Chapter 1
Mobile Computing:
An Emerging Issue in the Digitized World

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ABSTRACT

With the advent of complex but user friendly mobile communications technologies and transformation of mobile devices being handy for usage, the applications and utilities of mobile devices have come into the palm of almost each and every human being of this modern world. Furthermore, with the unprecedented growth of the Internet and its outreach, the demand and requirement of users are growing fast, ranging from basic livelihood support, to infotainment, to social networking. Applications of mobile devices nowadays do not include only the facilities for calling another cell phone and text messaging, but also connecting to social networks, service providers networks, and servers of various organizations, like academic or business or health sector, thus providing appropriate services to users, meeting daily demands including emergencies. However, all these are dependent on technologies, social, cultural, and economic issues, which this study has explored. This chapter is based on a survey of concurrent literatures on mobile computing, its applications, and challenges. This study has put forwards three applications of mobile computing: learning, health, and GIS. In this aspect, by exploring the background on mobile computing, the chapter discusses a few constraints and challenges that have emerged in terms of design and application issues. Thereafter, before the conclusion, the chapter puts forward a few future research hints.

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INTRODUCTION

Technology provision has evolved to support these days modern society with demanding expectations that has resulted in rapidly growing information systems. The creation of such ever-expanding and innovative systems is based upon a type of symbiotic relationship where technology facilitates new means, and opens up new horizons. Furthermore, in the context of adoptive technology, the expectations, requirements and demands of the society further fuel the development. As such, the fundamental building blocks of information systems are constantly being enhanced or new ones are identified to enable this development. As the world is passing through the new millennium, technology support is such that the society is on the brink of entering a true information age, where technology integration has became an essential element of social, economic, cultural and political systems (Hameed, 2003). Similar to any other human aspects or technological issues as such, a single technology cannot survive in the global competition. Rather, a combination of similar technologies or an integration of similar technologies adopted to face the demand and challenge has evolved throughout the years. Concept of mobile computing is such a technology, which is evolving and at the same time, it incorporates integrated technologies from diversified aspects of human nature satisfying the growing demand. Recent advances in hardware technologies, such as portable computers and wireless communication networks have led to the emergence of mobile computing systems (Dunham & Helal, 1995).

Mobile Computing is a technology that allows transmission of data, via a computer (or similar device) without having to be connected to a fixed physical link (Koudounas & Iqbal, 1996).

Furthermore, the availability of lightweight, portable computers and wireless technologies has created a new class of applications called mobile applications. These applications often run on scarce resource platforms, such as Personal Digital Assistants (PDAs), notebooks, and mobile phones, each of which have limited CPU power, memory, and battery life. They are usually connected to wireless links, which are also being characterized by lower bandwidths, higher error rates, and more frequent disconnections (Gaddah & Kunz, 2003). Evidently, mobile computing is a concept which is revolving around demand and capacity factors between human and computers satisfying aspects of requirements and competencies.

Mobile computing is a type of interaction between human and computer where the computing device, such as the computer, even in a normal situation can be thought of being not in static condition. This concept has brought out three aspects of computing; the communication network, the computing hardware, and the software. The mobile communication incorporates issues like communicating in ad-hoc environments among infrastructure networks as well as communication properties, protocols, data formats and physical technologies; the hardware focuses on mobile devices or device components; the software aspect deals with the necessities, uniqueness and sophistications of mobile applications.

Hence, as discussed above, the concept of mobile computing can mean that computing devices, for example, notebook-PCs, PDAs and wearable computers are carried by users rather than contained within a confined environment. In recent years, portable computing devices have become very small and powerful, giving their users access to a variety of applications in personalized form, regardless of the user locations. Each of these devices is intended to stay with a particular user so that the user's profile can be maintained in the portable device and can easily evolve over time, without having to be transferred from place to place in an external environment. Therefore, the mobile computing approach needs to provide both personalization and privacy. However, its users are forced to carry devices, such as PCs (in various