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Understanding continued ubiquitous decision support system usage behaviour

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ABSTRACT

With the recent surge in the use of ubiquitous computing devices, users are carrying their own ubiquitous decision support systems (UDSS) and making important decisions using them. UDSS enables decision makers to access mobile networks to acquire information at anytime, anywhere. However, there have been few studies investigating why UDSS users intend to use the systems continuously, as there would be a large number of elements to take into consideration. The specific factors of the UDSS that this study focuses on include the connectivity and context-awareness function, which were not considered in previous research on the adoption of UDSS. Accordingly, this study empirically explores this research question by using the scanphone-based ubiquitous delivery system (UDS), which many delivery service providers have been adopting recently as a form of the ubiquitous decision support system (UDSS). The results reveal that connectivity, context-awareness function, and perceived values play meaningful roles in the UDSS. Based on these results, this study suggests implications and directions for future research to enable the planning and realization of the future UDSS.

1. Introduction

In recent years, the corporate environment for information technology has been changing rapidly. With the advent of the internet, individually-focused work environments have been shifting toward network-based cooperation systems. As the new work environments produce a vast amount of information compared to the previous environments, the number of considerations involved in decision-making has increased accordingly. For this reason, corporations are putting a great deal of effort into drawing business intelligence from this massive information, using analysis methods like data mining or online analytical processing. In South Korea, these changes in the work environments are seeing significant acceleration due to the growth of the mobile market, and the so-called 'ubiquitous environment' is arriving. In the ubiquitous environment, it is expected that a higher level of interaction between companies and their clients will be enabled, as well as between providers and their partners, and the decision-making methods will also change with the changes in the work processes and methods (Kwon et al., 2005). As a result, the roles of the decision support system that supports decision-making in the ubiquitous environment will diversify and grow in importance. However, although previous studies reviewed the UDSS, they did not

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perform enough research on the actual acceptance status and the key functions of the UDSS. A ubiquitous decision support system (UDSS), enables decision makers to access mobile networks to acquire information and make transactions (connectivity) and to allow the geographic location and situation of users to be identified (context-aware function), thereby leading users to perform context-awareness-based decision making that is suitable for each user's condition. Previous studies have focused on UDSS definitions (Kwon et al., 2005), context-aware DSS (Chen and Chen, 2010). However, a few studies in relation to the importance of UDSS is due to the difficulty in finding an existing UDSS, which makes it hard to perform empirical research.

Therefore, this study intends to suggest a scanphone-based ubiquitous delivery system (UDS), which has recently been adopted by numerous delivery service providers, as a form of a UDSS, and to empirically analyze how the UDSS is being accepted by users. This UDS is regarded as a UDSS for the following reasons. First, the UDS not only offers a delivery information scanning function, but also provides delivery tracking, estimating, and store locating services by connecting the wireless internet technology and the GPS (global positioning system). Second, the UDS enables users to check the delivery status in real time using the service that is connected to the web server through the internet. Third, it enables same-day collection and delivery by contacting the closest delivery personnel at hand through the wireless internet and the GPS. As delivery service jobs have become more mobile-based, delivery personnel face new work environments; for real-time decision-making during the delivery process, they are using the UDS instead of the transactional processing system that scans and records delivery information, and thus the UDS in the delivery service field can be considered as a UDSS. The goal of this study is to examine the factors that affect the continuous intention of current UDS users to use the UDS. The study objectives are as follows: First, this study aims to evaluate the functions of the UDS as a UDSS, defining the required function of a decision support system in the ubiquitous environment as controllability. Second, this study also intends to examine the effects of the connectivity and context-awareness function, the key elements of the UDSS, and the perceived values of the UDSS on the continuous intention to use through trust and decision satisfaction.

2. Literature review

2.1. Ubiquitous

Advanced information technology has enabled users to receive the information they desire, any time and at any place, provided that users are connected to the network. However, it has limitations in that users must go to a network-connected location in order to use the services. This means that it is hard for users to access the services if they cannot easily move to a network-connected location. For this reason, several studies on mobility support for users have been conducted in the e-business field, with a particular focus on ubiquitous or pervasive computing. Ubiquitous, as Weiser (1993) suggested, means a state in which computers and objects are interconnected through a network without any spatial or temporal constraints. He advocated for an environment in which all objects are equipped with microcomputers and connected to a network, adopting the concept of 'computing everywhere'. Weiser (1993) interpreted the ubiquitous network as three concepts: Everywhere-on, everything-on, and always on. In addition, the terms ubiquitous network, ubiquitous computing, pervasive computing, and nomadic computing, are commonly combined with one another. In the ubiquitous environment, users can be provided with any information they need, anywhere and at any time, and mobile services can be offered to mobile users. Therefore, ubiquitous computing technology is emerging as a next-generation industry, and a number of related studies are being carried out in the relevant fields of academia.

Much of the previous research in the area of ubiquitous computing has been focused on the provision of more efficient services for users, as most users own mobile devices and are provided with diverse services, such as education, business, travel, and shopping, using their devices (Lyytinene and Yoo, 2002). The growing significance of users in the ubiquitous environment has invigorated research on the ubiquitous decision support system (UDSS) with the goal of more efficiently supporting decision-making by users. The UDSS, a type of next-generation decision support system, supports decision-making tasks of mobile decision makers by enabling them to access the intelligent space, anywhere and at any time. In particular, research related to the ubiquitous decision-making support system has been concentrated on improving the quality of decision-making in the process of making a purchase and providing relatively differentiated services through the use of the system, with the aim of improving the intention to purchase on the part of consumers. At the same time, mobile devices or dedicated devices are needed to experience the ubiquitous environment, so a number of studies have been performed that examined users' acceptance factors or attitude at the time of the introduction of such devices.

2.2. Evaluation of UDS as a UDSS

As stated above, although there have been frequent studies of ubiquitous computing, studies on the UDSS have been relatively insufficient. This study intends to use the conceptual definitions that Kwon et al. (2005) suggested regarding the UDSS.

As the cited research (Kwon et al., 2005) was among the first to mention UDSS, as well as to detail the scope of UDSS and its conceptual characteristics, and included case studies, it is expected to be instrumental in understanding the subject this study addresses. Kwon et al. (2005) define a UDSS as a system that supports users' decision-making process by enabling