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Factors Influencing the Uptake of Internet Connectivity in Meru Municipality, Meru County in Kenya

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Abstract

The main objective of the study was to investigate the factors influencing the uptake of internet connectivity among Meru Municipality residents. This study, therefore, examined the following factors affecting the uptake of internet connectivity: Bandwidth speed, cost of internet, advertisement, and literacy levels. Data was analyzed using SPSS. One of the key findings was the high price of internet subscriptions was one of the most hindrance factors to internet accessibility by a majority of youths and even adults. The advertisement found as the second influencing factor, with the majority of respondents feeling much has to be done by internet providers to reach potential customers. Considering the population sample had 98 percent O level of education, and 98% knew English or Kiswahili, Literacy levels discovered as the third influencing factor. Lastly, connection speed was the least factor. Hence, the study concluded that the high cost of the internet is one of the hindrance factors to internet penetration in Meru Municipality. Thus, an investigation should be initiated by internet service providers to determine the actual cost of internet provision across different towns as per the prevailing socio-economic climate in the area. Finally, the findings will be useful to the Ministry of Information and Technology, County Governments, Internet Service Providers, and other stakeholders who are aspiring to turn Kenya into a regional ICT hub and achieving Kenyans long term development plan of Vision 2030.

Keywords: Cost, Literacy, Bandwidth, Connectivity, Data, Internet, Router, Optical fiber, Advertisement.

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Contribution of this paper to the literature
This study contributes to existing literature by investigating the factors influencing the uptake of internet connectivity among Meru Municipality residents.

1. Background to the Study

Today the world has become a global village; people can communicate miles away each day through internet connectivity. The Internet is increasingly making its presence felt, not only playing an essential role in research and education but also serving as a catalyst to a country's socio-economic, cultural, and political development. It is therefore not a surprise that the Internet has become a development of the highest significance. Various connections are available across continents by different service providers (Titah & Barki, 2006).

As of 2010, the world average Internet Penetration Rate (IPR) was about 28.8 percent. The United States had an IPR of about 77 percent. Other countries that had IPRs of less than 1 percent included Burkina Faso and Cambodia, each with an IPR of 0.5 percent. Afghanistan, Benin, Mauritania, and Turkmenistan also had very low IPRs of 1.5 percent,1.8 percent, 1.0 percent, and 1.4 percent, respectively. Cuban official documents say that the country has an IPR of about 16 percent, but it's thought that the country's true IPR is closer to 1 to 3 percent. The countries that have the highest IPR include the Falkland Islands, Iceland, and Norway, with IPRs of 100 percent, 93.2 percent, and 90.9 percent, respectively. Other countries in Africa that had lots of Internet users as of 2011 included South Africa, with 6.8 million; Algeria, with about 4.7 million; and Sudan, with about 4.2 million. Algeria and South Africa had IPRs of almost 14 percent, and Sudan's was 9.3 percent. About 65 percent of Africa's Internet users in 2011 were from Nigeria, Egypt, or Morocco. Egypt had more Facebook users than Morocco and Nigeria, combined with about 9.4 million users. In 2007, less than 1 percent of Africans had access to broadband Internet (Simenda, 2009b).

Countries that have the lowest Internet access rates include Myanmar and East Timor, where 0.1 percent of the population has Internet access. Sierra Leone, where about 0.2 percent of the population does, and Bangladesh, the Central African Republic, Niger and the Democratic Republic of the Congo, where the Internet access rate is about 0.3 percent. More than 120 countries have an Internet Penetration Rate of less than 23.8 percent (Scott, 2006).

As of 2011, the African country with the highest Internet penetration rate (IPR), the percentage of a country's population that has Internet access was Morocco, with 41.3 percent of the people, or about 13.2 million people, having access to the Internet. Nigeria had the most Internet users, about 44 million, and an IPR of 28.3 percent. Internet users in Nigeria accounted for about 37 percent of all Internet users in Africa. Egypt was second in terms of Internet users, with about 20 million, and had an IPR of about 24.5 percent. Egypt's Internet users accounted for about 16.9 percent of the total for Africa (Simenda, 2009a).

According to Government of Kenya (2012) There are 22 million mobile subscribers in Kenya. Prepaid accounts for 99% of the total mobile subscriptions, the number of internet users was estimated at 8.69 million, the number of internet/data subscriptions is 3.2 million, Broadband subscriptions increased from 18,626 subscribers in the previous quarter to 84,726. A whopping 99% of the internet traffic in Kenya is done via mobile operators, meaning 3G, Edge or GPRS. An estimate for those with internet access in Kenya is closing in on 9 million users, and at over 22% of the population (GoK, 2012).

The 2nd CCK quarter report of 2011/2012 indicates the number of Internet users grew to 17.38 million as of December last year compared to 8.89 million users in the previous year, compared with the previous quarter, represents a growth of 21.55 percent. GoK statistics indicated 14.3 million Internet users in the previous quarter. GoK attributes the increase to intensified promotions on social media by mobile operators.

The use of the Internet has been on a rising trend, with the figure showing that 44.12 percent of the population has access to the Internet, with the majority accessing the Internet through mobile phones. According to the report, with the steady growth in mobile subscriptions, the increase in Internet usage is likely to continue as operators seek to leverage on new and emerging technologies to offer attractive packages aimed at garnering more subscribers to use this service. Kenya has a high penetration of mobile phones, standing at 71.3 percent, with 28.08 million mobile subscriptions in the country up from 26.49 million subscriptions recorded during the year 2010/2011.

The report, however, shows the bandwidths in Kenya are underutilized. According to the GoK (2012), available international bandwidth has increased more than 25-fold, from 202,720.02 Mbps from December 2010 to 5,261,919Mbps in December 2011. The usage levels remain low, with only 1.01 percent under-utilization. The period saw the number of internet subscriptions rise to 6,152,687 Internet subscriptions from 5,422,009 during the previous period, representing a 13.48 percent increase.

Broadband subscriptions increased to 131,829 from 126,589 recorded during the previous period. Mobile data/Internet subscriptions on GPRS/EDGE and 3G recorded the highest portion of the total Internet/data subscriptions of 6.07 million subscriptions compared to 5.37 million subscriptions recorded during the previous period. Fixed fiber subscriptions recorded an upward trend with a growth of 66.97 percent during the period. Compared to the same period of the past year, an increase of 337.43 percent was recorded, which shows that the service is rapidly gaining ground and possibly consuming subscriptions from satellite service that have been on a declining trend.

Additionally, satellite subscriptions declined from 774 subscriptions in the previous period to 669 during the quarter under review. A reduction of 13.57 percent was recorded during the period as well as a 27.36 percent decline compared to the same period of the previous year (GoK, 2012).

In Kenya, more towns are getting connected to the recently launched Fibre optical inclusive of the Meru, which is in tandem with Kenya's Vision 2030 objective of improving the quality of life for the citizens of Kenya. This will transform employment markets, enhancing social infrastructure, securing good governance, and making Kenya an ICT hub in Africa. Table 1 provides a summary of internet subscriptions per operator in Kenya by Communication Commission of Kenya in 2012.

Table-1. Internet Subscriptions per operator in Kenya by GoK (2012).

No	Name of the Operator	Subscriptions	Market Share
1	Safaricom	2,977,584	92.18
2	Airtel Kenya Ltd	149,053	4.61
3	Telkom Orange	77,668	2.40
4	Access Kenya	7,512	0.23
5	Wananchi Telkom Ltd	7,500	0.23
6	Kenya Data Networks	7,451	0.17
7	Africa Online	1,608	0.05
8	Flexible Bandwidth	1,198	0.04
9	Swift Global	1,133	0.03
10	Callkey Network Ltd	800	0.02
11	Others	516	0.01
12	Total	3,232,023	100

Source: GoK (2012).

1.1. Statement of the Problem

Meru is one of the towns in Kenya where internet subscriptions are low compared to other cities like Nakuru, Eldoret, Kisumu, with each having over 15,000 internet broadband subscriptions among other cities despite the availability of high-speed internet connections. Data available from Orange Telkom Meru Branch indicates a connection of 363 Units with 200 router connections and 163 live box connections, Meru Safaricom Retail Shop Data Bank (2013). Safaricom has over 2,200 internet connections in Meru Municipality, according to Meru Safaricom Retail Shop Data Bank (2013). Individuals, businesses, residential places, banks, government offices, hospitals, learning institutions, and other private entities have been connected to the internet, but the uptake has taken a low turn. Hence the researcher sought to investigate the factors influencing this slow uptake of internet connectivity by Meru Municipality residents as compared to other towns.

1.2. Purpose of the study

The purpose of the study was to investigate factors influencing the uptake of internet connectivity in Meru Municipality.

1.3. Objectives of the Study

The researcher's objectives of the study were:

i. To establish the influence of bandwidth speed on the uptake of internet connectivity in Meru Municipality.
ii. To assess the impact of advertisement on the uptake of internet connectivity in Meru Municipality.
iii. To determine the influence of the cost of the internet on the uptake of internet connectivity in Meru Municipality.
iv. To examine the influence of literacy levels on the uptake of internet connectivity in Meru Municipality.

1.4. Research Questions

The research study was guided by the following research questions:

i. How does bandwidth speed influence the uptake internet connectivity in Meru Municipality?
ii. How does advertisement influence the uptake of internet connectivity in Meru Municipality?
iii. How does cost of internet influence the uptake of internet connectivity in Meru Municipality?
iv. How does literacy level influence the uptake of internet connectivity in Meru Municipality?

1.5. Significance of the Study

The study would be relevant to the policymakers, especially the Ministry of Information and Technology, in assessing our steps toward achieving Kenya Vision 2030, which is our country's long-term development objective of making our country an ICT hub in Africa. It will also be necessary for measuring our achievements towards meeting the Millennium Development Goals.

Much of the information would also be vital to future academics, whereby the findings of this study will be used as a foundation base for further research.

1.6. Delimitation of the Study

The study covered Meru Municipality areas of Township, Gakoromone, and Kaaga. The researcher involved selected individuals connected to the internet. The findings of this study can also be generalized to larger populated towns like Kisumu or Nakuru, with a higher population of over 100,000 persons.

1.7. Limitations of the Study

The study was limited to several challenges; time to exhaustively cover all the Municipality area, also through the interview some of the respondents were unwilling to give some information for security reasons or answers they felt were too personal or difficult. The questionnaire design might have some inadequacy such that some information from the respondents might have been inaccurate.

1.8. Assumptions of the Study

The researcher assumed that majority of the Meru Municipality residents had a concrete idea of what internet connectivity entails.

The researcher assumed that the connected customers targeted as respondents participated fully in the

research, and their responses were honest.

2. Research Methodology

2.1. Introduction

The chapter dealt with the procedures through which the research data was collected. To be more specific, the research design, the target population, sampling methods (procedures), and methods of data collection are keys areas that the researcher studied.

2.2. Research Design

A research design is a program to guide the researcher in the collection, analyzing, and interpreting observable facts (Kothari, 2003). The research study was undertaken by the use of a descriptive survey. A descriptive survey is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals. This type of research attempts to describe such things as possible behavior, attitudes, and characteristics. Descriptive studies are not only restricted to fact-finding but may often result in the formulation of critical knowledge and solutions to significant problems (Kothari, 2003).

2.3. Target Population

The study covered Meru Municipality administrative area namely Township, Kaaga and Gakoromone areas with total households of 8,159 and a population of 27,303 persons covering an area of 8.7 Sq. KM. Sampling was done from a total population of 363 Orange internet connected units and 2,200 Safaricom connected individuals while the actual sample was got from individual connected persons among the connected population. The researcher therefore got the necessary information from them.

2.4. Sampling Procedure

Time and resources available to a researcher, the researcher should take a big sample as possible (Kothari, 2003). However, the sample size depends on other factors such as the number of variables in the study, type of the design, method of data analysis, and the size of the accessible population. For descriptive studies, 10% of the target population is enough (Kothari, 2003). Hence on this basis, the researcher used 20 connected units from a population of 200 units connected through routers and a sample of 16 connected units through live boxes (10% of the 200 and 163 units respectively). An example of 100 individuals was used as respondents from Safaricom (from a population of 2,200 Wi-fi routers connected individuals) to be distributed across the three administrative units of Gakoromone, Township and Kaaga areas (Kothari, 2003). The Sample was distributed as follows, if Pi represents proportion of population in stratum i, and n represents the total sample size, the number of element selected from stratum i, is n.pi, (Kothari, 2003). This was calculated as follows; Sample size (n) = 100 to be drawn from a population size (N)= 27,303 divided into three strata sizes. The actual respondents from the sample was determined by getting the list of all numbered connected units from Telkom Orange and Safaricom Data Banks and randomly picking the twenty-second connected individual in the list as per Table 2.

Table-2. Sample size.

Area	Formula	Sample Size
Township (N1)	4,156/ 27,303 * 100	15
Kaaga (N2)	11,689/ 27,303 * 100	43
Gakoromone (N3)	11, 458/27,303 * 100	42
Total		100

Source: Ndeke (2013).

2.5. Methods of Data Collection

Both primary and secondary data were used for this research study. Primary data was collected through the administration of questionnaires. The questions were both open and closed. Some of the questionnaires were self-administered but the researcher was also available to clarify any items that will be unclear to the respondents. Besides, some of the questionnaires were left to the respondents to fill later if they were unavailable to be collected on agreed date. Questionnaires were appropriate in gathering much information from respondents on the uptake of internet connectivity in Meru municipality.

2.6. Piloting

Piloting of the research document was carried out to determine the validity and reliability of the research instrument.

2.6.1. Validity of the Research Instrument

Validity is the degree to which a tool measures what it purports to measure. Validity is concerned with whether the findings are really what they appear to be about. The instrument validity was ensured through the continuous expert advice of my supervisors who are well versed in research.

Table-3. Operation definition of variables. Objectives.

	Type of Variable	Indicator	Measurement	Data collection Method	Level of scale	Types of analysis	Level of analysis
To investigate influence of bandwidth speed internet connectivity.	Independent Variable/ Bandwidth speed	Type of activity/ No of Customers using bandwidth band(5 to 9 mbps, 10 to 15 mbps)	Type of activity like File sharing, internet, web/data, video calling etc Numbers	Questionnaire/ Questionnaire	Nominal Ratio Nominal	Quantitative Quantitative	Descriptive Descriptive
To find out influence of advertisement on internet connectivity	Independent Variable Advertisement	Medium Target Pop Timing	TVs, Posters, Radio, road shows Audiences Time of advertisement.	Questionnaire	Nominal	Quantitative /Qualitative	Descriptive
To examine influence of internet cost on internet connectivity	Independent Variable Cost of internet	Duration Megabytes provided per K.sh	Days, Months, Number	Questionnaire	Nominal Nominal	Quantitative /Qualitative Qualitative/ Quantitative	Descriptive Descriptive
To establish influence of literacy levels on uptake of internet Connectivity	Independent Variable Literacy	Level of Education Languages Known	Levels Numbers	Questionnaire Questionnaire	Nominal Nominal	Qualitative/ Quantitative Quantitative / Qualitative	Descriptive Descriptive

Source : Ndeke (2013).

2.6.2. Reliability

Reliability is a measure of the degree to which a research instrument yields consistent results on data after repeated trials. A reliable tool is one that produces consistent results when used more than once to collect data from the sample randomly drawn from the sample population.

In the research study, a pilot study was carried out by administering the questionnaire to selected few individuals to determine the reliability of the tool. To test the reliability of the instrument, the researcher used spilt-half technique. The research instrument was split into two subtests, one consisting of odd-numbered items/questions and the other made of all even-numbered items. The score of all odd-numbered and even-numbered items of the responses in the pilot study was computed separately. The odd-numbered scores for all items were correlated with the even-numbered scores using the Pearson product correlation coefficient. The results of the Pearson Product correlation co-efficient turned out to be above 0.75, and hence the instrument was highly reliable.

2.7. Operation Definition of Variables

Factors influencing the uptake of internet connectivity in Meru Municipality definition of variables as shown in Table 3.

3. Data Analysis, Presentation and Interpretation

3.1. Introduction

This chapter deals with data analysis, presentation, and interpretation of the study findings, the findings were based on all data collected, including primary as well as secondary data collected from the field. The main objective was to investigate the factors influencing the uptake of internet connectivity among Meru Municipality residents. The research objectives covered included advertisement, cost of internet, literacy levels, and bandwidth speed. Data were analyzed using SPSS. The findings were then presented in tables, frequencies, and percentages.

3.2. Questionnaire Return Rate

A total of One hundred and thirty-six (136) questionnaires were distributed to the respondents across three administrative units of Township, Kaaga, and Gakoromone. Table 4 below represents the questionnaire return rate by Meru Municipality residents.

Table-4. Questionnaire return rate by Meru Municipality residents (2013).

Questionnaire return rate	No.
Total questionnaire given	136
Questionnaire returned	105
Percentage	76%

Source: Ndeke (2013).

Out of this, a total of 105 questionnaires were returned, representing a 76 percent return rate, which was adequate for analysis.

3.3. Descriptive Analysis on the Uptake of Internet Connectivity by Meru Municipality Residents

The study sought to determine the demographic characteristics of the respondents based on gender, educational level and language spoken and the findings are as presented in Table 5.

Table-5. demographic characteristics of Meru municipality residents by gender distribution (2013).

Sex	Frequency	Percent
Male	46	43.8
Female	59	56.2
Total	105	100

Source: Ndeke (2013).

Majority of the respondents 59 (56.2%) were female with while male was 46(43.8%); hence the respondents gender no wide variance. The study sought to investigate the respondent's level of education as shown in Table 6.

Table-6. Education level of Meru municipality resident's (2013).

Education Level	Frequency	Percent
Primary level	3	2.9
Secondary level	31	29.5
Diploma Level	41	39.0
University level	30	28.6
Total	105	100.0

Source: Ndeke (2013).

Of the respondents sampled, the majority (41) had a diploma level in education with 39.0 percent, while the primary level of education had the lowest respondents with (3) 2.9 percent. The secondary level had (31)29.5 percent while the university level had (30) 28.6 percent, indicating that the majority of the respondents were literate enough to know what internet connectivity entails.

The study sought to determine languages spoken by respondents, as shown in Table 7.

Table-7. Languages spoken by Meru municipality residents (2013).

Language	Frequency	Percent
English or Kiswahili	103	98.1
Foreign Languages	2	1.9
Total	105	100.0

Source: Ndeke (2013).

(103) 98.1 percent of the respondents were either familiar with English or Kiswahili, while only two respondents were familiar with foreign languages, mainly French, as Table 7 indicates.

The study sought to determine devices used by the respondent to access the internet, as shown in Table 8.

Table-8. Devices used to access the internet by Meru municipality residents (2013).

Type of device	Frequency	Percent
Computer	6	5.7
Mobile Phone	40	38.1
Both (Computer & Mobile)	59	56.2
Total	105	100.0

Source: Ndeke (2013).

A majority of the respondents used both computers and their mobile phones to connect to the internet with (59) 56.2 percent while (40) 38.1 percent used mobile phones while the rest (6) 5.7 percent used computers to surf hence the majority of respondents used both computers and mobile phones to access the internet as Table 8. indicates.

The study sought to determine megabytes subscribed and their cost by the respondents, as shown in Table 9.

Table-9. Megabytes cost (Subscriptions) of internet among Meru municipality residents.

Megabytes Prices	Frequency	Percent
0-49MB for less than KES 100	44	41.9
50-99MB for KES 100- 150	36	34.3
100-499MB for KES 150-500	19	18.1
500-1000MB for KES 500-1000	6	5.7
Total	105	100.0

Source: Ndeke (2013).

A majority of the respondents utilized a lower denomination Megabytes of less than KES 100 with a (44) 41.9 percent, (36) 34.3 percent subscribed to MB of between KES 100-150, (19)18.1 percent subscribed to cost of between 150-500 K.sh while (6) 5.7 % subscribed to the cost of between K.sh 500 and K.sh 1000 indicating that lower denomination subscriptions were in great use as shown in Table 9.

The study sought to find out the respondent's access to the internet, as shown in Table 10.

Table -10. Access to internet by Meru municipality residents (2013).

Frequency of access	Frequency	Percent
Once a Month	3	2.9
Once a week	17	16.2
Several times a week	40	38.1
Everyday	34	32.4
Several times a day	11	10.5
Total	105	100.0

Source: Ndeke (2013).

A majority of residents accessed internet several times per week with (40) 38.1 percent, (34) 32.4 percent accessed every day, (17)16.2 accessed once per week, (11)10.5 percent accessed several times a day while (3)2.9 percent accessed once a month clearly showing that majority of residents accessed the internet every day and several times a week as shown in Table 10.The study sought to find out respondent opinion on the cost of internet as shown in Table 11.

Table-11. Respondent opinion on the cost of internet by Meru municipality residents (2013).

Cost Level	Number	Percentage
Low cost	4	3.8
Medium Cost	58	55.2
High Cost	43	41.0
Total	105	100.0

Source: Ndeke (2013)

The majority of the respondent viewed the cost of internet cost as medium with (58) 55.2 percent, (43) 41.0 percent regarded the price as high while (4) 3.8 percent viewed the cost as low as shown by Table 11.

The study sought to investigate hours spent online by the respondent, as shown in Table 12.

Table-12. Hours spent online by Meru municipality residents (2013).

Hours Spent	Frequency	Percent
Less than five hours	40	38.1
Six to Fifteen hours	41	38.0
Over fifteen hours	24	22.9
Total	105	100.0

Source: Ndeke (2013)

The majority of the respondents spent zero to fifteen hours, representing an (81) 76 percent. The rest (24)22.9 percent spent over fifteen hours, clearly showing heavy use of the internet was minimal, as shown in Table 12.

Table-13. Meru municipality resident's connection speed opinion provided by internet service providers (2013).

Speed Level	Frequency	Percent
Very low	5	4.8
Low	5	4.8
Medium	53	50.5
High	31	29.5
Very high	11	10.5
Total	105	100.0

Source: Ndeke (2013)

The study sought the respondent's opinion on speed provided by the internet service provider, as shown in Table 13.

Majority of the respondents viewed the speed provided by their internet providers at medium level with (53) 50.5 percent, (31) 29.5 percent viewed the rate as high, (11)10.5 percent viewed the speed as very high while (5) 4.8 percent viewed the speed as low and very as shown in Table 13.

The research study sought to assess respondent's opinion on speed satisfaction level as shown in Table 14.

Table-14. Respondent opinion on speed satisfaction levels by Meru municipality residents (2013).

Opinion	Frequency	Percent
Yes	70	66.7
No	35	33.3
Total	105	100.0

Source: Ndeke (2013)

(70)66.7 percent of the respondents were satisfied with the speed. In comparison with (35), 33.3 percent viewed the rate as not satisfactory, clearly illustrating that majority of Meru residents were happy with the speed, as shown in Table 14.

The study sought to determine respondent use of the internet, as shown in Table 15.

Table-15. Meru Municipality residents use of internet (2013).

Use of internet	Frequency	Percent
Own entertainments	53	50.5
School or work purposes	52	49.5
Total	105	100.0

Source: Ndeke (2013)

Almost an equal number used the internet for own entertainment and school or work purposes with (53) 50.5 percent for entertainment while (52)49.5 for school or work purposes.

The study sought to determine the respondent's age distribution, as shown in Table 16.

Table-16. Meru Municipality residents age distribution (2013).

Age distribution	Frequency	Percent
10- 18 Years	16	15.2
19-25 Years	31	29.5
26-30 Years	32	30.5
31-35 Years	15	14.3
Over 35 Years	11	10.5
Total	105	100.0

Source: Ndeke (2013)

About (32) 30.5 percent of the respondents were in the age bracket of 26- 30 years, (31) 29.5 percent were in the age bracket of 19-25 years, (16) 15.2 percent were in the age bracket of 10-18 years and (15) 14.3 percent were in the age bracket of 31-35 years while (11)10.5 percent were over 35 years clearly indicating access to the internet was across the different age groups as shown in Table 16.The study sought to find out how the respondents learnt about internet connection shown in Table 17.

Table-17. How Meru Municipality residents learnt about internet connection (2013).

Medium	Frequency	Percent
TV advert	57	54.3
Posters Advert	32	30.5
Road show advert	4	3.8
Friends	12	11.4
Total	105	100.0

Source: Ndeke (2013)

The majority of the respondent learned about the internet through TV advert with (57) 54.3 percent, (32) 30.5 percent through posters, (12) 11.4 percent through friends, and (4)3.8 percent through roadshows as shown in Table 17.

The study sought to know whether the advertisement appealed to the respondent or not, as shown in Table 18.

Table-18. Opinion on advertisement appeal by Meru municipality residents (2013).

Residents Opinion	Frequency	Percent
Yes	89	84.8
No	16	15.2
Total	105	100.0

Source: Ndeke (2013)

Of the respondents sampled, (89) 84.8 percent were appealed by the advertisement while (16) 15.2 percent were not attracted by the ad, a clear indication that there was an opportunity for more publicity, as shown in Table 18.The study sought to determine respondent opinion on the factors influencing the uptake of internet connectivity as shown in Table 19.

Table-19. Opinion on the factors influencing the uptake of internet connectivity by Meru municipality residents (2013).

Residents Opinion	Frequency	Percent
Low Bandwidth speed	21	20.0
Lack of advertisement	18	17.1
High Cost	44	41.9
High literacy requirement	22	21.0
Total	105	100.0

Source: Ndeke (2013)

Of the respondents sampled (44), 41.9 viewed the high cost of the internet as one of the significant factor influencing internet connectivity, (22) 21 percent high literacy requirement, (21) 20 percent low bandwidth speed and (18) 17.1 percent lack of advertisement, a clear indication that cost was one of the significant factor influencing internet connectivity in Meru Municipality as shown in Table 19.

3.4 Cross Tabulation of Tables

i. To examine the influence of literacy levels on the uptake of internet connectivity among the Meru municipality residents

Table-20. A cross tabulation of respondent's education levels versus respondent use of internet.

	Respondent's use of internet			
Education level	**Own entertainment**	**School or work purposes**	**Total**	
Primary Level	Count	3	0	3
	% within education level	100.0%	0.0%	100.0%
Secondary Level	Count	26	5	31
	% within education level	83.9%	16.1%	100.0%
Diploma Level	Count	16	25	41
	% within education level	39.0%	61.0%	100.0%
University level	Count	8	22	30
	% within education level	26.7%	73.3%	100.0%
Total	Count	53	52	105
	% within education level	50.5%	49.5%	100.0%

Source: Ndeke (2013).

Education levels affected respondent use of the internet, a (3)100% with a primary level of education utilized the internet for own entertainment like chat rooms, playing computer games, and downloading music or video. (26) 83.9 % with a secondary level of education used the internet for own entertainment while (5) 16.1 % used the internet for school or work purposed like sending or receiving emails, word processing, and research. (16) 39 % with diploma level used internet for own entertainment while (25) 61 % used for school or work purposes. (8) 26.7 % with university-level used internet for entertainment while (22) 73.3 % used it for school or work purposes, as shown in Table 20. From this, we conclude that once the education level of respondents rises, much of the internet use is either for work or school purposes.

Table-21. Respondent literacy level * internet use chi-square test.

Statistic Test	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	25.728	3	.000
Likelihood ratio	28.518	3	.000
Total cases	105		

Source: Ndeke (2013).

Our p-value is 0.00, which is a very low probability making our variables dependent and thus concluding that education levels tie very much with what each respondent does when on the internet, since as one education level advances much of the internet use is either for work or school purposes as shown in Table 21.

Table-22. A cross tabulation of Respondent age versus use of the internet.

		Respondent's use of internet		
		Own entertainment	School or work purposes	Total
10-18 years	Count	15	1	16
	% within respondent age	93.8%	6.3%	100.0%
19-25 years	Count	16	15	31
	% within respondent age	51.6%	48.4%	100.0%
26-30years	Count	14	18	32
	% within respondent age	43.8%	56.3%	100.0%
31-35 years	Count	5	10	15
	% with respondent age	33.3%	66.7%	100.0%
Over 35 years	Count	3	8	11
	% within respondent age	27.3%	72.7%	100.0%
Total	Count	53	52	105
	% within respondent age	50.5%	49.5%	100.0%

Source: Ndeke (2013).

The majority of the respondents in the age bracket of 10-18 years used the internet for entertainment purposes with (15) 93. 8 % against (1) 6.3 % for school or work purposes. For 19- 25 age bracket, (16)51.6 % used for entertainment while (15)48.4% used for school or work purposes. For 26-30 age brackets, (14) 43.8 % used the internet for entertainment while (18)56.3% used for school or work purposes, as shown in Table 22. For 31-35 age brackets (5), 33.3 % used the internet for entertainment while (10) 66.7 % used for work or school purposes. For those over 35 years, (3)72.7 % used internet for school or work purposes while only (8)27.3 % used the internet for entertainment. Therefore, we can conclude that the younger generation used the internet for entertainment purposes, while the older generation utilized the internet for school or work purposes.

Table-23. Respondent age * use of internet chi-square test.

Statistical Test	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	16.714	4	.002
Likelihood ratio	19.281	4	.001
Total cases	105		

Source: Ndeke (2013).

Our p-value is 0.002, which is a very low probability making our variables dependent and thus concluding that respondent age ties very much with what each respondent does when on the internet as the younger generation uses the internet for entertainment. In comparison, the older generation uses the internet for work or school purposes, as shown in Table 23.

ii. To assess the influence of advertisement on the uptake of internet connectivity among Meru Municipality residents.

Table-24. A cross tabulation of how the respondent learnt versus age of the respondent.

Age	TV advert	Posters adv.	Road show	Adv Friends	Total
10-18 years Count	6	7	0	3	16
% within respondent age	37.5%	43.8%	0%	18.8%	100.0%
19-25 years Count	21	5	1	4	31
% within respondent age	67.7%	16.1%	3.2%	12.9%	100.0%
26-30 years Count	17	12	2	1	32
% within respondent age	53.1%	37.5%	6.3%	3.1%	100.0%
31-35 years Count	6	6	1	2	15
% within respondent age	40.0%	40.0%	6.7%	13.3%	100.0%
Over 35 years Count	7	2	0	2	11
% within respondent age	63.6%	18.2%	0.0%	18.2%	100.0%
Total Count	57	32	4	12	105
% within respondent age	54.3%	30.5%	3.8%	11.4%	100.0%

Source: Ndeke (2013).

For the 10-18 age bracket category, the majority of the respondents learned about the internet through posters advert at (7) 43.8% followed by TV advert at (6)37.5 %. For 19-25 years bracket, majority of the respondent learned about the internet through TVs advert at (21) 67.7% followed by posters at (5)16.1%. For 26-30 years bracket majority of the respondent learned about the internet through TV advert at (17)53.1% followed by posters at (12) 37.5%. For 31-35 years bracket majority of the respondent learned about the internet through TVs and posters advert tying at (12) 40.0 %, as shown in Table 24. Those over 35 years discovered through TV advert at (7) 63.6%. We conclude, therefore, the majority of the respondents learned about the internet through TVs and Posters advert at (57)54.3% and (32) 30.5% respectively.

Table-25. How the respondent learnt *age of respondent chi-square test.

Statistical Test	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	12.247	12	.426
Likelihood ratio	14.149	12	.291
Total cases	105		

Source: Ndeke (2013).

Our p-value is 0.426, which is a very high probability making our variables independent and thus concluding that the respondent age does not tie with how the respondent learned about internet connection, as shown in Table 25.

Table-26. A cross tabulation of how the respondent learnt versus advertisement appeal.

	Advertisement appeal to respondent		
How the respondent learnt	**Yes**	**No**	**Total**
TV advert	50	7	57
% within how the respondent learnt	87.7%	12.3%	100.0%
Posters advert	29	3	32
% within how the respondent learnt	90.6%	9.4%	100.0%
Road show advert	2	2	4
% within how the respondent learnt	50.0%	50.0%	100.0%
Friends	8	4	12
% within how the respondent learnt	66.7%	33.3%	100.0%
Total	89	16	105
% within how the respondent learnt	84.8%	No	100.0%

Source: Ndeke (2013).

In Table 26 above, (50) 87.7 % of the respondents who learned about internet connection through TVs advert were appealed by it, (29) 90.6 % of the respondents who learned about internet connection through posters were appealed by it, and (8) 66.7% of the respondents who learned about internet connection through friends were appealed. We conclude, therefore, that majority of the respondents were attracted by the advertisement to connect to the internet by whatever marketing medium.

iii. To determine the influence of cost of internet on the uptake of internet connectivity among Meru Municipality residents.

Table-27. A cross tabulation of megabytes cost versus hours spent online.

	Hours spent online			
Megabytes Cost	**Less than 5 hrs**	**6-15 hrs**	**Over 15 hrs**	**Total**
0-49MB for < KES 100	25	17	2	44
% within megabytes cost	56.8%	38.6%	4.5%	100.0%
50-99MB for KES 100-150 Count	11	17	8	36
% within megabytes cost	30.6%	47.2%	22.2%	100.0%
100-499 for KES 150-500	2	6	11	19
% within megabytes cost	10.5%	31.6%	57.9%	100.0%
500-1000MB for KES 500-1000 Count	2	1	3	6
%within megabytes cost	33.3%	16.7%	50.7%	100%
Total	40	41	**24**	**105**
%within megabytes cost	38.1%	39.0%	22.9%	100.0%

Source: Ndeke (2013).

Majority of the respondents who subscribed to less than 50MB spent less than five hours online with (25) 56.8%, (17) 47.2 % of the respondents who subscribed for 50-100MB spent six to fifteen hours online,(11) 57.9% of the respondents who subscribed 100-499 MB spent over fifteen hours online and (3) 50.7% of respondents who subscribed for 500-1000MB spent over fifteen hours as shown in Table 27. We conclude, therefore, that respondents spent more hours online as the data bundle subscription increased.

Table-28. Megabytes cost * hours spent online chi-square test.

Statistical Test	**Value**	**df**	**Asymp. Sig. (2 sided)**
Pearson Chi-square	28.671	6	.000
Likelihood ratio	29.541	6	.000
Total cases	105		

Source: Ndeke (2013).

Our p-value is 0.00, which is a very low probability making our variables dependent and thus concluding that megabytes prices (subscribed) ties very much with hours spent online by the respondents with higher subscriptions respondent spending more time online as shown in Table 28.

iv. To examine the influence of bandwidth speed on uptake of internet connectivity among Meru Municipality residents.

Table-29. A cross tabulation of connection speed versus access to interne.

	Access to internet by respondent					
Speed	**Once a month**	**Once a week**	**Several times a week**	**Everyday**	**Several times a day**	**Total**
Very low Count	0	2	0	2	1	5
% within speed	0%	40.0%	0%	40.0%	20.0%	100.0%
Low Count	2	1	1	0	1	5
% within speed	40.0%	20.0%	20.0%	0	20.0%	100.0%
Medium Count	0	7	19	21	6	53
% within speed	0	13.2%	35.2%	39.6%	11.3%	100.0%
High Count	0	4	14	10	3	31
% within speed	0%	12.9%	45.2%	32.3%	9.7%	100.0%
Very high Count	1	3	6	1	0	11
% within speed	9.1%	27.3%	54.5%	9.1%	0%	100.0%
Total Count	3	17	40	34	11	105
% within speed	2.9	16.2	38.1	32.4	10.5	100.0%

Source: Ndeke (2013).

Majority of the respondent who viewed connection speed as average accessed internet several times a week with (19) 35.2% while others who accessed the internet every day with (21) 39.6 %. Those who viewed connection speed as high accessed internet several times a week with (14) 45.2 % while others who accessed the internet every day with (10) 32.3%. The majority of the respondents who viewed connection speed as very high accessed the internet several times a week with (6) 54.5 %, as shown in Table 29. We conclude then the majority of respondents accessed the internet several times a week and viewed speed connection as medium and high.

Table-30. Connection speed * access to internet chi-square test.

Statistical Test	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	41.385	16	.000
Likelihood ratio	30.594	16	.015
Total cases	105		

Source: Ndeke (2013).

Our p-value is 0.00, which is a very low probability making our variables dependent and thus concluding that connection speed ties very much with access to the internet by respondents, as shown in Table 30.

Table-31. A Cross tabulation of connection speed versus respondent speed satisfaction.

	Respondent speed satisfaction		
Connection speed	**Yes**	**No**	**Total**
Very low	3	2	5
% within connection speed	60.0%	40.0%	100.0%
Low	2	3	5
% within connection speed	40.0%	60.0%	100.0%
Medium	33	20	53
% within connection speed	62.3%	37.7%	100.0%
High	23	8	31
% within connection speed	74.2%	25.4%	100.0%
Very high	9	2	**11**
% within connection speed	81.8%	18.2%	100.0%
Total	70	35	105
% within connection speed	66.7%	33.3%	100.0%

Source: Ndeke (2013).

Out of the 53 respondents who viewed the speed connection as medium, (33) 62.3% viewed the speed as satisfactory while (20) 37.7 percent viewed the speed on the negative side. Out of 31 respondents who viewed the speed as high, 74.2 % that is 23 respondents confirmed the speed to be satisfactory while (8)25.4 % viewed the speed as not adequate, as shown in Table 31. We conclude, therefore, that the respondents who saw the connection speed as medium and high were comfortable with it, that is, a total of 56 respondents.

4. Summary of Findings, Discussions, Conclusions and Recommendations

4.1. Summary of Findings

Out of the total of 105 respondents, The Majority of the respondents were females with 56.2 percent, while males represented 43.8 percent. To get a picture of literacy levels among the respondents, results on education levels indicated that Majority had diploma level in education with 39.0 percent. In comparison, the primary level of education had the lowest respondents, with 2.9 percent. The secondary level had 29.5 percent, while the university level had 28.6 percent. On languages spoken, 98.1 percent of the respondents were either familiar with English or Kiswahili, while only two respondents were familiar with foreign languages, mainly French.

The results also indicated that a majority of the respondents used both computers and their mobile phones to connect to the internet with 56.2 percent. In comparison, 38.1 percent used mobile phones, while the rest 5.7 percent used machines to access the internet. On the cost of internet and megabytes subscribed by respondents, the results analyzed indicated that a majority of the respondents utilized a lower denomination Megabytes of less than KES 100 with a percentage of 41.9 percent, 34.3 percent subscribed to MB of between KES 100-150, 18.1 percent subscribed to cost of between 150-500 K.sh. In contrast, 5.7 subscribed to the cost of between K.sh 500 and K.sh 1000. When asked about their general view on the value of the internet, the Majority of the respondent viewed the cost of internet cost as medium with 55.2 percent, 41.0 percent viewed the price as high while 3.8 percent viewed the cost as low.

On how often they accessed the internet, a majority of residents accessed the web several times per week, with 38.1 percent. 32.4 percent accessed every day,16.2 accessed once per week, 10.5 percent accessed several times a day while 2.9 percent accessed once a month while the Majority of the respondents spent between zero to fifteen hours representing 76 percent. The rest 22.0 percent spent over fifteen hours.

On the connection speed available, the majority of the respondents viewed the rate provided by their internet providers at medium level with 50.5 percent, 29.5 percent viewed the pace as high, 10.5 percent viewed the speed as very high. In comparison, 4.8 percent saw the rate as low and very. Besides, 66.7 percent of the respondents were satisfied with the speed, while 33.3 percent viewed the speed as not satisfactory.

On internet usage by the respondents, results indicate that almost an equal number used the internet for own entertainment and school or work purposes with 50.5 percent for entertainment while 49.5 for school or work purposes. The results investigated the age bracket of the respondent and discovered that about 30.5 percent of the respondents were in the age bracket of 26- 30 years, 29.5 percent were in the age bracket of 19-25 years,15.2 percent were in the age bracket of 10-18 years, and 14.3 percent were in the age bracket of 14.3 percent while 10.5 percent were over 35 years.

On how the respondent learned about their current internet connection, the majority of the respondents

learned about the internet through TV advert with 54.3 percent, 30.5 percent through posters, 11.4 percent through friends, and 3.8 percent through roadshows. Besides, of the respondents sampled, 84.8 percent were appealed by the advertisement, while 15.2 percent were not attracted by the ad. When asked about which factor the respondent thought influenced this uptake of the internet,41.9 viewed the high cost of the internet as one of the significant factor affecting internet connectivity, 21 percent high literacy requirement, 20 percent low bandwidth speed, and 17.1 percent lack of advertisement.

4.2. Discussions of Findings

Of the respondents sampled, Male represented 56.2% while females represented 43.8 % hence no significant variation. Therefore, we conclude that gender did not have much effect on internet connectivity and thus depended on individuality. To show the relationship between variables, cross-tabulation and Pearson square were calculated.

4.2.1. Objective One: Literacy Levels and Internet Connectivity

Education levels were cross-tabulated with the use of the internet; the results indicated that: 100% with a primary level of education utilized the internet for own entertainment like chat rooms, playing computer games, and downloading music or video. 83.9 percent with a secondary level of education used the internet for own entertainment. In comparison, 16.1 percent used the internet for school or work purposed like sending or receiving emails, word processing, and research. 39 % with diploma level used the internet for their own entertainment while 61 % used for school or work purposes. 26.7 % with university-level used internet for entertainment while 73.3 % used it for school or work purposes. From this, we conclude that once the education level of respondents rises, much of the internet use is either for work or school purposes. Besides, 98.1 percent were familiar with either English or Kiswahili, which is in tandem with what search engines like Google offer their contents in. Also, a chi-square test revealed a low probability hence concluding that education levels tie very much with what each respondent does when on the internet. This finding goes well with Rogers (1995) who noted that the internet has mainly diffused in urban areas among the comparatively wealthy and educated considering Meru Municipality is a metropolitan area.

4.2.2. Objective Two: Advertisement and Internet Connectivity.

A cross-tabulation between the advertisement medium through which respondents learned about internet connection and age revealed that; for 10-18 years bracket majority of the respondents learned about the internet through posters advert at 43.8% followed by TV advert at 37.5 %. For 19-25 years bracket majority of the respondent learned about the internet through TVs advert at 67.7% followed by posters at 16.1%, in 26-30 years bracket majority of the respondent learned about the internet through TVs advert at 53.1% followed by posters at 37.5%, in 31-35 years bracket majority of the respondent learned about the internet through TVs and posters advert tying at 40.0 %. Those over 35 years discovered through TV advert at 63.6%. The majority of the respondents learned about the internet through TVs and Posters advert at 54.3% and 30.5% respectively. A chi-square test revealed a high probability and thus concluding that the respondent's age does not tie with how the respondent learned about the internet connection. We can conclude that the purpose of advertising is to create awareness of the advertised product and provide information that will assist the consumer in making a purchase decision. The relevance of advertising as a promotional strategy, therefore, depends on its ability to influence consumers not only to purchase but to continue to repurchase and eventually develop- brand loyalty (Mittal, 2001).

4.2.3. Objective 3: Cost of Internet Connection

A cross-tabulation between the number of megabytes subscribed and hours spent online revealed that, Majority of the respondents who subscribed to less than 50MB spent less than five hours online with 56.8%, 47.2 % of the respondents who subscribed for 50- 100MB spent six to fifteen hours online, 57.9% of the respondents who subscribed to 100-499 MB spent over fifteen hours online and 50.7% of respondents who subscribed for 500-1000MB spent over fifteen hours. We therefore conclude that respondents spent more hours online as the data bundle subscription increased. The chi-square test also revealed a low probability hence finding that the cost of that megabyte (subscribed) ties very much with hours spent online by the respondents. We also conclude that the Majority of lower age brackets accept to lower data bundles mainly for chat room purposes. From these findings, we conclude that the high cost of the internet is a hindrance to internet subscription, which is much shared with GoK (2012), which found that 28 % of Kenyans cited the cost of internet subscription as a significant hindrance.

4.2.4. Objective Four: Internet Speed Connection.

On internet speed connection, the majority of the respondents viewed the speed provides by their internet providers at medium level with 50.5 percent, 29.5 percent viewed the rate as high, 10.5 percent viewed the speed as very high. In comparison, 4.8 percent saw the speed as low and very low. Hence the majority were comfortable with the rate, which can be attributed to the presence of 3G network provided by some of the internet service providers. The presence of high-speed could be attributed to the presence of fiber optic, which provides a more top speed packet. A concept shared by Mittal (2001) since fiber optic services starts as high as 10 or 20 Megabytes per second, with top-tier packages offering 50 Megabytes per second.

4.3. Conclusions

Internet connectivity is affected by many factors, including Connection speed available, cost of internet, advertisement provided, and literacy levels in a specific area. According to our research findings, the high price of internet subscriptions was identified as one of the most hindrance factor to internet accessibility by the majority of youths and even adults. The advertisement was found as the second influencing factor, with the majority of respondents feeling much has to be done by internet providers to reach potential customers. Considering the population sample had 98 percent O level of education, and 98% knew English or Kiswahili, Literacy levels was

found as the third influencing factor. Lastly, connection speed was perceived as the least factor which can be attributed to the presence of high-speed packet area around Meru Municipality. Hence it can be authoritatively concluded; that the high cost of the internet is one of the significant hindrance factors to the internet penetration in Meru Municipality.

4.4. Recommendations

1. A study should be initiated by internet service providers to determine the actual cost of internet provision across different towns, which shall be pegged to the prevailing socio-economic climate in the area.
2. Various internet providers should re-engineer their advertisement systems to capture many potential customers.
3. New areas should be mapped and included in high packet transmission sites by internet providers.

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