

AN INVESTIGATION INTO PROBLEMS OF INTERNET ACCESS AND USE IN DAR ES SALAAM, TANZANIA

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ABSTRACT

The Internet wave has had a positive impact in many aspects of national life including the economic, social, educational, political and scientific sectors. The Tanzanian government has recognised the role of the Internet in national development and is making efforts to enhance Internet access and use in the country. The Government's efforts in this regard include the enactment of a national science and technology policy, liberalizing the telecommunication sector, licensing several Internet service providers, setting up a regulatory body to oversee the privatisation of the telecommunications sector, reduction of import duty and other tariffs on software and hardware. Despite these efforts, there has been no significant increase in access and use of the Internet in Dar es Salaam and the whole of Tanzania. The study presents the results of a survey carried out on users to determine some of the problems limiting their Internet access and use in Dar es Salaam, Tanzania. The findings in usage are also presented. The results show that poor infrastructure, lack of awareness, unfriendly regulatory framework, high access charges are some of the factors limiting Internet access and use in Dar es Salaam, Tanzania.

Keywords: Internet access, Use of the Internet; Information channels.

DEVELOPMENT OF THE INTERNET IN TANZANIA

Internet development in Tanzania started in the early 90s with a very basic store and forward electronic mail facility through connections to Healthnet. Muhimbili University of Health Science, Commission of Science and Technology (COSTECH) and the University of Dar es Salaam were the first institutions to get connected. Tanzania Online and Cyber Twiga became the first online commercial companies to offer Internet services in the country through a connection from SITA (Société Internationale de Télécommunications Aéronautique) (Tanzania Internet Service Provider, 1997). Today, full Internet connectivity is available from 14 Internet Service

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Providers and this growth is attributed mainly to government policy changes. Policy changes in telecommunication sector started in 1993 when Parliament passed the Communications Act no. 18, which established the Tanzania Communication Commission that regulated telecommunication services and provided public telecommunications licences in Tanzania. New competitive services in communications have been established through private companies. Tanzania Communications Commission (TCC) has licensed new companies to complement existing Internet service providers or introduce new services to compete with Tanzania Telecommunication Company Limited (TTCL), which until recently has been a monopoly in the country. In the data communication arena, the companies that were granted licenses to operate were Datel, a joint venture company between TTCL and Nexus (a France Telecom subsidiary), SITA and Wilken Afsat. These companies were expected to facilitate wide area computer networking within Tanzania. Internet service provision until recently was deemed to be value-added service by the TCC. For this reason, Internet service providers (ISPs) could resell the service as long as they bought their Internet access connection through one of the three licensed data communication operators. Today, TCC has allowed individual ISPs to have direct international access. In 1996, Datel made Internet access available through VSAT (Very Small Aperture Terminal) satellite connections via France (Tanzania Commission for Science and Technology, 1999). Dar es Salaam today has a remarkable number of institutions from the government, non-governmental organisations and private sector that have been connected to the Internet. The University of Dar es Salaam, for example, has VSAT link, which is mainly for its own usage though limited commercial subscribers are allowed (Internet service providers in Tanzania, 1997).

Despite an increase in the number of both commercial and public Internet service providers (ISPs) in Tanzania in the last three years, Internet use in Dar es Salaam and the whole of Tanzania remains small as compared to neighbouring Kenya. Table 1 shows that Tanzania has 14 ISPs, while Kenya has 16. In terms of the number of users, Tanzania has 2,500 while Kenya has 15,000. In addition, the cost of Internet use per hour in Tanzania is US\$1.94 as opposed to US\$1.36 in Kenya. In terms of population per user, Tanzania has the highest number at 12,876 while Kenya has 1,935.

Table 1: East African Network Wizards Internet Host Survey Data

Country	No. of ISPs	No. of Users	Internet Kilo bits per sec.	Call Cost US\$/hour	Population /User	GDP US \$/head	Users/Kilo bits Internet Capacity
Kenya	16	15,000	2,000	1.36	1,935	330	8
Tanzania	14	2,500	1,098	1.94	12,876	139	2

Source: Where is Africa on the information highway? The status of Internet connectivity in Africa, 1999.

OBJECTIVES

The survey aimed to determine the problems limiting wider Internet access and use in Dar es Salaam, Tanzania, the level of Internet awareness and skills among users, the purpose and level of usage of the Internet. To accomplish these objectives, the respondents were asked the following research questions: (a) are users aware of the Internet facilities available in Dar es Salaam?; (b) for what purpose do users make use of the Internet facilities in Dar es Salaam?; (c) what problems does users face in Internet access and use in Dar es Salaam?.

The survey was carried out based on the following assumptions: (a) that the infrastructure problems hindered access and use of the Internet in Dar es Salaam; (b) there existed government policies that are meant to enhance Internet access and use in Tanzania; (c) Internet users in Dar es Salaam consisted of research organisations, government departments and the general public; (d) the level of Internet skills and awareness affected Internet access and use; (e) education level and type of job of a user affected Internet access and use; (f) the availability of access points enhanced Internet access and use; and (g) the cost of access to Internet influenced Internet usage.

The study tested hypotheses relevant to Internet access and use. The following null hypotheses were tested: (a) there is no relationship between the professional status of a person and the number of times that he/she uses the Internet; (b) there is no significant association between educational levels of a person with frequency of using the Internet; (c) there is no significant relationship between the frequency of using the Internet and the constraints associated with Internet access and use; and (d) there is no relationship between Internet awareness and level of usage of the Internet.

METHODOLOGY

The survey technique is considered appropriate for collecting detailed factual information that describe existing phenomena; identified problems, justified current conditions and make comparisons. Other advantages include the fact that it saved time and was cost-effective.

The target population consisted of Internet users from the University of Dar es Salaam, research institutions, government departments and the general public cyber cafes. These groups were chosen because they were key actors in Internet use in Dar es Salaam. The stratified random sampling method was used to draw the groups and considerable efforts were made to ensure that

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reasonable samples were drawn from each substratum. Questionnaire, physical observation and interview schedules were used to collect data.

Questionnaires were distributed to 1200 respondents from four organisations, namely, University of Dar es Salaam, Commission for Science and Technology and the President’s Office Civil Service Department. The questionnaire was used to measure the skills and awareness of using and accessing the Internet and problems affecting Internet usage. A total of 770 completed questionnaires were returned giving a response rate of 64.2%. Table 2 shows the total number of questionnaire distributed and the returns obtained from the various organisations.

Table 2: Response Rate Obtained from the Various Organisations

	Response Rates				
	UDSM	CYBER	COSTECH	GOV.	Total
Total questionnaire distributed	1,055	80	30	35	1,200
Total questionnaire returned	680	45	20	25	770
Rate of response (%)	64.5	56.3	66.7	71.4	64.2

Key: UDSM=University of Dar es Salaam; CYBER = Public cyber cafes; COSTECH = Commission for Science and Technology; GOV = Government departments.

RESULTS AND DISCUSSION

Frequency of Accessing the Internet

The respondents were asked to indicate how often they accessed and used the Internet. The results are shown in Table 3. The Table shows that the respondents who accessed and used the Internet everyday were 2.5% (20), and the rest used the Internet 2-3 days per week (2.9%, 22), once per week (9.9%, 76), less often (81.8%, 630) and those who never used the Internet were 2.9% (22). The results indicated that most respondents accessed and used the Internet either “less often” or they “never” accessed the Internet at all.

Table 3: Frequency of Accessing and Using the Internet (N=770)

Frequencies	Number of Respondents	Percentage	Cumulative Frequency (%)
Everyday	20	2.5	2.5
2-3 days per week	22	2.9	5.4
Once a week	76	9.9	15.3
Less often	630	81.8	97.1
Never	22	2.9	100.0

Educational Level and Internet Use and Access

The study investigated whether the educational level and occupation could influence Internet access and use. Respondents were asked to state their level of education and occupation status. Table 4 shows the educational level of respondents across the organisations that indicated they used the Internet. The results indicated no respondents with primary level education and all respondents had either acquired or were currently pursuing secondary, diploma,

Table 4: Educational Level of Respondents (N=770)

Educational Level	Number of Respondents	Percentage	Cumulative Frequency (%)
Primary	0	0	0
Secondary	6	0.8	0.8
Diploma	22	2.8	3.6
Bachelor	618	80.3	83.9
Master	103	13.4	97.3
Doctorate	21	2.7	100.0

bachelors, masters or Ph.D. studies. A total of 6 respondents had secondary level education, 22 had diploma qualifications, 618 had bachelors degree or were pursuing such studies, 103 had either master's degrees or were pursuing their master's studies, and 21 were pursuing or were holders of doctoral degree.

The results of Table 4 and Table 3 were cross-tabulated for a Chi-square test. The objective was to test whether there was a relationship between the levels of education of respondents and the frequency of using the Internet. The null hypothesis was that there is no relationship between the level of education and the number of times respondents use the Internet. At the significance of 5%, the value of Chi-square was 194.423 and the computed significance (p) was 0.001. The results indicated that there could be some relationship between the level of education of respondents and their frequency of using the Internet. The null hypothesis of no relationship was rejected.

Occupational Level and Internet Use and Access

Table 5 indicated the occupational status of respondents. Student users accounted for 84.4% of respondents, followed by those in the IT related jobs, lecturers, librarians, researchers, administrators and others. The Chi-square test was used to determine whether there was a relationship between the occupational status of respondents and the frequency of using the Internet.

Table 5: The Occupational Status of Respondents (N=770)

Occupations	Number of Respondents	Percentage	Cumulative Frequency (%)
Students	649	84.4	84.4
IT related jobs	22	2.9	87.3
Lecturers	20	2.6	89.9
Librarians	10	1.3	91.2
Researchers	7	0.9	92.1
Administration	47	6.1	98.2
Others	14	1.8	100.0

To achieve the best results, six professional status (IT related jobs, lecturers, librarians, researchers, administrators and other job were combined to get the category variable called “non-student professional”, while the student professional group remained unchanged. The results from Table 2 was also combined, where the variables, “everyday”, “2-3 days per week” and “once per week” were combined to get at “least once a week” while “less often” and never variables remained the same. The value of Chi-square obtained was 22.05 and the computed significance (p) was 0.01. Therefore, the null hypothesis was rejected, as the results indicated a relationship between the frequency of using Internet and occupational status of respondents.

Awareness and Skills of the Internet Users

This part of the study sought to find out whether the level of awareness and skills of Internet users affected Internet use. Users were asked whether they were aware and had the skills to perform various Internet applications such as messaging, browsing, downloading, purchasing, selling and reading newspapers. The possible responses from the respondents were either “yes” or “no”. Table 6 shows the results of respondents’ responses.

The majority of respondents from the University of Dar es Salaam used the Internet to read newspapers, followed by downloading files, browsing, advertising, purchasing and selling products or services. For the public at the Cyber cafes more of the respondents were aware of Internet for sending messages, advertising products and services, reading newspapers, browsing, downloading files, purchasing and selling products or services. At COSTECH, more than half of respondents are aware of most of the Internet applications. Comparatively, the awareness was quite low among government employees where only about a third (7-10 respondents out of 25) indicated using the Internet for seven applications presented.

Table 6: Awareness of Internet Applications Among Respondents

Category	UDSM		CYBER		COSTECH		GOV.		Row Total	
	N	Yes	N	Yes	N	Yes	N	Yes	NT	Yes
Messaging	679	10.9 (74)	45	44.4 (20)	20	75.0 (15)	25	36.0 (9)	769	15.3 (118)
Browsing	660	15.9 (105)	45	26.7 (12)	20	65.9 (13)	25	40.0 (10)	750	18.7 (140)
Downloading	600	22.3 (134)	45	11.1 (5)	20	80.0 (16)	25	28.0 (7)	690	23.5 (162)
Purchasing	502	14.3 (72)	45	8.9 (4)	20	75.0 (15)	25	28.0 (7)	592	16.6 (98)
Selling	498	14.3 (71)	45	13.3 (6)	20	75.0 (15)	25	32.0 (8)	588	17.0 (100)
Advertising	502	14.5 (73)	45	44.4 (20)	20	70.0 (14)	25	32.0 (8)	592	9.4 (54)
Reading newspapers	665	67.0 (446)	45	35.6 (16)	20	75.0 (15)	25	32.0 (8)	755	63.7 (481)

N= represents the number of respondents who responded to particular purpose of using the Internet
 NT= represents total number of respondents of all sectors.

Overall, the majority of respondents were using the Internet to read newspapers, download files, browse, sell and purchase products and services. The overall results indicated some inconsistency in terms of awareness of various Internet applications within each institution and across institutions. For example, at the University of Dar es Salaam, 447 respondents were aware of using the Internet for reading newspapers, while 84 were aware of using the Internet for sending messages. The result suggests that the level of awareness of Internet was limited to a particular Internet application in each research site.

Skills for Using the Internet

The respondents were asked whether they had skills to use the variety of applications on the Internet, namely, web searching, sending messages, purchasing and selling products or services (Table 7). The possible responses were “yes” or “no”. The “yes” response meant that the respondents had skills in the particular stipulated Internet applications. The results in the table show some inconsistent percentages of respondents having skills in various cited Internet applications. At the University of Dar es Salaam respondents reported to be very confident with their skills in sending messages, followed by web searching, selling and purchasing of services.

At Cyber cafes respondents reported being confident in sending messages and purchasing products and services. At COSTECH, about 70% of respondents

reported being confident in web searching, purchasing of products and services and sending messages. In the government departments, the respondents reported being less confident of their Internet skills (confidence ratings were between 16%-52%).

Table 7: Internet Skills Among Respondents

Category	UDSM		CYBER		COSTECH		GOV.		Row Total	
	N	Yes	N	Yes	N	Yes	N	Yes	NT	Yes
Web searching	671	15.5 (104)	45	23.3 (10)	20	75.5 (15)	25	16.0 (4)	761	17.5 (135)
Sending messages	674	75.1 (506)	45	93.3 (42)	14	70.0 (10)	25	20.0 (5)	674	84.1 (567)
Purchasing product or services	489	14.3 (70)	45	82.2 (37)	20	70.0 (14)	25	40.0 (10)	579	22.7 (131)
Selling product or services	493	14.6 (72)	45	15.6 (7)	20	14 (3)	25	52.0 (13)	583	19.4 (113)

N= represents the number of respondents who responded to particular purpose of using the Internet
 NT= represents total number of respondents of all sectors.

Overall results indicated non-consistent percentages of respondents having skills for one Internet application to another. It can be observed that the overall total percentage of respondents having skills of sending messages accounted for 84.0% (567), while the skills of other applications such as web searching, purchasing and selling products and services were 17.5% (133), 22.7% (131) and 19.4 (113) respectively. The results indicated that sending messages was a popular use of the Internet in Dar es Salaam.

Place Where Respondents Access and Use the Internet

The respondents were asked to state the places where they accessed the Internet and the frequency of accessing. The results are presented in Table 8. The majority of respondents accessed the Internet at the their libraries (65.2%) followed by the computer centre (17.0%), working place (10.8%), Cyber cafes (4.7%) and at home (1.4%).

Table 8: Access to the Internet by Location/Place

Type of Access	Number of Respondents	Percentage
Cyber cafes (n=769)	36	4.7
Library (N=768)	501	65.2
Working place (N=768)	83	10.8
Home (N=767)	11	1.4
Computer centre (N=769)	131	17.0

* Several respondents cited more than one source of access

Purpose for Using the Internet

The respondents were asked to state the purpose for which they used the Internet. Multiple choice questions were put forward. The results appeared in Table 9. The majority of respondents from UDSM (90.8%), the Cyber cafes (100%) and government departments (88%) used the Internet to communicate with family members. The respondents from COSTECH indicated using the Internet to search for information for assignments (70%) and business communication (70%). In general, 89.6% respondents used the Internet for family communication, followed by business communication (11.7%), reading newspapers (5.2%), searching information for assignment purposes (4.5%) and searching information for research (1.9%).

Table 9: Purposes of Using the Internet

Purpose	UDSM		CYBER		COSTECH		GOV.		Row Total	
	N	Yes	N	Yes	N	Yes	N	Yes	NT	Yes
Family communication	671	90.8 (609)	45	100.0 (100)	20	30.0 (6)	25	88.0 (22)	761	89.6 (682)
Searching information for assignment	680	4.6 (31)	45	0.0 (0)	20	70.0 (14)	45	0.0 (0)	770	4.5 (35)
Business communication	680	8.3 (56)	45	28.9 (13)	20	70.0 (14)	45	0.0 (0)	770	11.7 (90)
Reading newspapers	680	3.7 (25)	45	55.6 (25)	20	70.0 (14)	45	0.0 (0)	770	5.2 (40)
Searching information for research	680	1.5 (10)	45	0.0 (0)	20	25.0 (5)	45	0.0 (0)	770	1.9 (15)

N= represents the number of respondents who responded to particular purpose of using the Internet
 NT= represents total number of respondents of all sectors.

Constraints to Access and Use of the Internet

The respondents were asked to state the problems they faced in accessing and using the Internet. Open-ended questions were provided. The results are displayed in Table 10. At the University of Dar es Salaam, the indicated problems in accordance to the number who indicated yes were inadequate personal computers (75%), the server was always down (59.7), high access charges (51.4%) and power cuts (37.9%). Respondents from the Cyber cafes indicated a different choice in problems which were high access charges (75%), server was always down (66.7%), inadequate number of PCs (44%) and power cuts (37.9%). From COSTECH, the main problems indicated were inadequate number of PCs and power cuts (35% respectively) followed by the server was always down and high access charges (30%) respectively). For those in government departments, the main problems were power cuts (68%),

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server was always down (64%), inadequate number of PCs (60%) and high access charges (40%). When the total number of respondents from all sectors were considered, the emerged hierarchy of problems were inadequate number of PCs (71.7%), server was always down (59.5%), high access charges (51.9%) and power cuts (39.9%).

Table 10: Constraints of Internet Access and Use

Category	UDSM		CYBER		COSTECH		GOV.		Row Total	
	N	Yes	N	Yes	N	Yes	N	Yes	NT	Yes
Inadequate number of PCs	680	75.0 (510)	45	44.4 (20)	20	35.0 (7)	25	60.0 (15)	770	71.7 (552)
Server was always down	670	59.7 (400)	45	66.7 (30)	20	30.0 (6)	25	64.0 (16)	760	59.5 (452)
Power cut	660	37.9 (250)	45	37.9 (17)	20	35.0 (7)	25	68.0 (17)	750	39.9 (299)
High access charges	680	51.4 (350)	45	75.0 (34)	20	30.0 (6)	25	40.0 (10)	770	51.9 (400)

N= represents the number of respondents who responded to particular purpose of using the Internet
 NT= represents total number of respondents of all sectors.

The results obtained in Table 10 were cross-tabulated with the results from Table 3 (frequency of using the Internet). The value of the Chi-square computed was 105.69 ($p < 0.01$) and the null hypothesis that there is no significant relationship between the frequency of using the Internet and the problems of Internet access was rejected. The results imply that where there are problems in accessing the Internet, people tended to use Internet less often or never use it at all.

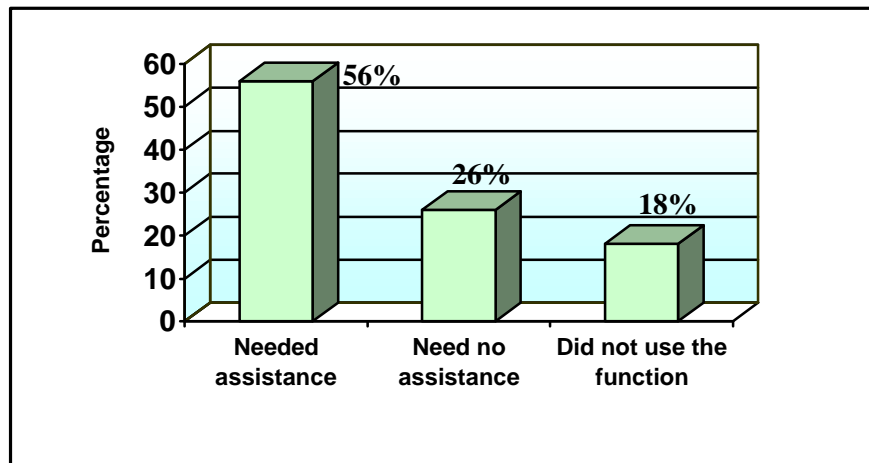
Personal Observations of Internet Use

This part of the study involved a total of 50 participants from UDSM, COSTECH, Cyber cafes and government departments who were observed using the Internet. The observation was aimed at identifying the purposes of using the Internet and problems faced by the users. It was observed that 60% of participants had never used a computer before, 35% had used it at least once and 5% had used computers regularly. Concerning the purpose for using the Internet, respondents' answers varied enormously. The results showed that 66.7% used the Internet for personal communication (sending and receiving mail messages), 18.3% used the Internet for web browsing and 15% used it for downloading files.

Whilst the observation was taking place, the researchers noted the ability of participants in using menu functions of Microsoft Internet Explorer or Netscape. When it became obvious that participants were unable to continue

with their activities because of lack of knowledge, the researchers and workstation attendants would give the users some clues. Figure 1 shows the percentage of participants who needed assistance and those who did not need any assistance or did not use the function. The results indicated that those participants who needed assistance accounted for 56%, those who did not need any assistance was 26% (13) and those who did not use the function at all was 18% (9). These results imply that users did not have sufficient skills to use the Internet.

Figure 1: Use of Netscape or Internet Explorer Functions (N=50)



The researchers also took note of the problems encountered by the participants during Internet use. Table 11 shows the problems with Internet use, which included handling search buttons, formulating keywords, sending and receiving mail messages, scrolling, mouse, cursor and loading files. In most types of use functions, the majority of respondents indicated extensive or occasional problems. Only between 5% to 15% of respondents experienced no problems.

The overall results reveal that using the mouse (72%) and scrolling (75%) were the biggest problems experienced by users. Very few participants (51%) experienced extensive problems with sending and receiving electronic mail. The results obtained did not confirm previous results obtained by using the questionnaires. It provided additional information indicating low skills in using the computer among observed respondents.

Table 11: Problems with the Internet Use (N=50)

Types of Use	Extensive Problems	Occasional Problems	Experienced No Problems (%)
Search button	65	30	5
Keywords	60	25	15
Sending and receiving messages	51	10	39
Scrolling	75	15	10
Mouse	72	15	13
Cursor	67	20	13
Loading files	64	26	10

CONCLUSION

The findings of the study revealed that many of the Internet users in Dar es Salaam accessed the Internet through the library, computer centre, cyber cafes, work places and at homes. The data collected through interviews with Internet users indicated that the library and computer centres at the University of Dar es Salaam charged lower fee for Internet access compared to the cyber cafes. This may be due to the fact that the library and computer centre were not obliged to pay business and operation licences to the government as they did not offer Internet services for commercial purposes. Consequently, the public institutions provide better benefits for users over other Internet operators.

In terms of frequency of using the Internet, the findings indicated that respondents used the Internet irregularly with 82% of respondents were found to use the Internet less often. The results obtained also indicated the existence of an association between the frequency of using the Internet and the access charged and Internet infrastructure. The infrequent use of the Internet was attributed to the inadequate number of computers connected to the Internet and poor Internet infrastructure that frustrated the users. The results is in agreement with Hudson (1998) who pointed out that the widespread use of the Internet is determined by the computer density, the availability of computer equipment needed for the Internet access and the conditions of Internet and telecommunication infrastructure.

In terms of skills for using the Internet, it was found that users had limited skills for using the various applications. This was indicated by responses from the questionnaire as well as respondents who were observed. About 80% of respondents had the skills in sending e-mail messages. However, only 17.5% indicated having the skills for searching the web, 22.7% knew how to

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purchase and 19.4% had the skills for selling product or services over the Internet.

The number of respondents who had skills within the various institutions differed. At COSTECH, the number of respondents who had skills for using the Internet for web searching was 15 (75.5%) and the number with skills for product or services was 3 (14%). In the government departments, the number of respondents who had skills for a stipulated Internet application was less than 50% except those with skills for using the Internet for selling product or services, which accounted for 13 (52.0%) of the respondents. The results imply that Internet access and use in government sectors was not quite wide spread in Dar es Salaam.

The survey indicated that the access and use of the Internet in Dar es Salaam was hampered by a number of factors such as the lack of regulatory support from the government, the unreliable infrastructure, the charges were beyond many users' means and the limited number of computers available. The erratic power supply made use of the services cumbersome. These problems had a negative impact for Internet access and use in Dar es Salaam. The users needed to wait for a long time before accessing the Internet and this situation frustrated the users. In terms of awareness and skills, the results revealed that the level of skills and awareness of the Internet users were very low. This had negatively affected Internet service provision by Internet operators. The Internet operators spent much time in assisting users to navigate the Internet. The charges levied for Internet use were charged at an hourly rate and this proved burdensome to the users.

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