

## Future Job Skill, an enabler of Network Transformation

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**Abstract** – The telecommunications industry of South Africa is an old and well established one, however due to rapid advancements in technology better referred to as the 4th industrial revolution, it is in turmoil and in a state of constant change and transformation. South Africa has seen an accelerated need for fast, reliable and sustainable Telecommunications networks and infrastructure but at a fraction of the cost even further exacerbated by the COVID crisis.

The 4th industrial revolution is related to technological advancements in robotics, AI, quantum computing, VR, IOT, 5G, 3D printing and not forgetting, fully autonomous motor vehicles. Consumers have already migrated to streaming services like Netflix and Showmax, which has destroyed the “video store” business model and online learning and self-education has become an acceptable new norm with online learning platforms like Udemy and Coursera becoming more popular. Internet based conference services like Skype, Zoom and MS Team have changed the way we do meetings and conferences and online shopping is also on an upward trajectory. Customer behavior has exponentially grown the consumption of mobile and fixed “data” services and Telecommunications service providers must respond accordingly or risk losing market share and profits

The traditional fixed line operators are moving into mobile technologies while mobile operators are moving into the fixed space with technologies like 5G being a direct competitor for fixed line broadband. Customers are becoming a driver for network transformation, dictating the products, expected service levels and even cost. Competition is vast with many new entrants and even entrants from other markets like the banking sector for example, consuming telecommunication market share

For Telecommunications service providers to improve service levels, provide a broadband service that is always “on” and to grow with the emerging technologies, an equally matching and possibly superior workforce with a specific future minded skill set is required as an enabler. This skill can by no means be purely academic based but must encompass aspects of relevant experience, education and vision.

The purpose of this research was to develop a criterion to define a “future job skill” in the telecommunications industry, then to evaluate and score employees of the selected organisation using the defined “future Job Skill” criteria and finally to test if there if there was a significant association between the highly scored “future job Skill” employees and the selected organisations current broadband fault rate, per province of South Africa. The organisation chosen is one of the giants in the fixed line broadband arena with a national footprint. Fault rate was chosen as it is a good indicator of user experience, using a percentage of the amount of failures per subscriber divided by the install base, over a set period.

**Keywords:** Telecommunications, broadband, customer, technology, service levels, transformation, future

### 1. Introduction

As the telecommunication industry transforms, driven by technological advancements and the consumption of “data” by consumers, so too, is there a need for the workforce to change and adapt to the current and future trends. Aspects of education and relevant skills must be considered and realigned to ensure that capabilities are built and nurtured around new and emerging technologies and that the pipeline is kept full of up and coming skilled candidates to fill the job requirements of the future.

Studies have found that there is a significant relationship between employee engagement and their associated productivity. If increased productivity is desired by management, there needs to be improvement in employee

engagement and methods of instilling a sense of employee pride (Buchan and Perfilieva, 2020). As businesses endeavour to maximise productivity, they must promote interest in engagement. Work engagement is considered a key factor in assessing wellbeing at work (Bakker, 2011). Employees are needed to be emotionally and cognitively committed to their company, their customers and their work. Even though the theory suggests that technological advanced jobs and knowledge intensive practices will dominate, the change in the industry has been gradual and over many decades thus far. (Baraby and Siegel, 2017).

Levels of achieved education has always been the single most used measuring stick and predictor of job fit in the past however, skills mapping to the tasks performed are now more relevant (Acemoglu and Autor, 2011). Statistics South Africa (Stats SA) has found that youth aged between 15–24 years are the most vulnerable in the labour market, with a 55% unemployment rate. Graduates in the same group are lower at 31%. Graduates therefore still stand a better chance of succeeding in the job market. The unemployment rate among adults (aged 35–64 years) was 18,0% during this period, while the employment-to-population ratio and labour force participation rate were 57,4% and 70,0%, respectively. Even with the high unemployment rate in SA, there are not enough qualified and skilled applicants to fill vacant positions (Kwach, 2020)

The “Future Job skill” in the context of this research was therefore not limited to qualification only but rather a combination of age grouping, job grade, years of ICT experience, qualifications and respective productivity in their current job roles, to create a concept of employee business value. The “Future Job Fit” score was based on the “weighted scoring” model. A weighted scoring model is a method of prioritizing items according to their value and then ranking them according to their final or overall weighted score. “The goal of the weighted scoring model is to calculate an objective, quantitative and business value for each item being measured” (Weighted Scoring | Definition and Overview, 2020)

Over and above the speed and price of broadband services, availability and swift restoration of services, in the event of a service outage are key and can easily be a differentiator between telecommunications operators. For this study, the researchers decided to use the measurement of “broadband fault rate” to determine the reliability of the service. The demand for fast, cheap and reliable broadband services are growing exponentially, reliable equipment and correctly skilled employees are what underpins the success of any telecommunications company.

Considering the rapidly changing telecommunications landscape in South Africa, a tough competitive environment between new and existing operators and then looking at internal factors to the organisation in question, like an ageing and constantly reducing workforce, legacy technical skills vs future technological skills and the areas needing to be improved upon with specific recommendations, this research was therefore suggested and approved.

## 2. Methods and Materials

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.

### 2.1 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.

### 2.2 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.

### 2.3 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

### 2.4 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.



Figure1. Sampling location

## 3 Research Strategy

The researchers borrowed a methodology from business modelling called “The weighted model”. Over and above the respondent’s level of qualification, they included age, job grade, years of ICT experience, and current productivity into their scoring criteria. They then allocated weightings to each of the identified independent variables, considering tangible and intangible value, to produce a “weighted average score” or “business value”

**WA:** Weighted average associated score representing the “Future Job Fit” criteria

**W<sub>i</sub>:** The allocated weight based on the business value associated to the item

**C<sub>i</sub>:** The count of occurrence of that item

WA	W <sub>i</sub>	C <sub>i</sub>
Future Job Fit Score criteria	Assigned Weight	Count of occurrence

Table 1. The Weighted Scoring Model

The results obtained from the questionnaires were inputted according to the criteria defined in the business value: weighted model and each respondent was given a score. The scores were then ranked according to either an “average” or “high” probability of being “future job fit” ready. Future job fit was then used as the dependent variable for cross tab analysis.

Once the respondents with the “high” scores were identified, their geographical locations were overlaid on the broadband fault rate percentages per geographical location to observe a correlation

Finally, Pearson chi-square test of association and Cross tab analysis was also used to determine the significance between the dependent and independent variables.

4 Results and Discussion

4.1 The Weighted Scoring Model

Based on the five categories selected, i.e. Age, job Grade, Years of ICT experience, qualifications and productivity, 120 of the respondents achieved an “average” score with 85 respondents scoring “high”.

Participants	Average Score	High Score
205	120	85

Table 2. Future Job Fit Distribution

4.2 Geographical Broadband fault Rate vs “High Future Job Fit” respondents

The study found that the geographical region with the largest amount of high scoring “future job fit” respondents were in the North Eastern Region (Pretoria), followed by Western & Southern regions, the lowest concertation was found in the Eastern and Central geographical regions.

In terms of broadband fault rate using data sheets provided by the company, (FY18 financial year, ending in March 2019) it was found that the North Eastern Region had the lowest broadband fault rate followed by Western & Southern regions with Eastern and Central being the highest or worst performing.

It was therefore concluded that geographical regions with a higher concentration of “high” scoring future job fit respondents were able to achieve lower fault rate values therefore providing a more reliable service.

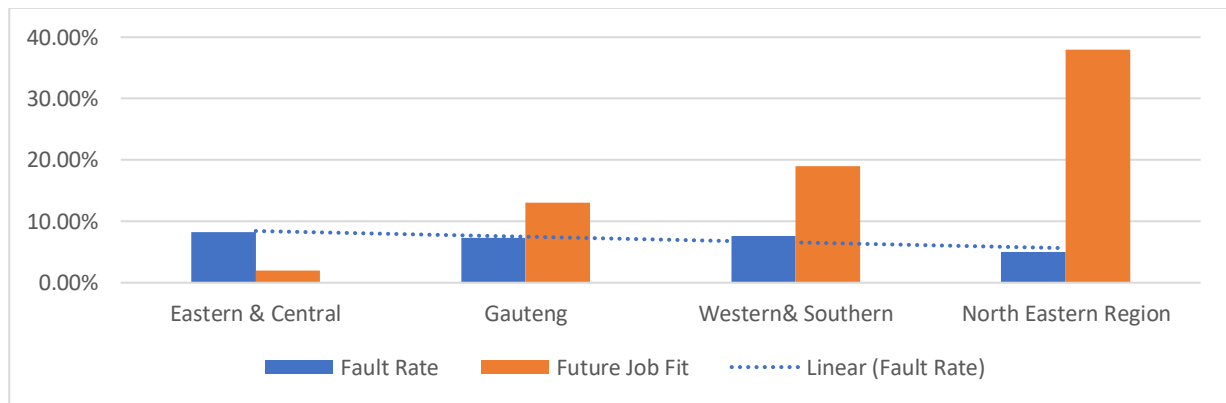


Table 2. Geographical Broadband Fault Rate vs “High future Job fit” respondents

4.3 Results from “Cross Tab” analysis

The Pearson chi-square test of association (Dawson and Trapp, 2004) and cross tab analysis was used for determining the independence or related strength of association between the variables. The strength between two categorical variables are significantly associated when their P-values are less than or equal to 0.05 (5% level of significance), it is then known that the two variables are independent of each other at the 5% “level of significance” Results of this study indicated that not all the P-Values were less than 0.05, therefore, not all the results obtained were valid

This study has identified 2 significant two-by-two associations between “Future Job fit” and the respondent’s demographics and 4 significant two-by-two associations between “Future job Fit” and Skills & Experience. There were also 11 significant two-by-two associations between “future job fit” and workforce sustainability

## 5 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

## 6 Conclusion

We find ourselves in a volatile industry that is fast paced and fast changing and has a lot of competition. It is also driven by “technological advances” in “big data analytics”, “artificial intelligence”, “machine learning”, “IOT” and related technologies. There is pressure from mobile network providers who are challenging broadband offerings with 4G and LTE solutions as well as the impending 5G. Highly scored “Future job fit” employees can be seen as an enabler and critical criteria for a company who is undergoing transformation in the Telecommunications landscape of South Africa, they should be seriously considered during recruitment.

This study found that only 41% of the employees who participated in the survey had a “high” weighted score for the “future job fit” category, while 59% were in the “average” category. With the future technological roadmap starting to emerge, it is recommended that the operator should start investing in building and increasing the amount of highly scored “future job skill” employees. The researchers also found that if the operator wants to improve their broadband fault rate, “higher” ranked “future job fit” employees can be used as a predictor of success. When looking at the regional broadband fault rate in comparison to the respondents with the “high” scored “Future Job Fit”, it was seen that “high” scored “Future Job Fit” candidates are inversely proportional to the poor Broadband fault rate.

“Future job fit” is however something that can be improved upon and the recommendation to the operator is to invest in training around the topic and criteria used to identify the “Future Job Fit” employees. The criteria should also be considered when recruiting new employees and during restructuring initiatives. It should be noted that the weighted scoring model can be further enhanced by adding a component of emotional intelligence and IQ and re-evaluating the model in a further study.

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