africa achieved a far higher speed, but, "fixed line" links are more consistent in broadband speed ranges.

In more developed countries however, "fixed line" services usually provide faster speeds than mobile broadband of similar offerings (Chetty et al., 2013). Per the company's website in 2020, however, it is quoted that, "at speeds of up to 200Mbps, there's no faster internet in South Africa than fiber. "It's reliable, affordable and faster than you've ever experienced. If your area is covered, your world is about to change" (Telkom, 2020).

Based on the comparison timeline between 2013 and 2020, the fiber evolution has transformed the fixed broadband experience in South Africa, however, a key note is made to the statement "if your area is covered" which implies that many areas are still being serviced by the legacy copper networks and old equipment.

The next Industrial revolution or industry 4.0 is also said to be merging borders between the digital, biological and physical, sometimes referred to as the "cyber-physical system". (Lee, 2019). It is also known for huge breakthroughs in many scientific fields of study, like robotics, AI, quantum computing, VR, IOT, 5G and 3D printing and not forgetting, fully autonomous motor vehicles.

For the operator in question, to keep up with technology advancements, high-speed bandwidth demands and to prepare for this "4th Industrial revolution", it is of utmost importance that the legacy networks, predominantly based on copper cables, be upgraded to next generation fiber optic technologies (FTTH) and that the current workforce are reskilled and trained accordingly with the view of a workforce that is "future job fit" ready.

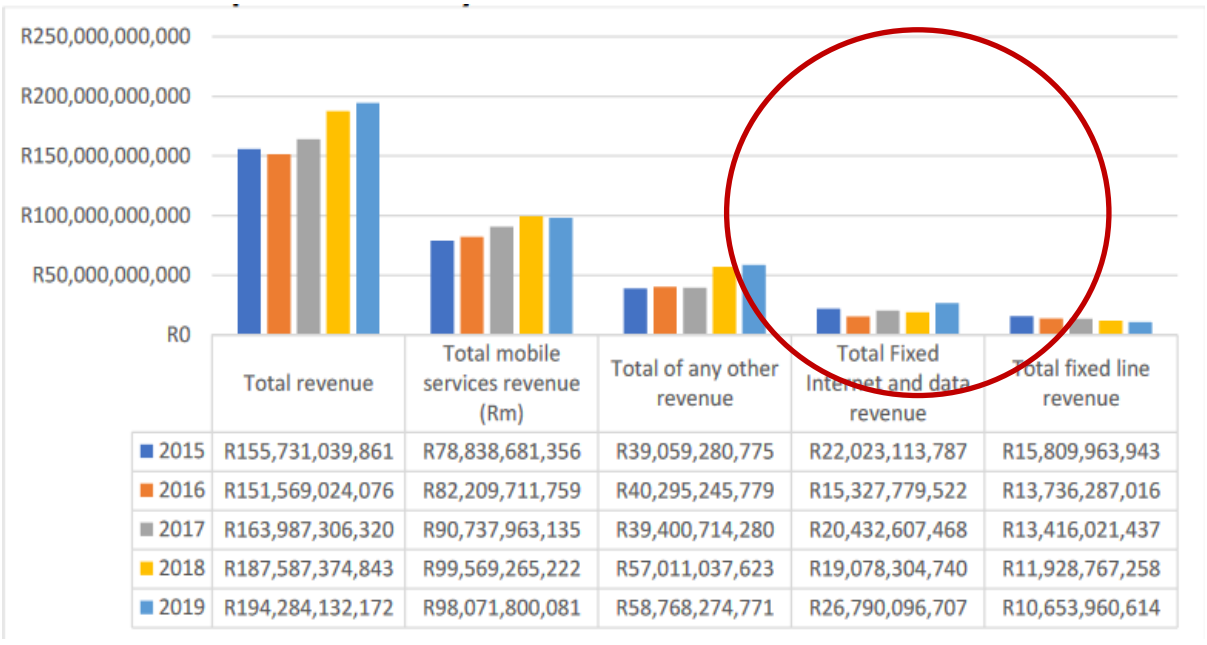
This mass migration from legacy copper cables to fiber optic cables is however a daunting task for any operator as it involves a high amount of CAPEX and OPEX expenditure, not forgetting large investment in infrastructure, training and systems. "Trenching is expensive, it can contribute 60% - 70% of the cost per FTTH home passed" (Ftthcouncil.eu, 2017).

Competition is high in the fiber market and Mobile "5G" is also a strong competitor for the broadband market share in South Africa. Fixed subscribers dropped from 974 181 in September 2018 to 781 255 in September 2019. (Moyo, 2020)

As per figure 1 below, most of the total telecommunications revenue is generated by mobile services with fixed line revenue being the smallest contributor but consistently declining over the last 5 years.

Fixed internet and data revenue have started to increase in 2019 as a result of the copper to fiber migration (Speed and reliability) and the increased demand in fixed data applications like, Netflixstreaming, YouTube & Ticktock.

Fixed line data is also lower priced than mobile data which is an advantage however reliability and customer service are also significant predictors of customer loyalty.



	Total revenue	Total mobile services revenue (Rm)	Total of any other revenue	Total Fixed Internet and data revenue	Total fixed line revenue
2015	R155,731,039,861	R78,838,681,356	R39,059,280,775	R22,023,113,787	R15,809,963,943
2016	R151,569,024,076	R82,209,711,759	R40,295,245,779	R15,327,779,522	R13,736,287,016
2017	R163,987,306,320	R90,737,963,135	R39,400,714,280	R20,432,607,468	R13,416,021,437
2018	R187,587,374,843	R99,569,265,222	R57,011,037,623	R19,078,304,740	R11,928,767,258
2019	R194,284,132,172	R98,071,800,081	R58,768,274,771	R26,790,096,707	R10,653,960,614

Figure1. SA telecommunication Revenue (5 Year trend)

Based on the significant but declining total fixed line revenue, atransformation is required in this arena. The customers use of emerging technologies now drive the specification and product offerings that telecommunications operators must deliver on or risk the market share to competitors.The need for a comprehensive study and strategy was therefore recommended.

2. Methods and Materials

2.1 Study design

A cross-sectional and descriptive research design methodology was used for the research. The study was descriptive, by describing the factors affecting the operator and the South African telecommunications landscape. The study was also cross-sectional as all data gathered from the respondents was done only once.

2.2 Study Participants

A random sample (Welman, Kruger and Mitchell, 2005:52) of participants from different business units within the operator was selected to participate namely, field technicians, network technicians, SOC and NOC engineers. A total number of 205 employees responded to the questionnaire.

2.3 Study Instruments

The selected instrument was a structured questionnaire (Babbie, 2010:89). The questionnaire of the study was "pre-tested" and "validated" before it was used for data collection. Data collection was completed over a 3-month period. The questionnaire has been chosen as the best data collection instrument. Questionnaires, if properly administered, yield high results and maintain anonymity (Dawson & Trapp, 2004:102).

The questionnaire used in this study includes continuous and discrete variables among others and was distributed via Google forms. Results were therefore captured and recorded as the questionnaires were completed by the respondents.

2.4 Validity and Reliability

With reference to "validity" and "reliability", Cooper and Schindler (2003:231) says that there is a major criterion that must be observed when evaluating a measurement tool.

The extent to which the "test" measures what we wished to measure is known as the validity. "Accuracy" and "precision" of measurement relates to reliability. These factors were taken into consideration when the selected method was chosen

2.5 Study Area and Setting

This research takes place in South Africa, in the province of Gauteng. The operators Head office is based in Centurion, but the study was not limited to Western Cape, Eastern Cape, Northern Cape and other Provinces.

Figure2. Sampling location

3 Research Strategy

The results obtained from the questionnaires were used in conjunction with market, regulatory and technology landscape deep dives.

Existing and well-known business analysis tools and methodologies were then used to map out key considerations, risks, opportunities and treats that the operator in question, needs to be aware of.

Lastly, a business model canvas was used to consolidate the strategy and present it to the operator.

4 Business Framework Analysis

Five well know business model and strategy frameworks were used. The Pestel analysis is a tool used for assessing external marketing environments, the results of which was used in a SWOT analysis. The TOWS analysis then looked at ways to use strengths to gain opportunities and minimize potential threats. It also used opportunities to overcome weaknesses and ways to minimize weaknesses to overcome threats."TOWS is a tool for strategy generation and SWOT was used to determine strength, weaknesses, opportunities and threats" (Friesner, 2020). Porter's Five Forces analyses was used to test the competitiveness ofthe environment (Investopedia, 2019) and the Strategy Diamond provided a visualize summary of the strategy

5 Results and Discussion

5.2 The "SWOT "Analysis

Acomprehensive SWOT analysis was formulated which noted key strengths and opportunities around "established brand", "existing customer base" and a high demand for broadband services in South Africa. Weaknesses and treats were also highlighted related to new markets and a competitive landscape driven by customer demand and new emerging technologies. Key notes were made on mobile product offerings (5G and LTE) and superior customer service as a distinctive differentiator.

5.3 The "PESTEL" Analysis

The PESTEL analysis listed key issues in the political, economic and social sectors as well as opportunities in the technological and legal aspects. The ever-weakening currency in South Africa and poor investor interest due to political instability makes the procurement of necessary technologies and investments in network transformations very expensive.

5.4 The "TOWS" Analysis

About converting strengths to opportunities, some key take always was around capitalizing on the existing fiber footprint, converting the legacy customer base and growing the mobile business into a hybrid model that incorporates the fixed and mobile aspect.Transforming weaknesses to opportunities will rely on automation, building "big data" Capabilities and the implementation of robotics, chatbots and autonomous systems. The TOWS analysis enabled us to formulate a proposed "attacking strategy", "building strategy" and "defensive strategy" for the operator to peruse.

5.5 Porters five forces

The legislative landscape and advancements in technology has made the treat of new entrants a substantial risk. Substitute or new emerging products that didn't previously exist, driven by technology advancement and the 4th industrial revolution is also ranked a highly as a concern for the operator to consider.

5.6 The strategy Diamond

Emerging technologies that enable the 4th industrial revolution, included but not limited to fiber to the home (FTTH), Fiber to the business (FTTB), 5G, "the internet of things" (IOT) etc are key arenas to operate in. Various

vehicles like mergers, acquisitions and ISP partnerships should be considered as well as outsourcing of non-key operations is necessary to keep the product cost as low as possible.

5.7 The Business Canvas

The above models were used to evaluate the strength, weaknesses, opportunities and threats that would help the operator to evolve and grow. We also looked at the attacking and defensive strategies that would need to be implemented as well as the markets, domains and appropriate staging times. A business model canvas was generated to highlight the key Partners, Activities, Value Propositions as well as Customer relationships, segments and channels. Proposed Cost structure and new potential revenue streams we highlighted.

Key partnerships include independent fiber infrastructure providers, shared infrastructure cost models, shared research and technology and the use of resellers and new wholesale product offerings

Key activities and value propositions include building a superior network, automation and enhanced self-service opportunities and service differentiators. Key resources touch on automation and emerging technologies as well as data scientist and engineering capabilities.

With the customer driving network transformation, customer relationships, segments and channels are a key component when mapping out customer journeys and delivering on customer expectations.

6 Research Ethics

Written permission from the operator was received before conducting research and the researcher requested for participant permission. Participant privacy and confidentiality will be maintained, no participant name will be mentioned, and no information will be given out unless the researcher is permitted to do so

7 Conclusion

The study confirmed the hypothesis that customer's consumption, customer behaviour and the adoption of new and emerging technologies are a key driver for network transformation.

The study also found that the operator in question has made some significant progress in its evolution strategy and journey; however opportunities do exist to further capitalize on new markets, hybrid operating models, structures and even mergers.

They have key strength and differentiators in terms of an existing market share, loyal customer base and dynamic product offerings but there are also real risks from traditional Mobile network operators delivering LTE, enterprise services as well 5G mobile services.Virtual network operators can attract customers with value added deals and are able to retain the customers without having the cost of investing in infrastructure, internet service providers and even non-traditional telecommunications sectors like the banking, etc. are able to do the same thing.

Technology is driving the market to change at a rapid rate and the customers' expectations are growing exponentially, it is up to the operators to constantly review and build on its operating model to remain relevant and grow with the 4th industrial revolution.

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