

Special Issue on Ubiquitous Media Systems: Guest Editors' Introduction

Eusebio Scornavacca¹, Stefano Za² and Kevin Carillo³
Guest Editors

¹University of Baltimore, Merrick School of Business, Baltimore, USA, escornavacca@ubalt.edu

²eCampus University, Faculty of Law, Novedrate, Italy, stefano.za@uniecampus.it

³Toulouse University, Toulouse Business School, Toulouse, France, k.carillo@tbs-education.fr
September 2016

Introduction to the Special Issue

As of 2014, the total number of all types of mobile-connected devices has exceeded the world's population and is forecasted to reach 1.5 devices per human being in 2019 [5]. The pace of the emergence and mainstream adoption of new forms of ubiquitous computing devices such as smartphones, tablets and 'phablets' has not ceased gaining momentum - demarking an evolutionary step in the *ubiquitous computing* trend [13]. The extinction of mobile phones and the proliferation of fluid multi-device platforms such as iOS, Android and Windows 10 have blurred the traditional boundaries between stationary and mobile information systems [4], [18].

This dissolution of the traditional segmentation of computing contexts represents a remarkable shift in the fundamental temporospatial nature of IT artifacts [10], [16]. Indeed, individuals are gradually ceasing to perceive their mobile and non-mobile devices as independent ecosystems, but rather as an evolving collection of interconnected devices that are progressively playing a major role in their daily lives [15], [17]. This significant technological evolution has given birth to a new and complex form of connected IT artifact, Ubiquitous Media Systems (UMS), that encapsulates various functions and provides fluid information access across a variety of channels; allowing users to accomplish a multitude of tasks and interact fluidly in a ubiquitous ecosystem [4].

As information access becomes fully ubiquitous and the utilitarian, as well as hedonic functionalities of those devices increase, the emergence of fluid and evolving techno-ecosystems poses important challenges and opportunities for e-commerce theory and practice. By gradually blurring physical, social and temporal boundaries *ubiquitous media systems* allow to deliver new as well as existing online products and services through a multitude of interconnected channels, but also engender radically novel and unthought-of opportunities for e-commerce [9], [11], [12].

Ubiquitous access to the Internet of things also represents new marketing opportunities for businesses as well as the challenge to deeply understand users' behavior in this fluid digital ecosystem [6]. Apprehending *ubiquitous media systems* user behavior is a difficult challenge as the rules that govern its functioning keep being redefined each time a new form of connected device appears on the market [3], [14].

Unfortunately, the understanding of the specificities that surround *ubiquitous media systems* in the electronic and mobile commerce contexts is also limited in information systems research [7], [8]. There is a general tendency to focus on individual or subsets of devices, functionalities, or sub-phenomena, which leads to a fragmented and distorted understanding of the *ubiquitous media systems* reality [1], [2]. This new, complex, interconnected and amalgamated form of IT artifact requires a more holistic and encompassing research approach that is capable of capturing the specificities and pervasiveness of *ubiquitous media systems*.

The objective of this issue is to start exploring in a more holistic perspective, the challenges and opportunities regarding ubiquitous media systems. The five papers selected for this special issue are original contributions that could be classified in two main groups. While the first three papers discuss design issues in developing digital platforms for delivering ubiquitous services, the remaining two articles analyze and discuss case studies related to digital payments.

Eriksson, Åkesson and Lund present a two-year action research study that focuses on the changes fostered by digitalization in the Swedish newspaper industry. The concept of Ubiquitous Media Environments (UME) is used to represent the vision of future media environments enabling device independent mass-scale distribution of ubiquitous media services in integrated infrastructures. Five applications of ubiquitous media services were developed and evaluated in collaboration with practitioners. The paper describes and discusses how ubiquitous media services can be designed to leverage value for advertisers and readers as well as how newspaper organizations can strategize for this new UME reality.

Carlsson and Walden's contribution is an interesting study that investigates how the use of UMS can address challenges of Europe's aging population. The authors present a set of guidelines for the design, implementation and testing of digital wellness services for the *young elderly* (individuals between the age of 60 and 75). In this research, digital wellness services are proposed as effective interventions to build wellness routines. The key goal

of such services is to provide a support platform to help keep the young elderly healthy, active and independent. One of the key recommendations is to actively engage elderly people in the development of digital platforms (co-creation process) instead of considering them as mere final customers.

The last paper discussing design issues in the development of digital platforms for delivering ubiquitous services is Nickerson and Mourato-Dussault's study of data storage approaches in ubiquitous environments. The authors provide an overview of mobile app design with a particular focus on the management and storage of data (online, offline, synchronized). Special consideration is given to the component in charge of storing mobile app data. The paper identifies three types of mobile apps and describes the stored data characteristics of each type. It proposes decision factors for selecting a data storage approach for a mobile app and the impact of the factors on the usability of the app. It concludes that the data storage approach selected for a mobile app shall depend on the characteristics of the situation in which the app will be used. The authors emphasize one particular approach (synchronized data storage) by highlighting its overall benefits over the other approaches.

The section in the special issues presenting case studies related to ubiquitous digital payments opens with Kazan, Tan and Lim's framework for examining the competitive principles of mobile payment platforms. The authors postulate that the strategic interplay of platform layers will drive the competitive dynamics of platform-driven ubiquitous systems. The framework is used in a comparative case study between monopolistic and federated mobile payment platforms as a way to illustrate its applicability and yield principles on the nature and impact of competition among platform-driven ubiquitous systems. The findings indicate that monopolistic mobile digital platforms attempt to create unique configurations to obtain monopolistic power by tightly coupling platform layers, which are difficult to replicate. Conversely, federated digital platforms compete by dispersing the service layer to harness the collective resources from individual firms. Furthermore, the interaction and integration among platform layers give rise to commodity and value platform layers that translate into competitive battlegrounds among mobile payment services. This paper could represent, to a certain extent, a concrete step in unraveling the competitive dynamics of platform-driven ubiquitous systems from an architectural viewpoint.

The final paper in this special issue is Staykova and Damsgaard's study on the adoption of mobile payment platforms. In recent years, very few mobile payment solutions have turned out to be successful as the majority of the services that are launched failed to gain a critical mass. The authors investigate successful platform adoption strategies by using the Reach and Range Framework for Multi-Sided Platforms. This approach provides a strategic tool to which mobile payment providers can adhere to in order to tackle some of the main challenges they face throughout the evolution of their platforms. The analysis indicates that successful mobile payment solutions tend to be launched as one-sided platforms and then gradually shift into two-sided. This study points out that the success of mobile payment platforms lies with the ability of the platform to balance the reach (number of participants) and the range (features and functionalities) of the platform.

With this set of papers, the aim of this special issue is to provide an initial forum in which preliminary research results are shared and discussed. This shall encourage scholars to consider the specificities and pervasiveness of *ubiquitous media systems* for the design of new digital platforms or else new ubiquitous services. We hope the content of this special issue will raise the interest of both academics and practitioners, providing an initial foundation to further explore the inner workings and specificities of *ubiquitous media systems*.

References

- [1] Y. Bang, D. Lee and K. Han, Access affordance of mobile technology in e-commerce: Change of purchase time dispersion, in Proceedings of the Thirty Fifth International Conference on Information Systems (ICIS2014), Auckland, NZ, 2014, pp. 1-15.
- [2] Y. Bang, D.-J. Lee, K. Han, M. Hwang, and J.-H. Ahn, Channel capabilities, product characteristics, and the impacts of mobile channel introduction, *Journal of Management Information Systems*, vol. 30, no. 2, pp. 101-126, 2013.
- [3] BUSINESS WIRE. (2014, September) A future fueled by phablets - worldwide phablet shipments to surpass portable PCs in 2014 and tablets by 2015, according to IDC, 2014. Business Wire. [Online]. Available: <http://www.businesswire.com/news/home/20140903006430/en/Future-Fueled-Phablets---Worldwide-Phablet-Shipments>
- [4] K. Carillo, E. Scornavacca and S. Za, An investigation of the role of dependency in predicting continuance intention to use ubiquitous media systems: Combining a media system perspective with expectation-confirmation theories, in Proceedings of the Twenty Second European Conference on Information Systems (ECIS2014), Tel Aviv, Israel, 2014, pp. 1-17.
- [5] Cisco. (2016, February) Cisco visual networking index: Global mobile data traffic forecast update 2015-2020. Cisco. [Online]. Available: http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html.
- [6] A. Ghose and S. P. Han, An empirical analysis of user content generation and usage behavior on the mobile internet, *Management Science*, vol. 57, no. 9, pp. 1671-1691, 2011.
- [7] A. Ghose, A. Goldfarb and S. P. Han, How is the mobile internet different?, *Information Systems Research*, vol. 24, no. 3, pp. 613-631, 2012.

- [8] A. Ghose, S. P. Han and K. Xu, Mobile commerce in the new tablet economy, in *Proceedings of the Thirty Fourth International conference on Information Systems (ICIS2013)*, Milan, Italy, 2013, pp. 1-18.
- [9] O. Henfridsson and R. Lindgren, Multi-contextuality in ubiquitous computing: Investigating the car case through action research, *Information and Organization*, vol. 15, no. 2, pp. 95-124, 2005.
- [10] M. H. Jackson, Fluidity, promiscuity, and mash-ups: New concepts for the study of mobility and communication, *Communication Monographs*, vol. 74, no. 3, pp. 408-413, 2007.
- [11] R. Lindgren, M. Andersson and O. Henfridsson, Multi-contextuality in boundary-spanning practices, *Information Systems Journal*, vol. 18, no. 6, pp. 641-661, 2008.
- [12] K. Lyytinen and Y. Yoo, Research commentary: The next wave of nomadic computing, *Information Systems Research*, vol. 13, no. 4, pp. 377-388, 2002.
- [13] K. Lyytinen, Y. Yoo, U. Varshney, M. Ackerman, G. Davis, M. Avital, D. Robey, S. Sawyer, and C. Sorensen, Surfing the next wave: Design and implementation challenges of ubiquitous computing, *Communications of the Association for Information Systems*, vol. 13, no. 1, pp. 697-716, 2004.
- [14] A. Oulasvirta, T. Rattenbury, L. Ma, and E. Raita, Habits make smartphone use more pervasive, *Personal and Ubiquitous Computing*, vol. 16, no. 1, pp. 105-114, 2012.
- [15] R. Scheepers and C. Middleton, Personal ICT ensembles and ubiquitous information systems environments: Key issues and research implications, *Communications of the Association for Information Systems*, vol. 33, no. 1, pp. 381-392, 2013.
- [16] E. Scornavacca, Incorporating system portability into technology acceptance models, in *Proceedings of the 13th International Conference on Mobile Business*, London, UK, 2014, pp. 1-12.
- [17] C. Sørensen and D. Gibson, Ubiquitous visions and opaque realities: Professionals talking about mobile technologies, *Info*, vol. 6, no. 3, pp. 188-196, 2004.
- [18] S. Vodanovich, D. Sundaram and M. Myers, Research commentary - digital natives and ubiquitous information systems, *Information Systems Research*, vol. 21, no. 4, pp. 711-723, 2010.