Preface

Healthcare delivery globally is at a cross roads. In particular, the U.S. healthcare system has been noted as being significantly more costly than any other OECD country (Wickramasinghe et al. 2008a). Moreover, the use of healthcare services in the U.S. is below the OECD median by most measures and it is predicted that healthcare costs will be over 20% of GDP before 2020 (Wickramasinghe et al. 2008a). Given this, most experts are in agreement that the current healthcare system in the US is in crisis. In response to the current untenable situation, the Obama government has made healthcare reform a priority (Wickramasinghe et al. 2008b). Integral to such reform is the need to redesign inefficient and out dated processes and transition to a patient centric technology enabled healthcare delivery system.

While the situation appears to be less drastic in Europe, cost increases and ineffective healthcare delivery is apparent (Wickramasinghe et al. 2008a; Gronlund 2002; European commission 2008), which in turn has led to similar sentiments having been voiced by the European leaders (The Oslo Declaration on Health 2003; Global Medical Forum Foundation 2005) and the World health organization (World Health Organization 1998; WHO-EMRO http://www.emro.who.int/his/ehealth/ehealthPlan.htm). Both European and US authorities define their initiatives primarily in terms of medical information technology centering on computerized patient record [CPR] or, in more acceptable parlance, the [EHR] electronic health record (Brailer and Terasawa 2003; Gronlund 2002). WHO's platform statement (Global Medical Forum Foundation 2005) speaks of "health telematics policy", an all inclusive term that incorporates not only HER but essentially all healthcare services provided at a distance and based on the use of information communications technologies [ICT]. While implementation of these concepts is preeminently realistic in the context of EU and USA, the WHO plan appears, for many reasons, a combination of a list of good ideas and delineation of significant obstacles that make the good ideas seem almost futuristic.

Effective conduct of healthcare operations is not only extremely expensive, but it is also extremely complex, particularly when executed at the global scale. Most healthcare problems affecting the world have multiple roots involving social,

economical, political, and even geographical factors whose combination provides fertile grounds for the spread of illnesses, prevalence of trauma, enhanced mortality, etc.

In the current debates of healthcare economy, ICT use then is heralded as the silver bullet. Healthcare is an information rich, knowledge intensive environment. In order to treat and diagnose even a simple condition a physician must combine many varied data elements and information. Such multispectral data must be carefully integrated and synthesised to allow medically appropriate management of the disease. Given the need to combine data and information into a coherent whole and then disseminate these findings to decision makers in a timely fashion, the benefits of ICT to support decision making of the physician and other actors throughout the healthcare system are clear (Wickramasinghe et al. 2005). In fact, we see the proliferation of many technologies such as HER (health electronic records), PACS (picture archive computerized systems) systems, CDSS (clinical decision support systems) etc. However and paradoxically, the more investment in ICT by healthcare the more global healthcare appears to be hampered by information chaos which in turn leads to inferior decision making, ineffective and inefficient operations, exponentially increasing costs and even loss of life (Wickramasinghe et al. 2005).

Recognizing the need for technology solutions does not in and of itself translate into realising the full potential afforded by the technology. To truly realise the full potential it is imperative to understand the healthcare technology paradigm, develop a sustainability model for the effective use of technology in a specific context and then successfully design and implement the patient centric technology solution (Suomi et al. 2007). Many of the problems with technology use are connected to the platform centric nature of these systems and the fact that they cannot support seamless transfer of data and information. This, on top of already inferior healthcare processes leads to the realizing of inferior, not superior healthcare delivery. Hence, it is of paramount importance to focus on designing effective and efficient healthcare processes enabled with technology to support the delivery of superior healthcare and thus better access, quality and value. An essential aspect then becomes identifying the barriers and facilitators to move from idea generation to concept realization and application.

In order to understand the role for technology in healthcare delivery, it is first important to understand the unique aspects of the healthcare industry, the key challenges and the components of the healthcare value proposition. Irrespective of the specific healthcare model, unlike most other industries, healthcare has the unique structure that the receiver of the services (i.e. the patient) is often not the predominant payer for those services (i.e. the insurance company). Moreover, any healthcare intervention is complex and typically involves directly or indirectly a multiplicity of players including providers, payers, patients and regulators (Heikkinen et al. 2009). This then leads to many economic dilemmas such as moral hazard, orthogonal considerations pertaining to cost versus quality and information asymmetry which in turn have the potential to create obstacles in an attempt to deliver efficient and effective healthcare (Wickramasinghe and Bali 2008; Wickramasinghe 2008; Wickramasinghe et al. 2007). In order to ameliorate these problems, relevant data, pertinent information

and germane knowledge play a vital role and can only be obtained via the prudent structure and design of technology (WHO-EMRO http://www.emro.who.int/his/ehealth/ehealthPlan.htm; Brailer and Terasawa 2003; Gronlund 2002). Of equal significance are the major challenges facing today's healthcare organizations; i.e., demographic challenges, technology challenges, and finance challenges (Wickramasinghe and Goldberg 2007; Wickramasinghe and Lichtenstein 2006; Sharmaet al. 2006; Von Lubitz and Wickramasinghe 2006; Wickramasinghe 2006).

Demographic challenges are reflected by longer life expectancy and an aging population; technology challenges include incorporating advances that keep people younger and healthier; and finance challenges are exacerbated by the escalating costs of treating everyone with the latest technologies. Healthcare organizations should respond to these challenges by focusing on three key solution strategies, which taken together form the healthcare value proposition (Wickramasinghe and Goldberg 2007); namely:

1. Access – caring for anyone, anytime, anywhere;
2. Quality – offering world class care and establishing integrated information repositories;
3. Value – providing effective and efficient healthcare delivery.

These three components are interconnected such that they continually impact on the other and all are necessary to meet the key challenges facing healthcare organizations today. In such a context it is yet again only through the judicious application of technology solutions that effect superior healthcare delivery (Wickramasinghe and Goldberg 2007; Wickramasinghe and Lichtenstein 2006).

Healthcare to date has been shaped by each nation's own set of cultures, traditions, payment mechanisms and patient expectations. Therefore, when looking at health systems throughout the world it is possible to place them on a continuum from high to essentially 100% government involvement at one extreme to little or essentially 0% government involvement at the other extreme. However, given the common problem facing healthcare globally; i.e., exponentially increasing costs, no matter which particular health system one examines, the future of the healthcare industry will be shaped by commonalties based on this key unifying problem and the common solution; namely, the embracing of ICT and thereby developing an e-health focus. In turn, this common problem and application of the common solution will bring with it three key future trends, including; (a) empowered consumers, (b) e-health adaptability and (c) shift to focus on healthcare prevention, as well as four key implications, including; (a) health insurance changes, (b) workforce changes and changes in the roles of stakeholders within the health system, (c) organizational changes and standardization and (d) the need to make difficult choices.

Currently, most if not all countries begin to analyse and evaluate what is essential to reform their own healthcare delivery system. The common solution appears to focus on the embracing of ICTs in particular some type of electronic medical record system (Suomi 2009). However, in order for such a solution to be truly beneficial it is necessary to critically evaluate the fundamental elements that must be considered to ensure sustainability and key metrics to ensure it does indeed support value driven

patient centric healthcare. To date no such book (to the best of our knowledge) has attempted to do this. Thus, we set out to bring together a collection of articles that focus on the key issues, critical success factors, barriers and facilitators related to sustainable electronic health records and thereby superior healthcare delivery. Moreover we invited experts in these respective areas and disciplines to contribute thereby making this compilation a collection of discussions and discourses on the state of the art from leading scholars.

Specifically, this book, presents various chapters that investigate the impact of adopting and implementing ICT in various health systems globally, and thus serves to (a) provide an understanding of the impact of ICT in healthcare delivery and how adapting to e-health impacts the healthcare industry and the various organizations within the healthcare industry, (b) identify the major barriers and facilitators related to ICT design, development and diffusion in the healthcare sector and (c) identify the major drivers and key success factors as well as to determine the implications on the healthcare industry at both the macro and micro level of the use of ICT to support value driven healthcare delivery.

The book consists of four sections: Innovation & Process, Design & Organisation, People and Information Systems and Information Technology. After a brief section introduction, the chapters in each section serve to discuss past, present and future implications; thus taken together they describe key issues necessary for the sustainability of prudent e-health solutions. This book then provides a thorough and far reaching analysis of key areas that must be considered when designing and developing superior e-health solutions. The book is as relevant for academics and scholars, the myriad of healthcare practitioners, consultants, graduate students and anyone who is desirous to have a complete understanding of the drivers, barriers and facilitators of successful e-health solutions. We hope our readers enjoy this book at least as much as we have enjoyed compiling it for you. We know you will find it a most invaluable resource.

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The Editors

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http://www.springer.com/978-1-4614-1535-0

Critical Issues for the Development of Sustainable E-health Solutions

Wickramasinghe, N.; Bali, R.; Suomi, R.; Kirn, S. (Eds.)
2012, XXXIV, 386 p., Hardcover
ISBN: 978-1-4614-1535-0