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Smart Phone and Mobile Computing

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Abstract:

The term "smart phones" when people talk about some fancy gadgets that look like a combination of cell phone and personal gadgets or personal digital assistants (PDA) and the term "wireless" is heard mostly from advertisements of cell phones and service plans by big wireless industry and computer industry, then the familiar notation strikes the notion of mobile computing and some concept of pervasive computing should be known. This paper briefly explains about the similarities, differences and the cutting edge technologies and emerging applications of next generation of mobile computing with some challenges, issues in the mobile domain.

Keywords: **Smart Phones, Mobile Computing, Wireless Networks, Pervasive Computing.**

I. Introduction

The next generation of mobile computing will foster the convergence of communication, computing, and consumer electronics. On the front end, a smart phone is likely to become a universal mobile terminal carrying integrated functionalities augmented by mobility and ubiquitous network access. The following literature review will give the brief idea about the technologies and techniques used in smart phones used with the help of mobile technology.

II. Mobile Computing

A. Literature Review

Mobile Computing refers to a broad set of computing operations that allow a user to access the information from portable devices such as laptop computers, PDA's, cell phones, handheld devices/Computers, music players, portable game devices, and so on., The two operational nodes in mobile computing are disconnected mode and connected mode. In the disconnected mode, information access on a mobile device is local, such as when someone uses a PDA to manage a schedule and an address book. In connected mode, the mobile devices supplies one or more types of wireless or wired network connectivity to enable network access. In the disconnected mode, a user can synchronize data on mobile device with a computer [2]. The synchronization may involve both download from and upload to the host computer. Applications in a mobile device are able to communicate directly with other devices or back-end system via network connections. The notion of nomadic computing refers to a special case of mobile computing- using a mobile device to connect to a wired or wireless network intermittently from place to place with support for high level mobility. An always in-active network connection is not required in nomadic computing. Smart Phone was initially coined by unknown marketing strategies to refer to a then-new class of cell phones that could factilate data access and processing with significant computing power. In addition to traditional voice communication and messaging functionality, a smart phone usually provides personal information management (PIM) applications and some wireless communication capacity. It is like a small, networked computer in the form of a cell phone. The very first generation of cell phones, despite their large size, could barely offer anything other than making phone calls. Later on, because of notable advances in semiconductor technology, cell phones were generally equipped with far more powerful processors larger storage and LCD (Liquid Crystal Display) screen that made it possible to perform some computing tasks locally. This paper uses the terms cell phones and mobile phone interchanging when referring to a voice-centric cellular device.

B. Mobile Computing Today

The general public perceives of smart phones as high-end, multifunctional, business-centric cell phones with higher resolution color display and fast mobile processors which are unaffordable to ordinary consumers due to the cost of the phone device and wireless data services. The vision

of "Anytime, Anywhere from any device" for mobile computing naturally leads to the issue of building a universal mobile platform for reliable and high performance computing with heterogeneous, seamless, wireless, access via limited computing recourses. Smart phones are generally considered for future convergence in mobile world.

Fig-1: Mobile computing today

III. Convergence of Computing and Communication

The future communication is growing and will be an example for many industries, professionals and they will involve the convergence of computing and communications as almost every aspect of information technology. It allows information access anywhere, anytime from any device. The trend will have huge impact on everyday life and enterprises, organizations and government started using the convergence of mobile communications in the form of applications and websites.

The network infrastructure is another important and remarkable advance in the link bandwidths of wired networks over last 10 years are an excellent example of technology can evolve beyond the expectation. In early years 10 Mpbs Ethernet utilized coaxial cable and twisted pair cables and then came the utilized coaxial cable and twisted pair cable and then 100 MPBS fast Ethernet and giga bytes and today OC192 10 gpbs fiber in the internet backbone. Network access evolved from 14.4 Kbp or 33.6 Kbp modems to 64 Kbp integrated services digital networks (ISDN) channels to ADSL and cable modems and soon to wireless LAN and WiMax are used.

The traditional voice-centric, circuit switching, cellular networks are being replaced by data-centric, packet switching 3G and 4G wireless LAN's are being deployed in office buildings, residential, hotels, coffee shops, restaurants and railway stations and airports. WiMax arguably a better "last- mile" solution for wireless technologies, broadband network access compared to cable modem or DSL is likely rolled out in a large scale and "Wifi" is used in large scale industry and some corporate, Educational Institutions are with emergence of wireless technology.

IV. Pervasive Computing

Existing mobile and wireless technologies have been continued to be, the core building blocks of mobile applications and services is an entirely new array of wireless technologies has already emerged from pioneering academia and research laboratories [3]. The new vision of computing blurs the borders of human environments and the computer to produce pervasive or ubiquitous computing. Some considered the "Anytime, Anywhere" goal of mobile computing to be a pre-active approach to need for information access, Whereas pervasive computing is considered as pro-active approach with vision "All the time everywhere" the fundamental destination between pervasive and any other computing framework is the way the user interacts with the computing facility.

V. Emerging Mobile Technologies and Applications

1. Cellular Networks
2. 802.11 Wireless LAN
3. Wireless Mesh Networks
4. Wi-Max Wireless Sensor Networks
5. RFID
6. WPAN

VI. Issues and Challenges

To satisfy the needs of business for cost effective, highly efficient and robust applications/operations to provide a rich experience to consumers. These developments that raise issues and challenges are mentioned in the following services.

A. Mobile Localization and Location Based Services

1. AdHoc Networks

2. Integration of heterogeneous wireless networks
3. Security and Policy
4. Multimedia on Mobile Devices
5. Smart Devices and Space
6. Contest-aware Computing
7. HCI and Middleware

VII. Conclusions

The discussed topic conclude that smart phones in mobile computing is enormously broad area, encompassing enabling wireless technologies, evolving wireless networks, novel services and applications, standardization, and business perspectives and opportunities. The paper explained briefly the fast paced, diverse domain by concentrating on state-of-art advancements in mobile computing research and developments in mobile computing research and development in both industry and academia aiming at bridging the gap between mobile computing research and business- centric commercial mobile applications. The topic includes a brief summary of industry practice and recent commercial development to provide some inside for industry professionals and academia to grasped key ideas and see how they real world. A solid work, understanding of the technical foundations of current technologies, systems and network is essential for everyone in mobile field.

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