

Chapter 6

Ubiquitous Eco Cities: Infrastructure, Technology and Management

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ABSTRACT

Efficient and effective urban management systems for Ubiquitous Eco Cities require having intelligent and integrated management mechanisms. This integration includes bringing together economic, socio-cultural and urban development with a well orchestrated, transparent and open decision-making system and necessary infrastructure and technologies. In Ubiquitous Eco Cities telecommunication technologies play an important role in monitoring and managing activities via wired and wireless networks. Particularly, technology convergence creates new ways in which information and telecommunication technologies are used and formed the backbone of urban management. The 21st Century is an era where information has converged, in which people are able to access a variety of services, including internet and location based services, through multi-functional devices and provides new opportunities in the management of Ubiquitous Eco Cities. This chapter discusses developments in telecommunication infrastructure and trends in convergence technologies and their implications on the management of Ubiquitous Eco Cities.

INTRODUCTION

During the last few decades across the globe urban system and structures have been changed dramatically by rapid urbanisation trends (Yeung, 2000). As a result of this urbanisation process urban systems have become increasingly complex and large in scale. At the moment sustainable

and efficient usage of scarce resources together with competing economic and social priorities are parts of everyday decisions required to be made by local governments, which are obliged to employ a sound urban management system that increases the understanding of, and capacity to undertake, the strategic management of urban areas (Teriman et al., 2009). Urban management is basically a process of deliberately directing and facilitating urban development, and also an

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integration of the traditional ideas of planning, with its physical, economic and social concerns, and recently latched to management with its emphasis on efficiency (Davey, 1993). The application of innovative systems to support urban management and collaborative decision-making offers considerably new opportunities for the 21st Century cities, particularly for Ubiquitous eco cities (U-eco cities).

U-eco city is a city that promises to provide an environmentally friendly urban milieu with advanced ubiquitous infrastructures and services for residents and visitors (Yigitcanlar, 2009a). Beyond this a U-eco city is claimed to be a sustainable city with an entire city dedicated to minimising the required inputs, of energy, water and food, and waste outputs, of heat, air and water pollution, by benefiting from ubiquitous technologies and sustainable urban development principles (Galloway, 2003). In U-eco cities urban and infrastructure planning, development and management require complex information and input from institutions, stakeholders and users to deal with spatial, social, economic, multi-dimensional and complex characteristics of urban and environmental phenomena and problems (Lee et al., 2008).

In U-eco cities telecommunication infrastructure forms the backbone network system of the management (Warf, 1998). Over the past few decades, telecommunications networks have become important infrastructure players and information and communication technologies (ICTs) form the basis of telecommunications infrastructure for U-eco cities (Hackler, 2003a). In the information era, ICTs play an increasingly important role in the planning, provision and management of urban infrastructure. Moreover, ICTs as telecommunication networks are major infrastructure management systems, and rapidly evolving and transforming into a network supported by convergence technologies that supports urban management. Telecommunication and infrastructure networks are rapidly moving from systems based on wired technology to those that

are wireless and seamless digital network systems (Dourish, 2004). Although ubiquitous computing network systems have become one of the major phases in many contemporary agendas in terms of the design and engineering of computer systems, their economic, social and environmental implications are yet to be explored (Weiser, 1991). Additionally, complexity of urban management in U-eco cities requires a new understanding including intelligent systems and tools to deal with this complexity. Given this significance, there is limited research that focuses on the implications of developments in the fields of telecommunication infrastructure, technology convergence and urban management on U-eco cities.

This chapter aims to investigate developments in telecommunication infrastructure, trends in convergence technologies and their implications on the management of U-eco cities. This chapter is organised in six sections. Following this introduction, secondly, we introduce U-eco cities as a new city form that aims to bring sustainability, efficiency and quality of life into cities. Thirdly, we present telecommunication infrastructures as the backbones of U-eco cities and their services that play an important role in monitoring and managing activities via wired and wireless networks. Then, we discuss technology convergence and its impacts on U-eco city formation that creates new ways in which information and telecommunication technologies are used and formed the base for urban management. Fifthly, we explore the need and potentials for intelligent systems as revolutionary urban management systems of U-eco cities. Lastly, we conclude by summarising the key findings of the research.

UBIQUITOUS ECO CITIES: A NEW CITY FORM

Eco and ubiquitous cities constitute the two distinctive facades of a contemporary city. Eco city forms the visible facade, where ubiquitous city

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