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Internet usage and user preferences in Saudi Arabia

Mohammed T. Simsim

Umm Al-Qura University, Makkah, Saudi Arabia

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Abstract Internet is becoming an integral part of the daily life for many people and it is spreading quickly. In this paper, we discuss Internet service in Saudi Arabia. We study the Internet service penetration among different social categories and study users' preference on Internet access times, communication system used for the connection, and the technical attributes of the Internet connection. The results revealed that email access was the main purpose for Internet use for most of the participants. Young users were found to use the Internet more frequently for chatting and entertainment than old users. Improving the speed and quality of the Internet connection were found to be more important than decreasing the price of the service. DSL was the most frequently used communication system to connect to the Internet. Whereas, satellite system was the most preferred alternative communication system but its relatively high cost prevented its wider spread among users. Results of this study provide insight on the present status of Internet usage in the Saudi society and provide basis for business and government agencies that may be considered in future development and policy formulation.

1. Introduction

The Internet is a global system of interconnected computer networks used by billions of users worldwide. It is a network of networks that consists of millions of private and public, academic, business, and government networks of local to global scope that are linked by copper wires, fiber-optic cables, wireless connections, and other technologies (Wikimedia, 2010). Similar to many of the discoveries in recent history, the Internet was first used for military purposes to provide a robust, fault-tolerant and distributed computer networks for the military of the United States of America in the 1960s. Further developments led to the commercialization of the Internet as an international network in the mid 1990s. Since that time, the role of the Internet in the daily life of many people around the globe has been increasing. The estimated number of Internet users around the world reached 1733,993,741 users by the end of September 2009 (Miniwatts, 2010a), which means that the Internet service has already penetrated to more than 25% of the world's population. This reflects a worldwide Internet user growth of more than 380% since the year 2000.

There are numerous independent studies discussing issues related to Internet technology and services in terms of its

E-mail address: msimsim@uqu.edu.sa

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diffusion and growth and its impact on individuals and communities. Such studies provide valuable insight on behavioral changes of Internet users and its influence on economy, education, culture, and the society in general. Byrne and Staehr (2008) discusses the gap between people who have access to information and communication technologies (ICT) and those who do not in Australia as one of the highest countries of ICT users. The paper scrutinizes Internet access and usage across a number of socio–economic dimensions. Employed women in Australia were found to be, overall, 1.4 times more likely than employed men to use the Internet. While Kennedy et al. (2003) found that, in USA, women use the Internet more for social reasons and that men use it more for seeking information and recreational activities. Stafford (2005) applies the Uses and Gratifications (U&G), which is a communications theory paradigm developed to understand media-use motivations, to examine the Internet usage motivations of technology students enrolled in an Internet-enabled distance education course. A key problem in distance education has to do with the social alienation that arises from the removal of students from their colleagues and the instructor, and one result of this study demonstrates that there are strong social motivations for Internet use in the distance education classroom. The paper concludes that students' Internet usage process motivations actually diverge into two distinct areas, related generally to searching versus browsing in the support of learning objectives.

For more research on economical, educational, social, and cultural issues related to Internet usage the reader may refer to papers in (Guofeng and Yuming, 2009; Chai et al., 2009; Taylor et al., 2003; Hinnant and Welch, 2003; Dass, 2009; Joyce, 2008; Yao and Li, 2009; Conti, 2009; Chen, 2009; Neumann, 1998; Robinson and Kestnbaum, 1999; Na and Chia, 2008; and Willis and Tranter, 2006.

Nevertheless, increasing popularity of the Internet and the demand for better Internet service calls for further improvements and innovations to make the technology even faster, cheaper, and easier for users. Stuckmann and Zimmermann (2009) outlines the limitations of current Internet technology and discusses research activities on future Internet architecture and network topology, spectrum-efficient access to future networks, and converged infrastructures in support of future networks. Kleinrock (2008) presents a vision of where the Internet is heading with a focus on where user participation, flexible applications and services, and innovation are appearing. Possible future Internet services and network and service management requirements are discussed in (Schönwälder et al., 2009). The paper concludes that users of future Internet services will request new moderation and management services and therefore there will be great potential in the evolution of the network and service management plane.

Developments in ICT are essential for economical growth and improvement of quality of life in modern societies. Therefore, the long-term vision of the government of Saudi Arabia is "the transformation into an information society and digital economy so as to increase productivity and provide communications and information technology (IT) services for all sectors of the society in all parts of the country and build a solid information industry that becomes a major source of income" (MCIT, 2006). Public access to the Internet in Saudi Arabia commenced in 1999, which is, definitely, a considerably late start compared to the rest of the world and even to neighboring countries. However, by the end of September 2009, the Internet service penetration rate in Saudi Arabia reached 26.8%, which represents an increase of 3750% since the year 2000 (Miniwatts, 2010b). Thus, Saudi Arabia, having 7.7 million Internet users, witnesses the largest Internet user population in the Arab world by the end of 2009. Further, the Internet is quickly spreading in Saudi Arabia, i.e. the service growth rate in Saudi Arabia is almost ten times the world's growth rate during the same period of time. So, when we study the development and meaning of the Internet in Saudi Arabia, we are looking at a short and rapidly changing event. Few research work has been reported that tracks the development of Internet service in Saudi Arabia, e.g. (Sait et al., 2007; AAG, 2008; AAG, 2009; RIIS, 2004; and CITC, 2007).

In this paper, we study Internet service and related issues in Saudi Arabia. We discuss the Internet service penetration among different social categories to examine differences, if any, in Internet usage patterns between young and old, male and female, married and unmarried, well-educated and less educated, rich and poor, and employed and unemployed. We survey Internet connection technologies and explore the importance of speed, price, capacity, and quality of connection from users perspective. Results presented here provide insight on the present status of Internet usage in the Saudi society. Furthermore, the results highlight areas for further research activities and provide a basis for business and government agencies that may be considered in future development and policy formulation.

In the next two sections, we discuss the research objectives and methodology. Then, analysis and discussion of the results are presented. Finally, the paper concludes with a summary, outlining the concluding remarks.

2. Research objectives

The study has the following aims:

- Determine Internet service diffusion within the Saudi society and examine differences in Internet usage across demographic and socio-economic factors (Table 1).
- Examine preferences of the technical factors related to the Internet service connection, e.g. speed, capacity, price, etc.
- Explore favorite communication systems to connect to the Internet, e.g. dial-up, DSL, satellite, etc.
- Identify usage patterns in terms of time and purpose.
- Recognize the frequently visited websites.

3. Research methodology

To determine the Internet usage patterns in Saudi Arabia, a survey was conducted during February 2009 in several areas of the country. The survey was distributed in residential, business, and educational sites. A total of 706 useable participations were obtained. Demographic and socio-economic factors (gender, age, nationality, marital status, city of residence, monthly income, level of education, and occupation) were sought from the participants. In addition, the survey included questions that serve the purpose of the study, which mainly address:

- The Internet usage obstacles for those who do not use the Internet,
- Preferred Internet access times,

- Main purposes for using the Internet,
- Communication systems used to connect to the Internet,
- Devices used to surf the Internet,
- Importance of Internet connection technical factors from users perspective,
- Average monthly expenditure on the Internet,
- Popular websites.

4. Analysis and discussion

Details of the demographic and socio-economic factors of the sample are given in Table 1, which shows that the participants cover wide ranges of age, qualification, income, etc. It is worth noting that most of the participants are from the Western region of Saudi Arabia. Specifically, around 67% are from Makkah administrative district, which is the most populated district in Saudi Arabia according to the Bulletin of population and housing characteristics (CDSI, 2007).

Table 1 Demographic factors of the participants.

Factor	Item	Percentage (%)
Gender	Male	76.3
	Female	23.7
Age (years old)	< 15	2.3
	15–18	9.1
	19–25	22.5
	26–35	37.0
	36–45	20.3
	> 45	8.9
Matrimony	Married	59.9
	Non-married	40.1
Nationality	Saudi	89.5
	Non-Saudi	10.5
City	Makkah	32.0
	Madinah	11.3
	Riyadh	11.8
	Jeddah	24.4
	Eastern province (Dammam and AlKhubar)	8.5
	Others (Qasim, Yanbu, Hail, Baha, Abha, Taif, Jazan, ...)	12.0
Monthly income (Saudi Riyals)	No income	7.2
	< 1000	11.8
	1000–3000	20.8
	3001–6000	19.4
	6001–9000	24.5
	> 9000	7.2
Education	Primary	3.3
	Intermediate	11.3
	Secondary	24.5
	Diploma	3.7
	Bachelor	50.3
	Post graduate	6.9
Occupation	Student	22.8
	Government employee	39.1
	Private sector employee	20.7
	Policeman (officer)	7.8
	Businessman	2.1
	Retired	0.8
	Housewife	5.0
	Non-employee	1.7

Table 2 Internet usage.

Internet user	Percentage (%)
Yes	84.4
No	15.6

Table 3 Internet usage obstacles.

Internet usage obstacle	Frequency	Percentage (%)
I do not know how to use the computer	29	26.4
I do not know how to surf the web	18	16.4
I do not have connection means	10	9.1
Its cost is high	8	7.3
I do not have enough time	44	40.0
My husband does not permit it	1	0.8

Most of the participants are found to be Internet users, while small percentage of 15.6% are not using the Internet, see Table 2. The data in Table 3 shows that small percentage of the participants are not using the Internet due to computer or Internet illiteracy. However, this should not be taken as an indication of high level of technological knowledge and practices among individuals of the society in Saudi Arabia in general. Actually, it can be attributed to the relatively higher percentage of educated individuals among the participants. Hence, 85.4% of the participants have secondary school certificate or higher.

Relation between Internet usage and the demographic and socio-economic factors of the users reveals that 86.1% of males are using the Internet while the corresponding percentage of Internet users among females is 79%. Further, 92.5% of people with ages between 19 and 25 years old are using the Internet, whereas only 69.8% of people older than 45 years are using the Internet. Yet, as far as occupancy is concerned, 42.9% of the housewives are not using the Internet, which is the highest percentage of non-Internet users compared to other occupancies and indicates noticeable technology illiteracy among non-working females.

People use the Internet for several purposes as illustrated in Table 4, which shows how frequently the participants use the Internet for scientific, cultural, commercial, email, chatting, and entertainment purposes. It is obvious that the most frequent purpose for using the Internet is to access the email, which is becoming an important way for communicating with friends, relatives, colleagues, and partners.

Table 5 shows the relation between using the Internet for cultural purposes and age of the user. It indicates that, generally speaking, older users use the Internet for cultural purposes more frequently than younger ones. Table 6 shows the relation between using the Internet for commercial purposes and the occupation. It indicates high reliance among businessmen to use the Internet for commercial purposes. Table 7 shows the relation between using the Internet for chatting and age of the user. It clearly indicates that young users are using the Internet for chatting more frequently than old ones. The results in Tables 5–7 are, to a great extent, intuitive. Thus, young people usually tend to spend much of their time in entertainment-related activities. Besides, chatting, as a modern way of

Table 4 Comparison between the different purposes of using the Internet.

Purpose	Always (%)	Sometime (%)	Rarely (%)	Do not use (%)	Statistical values
Email	68.5	16.3	4.2	11.1	$\mu = 1.58$ $\sigma = 0.998$
Scientific	47	41.4	7.7	4.2	$\mu = 1.69$ $\sigma = 0.787$
Cultural	40.4	41.9	12.2	5.4	$\mu = 1.83$ $\sigma = 0.843$
Recreational	36.9	37.1	14.9	11.1	$\mu = 2$ $\sigma = 0.981$
Chatting	25.3	22.3	20.6	31.7	$\mu = 2.59$ $\sigma = 1.178$
Entertainment	15.3	23.2	30.9	30.7	$\mu = 2.77$ $\sigma = 1.047$

Table 5 Relation between using the Internet for cultural purposes and age of the user.

Age (in years)	Always (%)	Sometime (%)	Rarely (%)	Do not use (%)
< 15	7.1	35.7	42.9	14.3
15–18	18.9	30.2	30.2	20.8
19–25	29.9	51.0	17.0	2.0
26–35	45.3	42.2	8.1	4.5
36–45	56.5	35.7	4.3	3.5
> 45	45.5	43.2	6.8	4.5

Table 6 Relation between using the Internet for commercial purposes and occupation of the user.

Occupation	Always (%)	Sometime (%)	Rarely (%)	Do not use (%)
Student	7.0	16.2	28.9	47.9
Government employee	13.9	24.2	33.6	28.3
Private sector employee	19.7	29.9	31.5	18.9
Policeman (officer)	24.3	32.4	29.7	13.5
Businessman	53.8	15.4	15.4	15.4
Retired	25.0	0.0	25.0	50.0
Housewife	15.0	10.0	30.0	45.0
Non-employee	22.2	22.2	11.1	44.4

Table 7 Relation between using the Internet for chatting and age of the user.

Age (in years)	Always (%)	Sometime (%)	Rarely (%)	Do not use (%)
< 15	35.7	21.4	14.3	28.6
15–18	54.7	22.6	5.7	17.0
19–25	41.5	21.8	19.7	17.0
26–35	17.9	27.4	20.6	34.1
36–45	11.3	16.5	27.0	45.2
> 45	6.8	13.6	27.3	52.3

communication, is more popular among young users than older ones. Also, e-commerce and similar activities are becoming an attractive alternative for business workers due to its simplicity and high efficiency in time and cost.

Speed and quality of the Internet connection, data transfer rate, and the maximum possible capacity are important technical attributes of the Internet connection. Table 8 shows the participants' opinions about the importance of these technical attributes. Data shown in the table indicates the high demand for high speed Internet connection and improved quality of connection. Therefore, it is required to improve the quality of service even if it incurred little increase in the cost.

Some people used to access the Internet every day while others may use it occasionally. Table 9 shows how much frequently Internet is being used among the participants and indicates that the majority are using the Internet on daily basis. Meanwhile, Table 10 shows the preferred Internet access time during the day and indicates a peak access time during late evening, i.e. from 06:00 PM to midnight. Table 11 shows the preferred Internet access day during the week, where the little increase during Wednesday and Thursday and little decrease during Friday can be attributed to the weekend vacation and Friday prayer. Table 12 illustrates that most of the participants used to access the Internet during the work and school periods. The peak in Internet access time during the late evening necessitates the network operators and service providers to work hard on increasing the network efficiency and improving the quality of the service.

Table 13 illustrates the time duration spent on Internet access every day for those who are using the Internet on daily basis. Thus, more than 70% of the daily Internet users spend at least 4 h every day surfing the World Wide Web (WWW) pages. On the other hand, more than 70% of those who use the Internet on weekly basis spend at least 5 h every week surfing the WWW pages, as illustrated in Table 14.

Dial-up, DSL, and Satellite are some communication systems used for Internet connection. Table 15 shows the different communication systems used by the participants to connect to the Internet and clearly indicates the existing popularity of the DSL. However, some people are not satisfied with their current communication system and prefer to use another system but for some reason they could not. Table 16 shows the preferred alternatives and indicates high dissatisfaction for the dial-up. Thus, more than 30% of the dial-up users seek other communication systems (17.8% preferred DSL, 8.9% preferred 3G, and 3.6% preferred Satellite) but they could not get it due to technical or social reasons. On the other hand, satellite was the most preferred alternative communication system, i.e. 44% of Internet users seeking an alternative communication

Table 8 Importance of Internet connection attributes.

Item	Very important (%)	Important (%)	Neutral (%)	Not important (%)	Never important (%)	Statistical values
Speed	89.9	8.2	0.8	0.3	0.7	$\mu = 1.14$ $\sigma = 0.485$
Quality of connection	82.6	14.8	0.7	0.7	1.3	$\mu = 1.23$ $\sigma = 0.629$
Price	66.4	18.6	7.6	5.0	2.3	$\mu = 1.58$ $\sigma = 0.99$
Download capacity	68.0	19.3	4.5	4.9	3.4	$\mu = 1.56$ $\sigma = 1.016$

Table 9 Internet access times.

Description	Percentage (%)
Daily	69.3
Weekly	12.8
Monthly	1.7
On necessity	16.3

Table 10 Preferred Internet access time during the day.

Time	Percentage (%)
Midnight–06.00 AM	13.3
06.00 AM–Noon time	17.1
Noon time–06.00 PM	16.8
06.00 PM–Midnight	52.9

Table 11 Preferred Internet access day.

Day	Percentage (%)
Saturday	14.17
Sunday	14.03
Monday	13.92
Tuesday	13.99
Wednesday	16.49
Thursday	15.51
Friday	11.89

Table 12 Preferred Internet access season.

Season	Percentage (%)
Work and school time	49.3
Recess and off days	26.8
Summer vacation	23.9

system picked the satellite as the favorite alternative but, generally, could not afford its cost. It is worth noting that satellite communication systems, which provide higher data rates and entails high cost, also grant an unrestricted Internet access as compared to other systems. Note, only 661 participants were able to name the communication system they are using to connect to Internet.

Table 13 Daily Internet access time duration for the daily users.

Duration (in hours)	Percentage (%)
1	14.3
2	22.8
3	19.5
4	13.7
5	6.8
6	10.1
7	1.3
8	4.9
9	0.7
10	1.3
>10	4.5

Table 14 Weekly Internet access time duration for the weekly users.

Duration (in hours)	Percentage (%)
1	15.6
2	12.5
3	9.4
4	12.5
5	21.9
6	3.1
7	9.4
9	3.1
10	6.3
>10	6.2

Table 15 Communication systems used to connect to the Internet.

Communication system	Percentage (%)
Dial-up	8.50
DSL	72.65
WiMax	1.10
3G	16.35
Satellite	1.20
Fiber optics	0.20

A person may access the Internet from his/her desktop, laptop, or mobile phone. Table 17 demonstrates that the Laptop is the most popular device used to surf the Internet. Thus, it

Table 16 Preferred alternative communication systems.

Communication system	Current users	Users preferring other systems	
		Frequency	Percentage (%)
Dial-up	56	17	30.36
DSL	481	78	16.22
WiMax	7	1	14.29
3G	108	24	22.22
Satellite	8	0	0.00
Fiber optics	1	0	0.00

Table 17 Devices used to access the Internet.

Device	Percentage (%)
Laptop	56.4
Desktop	37.4
Mobile phone	6.2

Table 18 Monthly cost of the Internet service.

Cost (in Saudi Riyals)	Percentage (%)
< 100	14.1
100–300	56.7
301–500	20.8
501–1000	6.0
> 1000	2.3

Table 19 Frequently visited websites.

Website	Percentage (%)
Google	48.6
YouTube	13.1
Yahoo	10.2
MSN	9.5
Tadawl	5.8
Facebook	4.8
AlArabia News	4.6
AlJazeera News	3.4

would be attractive to have joint promotional offers of the Internet with the purchase of new laptop units.

Internet service charges include installation cost and periodically paid fees, e.g. monthly subscription or recharging bills. Table 18 shows the monthly cost of Internet service usually paid by the participants, and indicates that the majority of the participants are paying 100–300 Saudi Riyals every month on Internet services. Note, only 596 participants were able to estimate the monthly cost of the Internet service.

The Internet carries a vast array of information resources and services, most notably the inter-linked hypertext documents of the WWW and the infrastructure to support electronic mail. It consists of hundreds of millions of websites. Each website is a collection of one or more web pages. However, some websites are more frequently visited than others. Table 19 lists the most frequently visited websites and clearly rank Google, the popular search engine website, on the top. Google is actually a very powerful search engine and is preferred worldwide for its innovation and simplicity. It was already the most popular search engine in Saudi Arabia in 2007 according to the report of the Communications and Information Technology Commission (CITC, 2007).

5. Conclusion

In this paper, we discussed Internet service in Saudi Arabia, which has the largest Internet user population in the Arab world and witnessed one of the fastest Internet service spread rates worldwide. We have studied the Internet service penetration among different social categories. The results revealed that Internet is spreading more between males than females and between young individuals than older ones. However, older users were found to use the Internet for cultural purposes more frequently than younger ones. Whereas, young users were found to use the Internet more frequently for chatting and entertainment than older ones. Furthermore, businessmen were found to have high reliance on the Internet use for commercial purposes. Overall, email access was the main purpose for Internet use.

Speed and quality of the Internet connection were the most important factors while the price was of less importance. Peak Internet access time was found to be in the late evening, i.e. from 06:00 PM to midnight. This calls for the service providers' attention in terms of technical actions, e.g. improve network efficiency, and promotional actions.

DSL was the most frequently used communication system to connect to the Internet. While, satellite system was the preferred alternative but its relatively high cost prevented its wider spread among users. Laptop was the most popular device used to surf the Internet. This may calls for more joint promotional offers between Internet service providers and laptop selling companies. Google was the most popular website, i.e. almost half of the participants placed it as the most frequently visited website.

While this exploratory research has revealed some interesting results. Further improvements can be considered by involving larger sample and studying additional factors related to customer's evaluation of services. Further research should be conducted to monitor consuming behaviors among young users, specially for entertainment and chatting, in order to detect possible Internet overuse or addiction. In addition, further research should be conducted to find out what people search for on the Internet.

Results presented here provide insight on the present status of Internet usage in the Saudi society. Furthermore, the results highlight areas for further research activities and provide a basis for business and government agencies that may be considered in future development and policy formulation.

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