A

Seminar report

On

Mobile Computing

Submitted in partial fulfillment of the requirement for the award of degree
Of Computer Science

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Preface

I have made this report file on the topic **PILL CAMERA,** I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to …………..who assisting me throughout the prepration of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

Acknowledgement

I would like to thank respected Mr…….. and Mr. ……..for giving me such a wonderful opportunity to expand my knowledge for my own branch and giving me guidelines to present a seminar report. It helped me a lot to realize of what we study for.

Secondly, I would like to thank my parents who patiently helped me as i went through my work and helped to modify and eliminate some of the irrelevant or un-necessary stuffs.

Thirdly, I would like to thank my friends who helped me to make my work more organized and well-stacked till the end.

Next, I would thank Microsoft for developing such a wonderful tool like MS Word. It helped my work a lot to remain error-free.

Last but clearly not the least, I would thank The Almighty for giving me strength to complete my report on time.

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<u>ntroduction</u>

The International Data Corporation (IDC) indicates that the most popular activities of mobile Internet users are search engine querying, reading news information, downloading multimedia, and using email and instant messaging clients. Over the next four years, IDC predicts the fastest-growing activities will be purchasing, social networking, and blogging.1 In essence, most services available through desktops will soon be accessed mainly through a large quantity (and variety) of mobile devices.

Exciting systems and networking innovation is happening on these devices, and it is a good time to be a mobile computing researcher. At the operating system level, we have seen the rise of the Linux-based Android platform gaining market share at the expense of the closed-source iPhone. At the same time, the App Store launched by Apple contains more than 200,000 applications that users can download for their phone. Google has followed suit with an equivalent (although less controlled) store for Android phones. Regardless of the authority model — on which the jury is still out — the application store model is here to stay. While previous application models involved service providers and phone producers only, now the service market is open to third-party developers who might even be the users themselves.

Clearly, this field is burgeoning and developing in many directions, driven by users' interests in interacting and "staying connected." With this in mind, it is worthwhile to stop and reflect on users' future needs and expectations as well as the challenges that this reality brings and the opportunities offered.

A Social Mobile World

One important aspect to note about the recent use of mobile computing is the increased access to social networking services from mobile devices. In fact, mobile users spend more time on social networking sites than desktop users. These statistics have several implications for systems and network builders in general: the number of mobile phone users is already much higher than desktop users, with much more dynamic connectivity patterns. This has impact, among other things, on the load of systems handling content for social networking sites.

The combination of mobile phone technologies and online social networks leads to a very appealing world for mobile advertisers and more generally for mobile service providers. Strategy Analytics estimates the expenditure on mobile advertising at US$3.6 billion in 2009, and projects US$38 billion by 2015.

Part of this forecast relies on the advantages of accessing social network services from a mobile device: through location information gathering - sensing user activity as well as social profiling - advertising can become more targeted and therefore better received and useful. It is not by chance that Twitter now lets users add latitude and longitude to any tweet and that Facebook has just launched Facebook Places.

Location-based social networks such as Foursquare and Gowalla are predicated on the use of this technology from a mobile device. This means that, all of a sudden, the messages posted on the social network are not only generated when the user is at his desk but also at any time throughout his day. They also come from myriad devices dispersed and roaming all over the world. And this is not limited to traditional messages: items of interest increasingly include video download, music, and media streaming.

Looking at the last two years of mobile and ubiquitous/pervasive computing (as well as sensor systems) conference programs, it is clear that the research community has developed a strong interest in so-called participatory sensing, where users' phones are employed as data collectors in the environment for all sorts of sensed information (from images to temperature to interaction patterns). In this context, several approaches have emerged to help with energy conservation to allow long-term data collection as well as usability . The potential of this approach has also been noted outside the computer science research community: behavioral psychologists and health professionals have realized the potential of a device constantly close to patients.
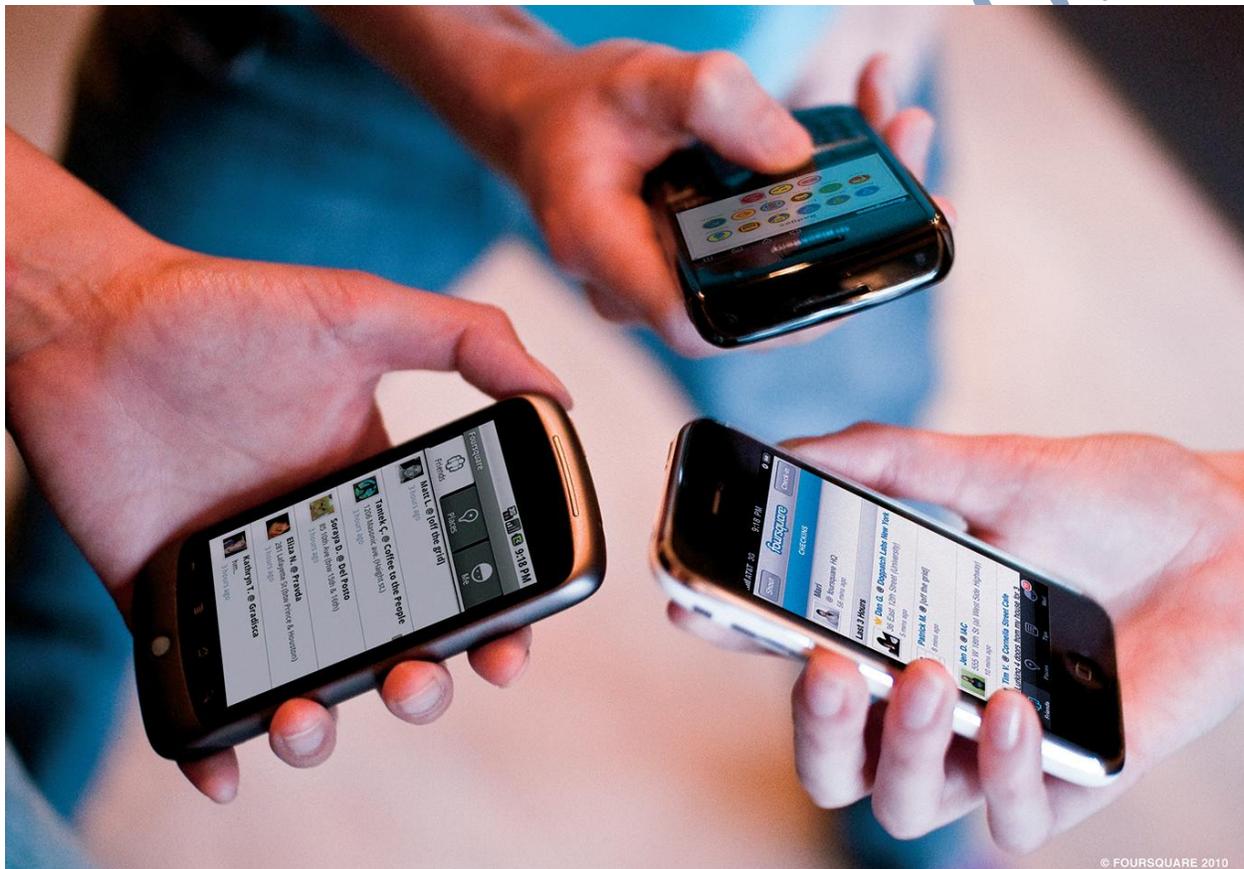
Figure 1. Location-based gaming. No longer restrained to just talking or texting, the new mobile landscape takes advantage of location information gathering. Foursquare, for example, is a social networking game played on mobile devices that senses users' locations and allows them to earn points and unlock badges as they explore locations in their city. (Source: Foursquare; used with permission.)

Upcoming Challenges

One interesting observable mismatch is that users expect the same level of service and performance on their phone as they experience on their desktops. For example, low latency and high responsiveness, ease of interaction, and always-on connectivity are the implicit user requirements. It is also, however, true that current devices' limitations are impacting the way individuals use devices (skimming through email rather than reading carefully, and producing very short answers). This, in turn, also induces new behavior in users. For instance, consumers who bought the iPad sued Apple because the device was shutting down after overheating, leaving users disappointed but still determined to own a device they can use to read the news from a deck chair on the beach.

There are a number of other challenges, as well, for mobile application and network developers that need attention. Each of these challenges must be solved before users' expectations can be met.

Energy :

Energy seems to be a permanent issue with these devices. Screens are getting bigger and more colorful, functionality is increasing, as is the number of network interfaces and sensors available and used by applications. Several of the most recent smart phones last no more than 12 hours without recharging, when continuously connecting to the network. While some of these issues will be solved at the hardware level by use of more sophisticated batteries or energy-scavenging solutions, there is also a need for improved software that works effectively (for example, through a smart sensor and with efficient use of network connectivity).

Bandwidth :

Downloading and streaming video and audio content seem popular. Unfortunately, even today, the current cellular network infrastructure is put under considerable pressure, and it seems bound to become worse. Research is happening on alternative techniques for smarter content caching or opportunistic use of local connectivity links (such as downloading interesting content from your

neighbors). Intelligent switching between interfaces, which would let users seamlessly exploit networks with more bandwidth when available (such as Wi-Fi), is also a promising idea.

System :

Given the availability of multiple applications developed by different sources, there is a need to engineer the device system in ways that allow for responsiveness and concurrent execution while considering the limited resources and different user interfaces available. At the same time, the high number of mobile devices and high frequency of use (because of the device's constant availability) imposes a load that burdens not just the network but also the back-end servers. Hence, we need customized techniques that take advantage of the knowledge of device location, access patterns, and user behavior.

User Interface :

The way people use services and devices cannot be forecast with precision. The success of short message service (SMS) was an unpredicted event. It is apparent that the interaction with systems happening from mobile devices is different from the one on desktop machines. Work on voice interfaces is promising but not yet ripe, although it has the potential to considerably change the kinds of services and ways in which services can be offered to users. The abundance of challenges for hardware and software research in this area are therefore appealing, and virtually all services offered now on the Internet need to consider the likelihood that users will soon be accessing them through a mobile device.

Security and Privacy :

While mobile malware hasn't captured too many headlines yet (with a few recent exceptions), it is clear that with more applications being deployed, more businesses placing phones at the core of their interest, and more data being collected through these devices, the interest of criminals is

bound to increase. Moreover, mobile devices can be stolen and tampered with while the owner is not present in easier ways than with desktops and servers.

Integration and Standardization :

We are at a stage where various forces are at work to gain a monopoly on the mobile services market. Although it is unclear how this will develop, as part of the academic community, I have the hope that some sort of open market solution will dominate. However, with open solutions come the challenges of standardization, heterogeneity, and interworking of different technologies and hardware: Will desktop computer history be able to teach us something?

Why Should We Care?

The applications and technologies I have mentioned are still quite primitive — and yet we are just one step away from the combination of location-based social networks and participatory (or crowd) sensing. On one hand, we have a powerful device able to capture a variety of details about our lives, including location and co-presence. On the other, we have tools that let us input information and messages, and link to other people explicitly. The power of this integration will certainly need to be confined somehow by clear privacy measures, but its implication on the scale of perceived user experience will no doubt be noted. This means, however, for us researchers that the challenges will just become harder to tackle. For example, who is in control of the data collected about users? Who can combine them? Can the user constrain them? How should location information be combined with place category information in a semantically and possibly standardized way? How are services able to process the realm of data within responsive and energy-efficient applications? Can we utilize user context data to fundamentally improve social network analysis measures — and ultimately, the knowledge we have about relationships, interaction, and mobility?

It is probably clear to many that the development of current technologies is marking the end of the Internet as we know it: the phrase "Internet of Things" is often associated with fragmentation because of the amount of devices that are and will be internetworked. However, the most powerful trend, and the one probably most hidden until recently, is the inherent human social nature that this fragmentation will be following closely, which will complement the virtual and yet real social weaving happening online. This process might, to give one example, open the doors to applications of the quite theoretical body of research on ad hoc and opportunistic networking: maybe with the social network trend, people and businesses are becoming acclimatized to the idea of the exploitation of social links to obtain more efficient and per-sonalized services (for example, by exploiting the local bandwidth available between two co-

located devices instead of using a cellular network), integrated with the overall centralized authorization of content and parties.

Advantages

Increase in Productivity :

Mobile devices can be used out in the field of various companies, therefore reducing the time and cost for clients and themselves.

Portability :

This would be one of the main advantages of mobile computing, you are not restricted to one location in order for you to get jobs done or even access email on the go

Cloud Computing :

This service is available for saving documents on a online server and being able to access them anytime and anywhere when you have a connection to the internet and can access these files on

several mobile devices or even PCs at home.

Location flexibility :

This has enabled user to work from anywhere as long as there is a connection established. A user can work without being in a fixed position. Their mobility ensures that they are able to carry out numerous tasks at the same time perform their stated jobs.

Saves Time :

The time consumed or wasted by travelling from different locations or to the office and back, have been slashed. One can now access all the important documents and files over a secure channel or portal and work as if they were on their computer. It has enhanced telecommuting in many companies. This also reduces unnecessary expenses that might be incurred.

Enhanced Productivity :

Productive nature has been boosted by the fact that a worker can simply work efficiently and effectively from which ever location they see comfortable and suitable. Users are able to work with comfortable environments.

Ease of research :

Research has been made easier, since users will go to the field and search for facts and feed them back to the system. It has also made it easier for field officer and researchers to collect and feed data from wherever they without making unnecessary trip to and from the office to the field.

Entertainment :

Video and audio recordings can now be streamed on the go using mobile computing. It's easy to access a wide variety of movies, educational and informative material. With the improvement and availability of high speed data connections at considerable costs, one is able to get all the entertainment they want as they browser the internet for streamed data. One can be able to watch news, movies, and documentaries among other entertainment offers over the internet. This was not such before mobile computing dawned on the computing world.

Streamlining of Business Processes :

Business processes are now easily available through secured connections. Basing on the factor of security, adequate measures have been put in place to ensure authentication and authorization of the user accessing those services.

Some business functions can be run over secure links and also the sharing of information between business partners. Also it's worth noting that lengthy travelling has been reduced, since there is the use of voice and video conferencing.

Meetings, seminars and other informative services can be conducted using the video and voice conferencing. This cuts down on travel time and expenditure.

Disadvantages

Quality of connectivity :

As one of the disadvantages, mobile devices will need either WiFi connectivity or mobile network connectivity such as GPRS, 3G and in some countries even 4G connectivity that is why this is a disadvantage because if you are not near any of these connections your access to the internet is very limited.

Security concerns :

Mobile VPNs are unsafe to connect to, and also syncing devices might also lead to security concerns. Accessing a WiFi network can also be risky because WPA and WEP security can be bypassed easily.

Power Consumption :

Due to the use of batteries in these devices, these do not tend to last long, if in a situation where there is no source of power for charging then that will certainly be a letdown.

Conclusion

This is the first article in a new column on mobile computing that will discuss several issues related to mobility and ubiquitous devices. The use of mobile devices has been soaring, with mobile subscribers surpassing 5 billion in 2010, according to the International Telecommunication Union (ITU), which is more than 70 percent of the world's population. ITU also forecasts that mobile Web access — via laptops and smart mobile devices — will overtake fixed desktop Web access within the next five years. In countries like India and China, this is already a reality.

The next time you update your Facebook status or Tweet, review a business report, read a magazine or make dinner reservations on a smartphone or tablet, remember how it used to be. Would you go back? Now, remember when you decided to take the plunge and purchase the smart mobile device. The journey from fascination to envy to necessity is led by the freedom that comes from mobile computing remember the desktop PC, now think about docking your laptop. In the future, you will either dock your tablet or your cell phone. Your Personal Mobile Device (PMD) will be your primary computing device for work and for personal pleasure. It is a gold rush all over again. Those companies that bring the most robust and desired software will rule the new application marketplace that marries smartphones and tablets to the Cloud.

2011 will be a year of proportionate options to connect and create a digital impression. In some ways, it will be overwhelming and in others a distraction. The investments companies make in the new decade to mobile computing for employees and consumers will set the tone for who leads and who follows The Vessel head disruptions for mobile computing provide the tipping points o free Cloud and flash storage, digital wallet transactions, gesture computing, and the herding of developers to the water hole that provides the most opportunity cash in on mobile apps. Wait not, and be part of the disruption revolution.

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