

[Recent and Future Trends in Mobile Computing](#) by K. Dhanakodi, P. Thirunavukkarasu, and A. T. Rajamanickam from *Journal of NanoScience and NanoTechnology* is available under a [Creative Commons Attribution 3.0 Unported](#) license. © 2012–13, IST. UMGC has modified this work and it is available under the original license.

Recent and Future Trends in Mobile Computing

K.Dhanakodi ^{*a}, P.Thirunavukkarasu ^b, A.T.Rajamanickam ^c

^a Department of Electronics and Communication Systems, K.S.G. College of Arts and Science, Coimbatore, Tamilnadu, India.

^b Department of Electronics, Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Coimbatore, Tamilnadu, India.

^c Department of Electronics and Communication Engineering, Adithya Institute of Technology, Coimbatore, Tamilnadu, India.

* e-mail id: dhanakodiecs@gmail.com

Keywords: Data Communication, CDPD technology, PSTN, Hand Over, File Transfer, Wide-Area-Networks

Abstract: Mobile Computing has fast become an important new paradigm in today's world of networked computing systems. Ranging from wireless laptops to cellular phones and WiFi/Bluetooth-enabled PDAs to wireless sensor networks, mobile computing has become ubiquitous in its impact on our daily lives. The debut of iPhones and the proliferation of other handheld devices has spurred excitement and interest in this evolving field.

1.Introduction

A technology that allows transmission of data, via a computer, without having to be connected to a fixed physical link. Mobile voice communication is widely established throughout the world and has had a very rapid increase in the number of subscribers to the various cellular networks over the across these cellular networks. This is the principle of mobile computing. Technology as it allows users to transmit data from remote locations to other remote or fixed locations. This proves to be the solution to the biggest problem of business people on the move - mobility. In this article we give an overview of existing cellular networks and describe in detail the CDPD technology which allows data communications across these networks. Finally, we look at the applications of Mobile Computing in the real world.

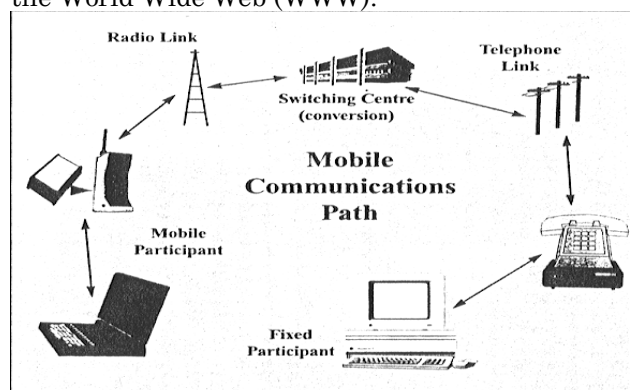
2.Mobile Switching Centre

The frequencies used vary according to the cellular network technology implemented. For GSM, 890 - 915 MHz range is used for transmission and 935 - 960 MHz for reception. The DCS technology uses frequencies in the 1800MHz range while PCS in the 1900MHz range. Each cell

has a number of channels associated with it. These are assigned to subscribers on demand. When a Mobile Station (MS) becomes 'active' it registers with the nearest BS. The corresponding MSC stores the information about that MS and its position. This information is used to direct incoming calls to the MS. If during a call the MS moves to an adjacent cell then a change of frequency will necessarily occur - since adjacent cells never use the same channels. This procedure is called hand over and is the key to Mobile communications. As the MS is approaching the edge of a cell, the BS monitors the decrease in signal power. The strength of the signal is compared with adjacent cells and the call is handed over to the cell with the strongest signal. During the switch, the line is lost for about 400ms. When the MS is going from one area to another it registers itself to the new MSC. Its location information is updated, thus allowing MSs to be used outside their 'home' areas.

3.Data Communications

Data Communications is the exchange of data using existing communication networks. The term data covers a wide range of applications including File Transfer (FT), interconnection between Wide-Area-Networks (WAN), facsimile (fax), electronic mail, access to the internet and the World Wide Web (WWW).



Data Communications have been achieved using a variety of networks such as PSTN, leased-lines and more recently ISDN (Integrated Services

Data Network) and ATM (Asynchronous Transfer Mode)/Frame Relay. Circuit switching implies that data from one user (sender) to another (receiver) has to follow a prespecified path. If a link to be used is busy, message cannot be redirected, a property which causes many delays. Packet switching is an attempt to make better utilization of the existing network by splitting the message to be sent into packets. Each packet contains information about the sender, the receiver, the position of the packet in the message as well as part of the actual message. There are many protocols defining the way packets can be sent from the sender to the receiver. The most widely used are the Virtual Circuit-Switching system, which implies that packets have to be sent through the same path.

4.Recent Trends In Mobile Computing

a)Compliance

Managing compliance and CSA scores are quickly becoming crucial ingredients to a business' success and the new HOS rules are compounding the challenge. Whether positive or negative, having access to actionable data on CSA scores will help all fleets improve their operation.

b)Data

The bring-your-own-device (BYOD) trend has influenced nearly every major business market, with consumers bringing and using their personal devices at work, and the trucking industry is no exception. New mobile applications, which are now delivered via the cloud, are giving fleets access to data they've never had before from fuel levels, to driver safety behaviors, weather and traffic conditions, and even real-time trailer connect/disconnect events.

c)Vehicle Safety

Research indicated that just 10% of truck drivers are responsible for a whopping 40% of all accidents involving commercial trucks. The FMCSA is placing a renewed focus on removing unsafe fleets from the roads, and exploring new driver and vehicle best practices and guidelines to improve safety.

d)Optimizing Resources

Regardless of the type of restrictions fleets face, advanced mobile technology is helping organizations of all sizes further optimize their operations through improved asset utilization and enhanced communications across a larger carrier

network resulting in increased productivity and profitability, and mutually beneficial outcomes. Fuel is the highest uncontrollable cost affecting carrier profitability taking as much as 30 percent of a carrier's revenue.

e)Managing Driver Behavior

Driver health and wellness are major issues currently facing the transportation industry. Recently, the Large Truck Crash Causation study reported that 13% of commercial motor vehicle drivers involved in accidents were considered to have been fatigued at the time of the crash.

5.Future Trends In Mobile Computing

a)Digital Convergence Erodes Boundaries

Physical and digital worlds are converging. As a result consumers expect uniform service whether they are in the physical world or if they are in the digital world. The convergence of the business and personal use of technology is also fueling this trend.

b)Digital Experience Delivery Makes (Or Breaks) Firms

Forrester makes the point that "A great digital experience is no longer a nice-to-have; it's a make-or-break point for your business as we more fully enter the digital age." The report points to a growing number of firms that have chosen a mobile-first approach, but then falling flat because "systems of record cannot keep up with engagement needs".

c) APIS Become Digital Glue

Forrester draws a comparison between service-oriented architecture (SOA) and application platform interfaces (APIs). Like the former, the latter provides "open access to useful functionality through network-based services using technologies that are readily accessible from a broad range of programming environments".

d)Firms shed yesterday's data limitations

Forrester maintains that "firms that embrace big data concepts, open data, and adopt new adaptive intelligence approaches are creating next generation smart systems that overcome limitations and create disruptive business innovations." Cheaper, more agile, collaborative, and adaptive methods for analytics and data sharing are key.

e)Sensors and devices draw ecosystems together

The Internet-of-Things will move from hype to reality with the ubiquity of connectivity

and proliferation of devices, and wearable computing will go from niche to broader use. This will turn the traditional “spray-and-pray promotional campaigns” into marketing to ecosystems that emerge as a result of these changes.

6. Conclusion

According to my aims and objectives of this paper I have done the detailed research and get the knowledge about it and the factors that need to be consider carefully. At this stage we are facing different types of problems and threats to the mobile industry, the two major aspects are the security and the usability issue. Detailed analysis of security issues is very important at least for a mobile wireless device, there are numbers of ways that it can be compromised, but I would like to draw an attention on the usability issues as well. They both need to be carefully planned and designed that the mobile user or target audience get used to it easily, effectively and securely.

7. References

1. Network Switching Techniques-Circuit, Packet and Datagram: Halsall, Fred. Data Communications, Computer Networks and Open Systems. 4th edition 1996.
2. Asynchronous Transfer Mode, Solution for Broadband ISDN, Third edition 1993, By Martin de Prycker.
3. J.Schiller, Mobile Communication, Addison Wesley, 2000.
4. William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley, 1993.