Editorial

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Biographical notes: Manal M. Yunis is an Assistant Professor of Information Technology Management in the Department of Information Technology and Operations Management at the Lebanese American University in Beirut, Lebanon. She holds a PhD in Business Administration with a concentration in Computer Information Systems from the University of Texas-Pan American. Her research interests include information and cyber security, ICT in healthcare, global information technology management, cloud computing, e-government, and adoption and diffusion of emerging technologies. She is a member of the Association of Information Systems (AIS), Decision Sciences Institute, and AIS Special Interest Groups, and she serves on the Editorial Board of the *International Journal of Electronic Healthcare*. She has several peer-refereed journal and conference publications, and is the recipient of many best paper awards from conferences and publishing groups.

Healthcare systems in countries, in general, and in low- and middle-income countries, in particular, face significant challenges in providing accessible, high-quality, and affordable care. In response, innovative approaches are sought by policy makers and nation strategists to eliminate the geographic and financial barriers to health. This has resulted in growing interest in the role that information, communication, and mobile technologies may potentially play in enhancing health information and services accessibility and quality in low- and middle-income countries.

Research studies have argued that making health information and services available online can improve patient experience through enhancing information exchange, shared decision-making, and informed choice (Gann and Grant, 2013). Internet use has also been associated with self-management (Voncken-Brewster et al., 2014) and health-promoting behaviours (Xavier et al., 2013). However, while Internet-based health information has potential benefits, and while efforts are being put to enhance the accessibility of ICT in healthcare, previous research studies found evidence of a 'digital divide' (e.g., Choi and Dinitto, 2013; Gordon and Hornbrook, 2016; McCloud et al., 2016). Accordingly, populations, at the national and individual levels, still need to keep pace with the increasingly existing amount of online health-related information and services (Estacio et al., 2017).

Examining developing countries, one can witness a remarkable increase in the number of cell phone and internet technologies users, yet a decrease in the cost of devices and offered services. Based on this, this special issue of *IJEH* is intended to contribute to

health technology providers, health programs implementers, decision makers, and policy strategists in their attempts to

- explore the magnitude of ehealth digital divide in developing countries
- examine the extent to which internet and mobile-based health technologies can help address the challenges faced by countries with resource-constricted health markets
- to reduce the digital divide gap through promoting ehealth services in terms of their availability, affordability, and quality.

By analysing ICT adoption and use within health programs in various countries, our *IJEH* special issue contributes to the e-health literature and offers new insight into several areas of concern in healthcare provision, accessibility, and quality. It examines specifically the use of ICT-enabled programs, the key issues that ICT can help address in the health sector, and the key challenges posed by the adoption and implementation of technology for health-related purposes at the client and service provider levels.

Nine papers were received, of which five with quality contributions were accepted. The topics revolved around the following areas:

- bridging the digital divide in healthcare
- adoption and use of health IT
- ehealth user performance
- IT contribution to quality healthcare
- health IT tools.

Bridging the digital divide in healthcare was addressed by Bhatia and Taneja in a paper entitled 'eHealth in India: a model for healthcare accessibility at the 'bottom of the pyramid'. Using qualitative and descriptive analysis approaches, the objective of this research was to examine the scope of eHealth as a means to reach the 'Bottom of the Pyramid (BOP)' in India and making healthcare services accessible to this segment. For this purpose, the authors conducted a detailed study of the eHealth initiatives in India in terms of their objectives, value proposition, penetration, customer segment, and operating model. This study also analysed the macro-economic, technological, social and other demographic factors in India in order to understand the scope and of eHealth in India in terms of its drivers and inhibitors. The findings and analyses of the study were based on literature review as well as qualitative data derived from discussions with healthcare providers and consumers. The main conclusion of the study is that improving healthcare accessibility at the BOP requires the adoption and use of mHealth. The authors contended that with high tele-density and reach of mobile phones, mHealth can be used to spread awareness regarding diseases, their precautions and possible cures. Once awareness is created, connecting the BOP population to healthcare providers for specialist services unavailable at their location should be addressed. Telemedicine will be an effective form to reach the BOP population, and at times when the availability of the same doctor might not be possible for all tele-consultations of the patient, it is important that the patient's health history and tele-consultation records be in electronic form to be transferred and shared easily. For this purpose, electronic health records will be useful.

Accordingly, the different forms of eHealth need to be integrated into the model for ensuring healthcare accessibility at the bottom of the pyramid.

ICT adoption and use in healthcare was the theme of the study presented by Alsyouf and Ishak. The study entitled 'Understanding EHRs continuance intention to use from the perspectives of UTAUT: practice environment moderating effect and top management support as predictor variables' examined the factors affecting nurse's intentions to continue using electronic health records (EHR) in Jordan. Nurses are important providers of healthcare services and are among the main users of EHR system. Therefore, their acceptance of an EHR system and its usage are of great significance when evaluating the success of an EHR system. A cross-sectional survey was conducted in the Jordanian public hospitals, which are fully implementing the EHR system, and, an extended model of the UTAUT was used as a framework. The findings indicated that effort expectancy, performance expectancy and facilitating conditions all positively influenced nurses' continuance intention to use EHRs. In addition, the results also show that top management support had a negative and significant relationship with nurses' continuance intention to use EHRs. Moreover, social influence had an insignificant relationship with continuance intention to use EHRs. The authors conducted a multi-group analysis, and results indicated that the relationship between effort expectancy and continuance intention was more significant for nurses working in a ward than for nurses working in special units. The findings of this study could be considered as an attestation of the need to support new technologies based on managerial and practical perspectives.

The paper entitled 'Impact of perceived HIS users' performance on job satisfaction: moderating effect of perceived HIS quality' by Maamari and Chaanine focused on the performance and job satisfaction of users of health information systems, and highlighted the role that the perceived quality of these systems could play in enhancing performance and satisfaction. The study surveyed the effect of perceived healthcare information system users' performance on their job satisfaction, and the moderating role of employees' perception of the healthcare information system's quality on the relationship. The results show that the perceived quality of the system coupled with their perceived performance using the system affect their job satisfaction. In these facilities, health information systems add value to their services at the expense of the employees' work load and performance, and thereby satisfaction. Therefore, the authors concluded, managers and administrators need to provide inclusion programs as well as training workshops and follow-up sessions. In addition, these healthcare facilities can build internal marketing programs to boost employees' perception of the system's quality and use.

Qutaishat from Jordan examined the area of self-management as enhanced by the use of ICT in healthcare. The author's paper entitled 'The moderating effect of information technology on the relationship between self-efficacy and self-management for patients with type(2) diabetes in Jordan' intended to investigate, through a survey study, the moderating effect of information technology on the relationship between self-efficacy and self-management for patients with type (2) diabetes in Jordan. Participants were chosen based on their diagnosis with diabetes (type (2) only) and also based on their experience of using information technology to access diabetes-related information. Several statistical tests were used to examine the research hypotheses, and the main finding highlighted the importance and significance of self-efficacy as a predictor for self-management. Equally important and interesting, information technology positively moderated the relationship between self-efficacy and self-management.

Finally, Harrington and Burge emphasised through a conceptual model presented in their paper 'Connecting digital pharma and e-healthcare value networks through product-service design: a conceptual model' the value derived from establishing collaboration between the pharmaceutical and healthcare systems. The authors contended that with the move towards more 'outcome' and 'value'-based treatment regimens – increasingly tailored for the individual patient – there is growing pressure on healthcare systems and the pharmaceutical sector to collaborate and co-develop innovative models of care and medication. Their paper examined the impact disruptive digital technologies may have on the UK Pharma/National Health Service (NHS) ecosystem, and is set within the boundaries of treating chronic diseases. A comprehensive generic model for designing more 'connected' value networks is developed, and validated by an expert panel in the specific case of type 2 diabetes. An underlying 'disconnection' between e-healthcare and pharma value networks, operating as independent entities, is demonstrated. Moreover, the extant literature details only simple product-fee relationships, without considering the value potential of more digitally connected partnerships. Hence, the authors explored the potential for emerging product-service system (PSS) concepts involving, for example, health information exchange mechanisms, interoperability and data analytics, wearable technologies, and patient Apps. Scenarios involving more distributed 'make-to-order' service models were also represented by the model – demonstrating the potential for technologies, such as 3D printing, to enable localised and personalised medication manufacture Underpinned by the literature on digital/IoT-based business models and PSSs. The authors suggested that the conceptual model has the potential to reduce complexity and provide practical guidance on future operating principles and protocols to be used in the design and implementation of improved e-healthcare solutions. In turn, this enables stakeholders to better understand potential relationships, serviceable aspects, data flows and revenue streams. Through use of the model, various disparities in key stakeholder perspectives are also captured in this paper. Findings include concerns on the collection and use of patient data, except if partnering mechanisms with the NHS were in place, and when devices/services could be provided for free. Stakeholder viewpoints expressing a preference to be at the centre of data collection, disagreement over data ownership and financial models, and the difficulty in establishing partnerships from a wearables technology provider perspective were also highlighted.

The interesting papers included in this special issue of *IJEH* highlight the importance of considering the factors that are most likely to be associated with reducing the digital divide in using and deriving added value from the adoption, diffusion, and use of ICT in healthcare services. It is important to consider the socio-economic, technological, infrastructure, organisational, and managerial factors associated with access and use of the internet to seek, provide, and exchange health information. Doing so could help in understanding how the adoption and use of digitisation of health information and services could impact healthcare providers and users with diverse health literacy needs and backgrounds.

Governments, policy-makers, and managers of healthcare institutions are recommended to identify and understand eHealth trends, opportunities and emerging challenges to reap their benefits and address their challenges(Gemert-Pijnen, 2012), so as to provide potential users with equitable and secure access that would promote the benefit they realise from using ICT in healthcare. Those recommendations for action mainly embrace three areas: reinforcing the policies related to the provision of information and communication technologies for health; supporting equity of access; and promoting the

growth of eHealth capacity, tools, and services. The eHealth area is rapidly changing. We have the opportunity to respond and shape its development, through international collaboration, national policies, and managerial procedures and efforts. Through proper use of ICT in healthcare, we can ensure that health information, services, and best practices are collaboratively flowing between healthcare service providers and patients so as to support a health system that promtes efficiency, better service, and healthier people!

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