Editorial

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The implications of information and communication technology (ICT) have significantly affected our society, reshaping urban form, culture and human behaviours across cities in the world. Recently, the aggressive trajectory of technology convergence which sees the transference of a variety of digital devices (e.g., digital camera, GPS and the internet) into a single converged smart device (e.g., smart phone and tablet computer) determines the life-and-death of the digital products. While some technologies are successfully adapted to the latest digital technology many other technologies simply disappear. Since smart phone (iPhone or Android) introduced with Google Maps the price of GPS navigations (e.g., TomTom and Navman) has been dropped: a similar pathway is also found in the digital camera. Indeed, the life-and-death of ICTs is closely related to the needs of people and place in the built environments.

The converged digital technologies require a bundle of digital sensors and sensor networks and the censored networks are controlled by the integrated management system, often referring to the *smart* system. In these days the smart phone allows to communicate people to people; people to object; and object to objects. While the digital device is getting smarter the transferring speed of digital information is also faster almost in a real-time base. The cloud computing becomes a hot topic in the digital world. The people now can access the information anywhere and anytime. This ubiquity of digital information imagines ubiquitous cities where people can access both urban IT and green environment service anywhere and anytime. The urban IT service includes the smart transport and smart building while the green environment service (eco-service) promotes a low-carbon living, renewable energy (e.g., photovoltaic), smart-grid and eco-millage. The convergence of the ICTs and eco-technologies (EcoTs) will be one of the core design principles for the future cities (Lee et al., 2008; Lee, 2009).

In the ubiquitous cities, activities such as receiving and sending information have become more flexible as more people can easily access the information throughout urban built environments such as buildings, shops, trees, street lights, parking lots and vehicles.

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For instance, the ICTs embedded intelligent roads and streets provide real-time traffic information (e.g., traffic volume and travel speed) to find a less congested travel route. In global cities like Seoul, Tokyo and Sydney, many foreigners and visitors may have difficulty in finding a way. The ‘smart-eye’ of QR code and smart guide service in their own language helps foreigners find their way. The EcoT sensors in intelligent buildings monitor not only air temperature (climate control) but also indoor air quality air (pollution control). Surprisingly, the value of the ubiquitous computing technologies has significantly contributed to the national productivity in many countries. According to the OECD statistics the proportion of the GRDP for the knowledge industry in OECD countries accounted for 25% in 1995, with the proportion surged to nearly 50% in 2010. In the agricultural era, over 75% workers were farmers while in the digital era it is estimated that over 75% people work in the knowledge industry (Kim et al., 2009).

Many urban frontiers anticipate the city futures. Mitchell’s (1999) E-Topia and Weiser’s (1991) ubiquitous computing envisage that the digital cities are transferred from virtual space with desktop computers to ubiquitous (or pervasive) cities with cloud computing technologies. This technological evolution makes a big shift from many people sharing a single desktop computer to a range of computers supporting a single person. The ubiquitous and cloud computing technologies embedded in the *smart* system encourage citizens to use public transport and car pool anywhere and anytime. The *smart* transport is underpinned by ubiquitous transit-oriented development (U-TOD) where ICTs, EcoTs and transportation services (timetables and wayfinding) are integrated in transport planning. The ubiquitous computing technologies have far-reaching implications for the future of urban management and planning, particularly in the area of the preventive disaster management for traffic accidents, crime, flooding and bush fires. The environmental sensors within both fixed and mobile EcoTs units work seamlessly to inform people of risks in real time. Moreover, people can easily report incidents using their smart phone, with police or fire officers able to confirm the risk and announce valid information via a digital map to warn the public (Moon et al., 2010).

Morden cities aim to provide an innovative solution to global urban issues such as ageing society, climate change, traffic congestion and public health management. It is envisaged that ubiquitous cities will foster a high quality of life, promoting active public participation using the ubiquitous computing technologies (Paskaleva, 2009). Climate change and its planning ramifications have become a major urban issue in Australia, Korea and Japan and all over the world are working on developing code green (Nash and Ehrenfeld, 1996). Although policy implications related to climate change adaptation and mitigation (e.g., carbon tax) are rigorously sought in many countries, there are relatively little efforts given to the implication of ubiquitous computing technologies. With the advantages of automation and seamless sensor monitoring systems in ubiquitous cities a low carbon living is a reliable urban strategy. For instance, a smart card with eco-mileage points provides an incentive to engage in carbon-free activities has significantly reduced energy consumption and carbon emission in Korea (Yigitcanlar and Han, 2010). This smart card monitors personal usage of electricity, water, gas and public and non-motorised transport in which ICTs and EcoTs are embedded. The eco-mileage card gives rewards, such as cyber money to those who actively reduce utility consumption and use environmentally friendly transport services.

Ever increasing automobile and urban density in mega cities has accelerated urban sprawl and agglomeration. Compact cities and urban consolidation policy often fail to slow down the speed of urban sprawl in many developed countries. Mixed use and high density development often bring negative consequences such as unaffordable housing, traffic congestion and environmental degradation. The cost of urban management has become a big challenge for smart growth strategies (Handy, 2005). Simple vibrate sensors embedded in high-rise buildings and bridges could monitor building safety with a lower maintaining cost than traditional monitoring methods (Teodorović and Lučić, 2006). The digital media wall of a building could form the basis for an integrated architectural media space and can be converted to a digital advertising wall, or a digital masterpiece-pictured open cultural place (Schiek, 2006). U-skin where ICTs are embedded in wall, floor, and ceiling create urban landscapes that help to reduce energy consumption.

The biggest challenge in planning ubiquitous cities is that urban planners and engineers assure that a quality of urban services can be continuously provided and consistently maintained regardless of the aggressive trajectory of technology convergence. Spatially integrated ICT services will be required to ubiquitously and seamlessly collect, convey and manipulate information to meet the needs of the end-users in everyday life. Data sensing, interfacing and reproducing technologies and software are crucial to the success of urban infrastructure management for future cities. Ubiquitous cities are not a utopian city, but a step-by-step technological pathway to improving the quality of life. Their aim is to ensure sustainable urban growth, as well as the active sharing of communication between humans, objects and ecology.

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