

# Impact of Internet Usage in Saudi Arabia: A Social Perspective

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## ABSTRACT

*Internet in the Kingdom of Saudi Arabia was introduced in the late 1990s. Being relatively new, its effects and impact on Saudi society are still in their infancy. A survey-based study was conducted to measure these effects, monitor their influence, project possible long-term developments, and define early measures that would best harness this new technology. Covering a span of two years, this study also identifies and documents any noticeable shifts in perspectives. This work presents the findings and observations drawn from this study and is based on the direct interpretation and cross-analysis of survey responses.*

*Keywords: Computers and Society, Social Perspective, Internet Usage, Saudi Arabia*

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## INTRODUCTION

Society and social systems can be defined as non-physical entities designed and constructed around man's inherent need to live and thrive within a non-isolated environment. We call it 'non-physical' in the sense that a society cannot be seen, heard or touched but it exists as a complex mechanism that presides over human behavior and inter-communication. Social systems are also characterized by their internal dynamics, which drive a definite though unsteady pace of change. There are numerous factors that comprise these dynamics; some of them being impact-oriented injecting sudden change in society, while others have a slow and steady influence, literally bringing about a social evolution over time.

Among these factors, modern technology developments and progress play a very significant role primarily by widening the arena of interaction, bringing different distinct societies and cultures into direct or indirect contact, each influencing the other. In essence, social systems are based on human interaction and communication; consequently, the technologies that alter these very basic elements also have the greatest potential to influence social evolution. As such, the Internet as an unprecedented communication technology has opened wide channels of interaction and information flow and hence, is very much a social phenomena. This paper views the Internet from the

perspective of cultural anthropology, wherein its influence on interaction within defined communities and between social groups is examined. The focus is regional where the influence of the Internet as an unmediated medium of expression, information, and leisure, and its impact on a strongly conservative Saudi society is documented. The purpose is not to pass judgment on the overall consequence of the Internet as to its positive or negative influence, but to describe its effects in ways that add to our understanding of society and our ability to predict and influence change.

The Internet can change individual behavioral and societal perspectives, often through provision of alternate means of social interaction. Given the immediacy of the medium, and the existence of virtually every conceivable interest group on the net, online addiction or overuse is of significant concern to an individual's mental and social health. Further, unmediated exposure to objectionable content, can have a corrupting influence on morality and spirituality. These changes, both positive and negative, when considered from a macro-perspective taking into consideration the outward-ripple effect, easily move beyond the individual into the more wider and variant domain of society.

The following section presents the reviewed literature and documents similar studies carried out elsewhere. Their approach and results give insight into possible outcomes and trends, and whether these are specific to the regional context or can be considered generic.

## **LITERATURE REVIEW**

The Internet has a profound effect on individuals and entire societies with its vast influence unrivalled by any technological achievement of the past century. Unfortunately, this impressive feature holds true for both its positive and negative effects wherein instead of a strong social bond, the Internet can catalyze undesired shifts in cultural norms, leading away from responsible and healthy social dynamism. As to an outright conviction about the Internet being a boon or bane to society at large, the topic remains highly controversial.

There have been numerous independent studies that have tracked the growth of Internet access world-wide since its inception in the late sixties. These provide a valuable insight into Internet diffusion patterns across highly varying economical, sociocultural and political contexts. In 1997, a paper by Larry Press documented numerous bodies and institutions that were responsible for tracking and reporting on Internet access from the perspectives of infrastructure, social influence and traffic density (Press, 1997). The same year, another extensive study on Internet growth patterns specifically in developing countries suggested towards common diffusion patterns (Bazar & Boalch, 1997). According to the authors, the premier users of Internet technologies are usually researchers and academics, from where it permeates among the population at large. However, the growth of Internet use has been fastest where there is a profit-driven initiative, such as the emergence of commercial ISP's. The paper investigated the components required for Internet roll-out and use, and proposed a model illustrating the process of diffusion and the main factors influencing it.

A seminal study by the prominent MOSAIC group<sup>i</sup> proposed a framework to effectively assess the extent and quality of Internet use and its underlying communication infrastructure within a country (Goodman et. al., 1998). The framework characterized six dimensions to Internet diffusion - pervasiveness, geographic dispersion, sectoral absorption, connectivity infrastructure, organizational infrastructure, and sophistication of use. Four ordinal values were defined along each dimension, ranging from the value 'zero' (non-existent) to value 'four' (highly developed). The study, at its time of publication had applied its framework to thirteen different countries, which were chosen to provide effectively diverse cases to test applicability and accuracy. Interestingly, the report had also focused on the situation in countries from the Middle East, where Internet use at the time was in its infancy. This framework soon gathered favor among research communities and served as the base for other surveys (Press et. al., 1998; Press, Foster, Goodman, 1999).

In addition to these works that focused on Internet diffusion and growth, other researchers directed their efforts toward studying the purely social and cultural impact of this explosive communication medium. Before moving on to documenting these studies, the relevant social aspects and their inter-relationship with the Internet are discussed below.

**Ethics:** The concept of ethics is fundamental to society; the ability of individuals to consciously distinguish between what is moral conduct, and what is not, guarantees a certain extent of trust needed to hold social mechanisms together. Further, communal interaction has to be tempered with the need to respect privacy, both for individuals as well as larger entities such as corporations. These aspects are clearly realized in real life, with security measures and deterrents such as imprisonment and fines. Unfortunately, the same cannot be said about online societies. Today, the frequent instances of online crime such as hacking, cracking encryptions, information snooping, identity theft etc., are grim indicators of the blurred concept of Internet ethics for many users. Though these acts are comparable to real life criminal behavior such as theft, forgery, fraud etc.; many people fail to make this connection. Often this is attributed to the immediacy of the medium, the lack of face-to-face interaction and apparent anonymity. Also the absence of social and penal deterrents is another significant factor. Often, instances of online vandalism and crime are perceived as achievements by both the perpetrator and society at large. The fact that many governments do not recognize online crime under their existing legislation hasn't helped the present situation. A significant outgrowth of this online crime and the lack of deterrent is the growing concern regarding e-terrorism. The definition of the term can be very broad, ranging from hate and panic-inducing hoax mails to active attacks on a country's communication infrastructure. A first step towards addressing this is appropriate and relevant government legislations and accountability measures. Additionally, the steps taken by government bodies and corporations to harden their infrastructure against subversion and e-terrorism are not so different than those that should already be in place given the present statistics of growing Internet crime. However, active online terrorism such as disrupting communication and compromising security often requires technical expertise and long-term Internet experience. With the Internet at its nascent stages in Saudi Arabia, and the absence of any prominent

underground hacker culture, active online terrorism in the Kingdom hasn't been covered in public-domain reports and publications.

**Cultural Conflict:** An increasingly important issue regarding the global Internet diffusion is the unavoidable cultural and moral conflict. As such, the applications of standards that would apply globally and could be recognized by all governments have often failed. Critics have found plenty to fear on the Internet: too many extreme political beliefs, too much sex, and too many strange religions (Postrel, 1998). As such, the global village, a model of overall harmony that the initial days of the Internet had projected is un-achievable due to technical and social reasons. A major factor is the different perception of priorities and moral values among distinct cultures, which at times are at stark contrast (Benson, 1998). An example of this is the widespread availability of undesired adult content material on the net. Although this wouldn't be considered ethically abhorrent in some western societies, it is totally incompatible with others, especially Saudi culture, given its Islamic roots. The conclusion is that steps must be taken through legislations enacted by governments and organizations for controlling quality of the media and the standard of content.

**Undesired adult content exposure:** Most surveys show that the ease of access to undesired adult content on the Internet has resulted in a distinct increase in the number of individuals viewing such content. Despite the blocking of such websites by governments and private ISPs, new websites are setup almost daily. Apart from this, unsolicited email relating to such undesired websites as well as unintentional redirection to related sites may grant access to such objectionable content. Even the practice of dynamic filtering where access may be denied based on suggestive words or offensive language on the requested web pages, can be bypassed. As the search for most of these words and terms is carried out with relevance to the English language, content in other languages may actually slip through.

In Saudi Arabia, substantial effort has been done to block sites that host objectionable content and services such as undesired adult content, online gambling, dating, etc. These sites are blocked as they conflict with the country's religious, cultural, legal and traditional norms. All Internet communications are directed through a central server based in Riyadh. In effect, the Internet here is more or less a vast Intranet spanning the entire Kingdom. The use of this central proxy server that filters both incoming and outgoing traffic has been analyzed from a performance point of view by Al-Furaih (Al-Furaih, 2002), and experimental results show that the use of these proxy software and hardware systems does not cause a significant delay or bottlenecks for the end user.

On the positive side, the Internet has numerous applications and known advantages. To name a few, getting in touch with friends/family members via email, obtaining information about products/services, finding medical/health information, searching for online jobs, listening to or downloading of music, visiting newsgroups/discussion forums, and watching news. On the negative side, though not so obvious, there are many factors to be taken into consideration. Internet activities can be addictive, or at the least highly time-consuming without the development of any definite constructive skill. Examples are

online gambling, games, simply surfing the net without a focus, breaching security for leisure, excessive involvement in chat rooms and newsgroups, etc. The risks to individuals and to society include 'diminution of social and intellectual skills, loss of motivation for more constructive activities, loss of jobs and livelihood' (Neumann, 1998). This topic of online addiction has fuelled a growing concern of the impact of virtual lives that which people live online, on their real-world existence, or real-life. As such, it is important to realize the place of the Internet as a medium to augment real-life social interaction without being an alternative.

A strong reason for the lack of a consensus on the Internet's social influence is the absence of any standard metric to measure these effects. Different research efforts have defined individual parameters and factors, the combined effect of which is translated into the overall impact on society. For example, a 1999 study by Robinson et al., considers 'time spent' online as the defining factor to measure the influence of the Internet on an individual. The supporting logic is that as more time is spent online, it directly affects the person's other activities and in turn, his/her social life (Robinson, Kestnbaum, 1999).

Further, the persuasiveness of the Internet and its impact as a medium for self-expression and interaction has led to an ongoing debate about its influence in contributing to a decline in real-life social relationships. Such an influence in the long run, cannot make up for real social face-to-face communication, and may result in the individual's isolation and overall depression (Turkle, 1996). However, at the other end of the spectrum, some research groups believe that the Internet improves social participation and social functions by freeing people from the constraints of geography or isolation. According to them, the Internet allows people to join groups on the basis of common interests rather than convenience (Katz & Aspden, 1997). This would result in a more healthy development, with each individual being able to realize his/her full potential.

One of the more well-known research articles on this issue was published in 1998 by Kraut et. al., which took a strong note on the negative influence of the Internet on social development (Kraut et. al., 1998). According to this report, which focused a target set of respondents, given the vast uses of the PC and the Internet that include communication, entertainment, education and information retrieval, the majority of people used this new technology primarily to augment their traditional mediums of social contact. However, these applications that so easily allow individuals to communicate with geographically distant acquaintances as well as strangers might actually eat into a significant proportion of the time these same people would spend with their families and friends. The report documented that 'Increase in Internet usage was associated with decline in social circles, and increased loneliness and depression'. Thus it concluded that users who use the Internet extensively tend to substitute online interactions, which inherently have very weak social ties, over the company of close friends and relatives. This study drew lots of attention and a fair share of criticism especially on its approach to the issue. Later in the same year, the authors published another article where they elaborated on their earlier results and clarified critical issues as to the methodology and implications of their research (Kraut, Scherlis, Patterson, Kiesler, Mukopadhyay, 1998). These authors continued their work with a follow-up paper published in 2002, in which they

documented a 3-year follow-up of the same group of respondents (Kraut et. al., 2002). Their overall conclusion was that the negative effects dissipated over time, and the sample generally experienced a positive effect of using the Internet. They concluded that the effect of Internet follows the rich getting richer model wherein extroverts i.e., people who are socially at ease derive maximum benefit, while introverts tend to isolate themselves even further.

Another study that implies that Internet usage could cause frustration and have negative effects, related this with the competence level of the Internet user (Neuman, O'Donnell, Schneider, 1996). The study concluded that compared to experienced users, novices engage in more aimless surfing, and hence are less likely to be able to find relevant information and thus get easily frustrated. This is however, not a negative effect of the Internet, but an inability on the part of the user due to lack of basic training.

There also have been numerous studies that report a positive impact of the Internet on society (Hampton & Wellman, 2000; Robinson et. al., 2002; Cole, 2000; Cole, 2003). The results from these survey-based studies suggest that the Internet is mostly used to complement existing social activity and doesn't directly replace it. Similarly, a study of international scholarly networks by Koku et al. shows that though the Internet helps in maintaining contact with different people, most of these are almost always those who users also meet in real life; hence this only serves to further strengthen social interaction (Koku, Nazer & Wellman, 2001). Yet, in another study by Nie and Erbring, most of the people who were surveyed, reported no change in their social lives, though excessive Internet users (logging more than 40 hours online per week) reported a decline in socializing, interaction, and other activities (Nie, Erbring, 2000).

As seen from all these above surveys and reports, taking a single-focused view on the Internet's social impact is quite impossible. There are too many factors and variables involved, not to mention the different metrics that are used to quantify the Internet's social influence. The challenging part is aligning the outcomes of the surveys discussed earlier, which often do not run parallel; they neither affirm nor contradict each other, but take a middle stand. To summarize, deriving a conclusion depends on how one interprets the results of these surveys as well as on the people involved. For example in the year 2000, moderate to heavy users self-reported that their usage of email instead of telephone contact resulted in 'loss of contact with their social environment' (Nie, Erbring, 2000). In contrast to this, Lin (2002) considers online communication (including email) as 'markedly expanding the stock of social capital'.

In a recent study by DiMaggio et al. (DiMaggio et. al., 2001), the authors took a moderate stance, and presented an excellent review of the possible social implications of the Internet. Their analyses of different studies report a pattern in the findings. Two conclusions made from it are:

1. The impact of Internet on society in general is not extreme; neither utopian hopes (extremely positive) nor a dystopian influence (extremely negative) are realized, but rather very much in the middle.

2. The possible impact of an Internet-savvy society also depends on a number of other factors, such as economic conditions, governmental regulations, its acceptance into mainstream education, and how the users collectively organize the evolving technology.

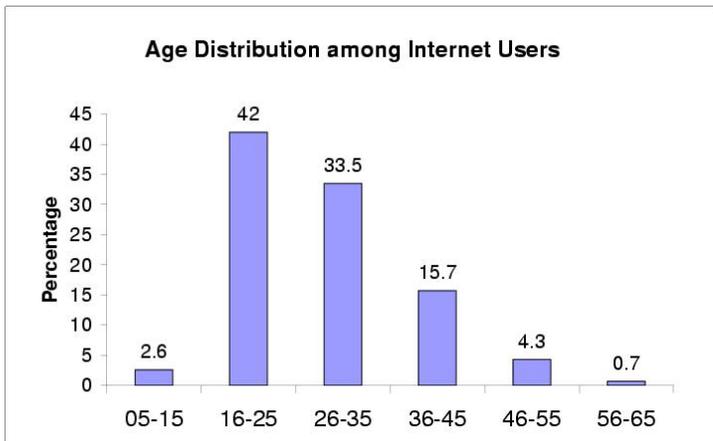
This section documented previous studies on the social implications of the Internet and the issues involved in it. In the following section, respondent profile for the survey is covered.

## **RESPONDENT PROFILE**

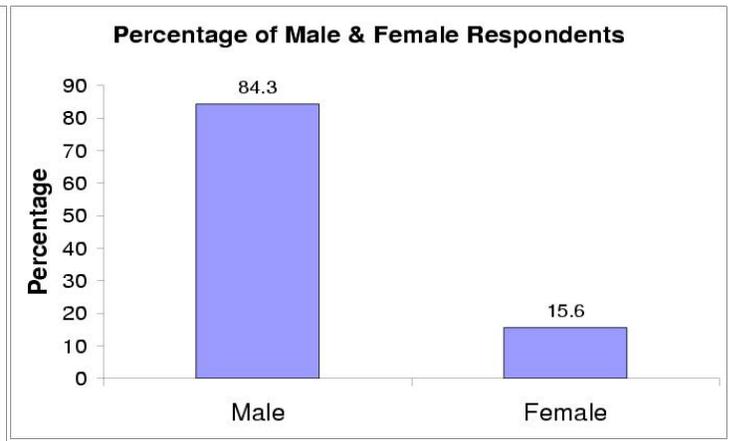
This subsection presents a profile of the respondents in terms of age, gender, education, occupation, and place of residence etc., correlated with their respective Internet use. This information is invaluable as it can be extended for a much larger, macro-level statistical construction of Internet usage trends within an entire society. An essential pre-requisite for such an extrapolation is a reasonably large collection of respondent inputs with an effectively random distribution in terms of their attributes. Our questionnaire relevant to studying social affects was purely web-based, hosted on a KFUPM web server in the public domain. Soliciting respondent input was achieved primarily through banner advertisements on broad-spectrum sites such as those belonging to Internet Service Providers and general-purpose commercial portals. As such, with the absence of any targeted advertising, the set of respondent profiles collected can be considered random. With over 3,000 inputs our statistic results can be justifiably extended to represent Internet usage trends within the entire populace.

An obvious fact to be realized here is that our interest group is the “online community” within the overall Saudi society, i.e., the people with Internet access. Hence the results presented document the Internet’s influence on these users and their social behavior and of course do not apply to a large segment of the Saudi population which does not have Internet connectivity. But, with the exponential growth rate in online access and its increasing ubiquity, these results are highly relevant. In order to develop a profile of the respondents, six different criteria are used. These are age, gender, employment, organization, education and geographical location.

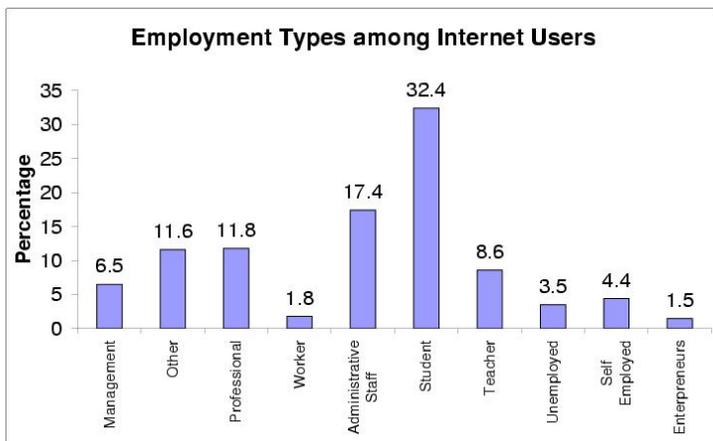
Figure 1: Respondent Profile of Internet users



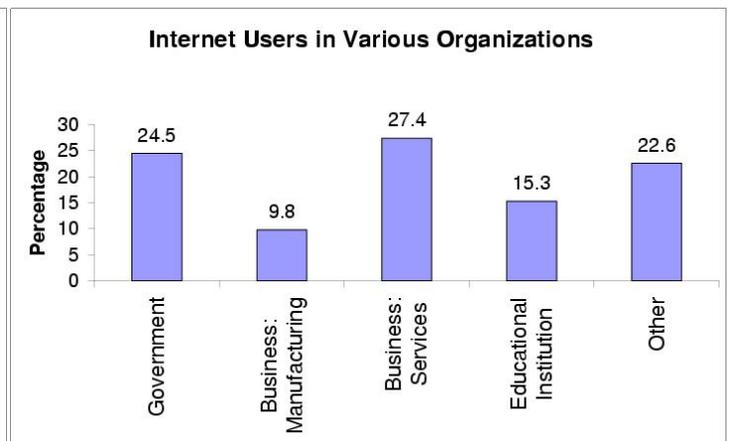
(a) Age Distribution



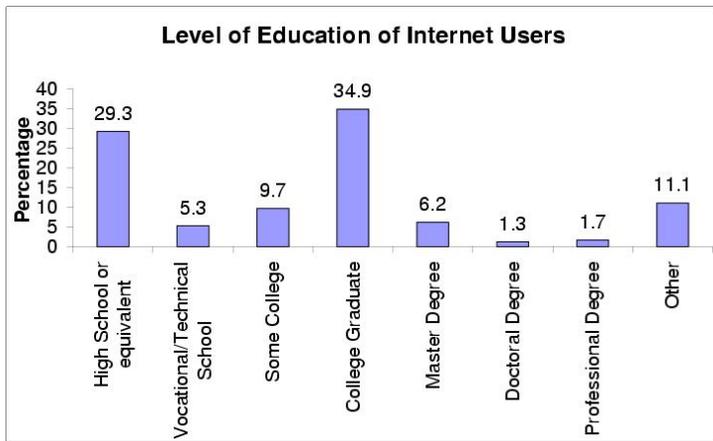
(b) Gender Distribution



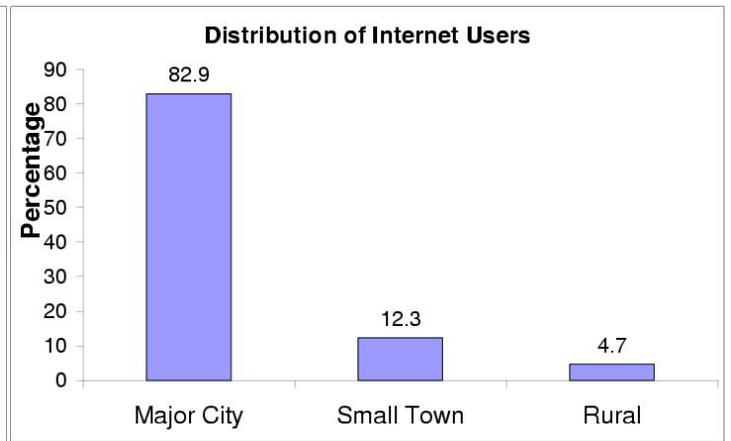
(c) Employment Distribution



(d) Organization Distribution



(e) Education Distribution



(f) Geographical Distribution

Figure 1(a) shows the age distribution among the total number of respondents. As observed from the chart, over three-quarters of the respondents are in the age group of 16-35. Hence, most of our analyses derived from our cross-queries will focus on this specific group. The purpose of this is to achieve in-depth analysis using the largest sample size, thereby reducing the influence of deviant data and variants.

Figure 1(b) shows the gender distribution of the respondents. As clearly seen, the males definitely have more opportunities accessing the Internet than the females, whether it is from home, work place or Internet cafés.

According to DIT<sup>ii</sup>, these results are not surprising, as they represent early stage patterns, common in the middle-east region. A survey done by them earlier in 1996 showed that the early users of Internet to be male, young and working in some part in of computer/technology business. Figure 1(c) gives an idea of Internet access in the Kingdom in relation to the type and nature of job. Figure 1(d) gives a broad classification of various types of organizations, and displays statistical graphs showing as to where Internet users work. Figure 1(e) shows the level of education of the Internet users (respondents). The levels queried varied from 'High School' to 'Doctoral and Professional Degree'. 'Vocational Training' and 'Some College Education' were also included. About 65% of the respondents possessed high school or college education. As shown in Figure 1(f), pertaining to area-wise distribution of Internet users, majority of Internet users reside in major cities, i.e., Jeddah, Riyadh, and Dammam. The reason for this is the limitation of Internet access facilities in rural areas.

## **RESULTS AND ANALYSIS**

This section reports and analyzes the results drawn from the survey. A two-tier approach is taken wherein the interpretation of direct result is presented followed by analysis of cross queries. The later approach is based on merging results for single questions to identify elaborate effects and bring to surface various usage patterns and effect of Internet on Saudi society.

### ***Results of Direct Questions***

Measurement and verification of trends in Internet usage requires considerable analysis of survey results documented over effectively long periods of time. This period may be a decade or even longer. Such extensive results annul the effect of variants and externalities that undoubtedly exist in a sample. Given the duration of our survey, only the effectively prominent trends have been extracted to eliminate data inconsistencies. Non-apparent trends are ignored.

The results were analyzed to determine change in trends during the life of the project. This two-year duration is split into four six-month periods and the trends in each are compared to determine variations. Obviously, the respondent set for each of these periods is distinct, both in terms of the size, and different individuals. For the first six months, there were 300 valid responses, for the second 700, and 1700 for each of the last two. Also, no significant numbers of people are expected to answer the survey more than once.

But given the sufficiently random nature of each of these respondent samples, significant variation in results over time can be extended to reflect trends for the entire Internet user population residing in Saudi Arabia. In other words, the results seen during each six-month period are considered independent of number of respondents and group attributes.

A primary trend that has to be documented is the change in the amount of time spent by users on the computers/Internet. The more time that people spend online, the greater the effect on other aspects of their life. As per the survey, computers and Internet are used in work places maximum for 10-20 hours per week; however, more than one-third of the respondents do not spend more than five hours per week online as a means of entertainment.

With respect to usage of Internet services, the most commonly used services included 'Usenet, Listserv, Discussion Forums' (chatting), 'Internet Phone', and 'Streaming Audio' (music) which are used by more than 40% of the respondents. This is shown in Figure 2.

Figure 2: Types of Internet Services used

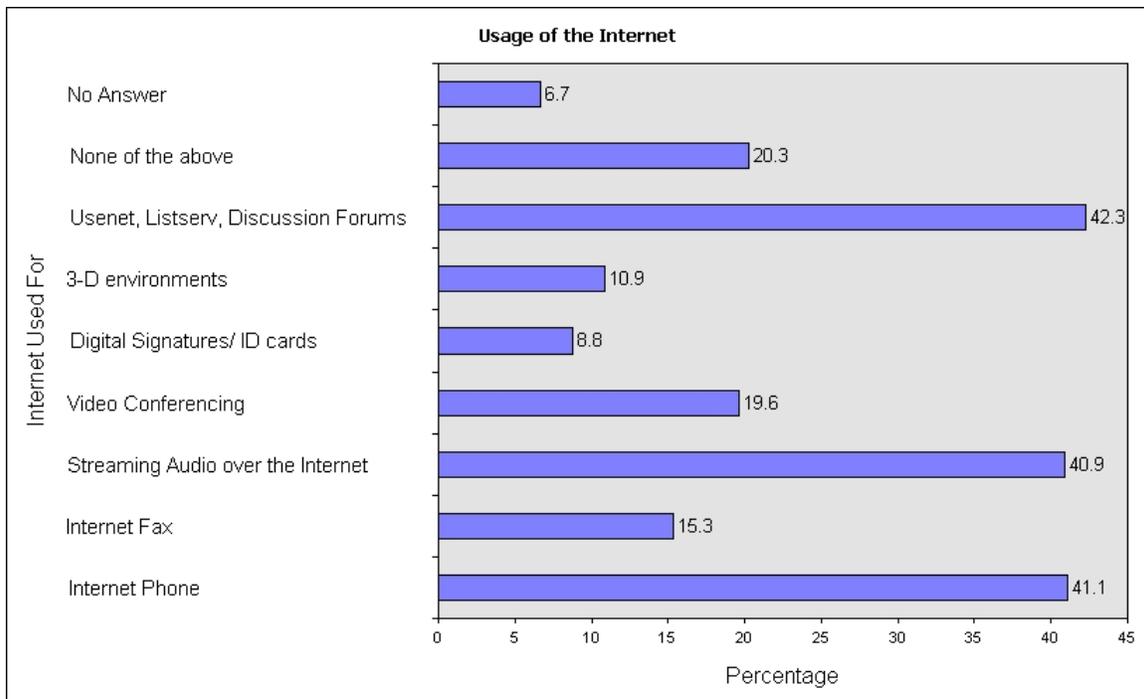


Figure 3: Internet Usage in Organizations

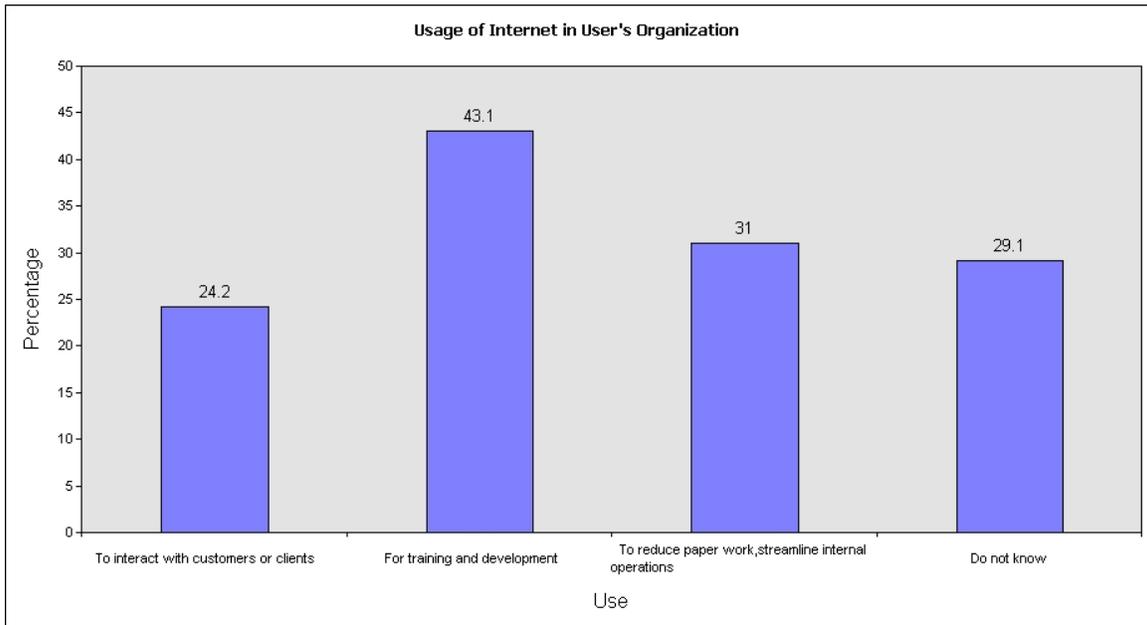


Figure 4: Duration of Internet Usage

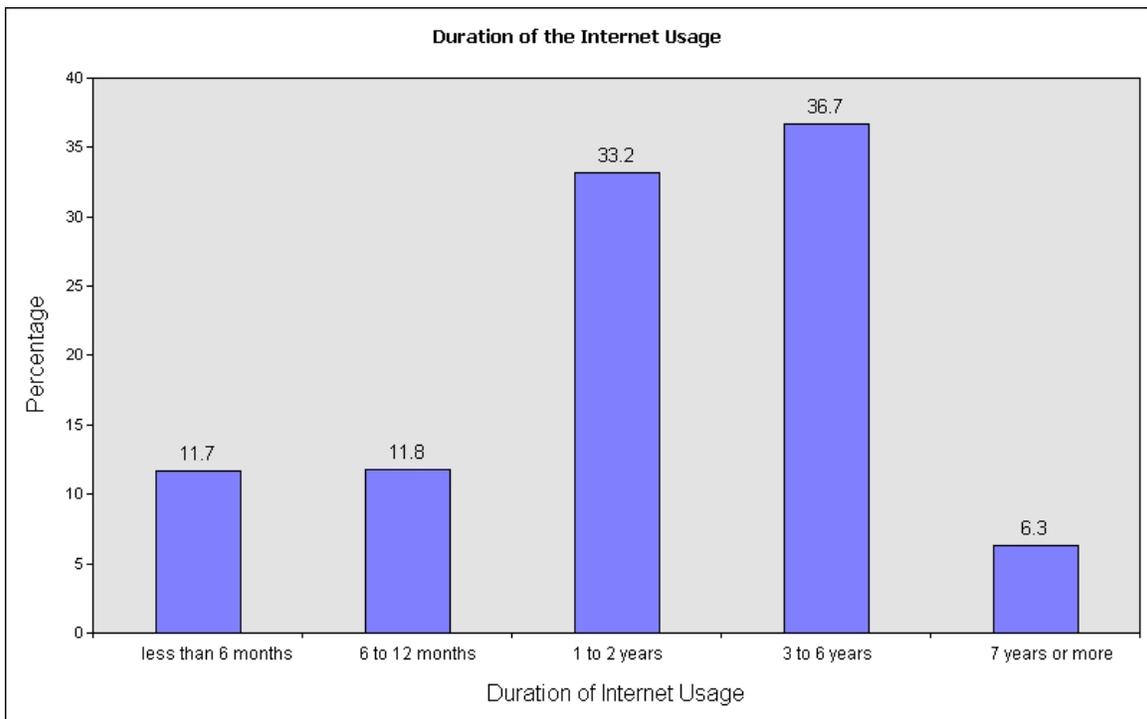


Figure 3 shows that one of the primary applications of the Internet in Saudi organizations and business is for training and development. However, given the rather slow Internet adoption almost 30% of respondents aren't aware of their company's online policies.

Figure 4 shows statistics for how long respondents have been using the Internet. More than one-third (36.7%) of them got online access within the past 3-6 years, i.e., after the Internet was made publicly available in Saudi Arabia in 1997. The small fraction of people who have been using the Internet for longer periods (7 years or more) would be those living abroad, or people who had gained online access via neighboring countries, such as Bahrain by paying long distance telephone charges.

Figure 5: Importance of various factors related to Internet

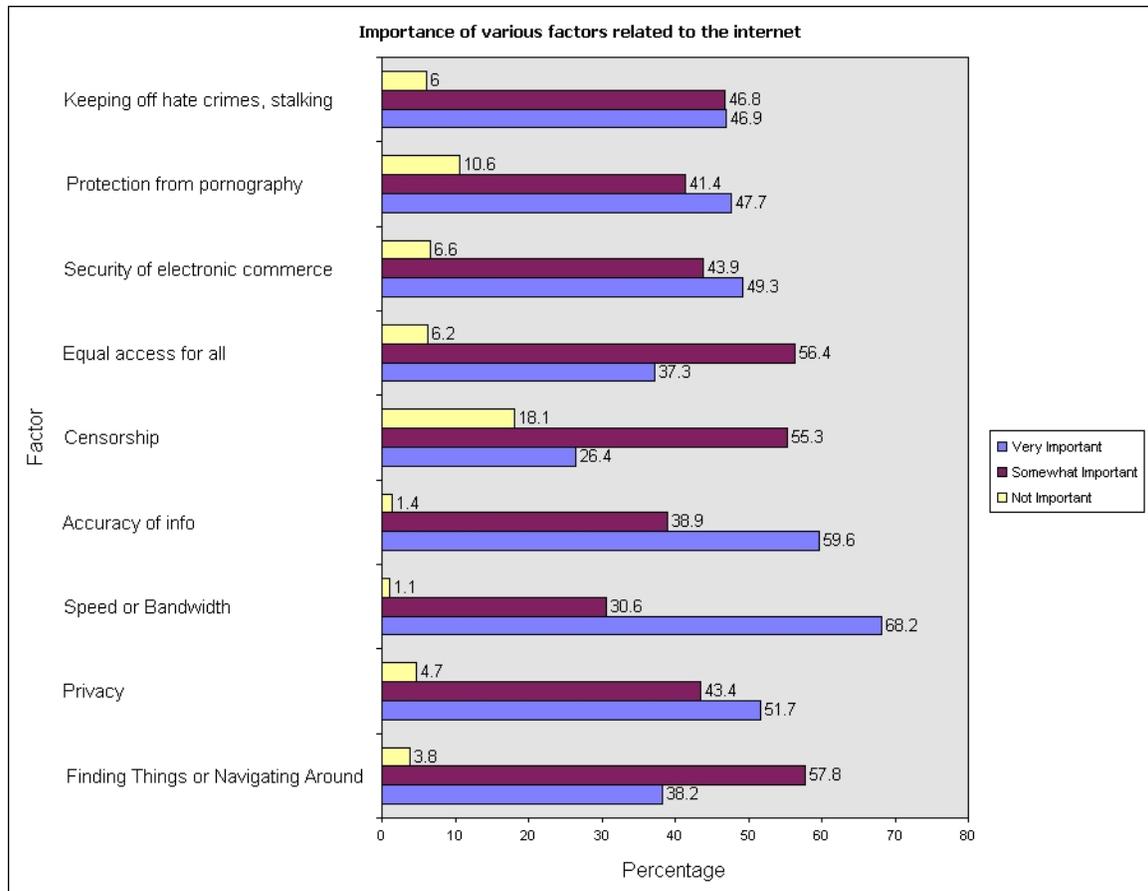


Figure 6: Level of satisfaction with the current skill to use Internet

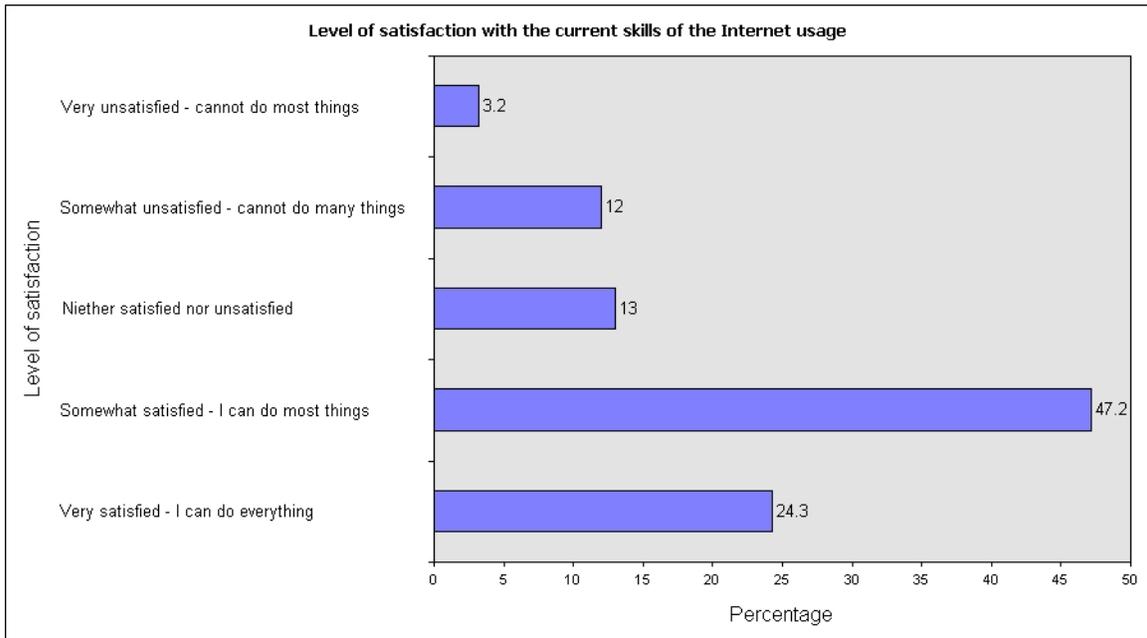
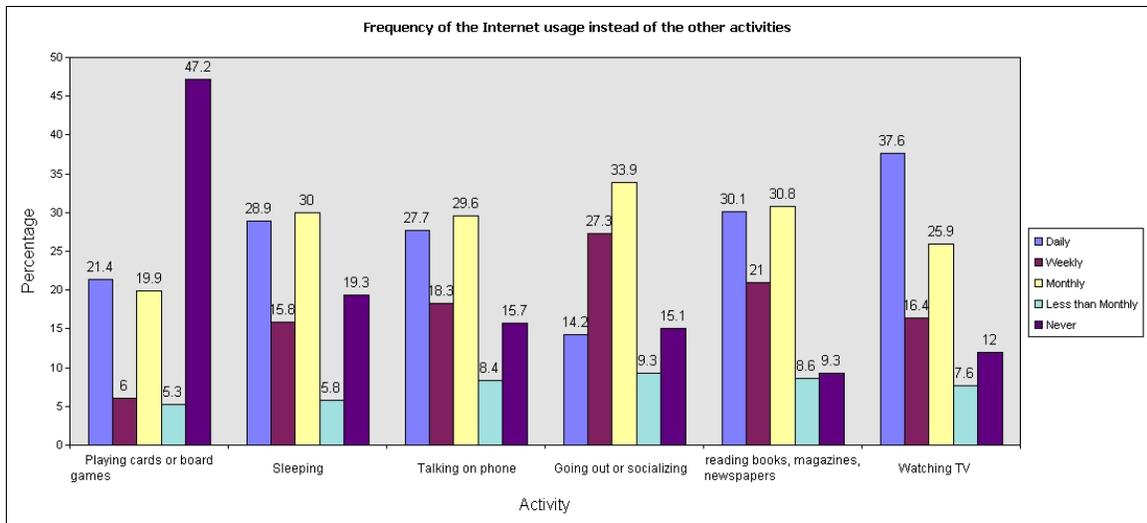


Figure 7: Frequency of Internet Usage instead of other activities



Importance of various factors as perceived by the respondent while using the Internet is shown in Figure 5. As seen from the graph, ‘Speed or Bandwidth’ of the Internet connection is most significant to users (68.2%), followed by accuracy of information (59.6%) and privacy (51.7%).

Figure 6 show the satisfaction level of Internet users and the related trends during the two years respectively. As seen from the graph, almost 50% of the users are ‘somewhat

satisfied' with their online skills and capability and are able to do most things. Another 25% of the users are very satisfied with their skill in using the Internet. As online skills development is most often proportional to length of use, the related steady trends reflect the growth in Internet usage.

Understandably, given the Internet's wide scope of application from work to leisure, its use is bound to affect user's other activities. Figure 7 gives a list of such activities that have taken a back-seat to the Internet. More than one-third of the users (37.6%) tend to reduce the time spent viewing television because of daily Internet access. Other activities affected by the Internet are 'reading books, magazines, and newspaper' as well as sleeping. On a weekly and monthly basis, the activity most affected by the Internet is 'going out or socializing' followed by 'reading books, etc'. Interestingly, the activities that are never affected by the usage of Internet are playing card or board games. A possible reason for this is that some card/board games are specific to the Saudi country/culture and don't have an online equivalent.

Two possible reasons for this decline in other activities of Internet users could be

1. Availability of services through the Internet, e.g., books, magazines, newspapers are available online on the Internet and are updated very frequently. Hence their traditional counterparts are definitely affected. Also, some television channels provide streaming audio/video via the Internet. Besides this, the Internet covers almost all facets of television use from news, information to leisure and fun. Hence, television has had the maximum setback.
2. Internet use can be at times addictive. This is indicated by the usage of Internet instead of sleeping. However, another possible reason for this might be due to slow connectivity during working hours. Moreover, people would prefer to go online after office hours during evenings and night hours. Subsequently, they lose out on sleep.

Figure 8: Frequencies of activities done on the Internet

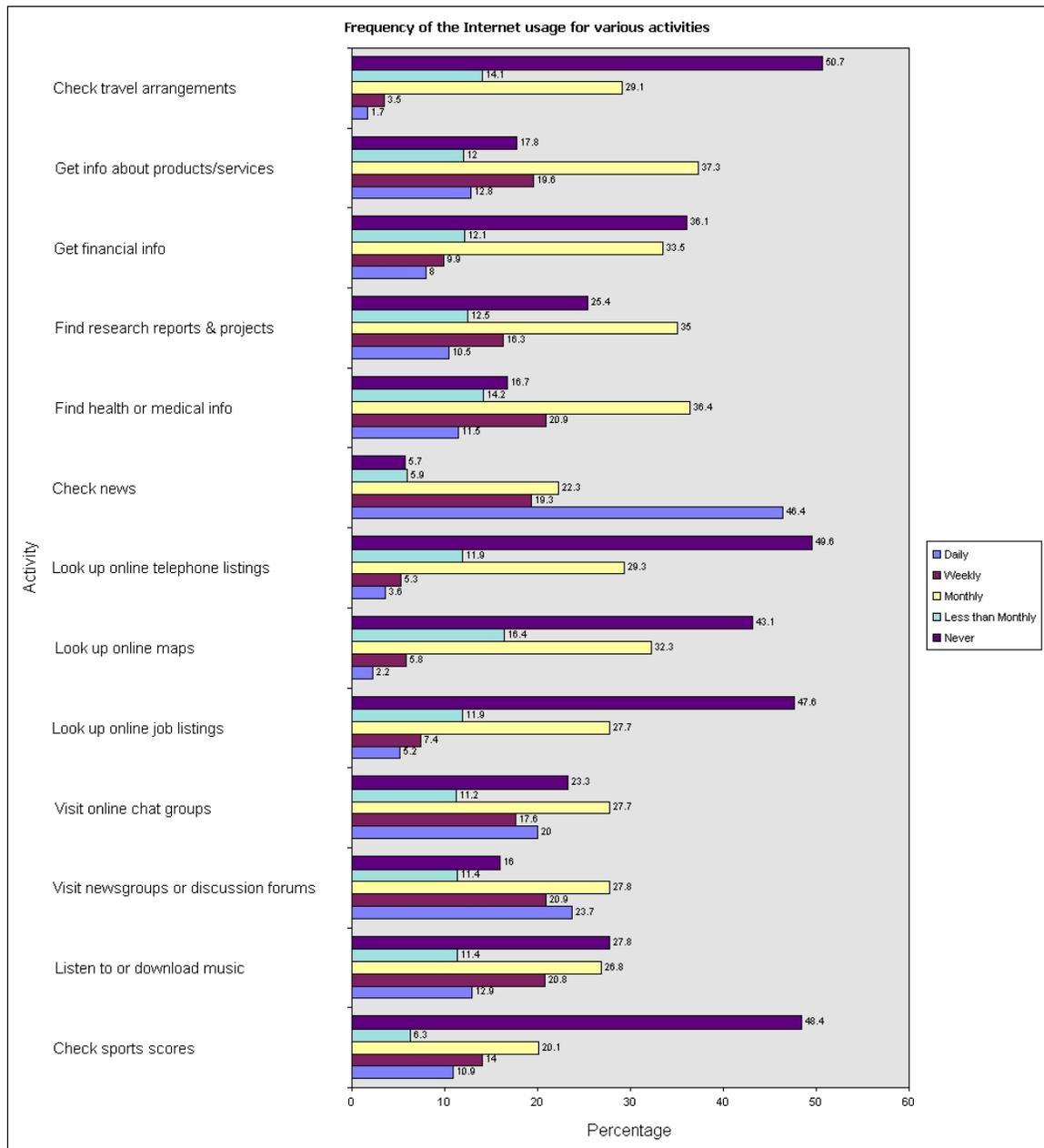


Figure 8 shows the frequency of Internet usage for various activities on a daily, weekly, and monthly basis. As seen in the graph, the most frequent daily activity is checking for news and updates (46.4%) and visiting newsgroups or discussion forums (23.7%). However, on a weekly basis, visiting newsgroups and listening/downloading of music is the most common activity followed by news. Further, considering a monthly basis, the more popular activities are searching and getting information about products and services as well as medical issues.

Figure 9 shows the various difficulties that the users consider as ‘big problems’, while

accessing the Internet. Maximum number of people reported problems with the slow Internet speed (45.3%), high cost of Internet access (31.8%) and sites that charge money for viewing content (30.9%).

Figure 10 shows that the Internet has definitely helped users in connecting to various types of other people. Almost 50% of the respondents use the Internet to connect to family members, as well as people in the same profession and with similar hobbies.

Figure 9: Difficulties faced while using the Internet

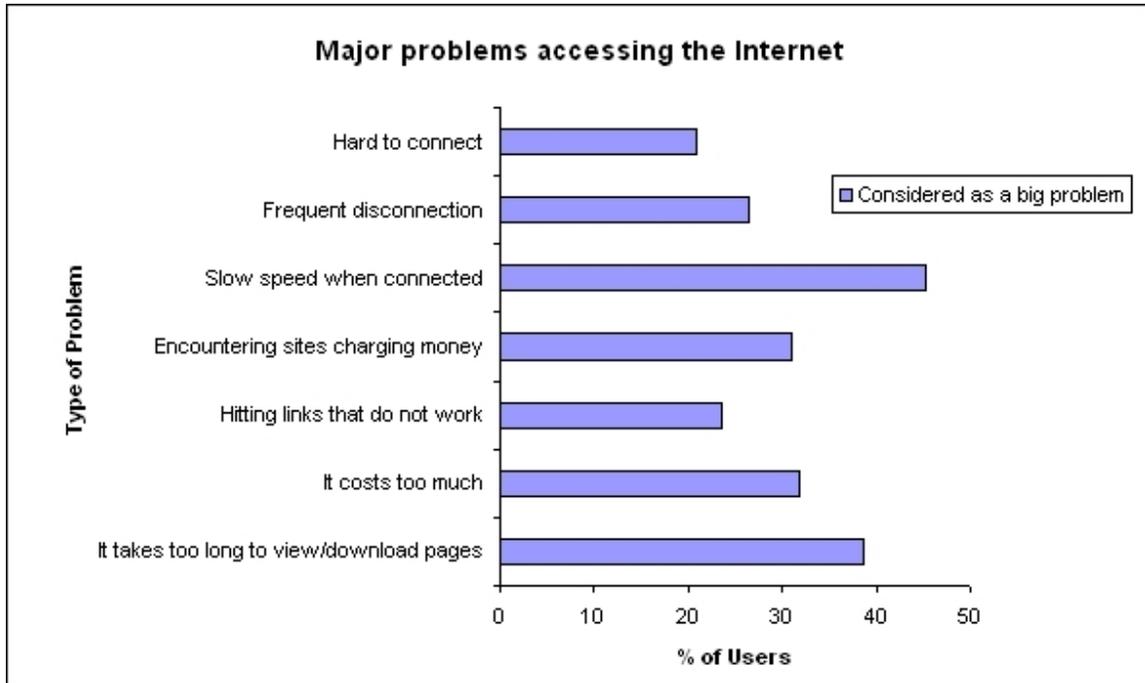


Figure 10: Internet helped in connecting to people

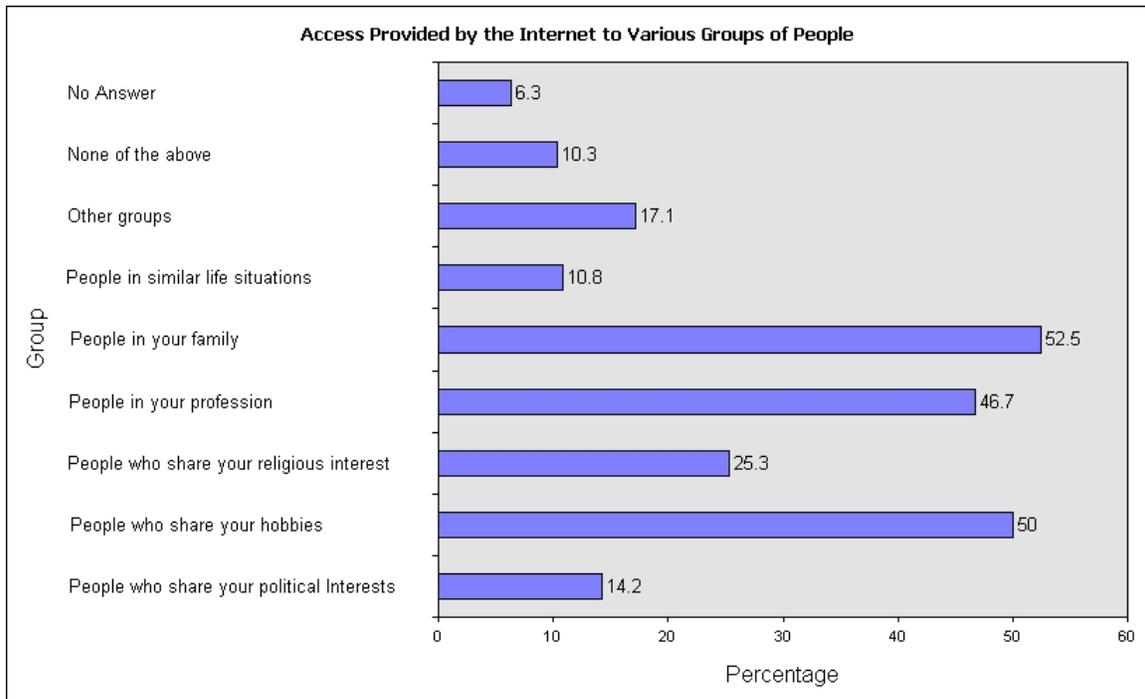
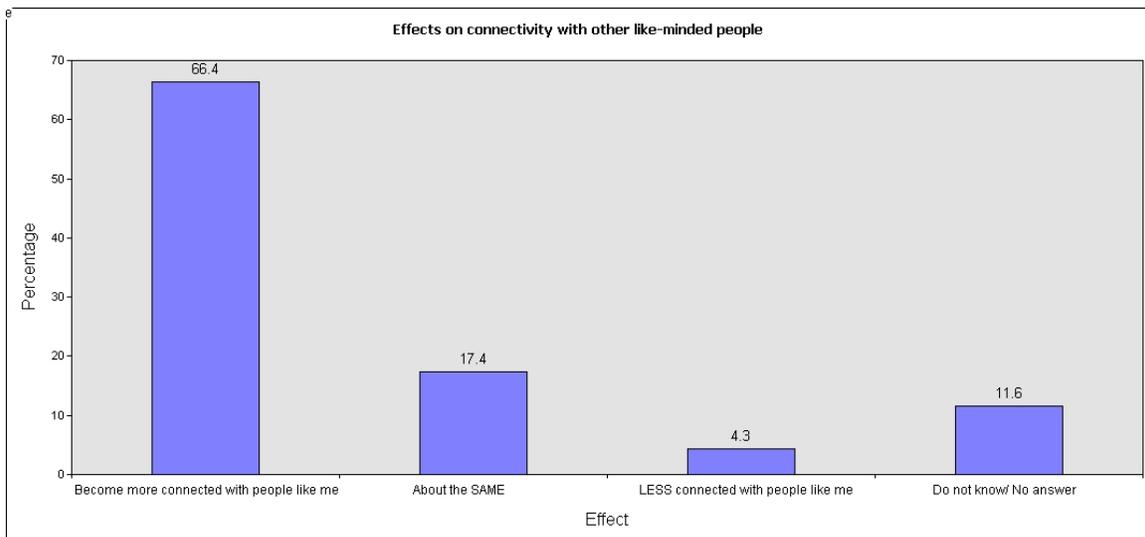


Figure 11: Effects of connectivity with other like-minded people



One of the prominent social aspects of the Internet is its ability to bring people with similar interests together. Figure 11 shows this Internet's influence in connecting like-minded people. A large number of respondents (66.4%) report that going online has indeed brought them into touch with people similar to themselves.

Figure 12 shows concern among Saudi Internet users for information privacy. With the large number of security issues on the net, it is natural that almost every person going online (86.7%) is concerned about his/her privacy.

Figure 13 shows the concern for online anonymity while browsing websites. As clearly seen, majority of users tend to agree on its importance. Though small, there is an increasing number of people who disagree with the need for online anonymity. This likely shows that people are becoming more comfortable with the Internet and are more open-minded.

*Figure 12: Concern of Privacy of Information*

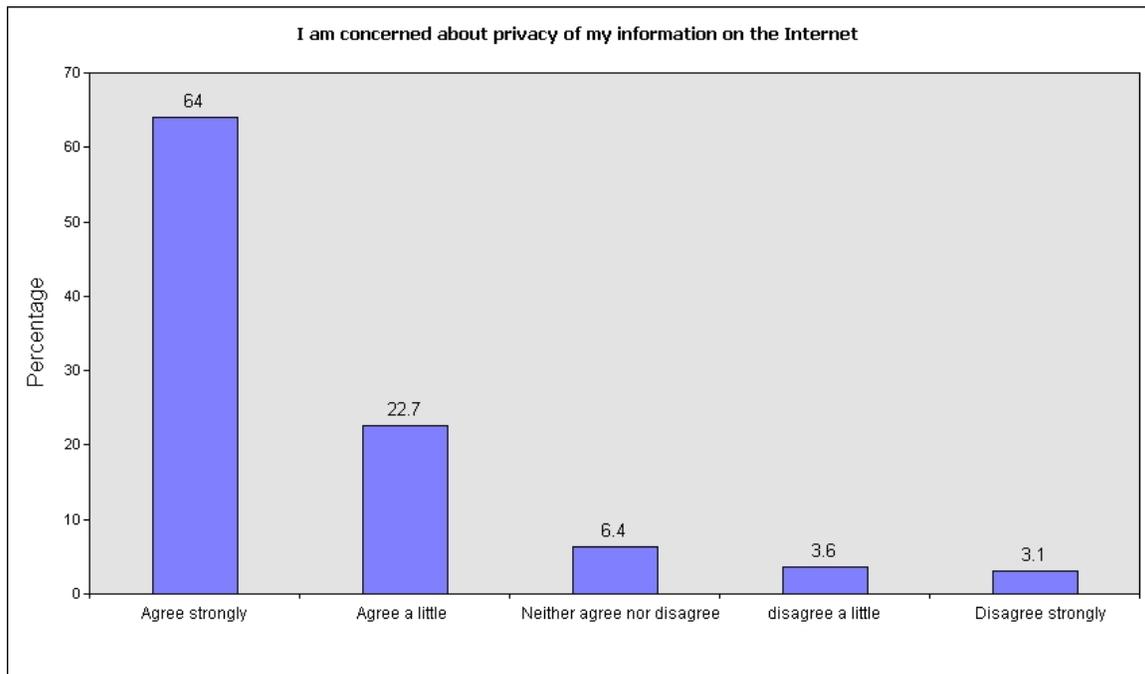


Figure 13: Anonymity while browsing

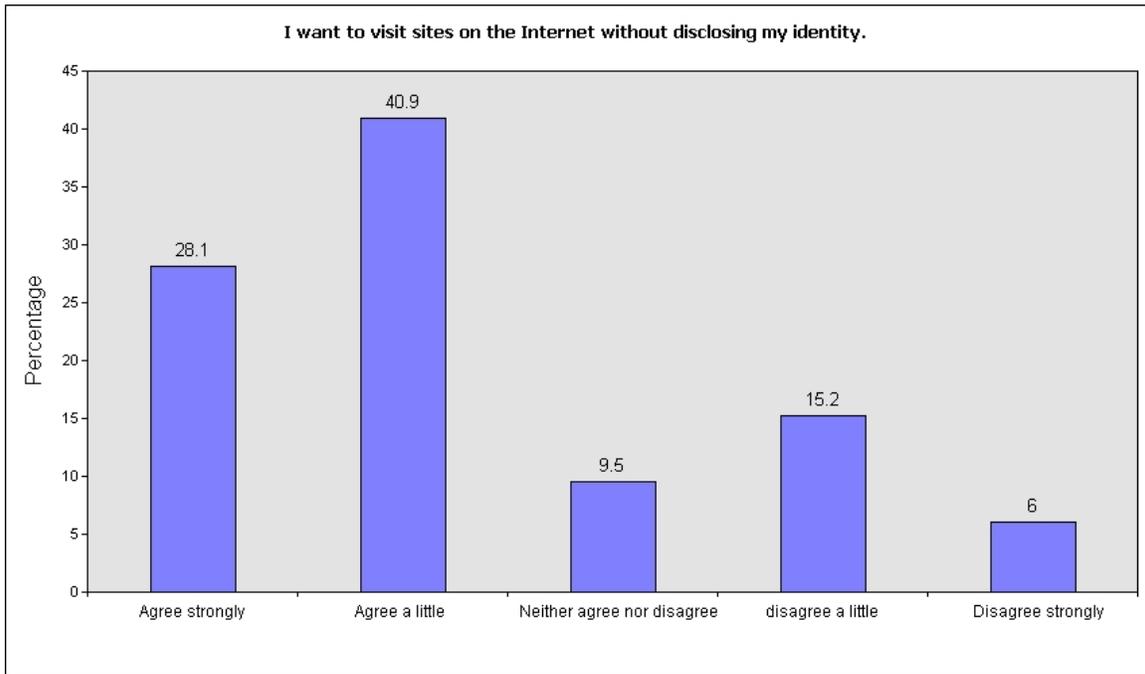


Figure 14: Place of access of Internet

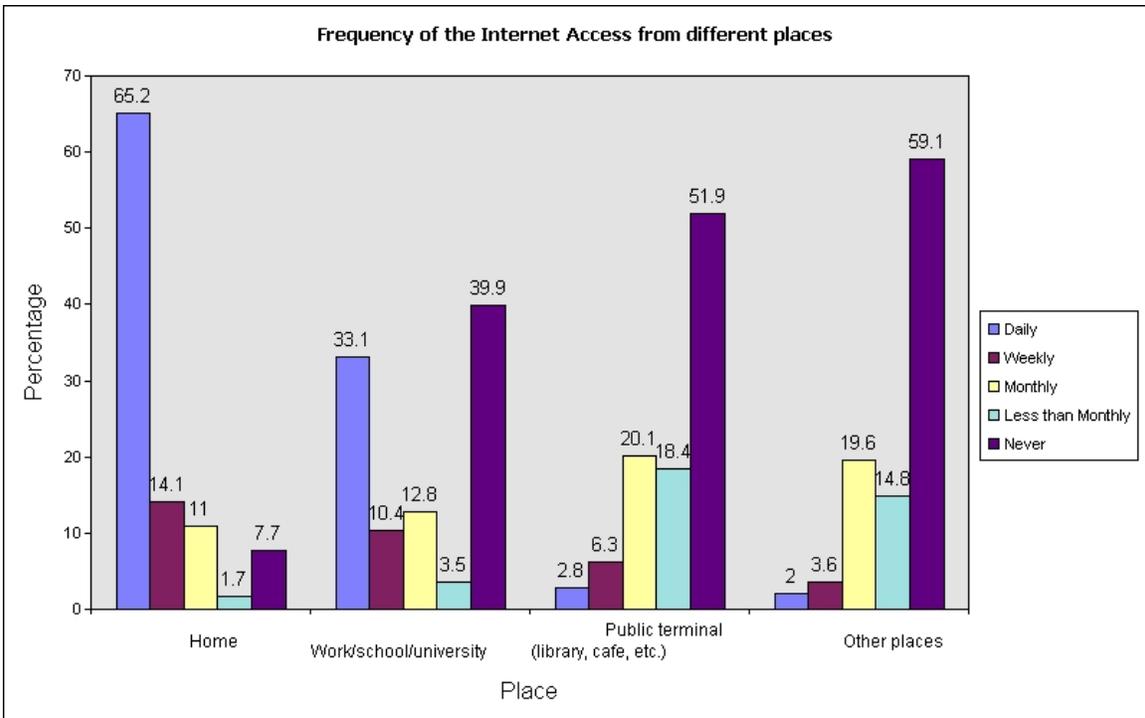


Figure 15: Paying for Internet Access

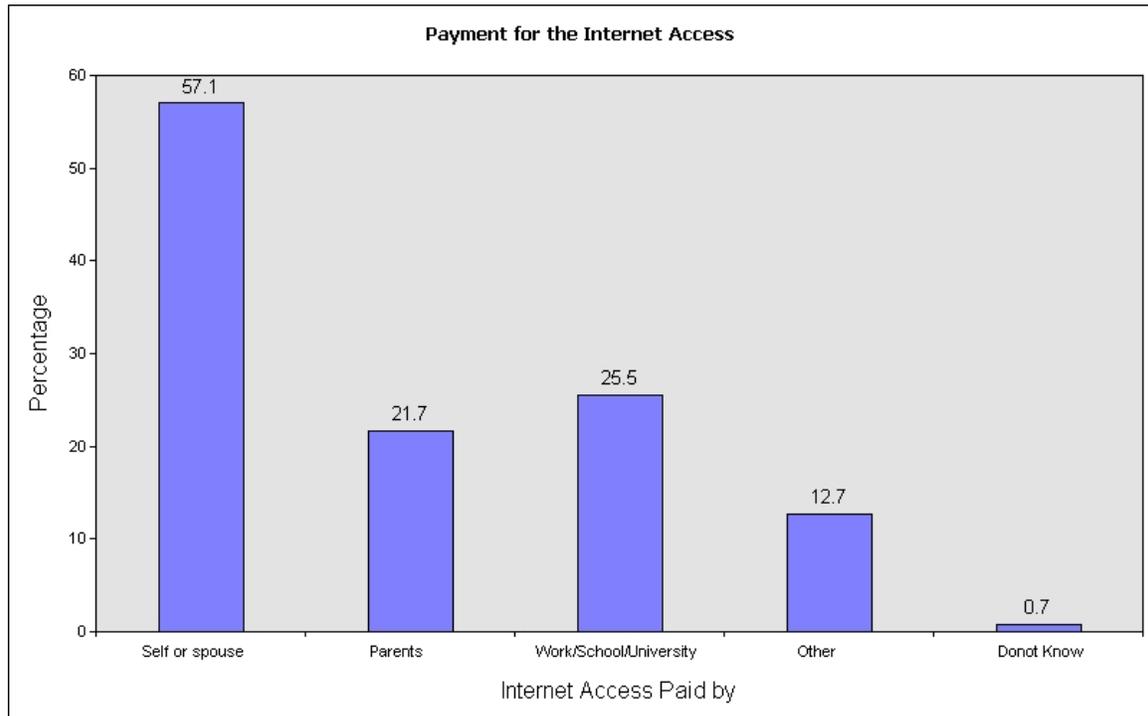


Figure 14 shows the place of access of Internet of the users. It is clear that on a daily basis, almost two-third of the users access it, while on a weekly basis, almost one-third access it from their homes.

Figure 15 shows the graph of 'who pays for the Internet access'. More than half of the users themselves pay for the Internet access, which is most likely to be accessed from home.

Based on these results in this subsection, a very basic idea of the effect of Internet on the society can be developed. It is seen that Internet usage patterns in Saudi organizations are changing, thereby affecting the way people work. Moreover, besides work, Internet/computers are steadily becoming a mainstream medium for fun, leisure and play. The Internet in various cases is replacing other traditional mediums, such as the television. It also affects other daily, weekly and monthly activities. Users are involved in a range of online activities from discussion forums, streaming media to online chatting and searching information on numerous issues. From a more direct social perspective, the Internet helps in connecting with people from different parts of the globe, eliminating geographical boundaries and creating new online social groups based on common interests.

### ***Results of Cross-Queries***

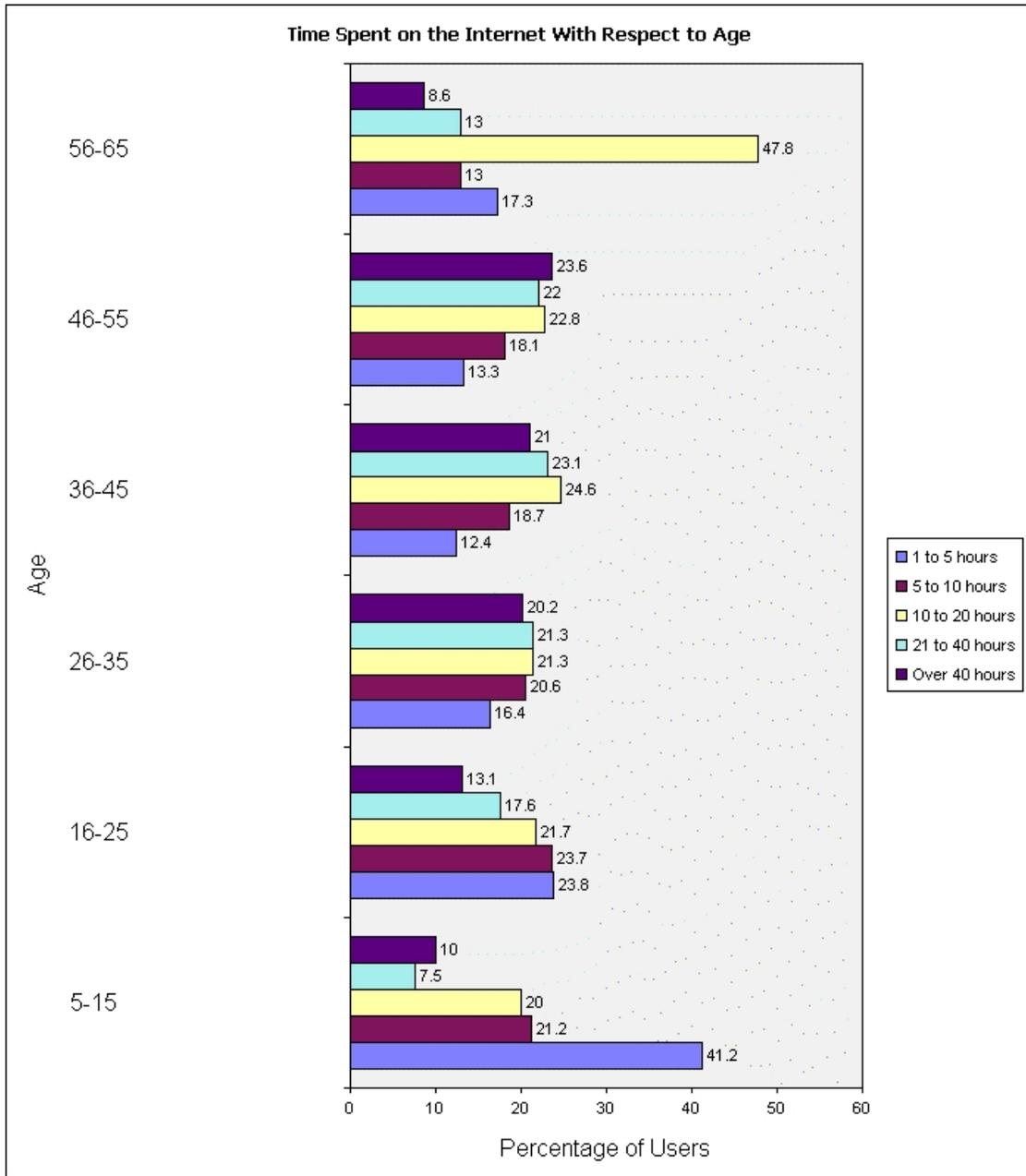
The results obtained in the previous direct questions can be merged and interrelated to give a more elaborate insight into various social aspects. Regression analysis is used to

determine the correlation between factors indicated by the correlation factor (CF) represented by  $\beta$ . Fundamentally, the value indicates how much of a change in one variable is explained by a change in another. The value of CF lies in the interval [0,1]. A magnitude of CF=1 shows an ideal (or 100%) correlation between the two variables, while a value of CF=0 suggests that there is no correlation. Moreover, a positive value of correlation coefficient signifies that the two variables are directly proportional to each other, i.e., if we increase the value of one variable, the value of other variable also increases proportionally. A negative value of correlation coefficient suggests that one of the variables is inversely proportional to the other variable.

### **Internet usage versus Age**

An important and primary factor from a social aspects point of view is Internet usage<sup>iii</sup> versus age distribution. Figure 16 illustrates this for an overall age range from five to sixty-five years. An analysis of this distribution provides insight into the extent of Internet use at different age levels.

Figure 16: Internet Usage versus Age



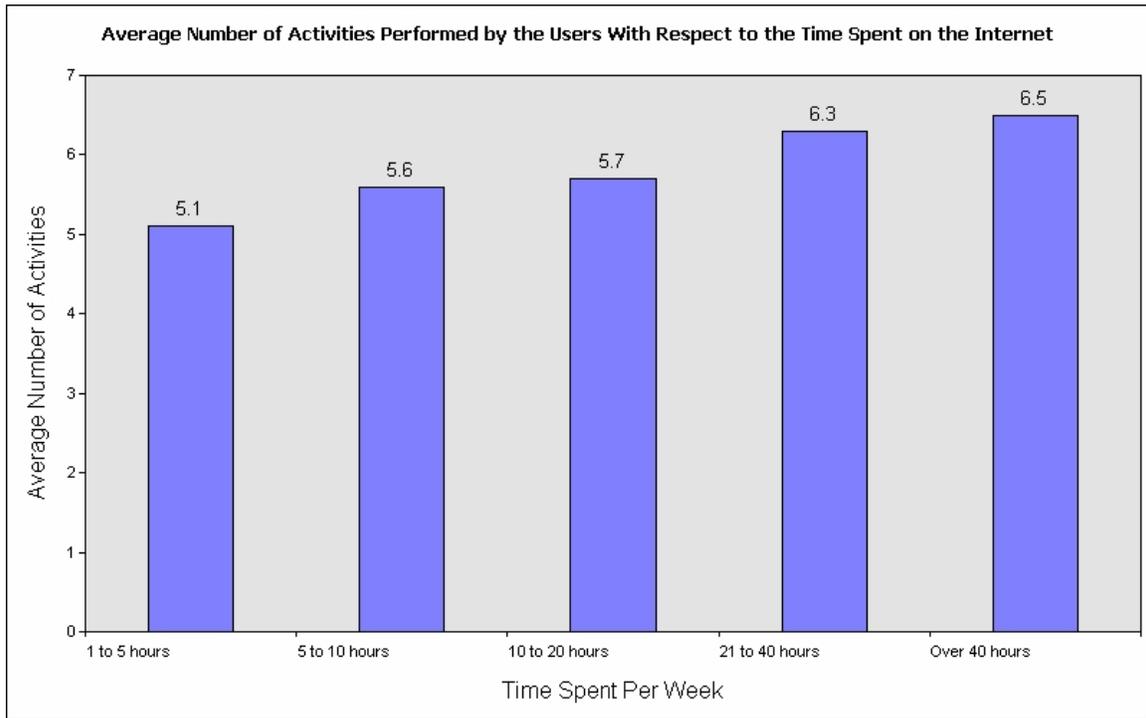
At the lower end of the age spectrum, the respondents, i.e., children access the Internet either from school or home and this is most often under the supervision of parents, guardians or teachers. Also, exposure at this level is introductory limited to emails, homework assistance, online games, etc. Hence the majority of respondents in this age group (41.2%) access the net for at most 1-5 hours per week. The higher-end users in this group would most likely be students in their teens (13-15) that understandably would have access on a less regulated scale. However, this trend is set to dramatically change in the near future with the deployment of online school endeavors such as the WATANI

Project<sup>iv</sup>. Projects such as these strive to implement an online school collaborative community for extending education beyond the traditional school model. Such an educational system would significantly increase student Internet access in the future. With increasing age groups, there is a significant increase in time spent on the Internet. The percentage of low-end users (1-5 and 5-10 hours/week) is seen to be clearly decreasing with the ascending age-bracket, although a slight increase is seen for the last group that relates to older individuals, between 56-65 years of age. An inverted trend is seen for the higher-end users (21-40 and over 40 hours/week). Their percentage in respective age groups is seen to increase, although tapering off to 8.6% and 13% respectively for the most elderly group. The significant percentage of high-end users in the middle age groups is explained by the fact that most access refers to Internet availability at the work place. Such long-term daily Internet availability may be interpreted as actual use although effective Internet access would be quite less. This analysis is further strengthened by the sharp fall in high-end users for the most elderly group, as a vast majority of these would be retired. A regression model of number of hours of **Internet usage per week** also shows that the **increasing** age has a significant effect<sup>v</sup>.

#### **Average number of Internet activities per week**

Figure 17 illustrates the average number of user activities tallied against the weekly Internet usage. Although there is the expected increase in average number of activities with longer working hours, this observed gradient is quite small, but significant<sup>vi</sup>, i.e., more time spent on the Internet per week means more average activities. Mostly all users engage in similar activities, although different combinations and permutations of such activities would exist. This also supports our earlier inference that people, who have Internet access for more than 40 hours per week, are most often employees with Internet availability at the office.

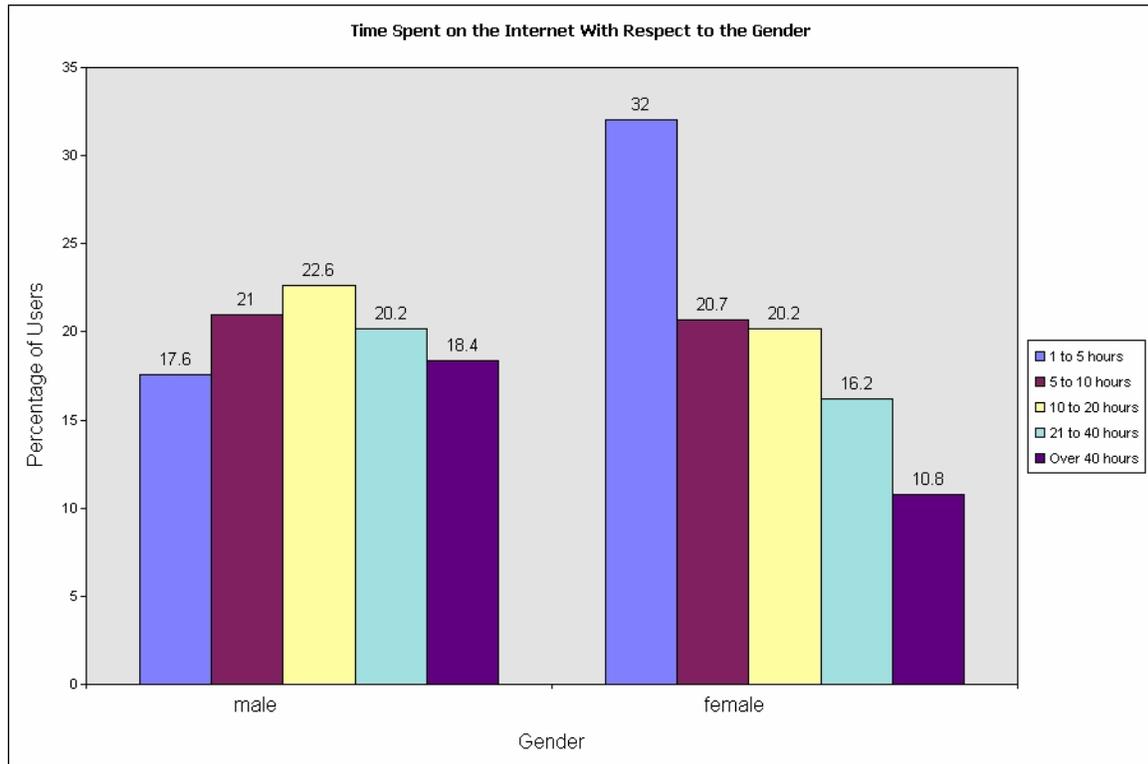
Figure 17: Average number of user activities versus Time spent on the Internet



### Internet usage versus gender

Figure 18 observes whether there exist any significantly different patterns for Internet usage by either gender. The reason that there are a considerably higher percentage of female users (32%) at the lower-end (1-5 hours per week) as compared to males (17.6%). This is because most females would only have dial-up access from their homes as compared to males who may have Internet facilities at the workplace, as well as Internet cafés. Correspondingly this also explains the difference observed for higher-end users (21-40 hours per week, more than 40 hours per week), with respect to a larger male percentage. For moderate Internet use, it is seen that although the number of male respondents were over five times that of female respondents (refer to respondents' profile above), time spent online had similar usage pattern. The regression model shows that females are less likely to use Internet as compared to males, and is significant<sup>vii</sup>.

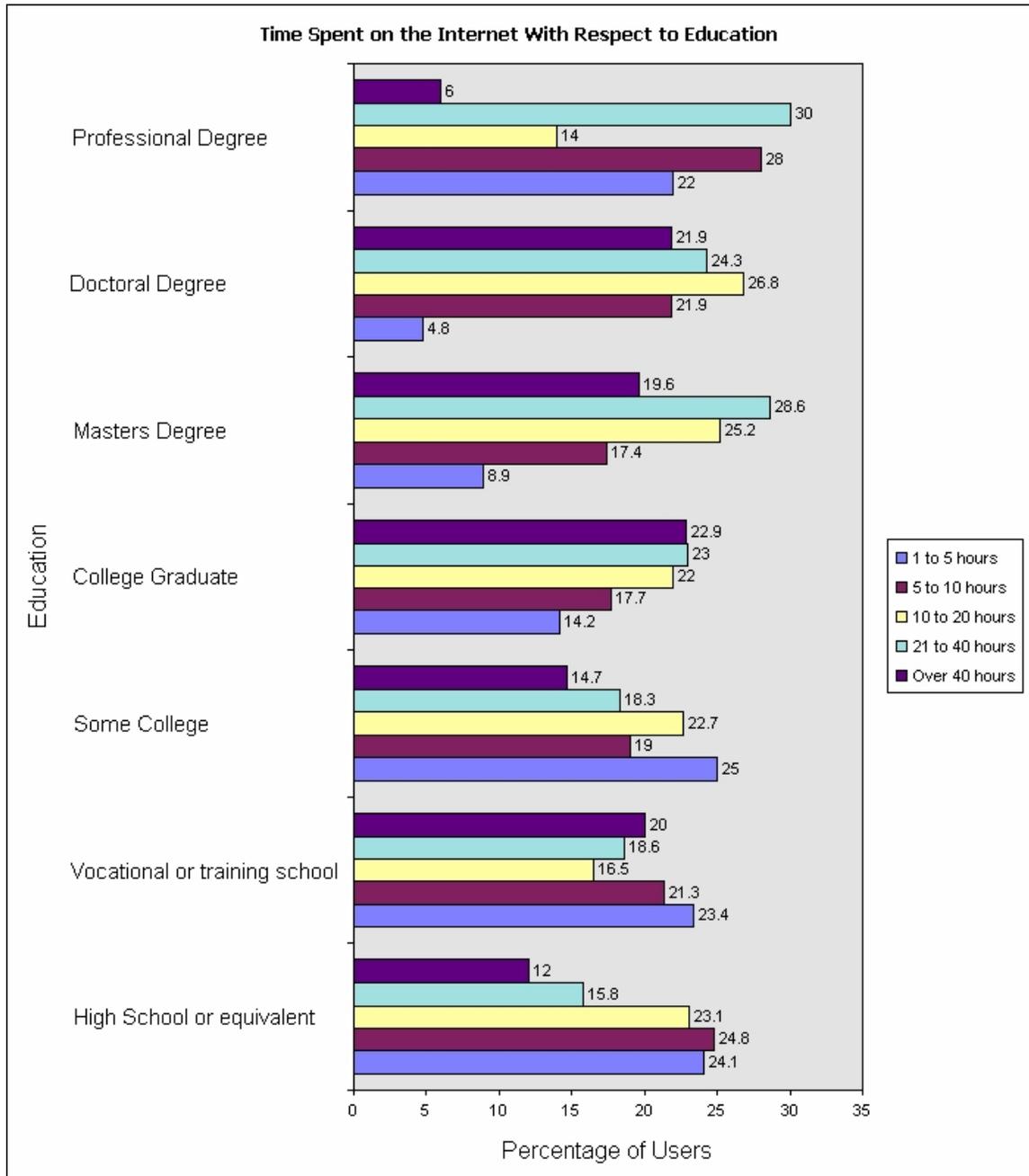
Figure 18: Time spent on the Internet versus Gender



### Internet usage versus Level of Education

Figure 19 provides for observations regarding the impact of education on Internet usage. From this graph, the distribution shows that online access is more or less the same irrespective of educational background. However, the regression for this shows that higher the educational level, users tend to use Internet for more hours, which is statistically significant<sup>viii</sup>. This inference compensates for individual group characteristics; for example, users with a masters or doctoral background would tend to use the Internet more extensively for research-oriented applications while this would not be the case for user with a less extensive education.

Figure 19: Time Spent on the Internet with respect to User's Education

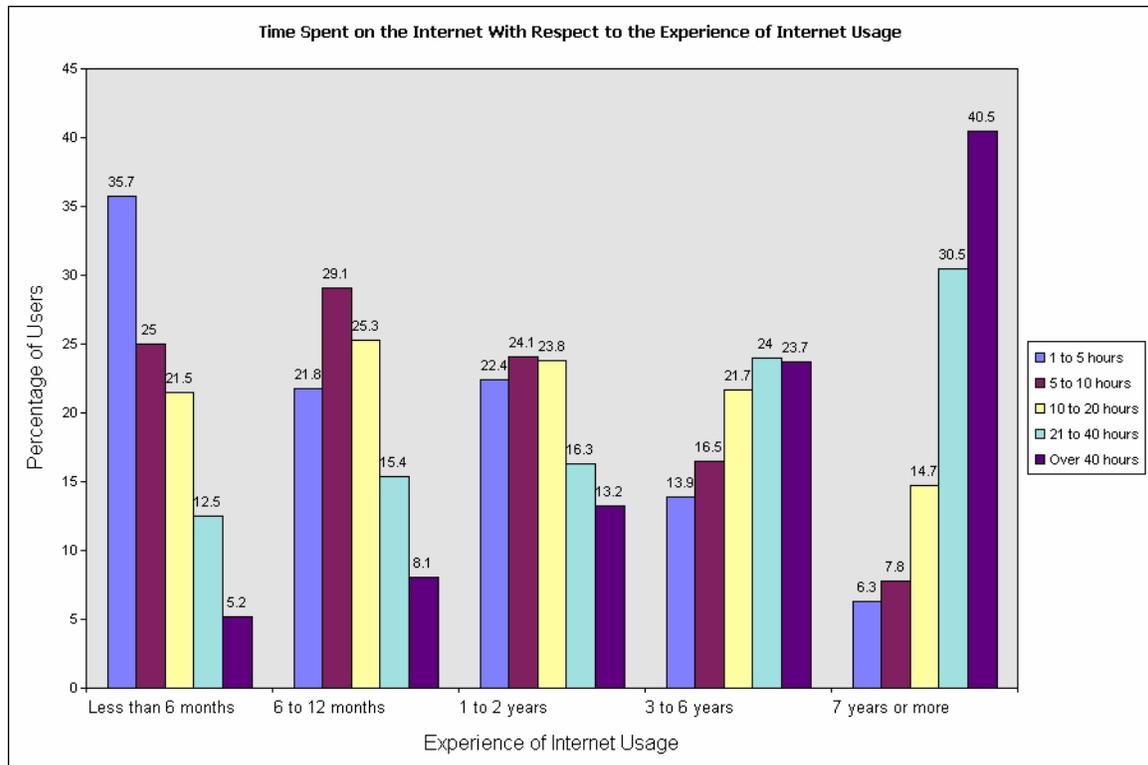


### Internet usage versus online experience

Figure 20 illustrates the interesting aspect of how Internet usage changes with online experience. Considering the two ends of the timeline spectrum, i.e., 'Less than 6 months', and '7 years or more', the far-reaching change in Internet usage is obvious. People with extensive online experience are bound to utilize its benefits for work as well as leisure as much as possible. Looking at the graphs reported for the more moderate timelines,

ranging from ‘6 to 12 months’ to ‘3 to 6 years’, the flow overall represents an obvious tendency for users to spend more time online. A very probable reason for the exceptional trend seen between users with ‘Less than 6 months’ and ‘6 to 12 months’ experience is that the former may still be considered as novices, with a large number preferring to spend moderate time periods online. Also a significant factor could be what people would perceive as healthy Internet usage versus Internet addiction. In other words, more Internet experience increases the amount of time spent online, which is statistically significant<sup>ix</sup>.

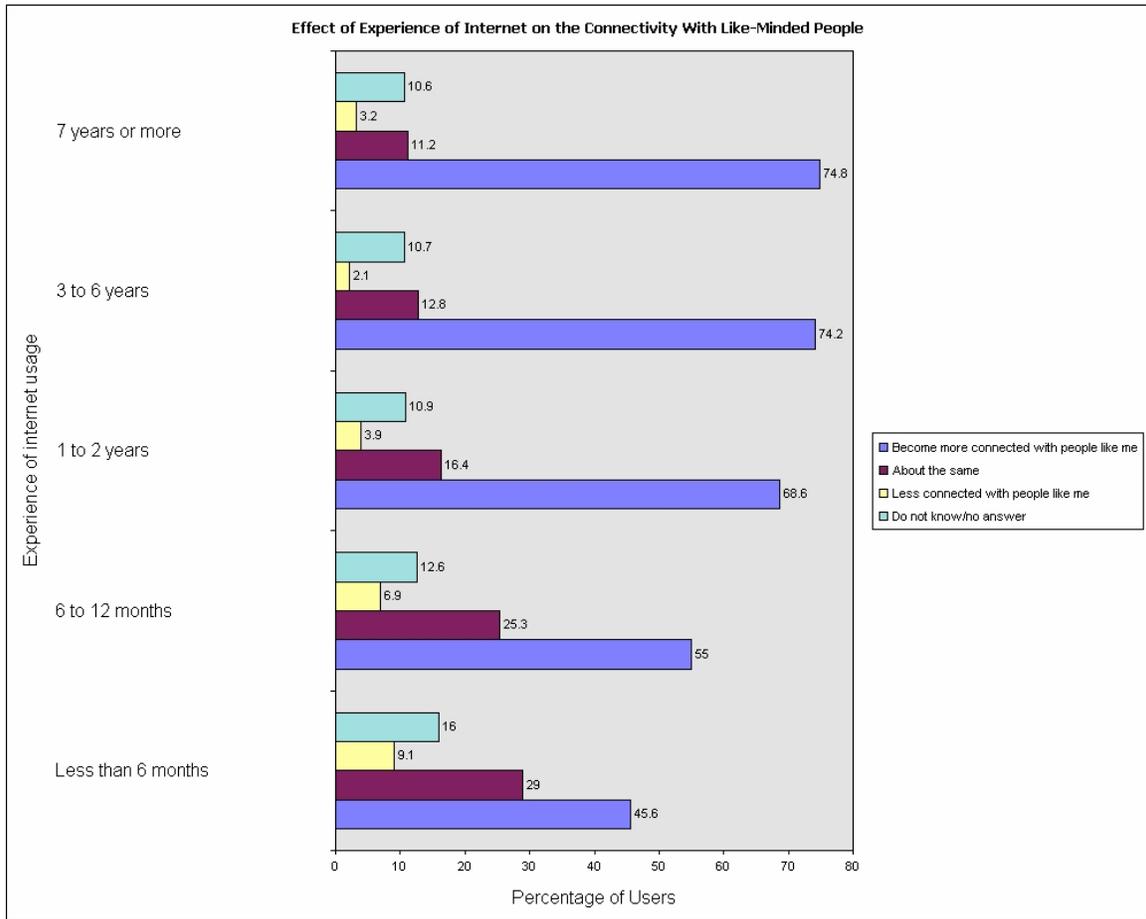
Figure 20: Time Spent on the Internet versus Internet Experience



### Effect on Connectivity with Internet experience

Earlier, Figure 11 has considered the potential of the Internet as a social-interaction medium, connecting people with similar interests. An overwhelming majority of users (66.6%) support this basic characteristic of the Internet. Mostly people who do feel otherwise (4.4%) are novice Internet users, not yet able to effectively utilize the tools that the Internet provides. To confirm the result obtained earlier in Figure 21, which compares connectivity with online experience. It is seen that with increasing online experience, the number of people who agree with the potential of the Internet as a tool for social-interaction and connectivity increases considerably. With time, users get acquainted with various activity or special interest groups, form online social communities etc. This is again verified with regression model, which shows that the effect is significant<sup>x</sup>.

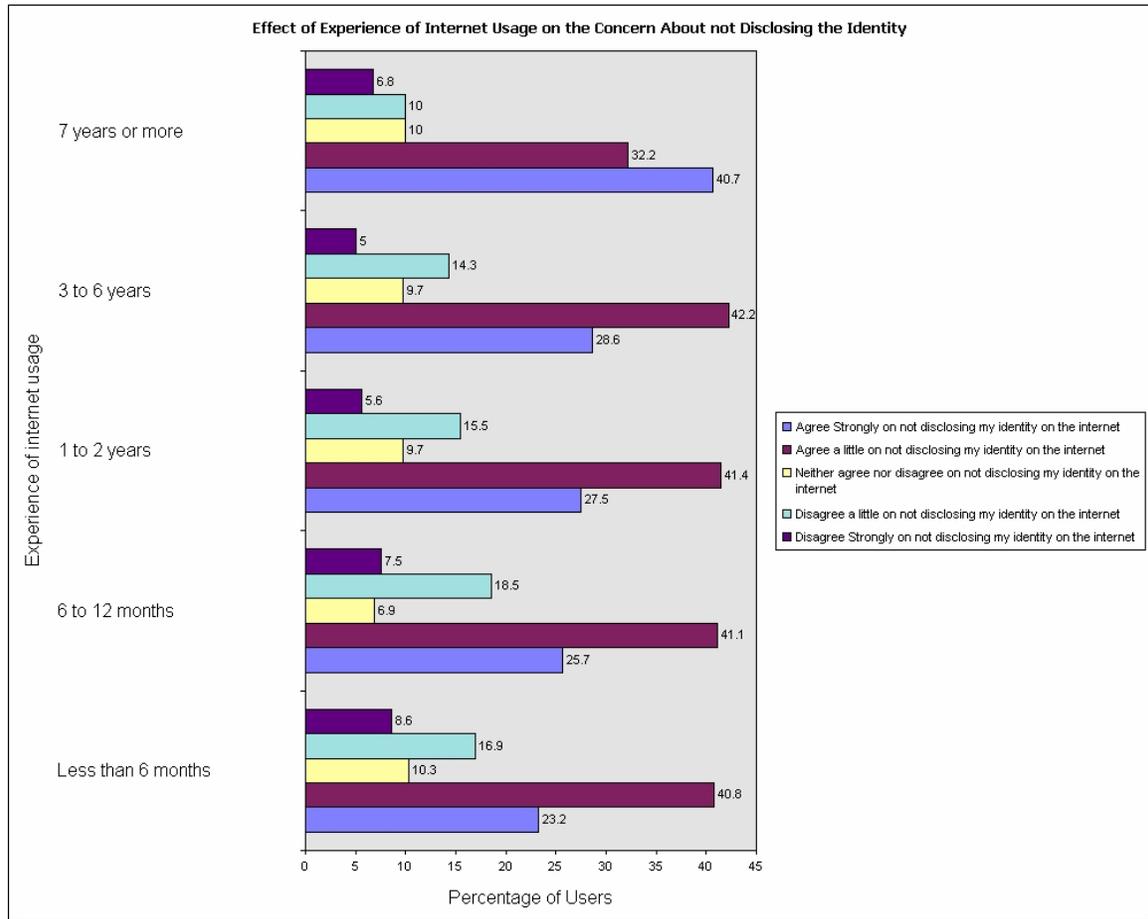
Figure 21: Online Experience versus Connectivity with like-minded people



### Privacy Concerns versus Internet Experience

Another significant question that the Internet raises is online privacy and censorship. Figure 12 illustrated the user’s awareness of online privacy. A high percentage of users (64%) do agree with the need for applying measures that would allow individuals to use the web securely. As seen earlier this awareness of details comes from online experience. Novice users do not consider this issue of online confidentiality very important as seen from Figure 22, which documents such user awareness against online experience. As seen, with increasing time spent online, users start considering the Internet as an extension of everyday life and hence register a growing concern regarding its discretion and privacy.

Figure 22: Online Privacy Concerns versus Online Experience



### Internet experience vs. availability of various electronic gadgets

The results show that users with more than one computer and other electronic gadgets at their homes (possibly techno-savvy and well-to-do users) tend to have been using the Internet for a longer duration and the trend is found to be significant<sup>xi</sup>.

### Internet experience versus place of access

Users who access Internet on a daily and weekly basis from home tend to have been using Internet for a longer duration whose effect is statistically significant<sup>xii</sup>.

This subsection reported on results and analyses seen through cross-querying or merging directly obtained results. Regression analysis was used to identify significant trends.

## SOCIAL DYNAMICS & SUGGESTED INITIATIVES

The Internet as a dynamic medium of communication and interaction has a significant impact on society and social dynamism. With relevance to Saudi Arabia, this induced social change has only just started. Over the years, there has been an exponential growth in the Saudi online population, a trend that is bound to continue. But with this growing

connectivity, the Internet's impact on our society has to be considered. There is no doubt that the Internet provides immense opportunities for social development by easily connecting individuals with family and friends, or bringing people with similar interests together. However, the Internet is in essence an individual-oriented technology, i.e., it is rarely used in groups, but rather by single persons. Hence, there are chances that it may inadvertently lead to isolation from family and society. Further, given the unmediated nature of the medium, there are definitely points of social and cultural conflict that have to be addressed. Given the results and their analyses in the previous section, there is a need to discuss steps, which if taken, would have a positive effect of Internet influence in the Arab region and in Saudi Arabia in particular.

The first and foremost is achieving Internet ubiquity, i.e., achieving more widespread Internet connectivity for a broader spectrum of the population. An obvious measure would be reducing Internet access costs significantly. However, a singular factor that mandates thorough debate on initiatives for Internet diffusion in the country is Saudi Arabia's largely unique social structure and its dynamics. It is important to illustrate initiatives that accelerate development within the context of maintaining the country's social, cultural and religious framework. One such perspective to be considered is the emphasis on gender-based segregation in Saudi society. Also the present restriction on women drivers, directly curtails the mobility of females in the country. This is reflected in the statistics drawn from the earlier section on Respondent Profile, wherein the vast majority of people answering the survey were males, due to lack of Internet Access for women. Also, regarding the fraction of working women, most jobs are related to teaching and health-care. There is a definite need to improve Internet diffusion specifically among Saudi females. This could be best achieved through targeted training and awareness programs and exclusive female Internet access centers. Given the segregated schools, colleges and work environments, achieving such targeted awareness is straightforward.

An interesting social affect of Internet is the communication avenue it presents between males and females in the country. It was seen earlier that a significant online activity among respondents is chatting or discussion forums. Though no feasible measures are apparent to curtail this medium, the effect on Saudi society is likely to be minimal, given the close-knit family structures. Such a medium may even be desirable, with the increasing world-exposure from ubiquitous Satellite TV and the growing Internet usage.

Another significant aspect to consider is the education system in the Kingdom, which has traditionally been Arabic-centric. The absence of English as a language supported by the school system would be a major hindrance to expanding Internet use in academic institutions and among young people. Though, this is rapidly changing with English being introduced as a second-language in almost all schools, there is the relevant fact that Arabic online content is very scarce, especially in terms of educational websites and pages. There is a need for a conscious effort, even government-funded to address this void. Ongoing projects such as the earlier mentioned WATANI or School Net Project<sup>xiii</sup> are good initial steps, which aim at connecting the educational institutions nationwide and creating a standardized and strong learning system. At the same time, more emphasis should be given on training teachers, students and the general population through

dedicated education and awareness programs, so that they easily adapt to the new methodology.

From our respondent classification earlier in section 3 and later analysis, it is evident that a majority of Internet users are students from universities and colleges. The lack of Internet use among the working masses, specifically those self-employed and entrepreneurs is directly related to the existing high costs of Internet access, especially broadband connectivity. To counter this, special tariff systems can be structured and deployed for Internet connectivity for Small and Medium Enterprises (SMEs). Also, promoting e-Services for government-people interaction would be a strong step towards Internet awareness, not to mention streamlining what may often be bureaucratic procedures.

Continuing with relating initiatives with respondent classification, it was seen earlier that an overwhelming majority of users are from major cities with Internet diffusion at a bare minimum in towns and rural areas. In addition to deploying online portals for government Services, introduction of e-Learning is crucial. Besides being an outreach program for students in remote places, online content delivery models would foster Internet awareness in rural areas. Numerous relevant projects have been started specifically at the University levels to develop such e-Learning systems as standard education models<sup>xiv</sup>.

## **CONCLUSION**

In this paper, the Internet usage from the perspective of cultural anthropology was studied, focusing on its influence on Saudi society. The literature review identified various aspects of Internet-societal interaction and documented similar-purpose projects as case studies. Discussion and analysis of the results from our web-based survey were presented. These statistics provided insight on the present status of Internet in Saudi society and elaborated on trends observed during the two-year life of this project, supported by KACST (King AbdulAziz City for Science and Technology) under project code AR-19-16.

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## ENDNOTES

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<sup>i</sup><http://mosaic.unomaha.edu/Pages/mosaicgroup.html>

<sup>ii</sup><http://www.dit.net>

<sup>iii</sup>‘Usage’ here refers to the number of hours/week and ‘Duration/Experience’ is the number of years of Internet use

<sup>iv</sup><http://www.watani.org.sa>

<sup>v</sup>  $\beta=0.141$  and intercept=2.518

<sup>vi</sup>  $\beta= 0.284$  and intercept=3.758

<sup>vii</sup>  $\beta = -0.09$  and intercept=3.47

<sup>viii</sup>  $\beta = 0.065$  and intercept=3.195

<sup>ix</sup>  $\beta = 0.296$  and intercept = 2.454

<sup>x</sup>  $\beta = -0.15$  and intercept=3.39

<sup>xi</sup>  $\beta = 0.339$  and intercept=3.054

<sup>xii</sup>  $\beta = -0.13$  and intercept=2.178

<sup>xiii</sup><http://www.watani.org.sa>

<sup>xiv</sup><http://www.kfupm.edu.sa/dad/elearn/online/samples.htm>