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Trends Regarding WiFi in Gauteng South Africa

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Abstract: The demand for data usage in South Africa is growing and this growth is creating a heavy demand on the network of telecommunication providers. The challenge facing South Africa is a lack of spectrum especially for high-speed access of Long Term Evolution networks, which creates a set of challenges in providing services to their customers for these telecommunication providers.

The paper presents a narrative to ascertain where consumers in Gauteng access WiFi on a regular basis, how often they access these WiFi hot spots, reasons for their access. The findings would reflect the consumers' buying behaviours as the target population to discover trends and patterns using WiFi.

A qualitative methods approach was chosen. This was based on the buying behaviour, trends and patterns of WiFi users and how Telecommunication Service Providers and businesses could position themselves as a WiFi provider and capture this market.

Respondents were regular users of WiFi and had good knowledge and understanding of WiFi. The biggest benefit of WiFi hotspots to them was that it was free and conveniently located and saved them on their personal data usage.

Whilst there is a sporadic WiFi footprint available in Gauteng, the service needs to be expanded and made more accessible in all restaurants, taxi ranks, universities, shopping malls, gated communities. WiFi can be provided to cover a wider range at shopping malls by Telecommunication Service Providers partnering up with providers of public and private WiFi hotspots.

Key words: consumer buying behaviour; WiFi; patterns; trends; hotspots; technology; telecommunication
JEL codes: O32

1. Introduction

Chaffey (2011, p. 170) defines WiFi as "*a high speed wireless local-area network enabling wireless access to the internet for mobile, office and home use*". Whilst WiFi can be deployed in the office and at home environments, it has attracted the most attention for its potential for offering wireless access in cities and towns without the need for a fixed connection. It is also used for long-range connectivity in peri-urban and even rural areas. WiFi is a low cost, easy to install solution that can help operators manage data traffic growth at reduced costs (Lee, Yi, Chong & Jin, 2014). The key advantage of WiFi hotspot is that they operate over an unlicensed spectrum (Srinivasan, Dey, Kumar & Mukherjee, 2012). WiFi hotspots are continuing to proliferate and are

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becoming ubiquitous for semi-nomadic data connectivity. WiFi technology has an option to increase the service and businesses reach for both Telecommunication Service Providers (TSP) and businesses. Mobile service providers and wireless operators view WiFi as another wireless technology that can augment their macro and small cell networks (Marcus & Burns, 2013). The ability to deal with an unlicensed spectrum has an additional appeal for service providers and network operators. This is a significant fact when considering the effect the delivery of mobile service over the inexpensive, licensed-exempt spectrum of WiFi networks will have on a TSP's ability to compete. Notwithstanding the latter about Wi-Fi, there is little research about how consumers in South Africa are using WiFi and how they intend to use it in the future.

1.1 Demands for Data Consumption

"The insatiable demand for smartphones, tablets, and other connected devices is generating staggering amounts of mobile data. The Cisco Visual Networking Index (VNI) predicts that global mobile data traffic will increase 18 fold from 2011 to 2016, reaching 10.8 Exabyte per month" (Taylor, Young & Noronha, 2012, p. 2). WiFi has emerged as a disruptive technology that has grown by stealth to dominate the global wireless data domain. This is true not only in terms of the number and in terms of range of devices in the market but also the volumes of data transferred. WiFi uses unlicensed spectrum and until recently, most technologists and mobile industry executives viewed WiFi as the "poor cousin" to licensed mobile communications. Most mobile operators now realize that offloading data traffic to WiFi can, and must, play a significant role in helping them avoid clogged networks and unhappy customers. In all of this strategizing about WiFi, and according to Taylor et al. (2012) there is little research about how consumers are actually using WiFi and what are their behaviours, patterns and trends. More specifically, what drives a user to connect his or her device to the Internet with WiFi rather than "mobile"? Operators of fixed, mobile, converged and pure-play WiFi are moving beyond using WiFi just for convenient access, or data offload.

1.2 Growth Factors of WiFi

Consumer preference for Smartphones has resulted in a massive uptake of Smartphones. This is coupled with a wider choice in tablets and "phablets" available on the market as well as these devices being WiFi enabled (Chaffey, 2017).

Many users own more than one device. Mobile network providers have to design multi - Subscriber Identity Module (SIM) products to cater for multiple device ownership. South Africans as well as the global environment are seeing more applications, both free and paid for (Kende, 2015). The demand for data and access to it is resulting in faster and more capable WiFi technologies (Goldstuk, 2008). South Africans are demanding more hotspots for free or low cost bandwidth (Goldstuk, 2008).

1.3 Monetizing WiFi

According to Lippis (2012, p. 1), "67% of Mobile Internet users use their smartphone to research a purchase and actually visit the store that advertised it, or that 72% have made purchases based on a local advertisement delivered to their smartphone. Mobility and proximity are coming together in the fact that 94% of users who receive location-based services consider them valuable". These statistics indicates a shift in consumer behaviour from just getting WiFi service to one that demands high-speed mobile Internet access in retail locales, hotels, transportation systems, restaurants, hospitals, and sports stadiums. This new consumer-to-business relationship is and can further accelerate a shift from a mobile voice to a mobile nomadic data world. There is a new ecosystem emerging where various companies contribute certain aspects of a mobile experience, such as location services, notification/offer services, indoor blue dot detail and mobile client foot tracking (Lippis, 2012). In this regard, an

indoor WiFi network can be considered as being a GPS indoor network that is leveraged for location and context. For consumer businesses, this is becoming a necessity and not just a nice-to-have service as it is fundamentally changing their business relationship with customers. Taylor et al. (2012) in their study found that, whilst mobile users are drawn to the speed and lower cost of WiFi networks, they are sometimes challenged by the difficulty of locating access points and by variability in performance. These opportunities therefore create a compelling reason as to why businesses should offer WiFi to their customers.

1.4 Business Reasons for WiFi

The market is driven by a customer appetite for wireless data at lower cost. This is supported by a maturing set of technology standards, a prevalence of WiFi-enabled Smartphones, the ease of use of WiFi hotspots and the emergence of the Internet of Things (Parsons, 2009). "*More than two out of three consumers say WiFi availability influences their decisions about where to shop*" (Harris, 2014, p. 1). Given the significant competitive advantage, a coherent and well-executed WiFi strategy can create in a world of exponentially rising bandwidth demand, then this technology merits serious consideration. Hence businesses and TSPs need to understand how customers select, buy and use goods.

2. Consumer Buying Behaviour

"Consumer behaviour is the study of how individuals, groups, and organizations select, buy, use, and dispose of goods, services, ideas, or experiences to satisfy their needs and wants. A consumer's buying behaviour is influenced by cultural, social and personal factors" (Kotler & Keller, 2012, p. 173). There are factors that impact the consumer's buying behaviour. The influences of these factors impact the consumer's buying decision differently and vary from consumer to consumer. Consumer purchases are strongly influenced by cultural, social and personal factors. Of these, Kotler and Keller (2012) suggest that cultural factors exert the broadest and deepest influence. "Culture is the set of basic values, perceptions, wants and behaviours learned by a member of society from family and other important institutions" (Jisana, 2014, p. 35). Social factors also impact the CBB and important factors are: reference groups, family, role and status. Personal factors can also affect CBB and some of the important factors are lifestyle, economic situation, occupation, age, personality and self-concept (Kotler & Keller, 2012). By understanding not only how the consumer behaves when buying, but also the way the consumer behaves as the consumer does, both TSPs and businesses can makes decisions that will tie in more closely with consumer needs and desires.

2.1 Consumer Trends

Consumers have become accustomed to fast-paced lifestyles, having been conditioned by the Internet, instant messaging, fast food, and mobile phones; and now they want and expect instant access to everything. To accommodate the faster pace of life, consumers are multitasking and making convenience a priority in their online shopping choices (Zentner, Smith & Kaya, 2012). The following assessments of social trends that are impacting the consumer marketplace from Miller and Washington (2009) have been adapted:

- **Technology Immersed**: Today's young consumers have never known life without the Internet.
- **Independent, Informed, and Media-savvy**: The combination of a seemingly boundary-less, technology-driven world with unprecedented media immersion is resulting in a growing level of sophistication among consumers.
- **Kids Growing Older Younger**: Lifestyles and life roles continue to evolve as more women become the

higher income earner of a couple.

- **Blurring Life Boundaries**: Everyplace is a place for anything. Boundaries are blurring between home and work, between leisure and industry, between accessible and incommunicado.
- **Multicultural Mainstreaming**: Diversity has reached the scale whereby it's having a powerful impact on mainstream consumers. The growth and growing influence of minority cultures are resulting in a cultural shape-shifting in which the tastes, customs, interests, and activities of ethnic populations are being adopted by other cultures and ultimately the mainstream.

2.2 Technology Trends

The following table presents an assessment of technological trends that are impacting the consumer marketplace as cited by Miller and Washington (2009) and have been adapted by the researchers:

Table 1 Technological Trends

The Digital Life	Digital technologies have reached mass acceptance, with digital products representing approximately 60% of consumers' home electronics spending (Currie, 2013). In the past few years the popularity of digitally formatted content, wider availability of broadband, the development of wireless network technology, and the increasing sophistication of personal digital devices have acted as catalysts to usher in an age of digital media in the home.
New Mobile Frontier	As digital products approach ubiquity, the next technology wave will have a common thread — mobility. A true mobile lifestyle, in which people are able to communicate, work, or play anytime and anywhere, is slowly coming into reach
Integrating Geo-location Technology	Interest in geo-location or location aware technology is growing. This influences consumer trends by directing consumers to the items that they desire (a pull marketing strategy) to purchase as well as based on the consumer profiling inform of what the customer "likes" and where it can be found in the closest proximity (a push marketing strategy).
Convergence	The industry's vision of convergence has been described as "the day when all computing devices communicate and when all communication devices compute" (Cobler, 2008). With this type of convergence a consumer's trend will move from using a few selected devices to using any device on any technology where WiFi will play a significant role.
Price Deflation	Higher consumer awareness and acceptance and increased competition are fuelling rapid price deflation for many categories of technology products. It also will foster new opportunities to improve productivity, marketing, merchandising, and customer communication for retailers and suppliers.
Technology Miniaturization	Users are demanding more from their devices in terms of functionality, speed, and affordability; they also are demanding greater portability.
Smart Technologies	Radio-frequency identification (RFID) technology, which makes inanimate, objects intelligent and capable of interacting with one another as they travel through the supply. This results in the growth of smart products, smart signs, smart labels, smart shelves, smart carts, and smart cards.

2.3 Shifting Use of Media

New media now competes fiercely with old media. The following are three areas of impact of new media from Miller and Washington (2009) and has been adapted:

New Media Platforms: The concept of a mass communications market is quickly eroding. There are more sources of media than ever and more ways to get information, namely from: movie theatres, sports arenas, and school cafeterias to product placements in TV shows, movies, video games, and everything is becoming an advertising medium.

New Marketing Messages: In a world saturated with advertising, traditional media and traditional messages are increasingly ineffective. Consumers in South Africa are more demanding that they expect more and will readily defect from retailers and online shopping places which do not deliver on these expectations.

New Marketing Technologies: New marketing technologies are facilitating the ability to reach people on a more customized and personalized basis. Geo-targeting using GPS technology enables marketers to track customers and dispatch a message when they are near a point of purchase. There is abundance and consumers have more things than they actually need, so the process of persuading them to buy more comes down to stimulating wants and desires (Currie, 2013).

Shoppers will increasingly look for status, recognition and self-esteem in their online shopping and leisure habits. TSPs and businesses will have to understand these trends and will need to treat individuals with respect and care, build consumer trust, improve the online experience or lose them to competitors. The latter is supported by Husic and Cicic (2009, p. 234) who state, "by using status goods as symbols, individuals communicate meaning about themselves to their reference groups." The desire for status involves the acquiring of items that represent status to the individual (Eastman et al., 1999). There is scant information on consumer patterns for WiFi, hence the use of general research material on consumer patterns were used and compared with the research results specific to WiFi.

2.4 Consumer Pattern Characteristics

Consumers of WiFi will stay longer on a WiFi hotspot if it was free or set at a lower price than competitors. This view is not void of the fact that some of the identified individual differences might be related to demographic factors, such as family size and income. Consumers will tend to maximize not only monetary aspects but also quality factors. In the case of WiFi these factors will include the quality of service, drop-offs and the speed of the internet at that WiFi hotspot. Some of the following factors such as consumer attitude, shopping strategies and shopping knowledge acquisitions have an impact on consumer consumption behaviours.

Consumer patterns are determined on value for money, that is, a cheaper price when compared to competitors or alternatively if it is for "free". Quality factors such as drop-offs, stability of the network, and speed of data as well as the credibility and reliability of the information at a WiFi hotspot also impact the consumer's usage pattern. The demand for data has resulted in driving demand growth for WiFi in South Africa. This demand creates an opportunity to monetizing WiFi and hence a reason for business to offer WiFi. Without understanding a consumer's buying behaviour, patterns and trends, a business or TSP may invest in deploying expensive WiFi technology and the associated infrastructure and not realise the business benefit. It is therefore important for businesses to understand how customers select, buy and use goods.

The research question is about the buying behaviour, trends and patterns of WiFi users and how TSP's and businesses could position themselves as a WiFi provider and to capture this market.

3. Research Design and Methodology

A qualitative research approach was used for this study involving the use of semi-structured interviews and four focus groups as the primary methods. The choice of selecting a qualitative research approach was based on focusing on phenomena that occurred in a natural setting as well as capturing and studying the complexity of those phenomena (Leedy & Ormrod, 2014). Following the phenomenological approach, an understanding in events specific to CBB, patterns and trends regarding WiFi in Gauteng SA was required. This normally translates into gathering "deep" information and perceptions through inductive, qualitative methods such as interviews, discussions and participant observation, and representing it from the perspective of the research participant(s).

3.1 Questionnaire Design

Four focus group discussions were conducted in the Gauteng province - two in Johannesburg and two in Pretoria in South Africa. Each focus group comprised of 10 respondents. In addition, 40 respondents were selected on predefined criteria for a face-to-face structured interview. A total of 80 respondents participated in this study (40 in the focus groups and 40 in the face-to-face interviews). None of these respondents participated in both the focus group and face-to-face interview. A contact database over 2000 contacts in Linkedin was used and respondents were profiled to form a pool of 719 candidates for this study. A message via Linkedin was sent to these 719 candidates through an informed consent letter. The message indicated that the search was for respondents from Johannesburg and Pretoria residing in Gauteng, and respondents could chose to be part of a focus group study or be part of the face-to-face interview. The questions (*see Appendix A*) were designed in a manner to help determine the behaviour, trends and patterns of WiFi users in Gauteng. The interviews were designed to ascertain: (i) where consumers accessed WiFi on a regular basis; (ii) how often they accessed these WiFi hot spots; (iii) reasons for their access, for example — download movies, download Apps, download songs, to send e-mails, and general browsing of the internet. The interview also focused on how much on average consumers were willing to pay for WiFi (after accessing free WiFi for 30 minutes) and how much they have paid for this service in the past. The focus group discussions followed the same pattern as the individual interviews. The focus group discussions were recorded, transcribed and analysed. The targeted population for this study was from Gauteng, South Africa. From this population a sample of eighty six respondents were selected for both the pilot and main study using a purposive sampling technique. The purposive sampling technique was used for this study to achieve an adequate number of valid results based on limited budget and timeframe. Fraenkel and Wallen (2010) recommend purposive sampling when the researchers believe that the selected sample will be representative and/or the participants will be informative about the unit of measure.

3.2 Data Collection Process

Demographics such as gender, age, education and race were variables that were carefully considered for this study to ensure a fair representation of the population. From the 719 candidates, 247 responses were received from people wanting to participate. For the purpose of this study, familiarity with the interview or focus group participant was of limited concern to the researchers. After careful consideration based on the predetermined criteria 86 people who met the criteria for this research study from a pool of 123 screened potential participants out of the 247 respondents. A pilot study was conducted and some minor corrections such as leading questions and grammatical errors were made to the questionnaire. The sample of the pilot study was not incorporated in the main study. The pilot study was conducted for the purpose of verifying the reliability and validity of the research measures, which are based on well-established literature. To provide for transferability, the research study presented findings with “thick” descriptions of the phenomena.

3.3 Validity and Reliability

Based on the above literature and the discussion below, the study was considered both reliable and valid. The researchers however, acknowledge that the research study may include the following sources of error: This study analysed the first coding process through initial coding. This type of coding was chosen to examine, compare and search for similarities and differences throughout the data, and as (Charmaz, 2006, p. 46) contextualises “....to remain open to all possible theoretical directions indicated by your readings of the data”. The second level coding chosen, was Pattern coding. Pattern coding gave to this study the basis to explain major themes underneath the segments of the data; patterns in CBB, patterns and trends, the search for causes and explanations to the possible

phenomenon, and finally, the platform to construct frameworks and processes. To conclude, a triangulation of the patterns and themes creates new levels of understanding of the existing knowledge by reviewing the interviews, focused group discussions and secondary data in a comparative analysis with the previous two levels of coding (Saldana, 2009). To achieve triangulation the data that was collected was compared and checked for patterns and trends between the face-to-face interview results and the focus group discussion results. The face-to-face interview results and the focus group discussion results were compared to the secondary data in the literature review. The captured data from the semi structured interviews were coded and grouped as required.

3.4 Triangulation

Three different sources of data were used: secondary data (books, articles), and primary data (which comprised face-to-face interviews as well as focus group transcripts. In this way it was ensured that there was more agreement of different data sources on a particular issue and hence, the more dependable (reliable) the interpretation of the data (Leedy & Ormrod, 2014). The data was compared and checked for patterns between the face-to-face interview results and the focus group discussion results. The face-to-face interview results and the focus group discussion results were compared to the secondary data in the literature review. It was found that there was consistency in the interview process, that the interview process was credible, that there was conformity and that the collected information was applicable to the study.

3.5 Methods of Achieving Validity

The results of the pilot study showed high clarity and credibility. The findings of this research are stable and hence dependable and confirmable to the internal coherence of the data in relation to the findings, interpretations and recommendations. Content validity was utilised to increase the validity of the research and participants were shown excerpts of the researchers' interpretation of their interviews to ensure that the correct information was captured. In addition, Face validity, as the name suggests, is a measure of how representative a research project is "at face value", and whether it appears to be a good project. This was achieved as well.

3.6 Data Capturing

All forty face-to-face interviews were administered by the researchers. Each interview was captured on the designed interview question. An Excel spread sheet was created and the raw data from the interview sheet and notes were captured on this spread sheet after each interview. Some minor errors were found and the necessary corrections were made. Face-to-face interviews were captured on pre-designed forms. Focus Group discussions were recorded and transcribed.

Each focus group was audio recorded using a digital recorder. Copious notes were made during each focus group discussion. After each focus group discussion the notes were documented with references to the audio recordings so that it could be later compared with the audio recording.

3.7 Data Analysis

The first coding process was analysed through initial coding. This type of coding was chosen to examine, compare and search for similarities and differences throughout the data, and as (Charmaz, 2006, p. 46) contextualises "....to remain open to all possible theoretical directions indicated by your readings of the data". The second level coding chosen, was Pattern coding. Pattern coding gave to this study the basis to explain major themes underneath the segments of the data; patterns in CBB, patterns and trends, the search for causes and explanations to the possible phenomenon, and finally, the platform to construct frameworks and processes. To conclude, a triangulation of the patterns and themes creates new levels of understanding of the existing knowledge by reviewing the interviews, focused group discussions and secondary data in a comparative analysis with the

previous two levels of coding (Saldana, 2009). The captured data from the semi structured interview was coded and grouped as required.

3.8 Findings of Face-to-Face Interviews

Respondents accessed the internet on a daily basis using mostly smartphones and engaged mostly in social activities such as Facebook, WhatsApp, Instagram and YouTube. Respondents mentioned that the biggest benefit of WiFi hotspots was that it was free and conveniently located. Respondents mainly used smartphones and accessed WiFi hotspots in primary locations such as fast food outlets, at home, business premises and at school. Most participants were not willing to spend extra money for more time in a WiFi hotspot. WiFi security was not something that respondents cared about or knew much about. Most of the participants were identified as "technology innovators" when it came to experimenting and trying out new technologies. Respondents indicated that in future they would increase their usage of WiFi. Home was preferred as the most ideal location where most respondents wished to have access to WiFi in the future.

3.9 Findings on the Focus Group Discussions

Based on the 4 focus groups conducted, the following aspects pertaining to WiFi usage and awareness are highlighted. Respondents were regular users of the internet and used it everywhere they went. The expertise of WiFi and its benefits was strong amongst the groups and they indicated that the major benefit was that it saved on personal data and cost. The activities engaged in a WiFi hotspot varied to social networks, downloaded movies/music, watched videos on U-Tube and updated their phone software. Most respondents found it easy to use hotspots. A few mentioned having difficulties. WiFi usage will increase as more hotspots become available. Respondents were not willing to spend more money on WiFi. They said that if the 30 minutes were used up they would move on to the next location. Passwords, slow internet speed, long registration processes in hotspots and download restrictions were seen as what limited participants when they were in a hotspot. Respondents did not consider trust and safety of WiFi hotspots. They believed that if hackers wanted their information, they would get it. Most of the respondents were keen on trying out and experimenting with new technologies. Home was identified as the best ideal location for WiFi. Others mentioned taxis, 'chill spots', street lights, 'everywhere' and more range at shopping malls.

4. Discussion and Analysis

The total number of respondents interviewed was forty. 57.0% were males and 43.0% were females. The largest number (52.5%) of respondents fell into the age group 18-24 years and second largest (37.5%) into the 25-34 years classification category. Three of forty (7.5%) fell into the 35-49 year age group and one of forty fell into the 50+ year group. The race groupings of the respondents were as follows: Blacks = 70.0%; Whites = 15.0%; Indians = 10.0%; Coloureds = 5.0%. Based on demographics the race distribution is a fair representation of the population in Gauteng (see Figure 1). Regarding Job status, 37.7% of the respondents worked full time, whilst another 37.5 % were students. 12.5% of the respondents worked part time, 5.0% were self- employed, whilst 2.5% were unemployed and one person (2.5%) was a housewife. One person (2.5%) refused to answer. On Education levels, 10.0% of the respondents had a post university qualification, 32.5% of respondents had some university qualification, 17.5% had a diploma, 17.5% had matric/grade 12 and 22.5% completed some high school qualification.

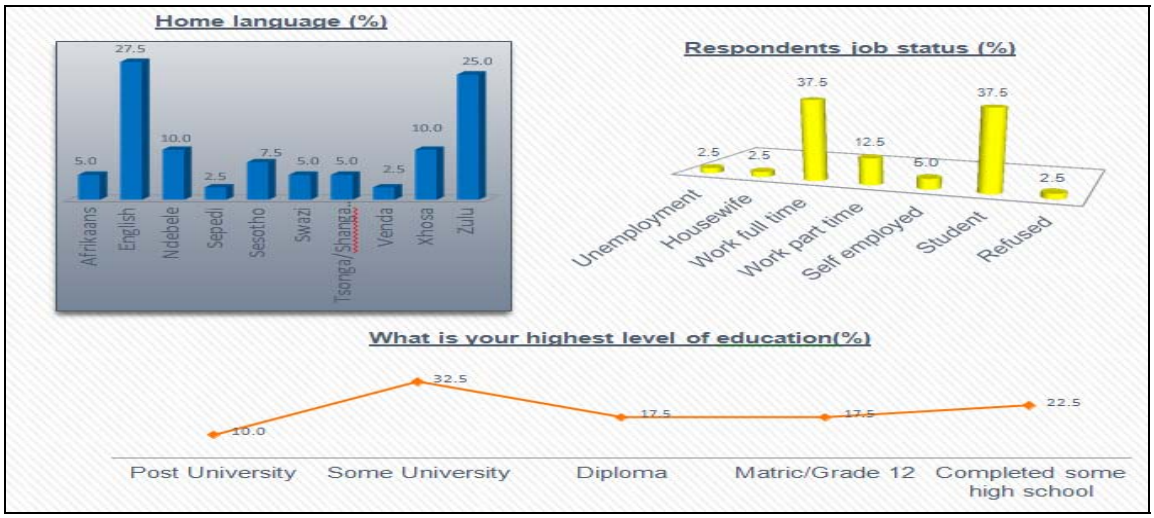

Figure 1 Profile by Language, Job and Education

Regarding respondent's response regarding access to Information (see Figure 2) 77.5% stated that they trusted the Wi-Fi service compared to 22.5% who did not trust the service. 37.5% felt that their information was protected versus 22.5% who said that their information was not protected. 40% could not say whether their information was protected or not. 20.0% knew that Wi-Fi definitely had a commercial purpose versus 22.5% who did not know. 57.5% were not aware of the commercial purpose of Wi-Fi and felt that it was a free service. 27.5% knew that businesses could access their information versus 17.5% who felt that business could not access their information. 55.0% could not tell if business could or could not access their information.

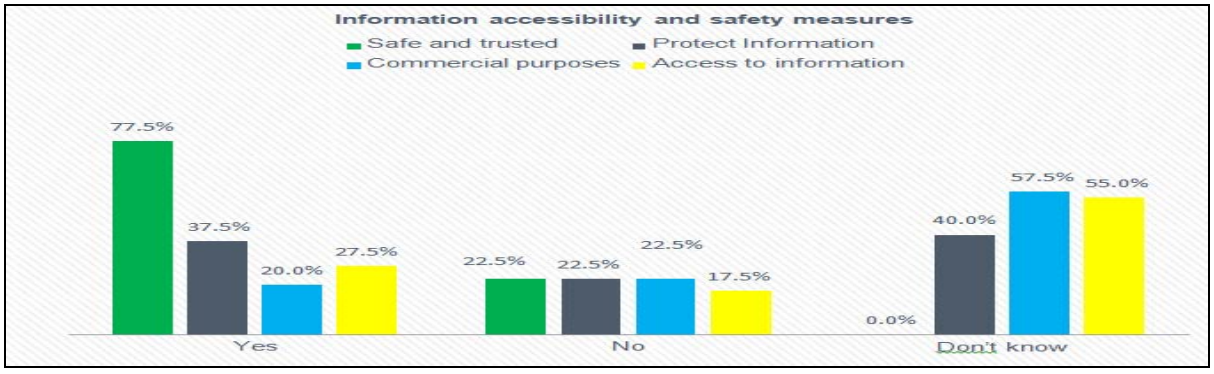

Figure 2 Information Protection, Privacy and Safety/Trust

4.1 Selected Findings on the Focus Group Discussions

Does Wi-Fi Make It Easier To Perform Tasks?

I struggle with connectivity. Yesterday I was at a Tshisanyama that has Wi-Fi and I kept trying to connect but I could not I eventually gave up" (Pretoria 25-34 years)

"The difficulty of using it is when they block applications or when it requires a password" (Johannesburg 18-24 years)

"I had a problem, I know that at UJ on campus they block access to Facebook and stuff like that so it depends on what kind of a hotspot you are using, if you are using a normal hotspot then you can basically do whatever you want but if they have limits on it then you can't." (Johannesburg 18-24 years)

4.2 Analysis

The majority of respondents did not agree with the statement about Wi-Fi making it easier for them to complete tasks. Respondents stated that some sites were blocked at free Wi-Fi sites and that they would have liked to access these social media sites. Other respondents highlighted that the access codes were problematic because in some occasions they had been denied access. They further mentioned that the free minutes or data that is given in these hotspots was limited and they needed more time.

Most respondents recognized that free Wi-Fi was restricted in terms of what you can view or download; however, they appreciated the "free service". They indicated that these restrictions in some hotspots made it difficult for them to download music/movies, play games and access social networks. Others cited that the upload and speed in hotspots was slow due to traffic and that restricted their usage.

4.3 Overall Summary of Findings

Respondents were regular users of WiFi and had good knowledge and understanding of WiFi. The biggest benefit of WiFi hotspots to them was that it was free and conveniently located and saved them on their personal data usage. WiFi hotspots were used in the following locations: fast food outlets, at home, business premises and at school. The participants were "technology innovators" when it came to experimenting and trying out new technologies. Since respondents were not willing to pay for WiFi services, businesses could offer WiFi for free but use the opportunity to market their product and services by way of push messages. One such example from the literature is the use of the "blue dot" displayed on a Smartphone within a mapping or navigation application similar to the function on a navigation devices sold today. Just as a normal navigation device that guides you, the indoor blue dot will guide you through a shopping mall, sports stadium, museum, hospital or casino once you are in range and in that vicinity. Businesses could use this tool on WiFi to encourage foot traffic towards their businesses. Most respondents used smartphones and engaged regularly in varied social activities such as Facebook, WhatsApp, Instagram and YouTube. If respondents were placed in a position that they will have to pay for this service, the research uncovered that this will be in the lower rand value denominations. The research found that businesses should find "other ways" of funding WiFi rather than charging for the service. "Other ways" could be information on store specials, adverts and promotions by businesses. Respondents were not willing to pay for the service and saw it as a "free" service.

5. Conclusion

The demand for WiFi is definitely growing. Whilst there is a sporadic WiFi footprint available in Gauteng, the service needs to be expanded and made more accessible in all restaurants, taxi ranks, universities, shopping malls, and gated communities. WiFi can be provided to cover a wider range at shopping malls by TSP's partnering up with providers of public and private WiFi hotspots. WiFi can be provided to businesses so that they can provide free access to the prospective customers. In this way, TSP's can partner with WiFi technology providers or 'go it alone' and provide these services to businesses. Businesses in turn can, by using Location Based Services push messages on promotions, special offers and other relevant marketing material to the users once they are in the vicinity or range of their businesses.

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Appendix Research Questionnaire

Respondent Name									
Interview date					2	0	1	4	

1. Gender	Male	1
	Female	2
2. Age	18-24	1
	25-34	2
	35-49	3
	50+	4
3. Race	Black	1
	Coloured	2
	Indian	3
	White	4
4. What is your home language?	Afrikaans	1
	English	2
	Ndebele	3
	Sepedi	4
	Sesotho	5
	Swazi	6
	Tsonga/Shangaan	7
	Tswana	8
	Venda	9
	Xhosa	10
	Zulu	11
	Other (Specify)……..	12
5. What is your highest level of education?	No schooling	1
	Some primary	2
	Completed primary	3
	Completed some high school	4
	Matric /Grade 12	5
	Diploma	6
	Some University	7
	Post University	8
6. Employment Status	Unemployed	1
	Housewife	2
	Work full time	3
	Work part time	4
	Self employed	5
	Pensioner	6
	Student	7
	Refused	8

I will now ask you general questions about your network provider and your views with regards to telecommunications in South Africa.

7. Which network provider(s) do you use?

Vodacom	1
Cell C	2
MTN	3
Telkom Mobile	4
Virgin Mobile	5

8. How many working SIM cards do you have?

ONE	1
TWO	2
MORE THAN TWO	3

9. On average how much do you spend monthly on telecoms?

R51-R100	1
R101-R200	2
R201-R500	3
R501+	4

10. What do you use most of your airtime for?

Voice Calls	1
SMS/MMS	2
Whatsapp	3
BBM	4
Facebook	5
Twitter	6
Internet browsing	7
Other (Specify)…….	9

Wi-Fi Access

11. Do you know about Wi-Fi hotspots?

Yes	1
No	2

12. How did you get to know about Wi-Fi “hotspots”

Friends	1
Relatives	2
Internet	3
Newspaper	4
Billboards	5
Adverts on television	6
Adverts on radio	7
Other (specify)	8

13. May you please tell me where was the last place that you accessed a Wi-Fi hotspot in the last 7 days?

Fast food outlet/Restaurant	1
Business Premises	2
At school/college/university	3
Government Offices	4
Airport	5
Taxi rank/in a Taxi	6
Hotels/B&B's/Lodges	7
Other (specify)……	8

14. During that time when you were using the Wi-Fi hotspot what did you use to get access?

Smartphone	1
tablet	2
Laptop	3

15. Where do you normally access Wi-Fi hotspots?

Fast food outlet/Restaurant	1
Business Premises	2
At school/college/university	3
Government Offices	4
Airport	5
Taxi rank/in a Taxi	6
Hotels/B&B's/Lodges	7
Other (specify)……	8

16. What are your reasons for using those places? (ask only for locations mentioned in Q15)

Wi-Fi is free for a long as you want	1
They are conveniently located	2
Their internet speed is fast	3
Their downloading speed is fast	4
Their uploading speed is fast	5
I am allowed to download as much data as I want	6
Other (specify)	7

Wi-Fi Usage

16. How often do you access Wi-Fi hotspots in a week?

Daily	Once a week	3 times A week	More than 3 times
1	2	3	4

17. How often do you access Wi-Fi hotspots in a month?

Once a week	More than once a week	After every two weeks	After every three weeks	Once a month
1	2	3	4	5

18. Would you say that you intentionally go to a Wi-Fi hotspot or you use Wi-Fi when you find yourself in an area with Wi-Fi?

I go intentionally	1
I access because I am in a Wi-Fi hotspot area	2

19. What activities do you normally engage in when in a Wi-Fi hotspot?

I surf the internet	1
I send emails	2
I play games	3
I do my assignments	4
I deal with work related issues	5
I Skype with friends and family	6
I Skype with business colleagues	7
Other (Specify)……	8

20. Would you say that Wi-Fi hotspots make it easy for you to engage in whatever you want to do?

Yes	1
No	2

21. Suppose you were to encounter a problem while using a Wi-Fi hotspot, would you say you know where or whom to go to?

Yes	1
No	2

22. Would you say that learning how to use a Wi-Fi hotspot was an easy thing for you to do or it was difficult?

It was easy for me	1
It was difficult for me	2

Facilitation Conditions

23. Do you think that you have enough knowledge on how to independently access a Wi-Fi hotspot without assistance?

Yes	1
No	2

24. Are the Wi-Fi hotspots that you have accessed compatible with your phone/tablet or computer? (please refer to Q14)

	Yes	No
Phone	1	1
Tablet	2	2
Computer	3	3

25. In the past how much have you paid for Wi-Fi (after accessing free Wi-Fi for 30 minutes)?

R5	1
R10	2
R15	3
R20-R30	4
R30-R40	5
R50	6
Other (Specify)……..	7

26. How much would you be willing to pay for Wi-Fi (after accessing free Wi-Fi for 30 minutes)?

R5	1
R10	2
R15	3
R20-R30	4
R30-R40	5
R50	6
Other (Specify)……..	7

Trust of Wireless

27. Do you believe that Wi-Fi hotspots are safe and trusted access points?

Yes	1
No	2

28 Do you believe that when you are using Wi-Fi hotspots there are systems in place to protect your personal information?

Yes	1
No	2

29 If your information was collected for commercial purposes when you were using Wi-Fi, do you believe that you would be immediately notified?

Yes	1
No	2

30 Do you think that if you requested access to the information that was used you would be allowed access?

Yes	1
No	2

Personal Innovativeness

31 Do you consider yourself to be a person that likes to interact and experiment with new technologies?

Yes	1
No	2

32 If you heard about a new technology, amongst your friends, relatives and colleagues you would be the first to try it out?

Yes	1
No	2

33 In future, are you most likely to increase your use of Wi-Fi?

Yes	1
No	2

34. Would you say that your increase of use would most likely be on the following?

Business Use	1
Social Use	2
Entertainment	3
Other (Specify)……	4

CLOSE THE INTERVIEW AND THANK THE RESPONDENT