
Foreword

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Biographical notes: Reima Suomi is a Professor of Information Systems Science at University of Turku, Finland and a part-time Professor at Central China Normal University, Wuhan, China. Currently he concentrates on topics of healthcare IS and telecommunications, including issues such as management of networks, electronic and mobile business, circulation economy, virtual organisations, social media and governance structures. He has published in journals such as *Communications of the Association for Information Systems*, *European Journal of Information Systems*, *Computers, Informatics, Nursing, Information & Management*, *Information Services & Use*, *Technology Analysis*

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Nilmini Wickramasinghe is a Professor-Director of Health Informatics Management at Epworth HealthCare and a Professor in Health Informatics Management at Deakin University's Faculty of Health. She researches and teaches within the information systems domain with particular focus on designing, developing and implementing IS/IT solutions to effect superior, patient centric healthcare delivery. She collaborates with leading scholars at various premier healthcare organisations throughout Australasia, the USA and Europe and has published more than 375 refereed scholarly articles, more than 12 books, numerous book chapters, an encyclopaedia and has a well established funded research track record.

Health is maintained and healthcare delivered through complex arrangements. Complexity is everywhere. The basic unit of action, human body, is the most sophisticated organism in the world, and no-one possessed complete understanding of its function, not now and neither most likely ever in the future. Health and social problems are elaborate, and touched upon and mediated in complicated social networks. Health and social care operations can be arduous, and they are delivered through interlaced processes involving sophisticated technologies and regulatory frameworks.

One particular component adding to complexity is of course information technology, or as the current trendy word formulates 'digitalisation'. Information systems end up to be convoluted arrangements by nature, and not all details of the system can be mastered by a single human. In such a way, human bodies and IT systems are complex systems needing cooperation between people when being administered and catered for.

All this indicates that we should try to understand the totality of the system, and that we should take actions to reduce and manage the complexity. This strongly refers to system thinking. With adding the prefix 'eco' to the 'system' ending to 'ecosystem' means for us that the system has a life of its own, and that not all components cannot be steered by some omnipotent actor – if there even would be demand for that.

It is extremely good that ecosystems have their own life. That means that they can be sustainable. Unfortunately we all too often see that health and social care initiatives are not sustainable, but die after for example external finance is ending. Luckily, health and social relations have always been catered for through the history of mankind, and the total ecosystem will keep on working in every case. In our special issue, we however have asked the authors to especially address the issue of sustainability in their contributions.

Complex systems must be modelled. The model is always a pale simplification of the reality. Even the best model is a partial truth, and the details of the total system cannot all be addressed in the models. Models can be formal, but even narrative and other unstructured models of reality have the potential to offer insights to the complicated ecosystems.

We have taken seriously the concept of health and well-being. They need proactive and protective actions, otherwise we end to the realm of diseases and different malfunctionings of the human mind and body, and then we are already late with many issues. We appreciate solutions for medical care and cure, but even more there is demand for health and well-being maintenance as long as possible.

With these ideas we set the agenda for the conference 'Well-being in the information society – well-being ecosystems'. Out of the over forty candidates these four articles have made it all the way to the special issue. As can be expected, none of the articles masters a total picture of the health can well-being ecosystems, but we believe that each of the articles provides an unique and interesting viewpoint to the total health and well-being ecosystem.

In his article 'The digitalisation of the medical value network – how information asymmetries can be managed with digital innovations' T. Peltoniemi reviews major innovations on medicine value chain and delivery. Digitalisation is seen in the article as a catalyst for better performing health and well-being value networks and decreased information asymmetry, which both contribute to the better functioning of medicine value chain.

Key innovations in the digitalisation of medical value network are according to the article electronic prescriptions, the generic substitution system and different automated solutions to medicine dispensing. Major trends behind these medicine-related innovations are improved electronic health records and developments in outcomes-based and evidence-based management of health.

The especially trendy topic of blockchain application is also taken up in the Peltoniemi article. Blockchain technology is not a candidate to store health information, but rather metadata on it. Blockchain technology in healthcare can be used by users to manage their health records totality and access to individual records.

The topic of medicine demand management is also taken up in the article. Vast amounts of medicines land into waste because of several reasons, both in in- and out-hospital environments. Digitalisation can again be a key catalyst to make medicine demand and supply meet better.

Ágústa Pálsdóttir and Sigríður Björk Einarsdóttir work in their article 'Senior citizens – perceived health self-efficacy and information barriers' on the important concept of health self-efficacy. The paper reports an empirical study among senior citizen of 60 years or more in Iceland.

The empirical study part is preceded by an interesting literature analysis on the health self-efficacy. From that we learn among other things that self-efficacy is about own assessment and feelings, not about any measured skills or capabilities. Self-efficacy must be separately measured in all activities, self-efficacy in one area of life does not automatically turn into self-efficacy in some other area of life management.

The empirical study found that education has a strong correlation with self-efficacy. The better education, in general the more self-efficacy is reported. As elderly people get even older, in this study over 68 years or more, the education effects on self-efficacy get smaller.

Another key topic in the article is that of information barriers. Physical information barriers such as lack of hardware and access, financial resources and time are present, but even more important might be those of cognitive information barriers. Information might be too little or too much, and its quality and the way it is presented is not always optimal for all users. Clearly there is a broad work area to be tackled to improve information access. After lower information barriers, senior citizen are most likely to face higher levels of health self-efficacy.

The article 'Towards improving shift leaders' information management in intensive care units: developing and testing a model for a management information system' by Laura-Maria Peltonen, Heljä Lundgrén-Laine and Sanna Salanterä touches upon the crucial problem of information exchange of information between different shifts in hospital settings. The study importance is highlighted on its focus on the highly demanding and information-rich intensive care unit work.

The study at hand develops and tests a model for managerial information system for shift leaders in intensive care environments. The article nicely illustrates how the information needed for management is not just in electronic information systems, but rather combines information from human, manual and observational sources to information from electronic sources. The perils of information overload were identified as a major risk in the study, as well dependence on a total electronic system would be very disastrous in the case of system downtime, which might happen because of several reasons.

A point worth picking up in the plan for the intensive care information system is its orientation towards future. Each shift should already beforehand plan the activities of the next shift, so that work can continue fluently and setting up the stage in the beginning of the next shift will not take too much time and attention. Everywhere in health care, but maybe especially in intensive health care it is important to allocate the best and most skilful resources to each patient, for immediate care. After that it can be planned whether staff can also be allocated to secondary tasks, such as training and education.

The article 'Healthcare as a business environment – analysing the Finnish health technology industry' by Reetta Raitoharju, Tuomas Ranti and Mikko Grönlund studies the current status of Finnish Health Technology Industry. Data is collected from a financial analysis based on Orbis Europe database, and a survey on which 35 Finnish health technology companies participated. The survey touched upon a wide area of topics, including aspects such as product portfolio, market entrance strategies, future plans and activities in export and internationalisation.

In general, one might read from the results that health technology is an industry as any other. As in technology industries in general, orientation might be bigger towards customer, at the cost of current orientation towards products and technology. In the sample of the 35 companies studied, both success stories as well as crisis companies could be identified.

We wish to thank Inderscience Publishers and the *International Journal of Telemedicine and Clinical Practices* for publishing this special issue and guiding us very professionally through the editing phases. A big thank goes of course to the authors of the special issue for sharing their knowledge, as well as for all the reviewers who catered for quality assurance for this special issue. We wish all the readers good and educating moments when consuming the articles.