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Proceedings of the
Seventh International
Conference on
Well-Being in the Information
Society: Fighting Inequalities
(WIS 2018)

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Seventh International Conference on
Well-Being in the Information Society:
Fighting Inequalities
(WIS 2018)

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Roland Trill, and Hamed Ahmadinia (Eds.)

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PREFACE

This publication contains selected and reviewed abstracts that were presented at the Well-Being In the Information Society - WIS 2018 conference, which took place in Turku in Finland, during 27-29 August, 2018. The conference, which started in 2006, is a biannual event that is now being held for the seventh time.

The conference is multidisciplinary in nature. It brings together scientist and practitioners from several academic disciplines and professional specializations from around the world who share their current expertise and experiences, and exchange their views on the latest developments within the field.

The focal point of the WIS conference has from the beginning been the use of information technology to promote equality in well-being. This, together with the main theme of the conference this year, 'fighting inequalities', is reflected in the content and emphasis in the publication.

We would like to express our gratitude to all of those who have contributed to the WIS 2018 conference. We owe our special thanks to the Federation of Finnish Learned Societies, the Foundation for Economic Education and Åbo Akademi University Foundation. Without the financial support received from it, the event could not have taken place. The Programme Committee and the Programme Chairs also deserve appreciations for their work and the time that they committed to ensure that the conference became successful.

We would also like to take this opportunity to acknowledge the work of the authors and thank them for participating in this publication, as well the external reviewers to helped to ensure the quality of it.

It is our great pleasure and honour to introduce this issue of the TUCS Lecture Notes to the readers. We hope that it will stimulate the interest for further research about fighting inequality in well-being.

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Table of Contents

Panel Keynote Speech: Women Participation in Tertiary Education in Sri Lanka with Special Emphasis on Science Education	1
<i>Kshanika Hirimburegama and Nisansala Vidanapathirana</i>	
Digital Tools Challenge Well-being at Work	7
<i>Arja Ala-Laurinaho, Seppo Tuomivaara and Pia Perttula</i>	
Differences in Seeking Health Information Sources Among the Elderly	13
<i>Muzawir Arief, Sari Rissanen and Kaija Saranto</i>	
Health Information-Seeking Styles and Inequalities in Health-Promoting Behavior	19
<i>Kristina Eriksson-Backa and Hai Nguyen</i>	
Comparison of food frequency questionnaire data and shopping records for the assessment of food intake	25
<i>Antti Kallonen, Soumya Das, Hannu Nieminen and Riitta Sallinen</i>	
Use of Data Cloud Services in Clinical Environment. Case: 2 x Video-Electroencephalography in Different Domains	31
<i>Jukka Laaksonen and Jyri Rajamäki</i>	
Requirements Engineering as a Part of Business Process and Information System Development	35
<i>Altti Lagstedt and Tomi Dahlberg</i>	
Secondary School Nurse as an information source for Finnish Sexual and Gender Minority Youth	41
<i>Minna Laiti, Heidi Parisod, Anni Pakarinen, Salla Sariola and Sanna Salanterä</i>	
Smoking Cessation through Online Health Communities: A Social Support Perspective	45
<i>Chenglong Li</i>	
An Investigation of The Health Tourism Website's Continuance Intention: A Case Study in China	51
<i>Ting Long</i>	
Fighting inequalities - Whose Battle Is It? A Literature Review to Explore Paradigms and Equality Related Topics in the HIS Research Arena	57
<i>Teijo Peltoniemi</i>	
Video-Based Learning Game – Can It Increase Safety Awareness among Forklift Drivers?	63
<i>Pia Perttula, Henriikka Ratilainen and Vuokko Puro</i>	
Supporting Employee Wellbeing through Digital User Services	67
<i>Vitalija Petrulaitiene and Suvi Nenonen</i>	
Misinformation as a Barrier to Social Inclusion in the Context of Asylum Seekers in Finland	71
<i>Hilda Ruokolainen</i>	
The eProfessionals as Promoters of Digitalisation in Social and Health Care	75
<i>Päivi Sihvo, Susanne Hämäläinen, Aija Hietanen, Jaana Nykänen, Jaana Hämäläinen and Heli Jääskeläinen</i>	
Data Mining in Promoting Public Health Care Reputation: Finding Harm Causing Factors in Patient Safety Records	83
<i>Olli Sjöblom, Kinnunen Ulla-Mari, Eija Kivekäs, Sari Palojoki, Reima Suomi and Kaija Saranto</i>	

How to measure Digital Health Literacy!	87
<i>Roland Trill</i>	
The Challenge of Digital Divide and Diversity in Future Youth Information Work	91
<i>Gunilla Widén and Muhaimin Karim</i>	

Panel Keynote Speech

Women Participation in Tertiary Education in Sri Lanka with Special Emphasis on Science Education

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Abstract. Even though Gender Parity Index in tertiary education in Sri Lanka is far better among Asian countries, women participation in higher education in Sri Lanka, especially in sciences, appears to be limited and hence a study was conducted. It was revealed that women are keen to pursue their higher studies in sciences but think that learning science is difficult. The study also showed there is a potential for young girls, especially those having agriculture as a career, to be involved in sciences together with IT as they are keen to empower themselves on knowledge based agriculture. It was also revealed that women in rural sector are now aware that science together with IT could improve their livelihood in several fold.

Keywords: Online Community, Social Support, Smoking Cessation. Equality, Empowerment, Gender, ICT, Science & technology.

1 Introduction

It is known that Gender Parity Index in tertiary education in Sri Lanka is far better than many other countries in South and East Asia (Figure 1). It is a commonly held view in Sri Lanka that women are less engaged in science education but more in non-science subjects (Figure 2). Science is for everyone and women have to be an equal beneficiary to the advantages offered by the technology. Science knowledge would allow efficiency in office, factory or at home in the kitchen & garden.

1.1 Highlights of university education

- Females- largest beneficiaries in University Education
- Female participation in Arts stream has significantly increased from 70% to 77% over the 5 years while no changes in Physical Science stream (still below 25%)
- The GPI for Management, Medicine and Sciences is at average level at 1.1
- The same trend GPI cannot be seen in postgraduate education (female: below the 50%)

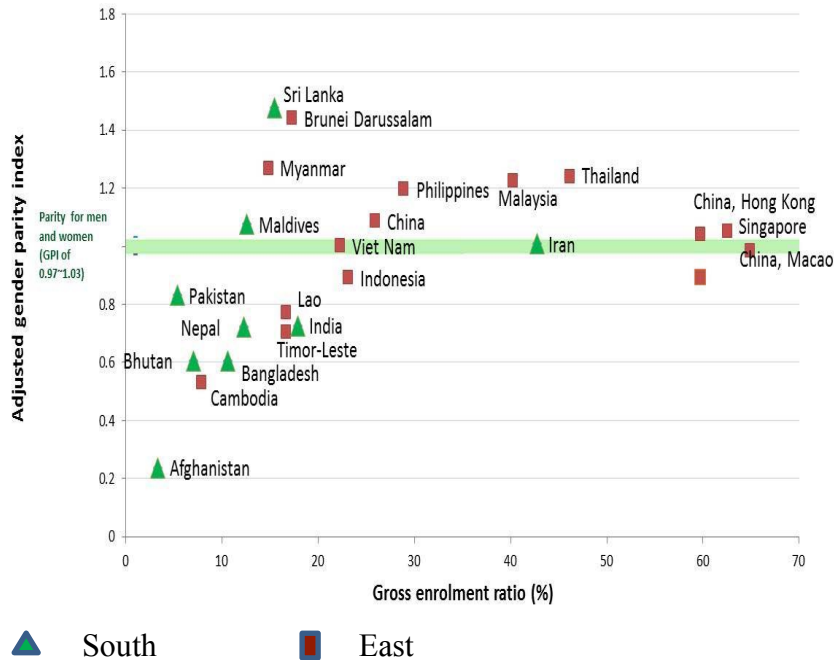


Figure 1 Gender Parity Index (GPI) in tertiary education – 2010 [3]

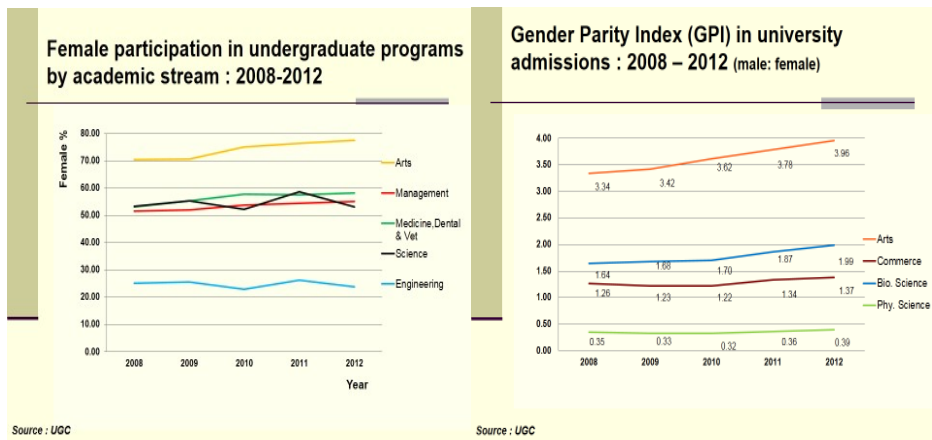


Figure 2. Female participation in science education (UGC, 2013) [2].

1.2 Tertiary education in rural women

The knowledge through science education with ICT should be shared by all levels of people, especially by rural women. A mother, a house wife knowledge on sciences would greatly affect her day to day handling of family, i.e. nutrition of children, education and even handling of the spouse for unity and upgrading of the family.

The range of areas in which science can put a greater control in the hands of women is wide and continuously expanding and having access to lifelong learning opportunities. Science together with ICT has the potential to reach rural women previously not been reached, thereby empower them to participate in economic and social progress.

A survey was conducted among rural women and men on the level of education, how interested they were to gain knowledge in agriculture related sciences and how knowledge based cultivations have upgraded their income with other benefits. Information on women in science was also obtained from a survey of University Grants Commission in Sri Lanka and the World Bank project on “Higher Education for Twenty-first Century (HETC Project) carried out in Sri Lanka.

A significant factor that releases people from poverty and empowers them socio-economically is knowledge. Knowledge gained through education would upgrade their day today life and their profession. Also, educating a female would contribute to the well-being of the children of a family in education, health, culture & ethics. In the context of knowledge sphere, the issues of gender equality, equity and empowerment of women become even more significant as women have a strategic role in incubation and transfer of critical knowledge of survival for communities.

Women, because of their biological and social roles, are generally more rooted than men in the confines of their locality. A research conducted by World Bank has revealed an encouraging outcome that people, especially women, wanted access to knowledge and opportunities instead of charity to fight conditions leading to poverty [1]. In order

to meet this, the University of Colombo Institute for Agro-technology and Rural Sciences in Hambantota, developed knowledge based tissue-cultured banana cultivation program using novel agro-biotechnology and ICT especially for empowering rural women.

Agro-biotechnology knowledge based cultivation of tissue culture banana plants for rural women farmers has been practicing for the past two decades in North, South, East and North Central parts of Sri Lanka where the women in the family play a major role in agriculture. Women were trained for ICT by the institute and are using computers to get information on growing and marketing of bananas. Women trainers were developed to train the other women in the village in order to increase the women involvement in knowledge based cultivations.

The institute developed a digital content including all information of growing tissue cultured banana up to harvesting of bunches, in local and English languages and published in Wiki Educator for banana farmers. Women leaders from the rural village took part in developing the content and feedback were received on the content by the farmers to ensure its user friendly delivery. Women were gaining knowledge through this digital content resulting in tenfold enhanced products from their cultivations. The institute, in 2009 commenced a Diploma & Bachelor degree program in Agro-technology with relevant ICT tools, for the Sri Lankan farmers to pursue on-the-job higher education. Women were specially targeted as the delivery mode was convenient for them. The online program consisted of diverse science based agriculture subjects prepared on Moodle Learning Management System in local language and English. The courses focused to build skills and knowledge where the farmers applied immediately to their cultivations thereby enhancing quality and quantity of their products earning more to upgrade livelihood. This is a new opportunity also for women who have special interest in agriculture and competency gained through knowledge enables them to climb the ladder of socio-economic success [4].

Women farmers (40%) who were involved in the education program illustrated a commendable performance with improved socio-economic level. Further the institute is making knowledge based women agriculture entrepreneurs. Some entrepreneurs who were enthusiastic in agri-businesses such as orchid cultivation with net houses, agro-eco tourism, organic fertilizer production, commercial level floriculture industry etc. were trained for ICT tools that are necessary for handling the agro- business.

1.3 Enhanced income generation

At the beginning of the course income of most women had 57% generated from agriculture and had less purchasing power. But with the knowledge gained through following the course, 90% women increased their income by 75% with improved purchasing power. With the science education, social recognition, purchasing power and thereby job satisfaction were also observed. With the improvement of their knowledge on agriculture, farmers were able to increase their income while modernizing their farm enterprises with technical and entrepreneurship skills.

Even though this observation was common to both women and men, it was more prominent in women as many were at home having joined their male counterparts with fewer benefits. Women entrepreneurs commenced their own home page for promoting their products and are using Internet web browsing and other ICT tools in order to improve socio-economic status.

1.4 Potential to pursue higher education in Science by rural women

Throughout the country, rural sector women in the program showed better participation & performance than men, in online discussion forums, chat sessions, uploading assignments and access of other online tools illustrating their potential. Therefore it was possible to introduce novel technology in agriculture and create agro businesses through disseminating knowledge for farming community in Sri Lanka without gender barriers, in fact women illustrating better performance. With the education program 85% of the women in rural sector have either improved their agri-business or started new agribusinesses. The tenfold increase in income attracted them for science knowledge based agriculture.

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Digital Tools Challenge Well-being at Work

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Abstract. Digitalised information and integrated IT systems affect work systems and well-being at work. We present changes in work and their effects on well-being in two different kinds of process, namely the wood procurement process and the accounting process. We investigate well-being in digitalised work in terms of the meaningfulness of work and the obstacles to or enablers of the accomplishment of work. The changes, which were due to the implementation and development of IT systems, included renewed division of labour, increased networking and the automatising of routine tasks. As these changes have profound effects on the content of work, it is important to find ways in which to help employees find new meaning and motivation for their work, and to build a new personal relationship with their changing work. Collaborative means also enhance the collective understanding of renewed work processes, which further forms a basis for renewing practices in line with well-being at work, and creates prospects for extending the development to the process, organisational and network levels.

Keywords: Digital Tool, Well-being at Work, Activity Theory

1 Introduction and approach

The introduction of new tools typically aims to increase the productivity and efficiency of current production and service processes. However, it is predicted that highly developed and integrated digital platforms and information systems in particular will substantially change the patterns of work and ways of working. Such changes will also have profound effects on well-being at work.

In our case research, we investigate how digitalised information and integrated IT systems affect the work system and well-being at work. We present work changes and their effects on well-being in two different processes, namely the wood procurement process and the accounting process. New operational logics are developing in both branches, as integrated IT systems are enabling a new kind of division of work and networking, automation is replacing routine tasks, and the new tasks require new competencies and orientation.

The analysis is based on the activity theoretical approach and on the methodology of Developmental Work Research (DWR) in particular [1,2,3], which offers analytical tools to investigate changes in work as a systemic, ongoing process, and combines practice-level changes with larger organisational transformations. The model of the activity system [1] describes the basic structure and elements of work: the object, which denotes

the meaning and purpose of collective work, and materialises it into a concrete entity that is transferred into outcomes during the work process; the actors in the work (subject); the tools they use in this process; the others involved (community); how the tasks are divided (division of work); and the rules that guide and control the work. The disturbances and anomalies of everyday work indicate tensions and contradictions within the work activity and with neighbouring work systems, requiring transformations in the activity and the collaborating network. Mäkitalo [4] has introduced a concept of *object dependent well-being*: ‘the successful accomplishment or the possibility of a successful accomplishment of individual actions in the direction of individual’s motive constructed from the collective object and motive of activity’. The activity theoretical frame thus offers a conceptual model to investigate well-being in digitalised work from the point of view of both the meaningfulness of work and the disturbances in and obstacles to the accomplishment of work.

2 Data and methods

We gathered our data from two case networks. The wood procurement network comprised a large forestry company and some small and medium-sized forest machinery and transport enterprises, all aiming for efficient wood procurement processes. The forestry company purchased the cutting and transportation phases of the procurement process as services from the enterprises. We interviewed 22 people in different positions in the network: 10 forest specialists from the forestry company working in purchasing, production planning and control, and transport planning and control. We also interviewed four entrepreneurs, one foreman and four drivers working in cutting and near and far transportation, and three people (managers and change agents) working in systems development.

In the accounting network, the centre was the IT supplier and the members were the accounting enterprises, sharing an interest in digitalising accounting processes and developing new business models and operational logics. We interviewed 14 people: the IT system supplier’s two concept managers, a service co-ordinator and a product owner, and four accountants; three managers, two of which were entrepreneurs; and three of the accounting enterprise’s customers.

The interviews were thematic and consisted of the following themes: background information; personal work, work tasks and processes; the use of IT, especially in networks; changes in work and IT use; work development and IT system implementation practices; well-being and safety at work; and future considerations concerning work and IT use. To elaborate on the preliminary results of the interviews, we organised a workshop for the interviewees and key managers in both networks, and these discussions further matured the data and interpretations.

The qualitative analysis was based on the content analysis method [5] in which the transcription texts of interviews are classified via principles that arise from the theory base of the research. In our case, we derived the codes we used from the theoretical concepts of the DWR, and tailored and operationalised them according to the content of the data. The text segmentation in coding was based on the semantic meaning of the

sentence or the period of the text in which the unit of analysis was the interviewee's work as a changing activity system, with their experiences of the obstacles to and enablers of well-being at work.

3 Findings

Next, we describe the changes that occurred due to introducing and developing IT systems in the wood procurement and accounting networks by focusing on the tasks of the forest operator and accountant. We then illustrate their consequences for well-being at work. The descriptions are based on our analysis of the interview data and workshop discussions.

3.1 Changes in work due to integrated IT systems

Production planning and control in the wood procurement process includes combining information on the stands marked for cutting, the raw material needs of the mills, locations, and the contractors' capacity to make plans and instructions for cutting and logistical operations. Previously, the forest operator, with the title of 'harvesting foreman', produced detailed harvesting instructions for contractors, harvesters and forwarder drivers, using different kinds of data systems, notes, and their own excel sheets as tools. Today, the planning tools comprise shared data systems (ERP 1), with more detailed, online and continuously updated data, although personalised excel sheets are also still used. The forest operator produces short-term pre-plans and sets targets for the quality and amount of timber for harvesting enterprises, and the enterprises then internally fine-tune these plans for specific harvesters (changed division of work). The main interaction with the different actors of the process takes place via mobile and online information systems. The next technical development step in the planning of the wood procurement process is the implementation of the ERP 2 system (new tool). ERP 2 uses algorithms and data in the more integrated IT systems to produce automated plans, instructions and reports. These developments will further change the role of forest operators: their tasks will include monitoring the systems and problem-solving in cases of disturbance, extend the planning period to a couple of weeks, and expand the scope of instructions into areal plans.

In the accounting process, the tools and means used by accountants have changed from paper materials and separate IT systems to electronic data, data transfer and more integrated IT systems. The automation of data recording has replaced manual work such as the recording of purchase and sales invoices and the creating of personal ledgers and timing payment traffic; and service portals have replaced face-to-face services. Tasks such as the revision of information in the integrated system, system guidance, monitoring finances, and consulting are emphasised. An accountant's role will become more like that of a consultant, and the system supplier will provide shared systems and interfaces, which will then be further developed in co-operation in the network, to obtain

up-to-date financial data for business, and more automated statutory reports and notifications.

As the descriptions above show, the work of forest operators and accountants has changed, and continues to do so, as technology develops. In both fields, the information needed at work has been digitalised, and is now derived from shared systems; it is online, up to date and mobile. The integration of systems and processes as such has increased working in networks, and the division of work is renewed within both the company and the entire network, which comprises producers, subcontractors, IT suppliers, and even customers. Routine tasks have been automatised, and the roles and responsibilities of clerical workers and employees have expanded because planning and control tasks have shifted down in the hierarchy. Changes in job descriptions have raised new requirements for know-how and increased the number of expert tasks.

3.2 Challenges to Well-being at Work

These developments present major changes in the object and activity system, and challenge well-being at work. In terms of object-dependent well-being, the employees need to rethink the meaning of their work, as well as their identity as workers [4,6]. The interviews revealed that some employees felt they had lost part of their previously meaningful core tasks, and some of the new tasks felt uninteresting or fragmented, or seemed to reduce their decision latitude in timing and organising their work. For example, as planning tasks are partly automated and replaced by monitoring and reacting to problems, they fear that the system will set the pace and the tasks at hand, and that the opportunities to use their planning skills will diminish. In addition to this, the consultative role will require completely new skills and competencies, such as more knowledge of financial management.

The emerging work processes, structures and tools create tensions (contradictions, [1]) in daily work. At times, the changes in IT systems have caused confusion among employees in terms of their tasks and the division of work, and diminished the fluency of their work, increasing time pressure and workload. On the other hand, IT improvements to solve daily problems decrease disruptions in work and promote fluency and control over work. For example, an accountant initiated a feature development in the form of payment timing, which would ensure more fluent, efficient and customer-oriented service. Such improvements are steps towards refining IT tools in line with the organisation's service-oriented strategy [7].

4 Discussion and Conclusions

In this article, we have shown how the implementation and development of IT systems lay the grounds for the reform of individual work and co-operation in networks. While some employees experience fear and uncertainty in the face of these changes, others welcome new inspiring tasks and opportunities to develop in their work. Even during the changes, ensuring meaningfulness, decision latitude and opportunities to influence one's work is vital for well-being at work, as are opportunities for learning [8,9]. Koli

10] proposed that the collective construction of the renewed object of work helps employees find new meaning and motivation for their work, and thus build a new personal relationship with their changing work, with new sources of meaningfulness. In our cases, training, for example, included learning not only how to use the new IT systems and their features but also learning new practices, interconnections between different tasks and phases, and the new logic of production as a context for using the new tool. Such collective understanding forms a basis for renewing practices in line with well-being at work, and opens up prospects for extending the development to the process, organisational and network levels [7,11].

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Differences in Seeking Health Information Sources Among the Elderly

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Abstract. Health information is important to improve elderly knowledge in managing their health. With better knowledge, elderly behavior toward better health can be positively influenced. The data collection from Elderly Survey of Wellbeing in North Savo Finland with total sample N = 2505 and consist of two age cohort group 60s n =1515 and 70s n = 990 in 2012.

This study evaluated differences among elderly in seeking the information and influential factors related with Information seeking. The top three most frequently reported sources of health information were doctors, family members, public health nurse/social worker, followed by friends, internet or social media and the lowest reported source was organizations.

Younger age group (60s) was more likely to seek health advise from the Internet or Social Media compared to the 70s group. (odds ratio [OR] = 1.724, p<0.001). While Females were more likely to use online health information rather than males (odds ratio [OR] = 1.706, p<0.001). Highly educated elderly tend to seek online health information with odds more than 1.5 lower educated elderly. For elderly who have disability or illness, the more likely health information source are public health nurse with doctors with OR = 1.457, p<0.001, and OR = 1,801, p<0.001 respectively. In addition, ill elderly, female and active internet user tend to have more than 2 information sources compare to others.

This study recommended that currently online media channel was still under use for elderly with health problem, older age category and males. This study recommended the needs to promote more the utilization of digital online as it has benefit especially for people who lack of mobility because physical disadvantages.

Keywords: Elderly, Health, Information.

1 Introduction

Health information is important to improve elderly knowledge in managing their health. With better knowledge, elderly behavior toward better health can be positively influenced. There are many health information sources: television, radio, the Internet, newspapers, magazines, family and friends [1 – 2]. Moreover, with the Internet’s rapid development, the volume of health information content has grown significantly. A 2011 survey from the US showed that health information was the third most popular among internet users (with email and search engines taking the top two slots) [3]. Another survey from the US in 2013 demonstrated that health information from the Internet has been used to study medical conditions that are of interest to the user (35%), and 53% of them have discussed the information with their health practitioners, and 41 % of the information discussed online has been confirmed by clinicians [4]. Besides the potency of the Internet as a health information resource, conventional media channels were still popular, with 70% of adults living in US having sought information from a doctor or other health care professional, and 60% of them have relied on the information and support from friends and family [4]. Concepts related with needs and the seeking and use of health or medicine information is called health information literacy (HIL) [5]. In addition, reliable, understandable health information is one major player within HIL [6].

This study evaluates differences among the elderly in seeking information and influential factors related to information seeking. There were different findings and factors related with the elderly in the utilization of the Internet through their heterogeneity and various ICT (Information and Communication Technology)in accessing the information; it is important to clarify the previous studies and to point out specific case studies for effective implementation. There are two research questions in this study (1) What is the most popular health information seeking method among the elderly? (2) How do demographic and socioeconomic backgrounds associated with the elderly’s preferences affect them when seeking health information advice? Therefore, the purposes of this study are to evaluate current health information sources that are popular among the elderly and to analyze any significant demographic and socio-economic factors for the elderly in terms of seeking health information. The outcome of the study is targeted to provide recommendations in managing the health information sources and to promote the use of ICT for the health of older people as alternative health information sources with many benefits.

2 Material and Method of Analysis

Data was collected from the Elderly Survey of Wellbeing in North Savo, Finland. The Age Innovation 2012 - 2014 Project was used as a primary data source in this study, with collaboration between the University of Eastern Finland and the municipalities within North Savo region, Finland, and it was funded by the European Social Fund [7]. One sub study for the project was the Ageing and Well-being of North Savo, which was

started in 2012. There were 3902 and 1920 questionnaires for subjects in their 60s and 70s, respectively posted in November 2012 and in January 2013. Additionally, 2849 and 1176 questionnaires were sent to subjects in their 60s and 70s (with a response rate of 25%). The total sample was $N = 2508$, and it consisted of two age cohort groups: (for the 60s) $n = 1515$ and (for the 70s) $n = 990$. There were also three people who did not mention their ages. The genders were well balanced with males appearing at $n = 1116$ (44, 5%) and females at $n = 1391$ (55, 5%), with 1 participant who did not state his/her gender. In addition, the gender balance within the 60s group with males was $n = 682$ and was $n = 833$ for the females; this means 45% were male and 55% were female. For the oldest group, the males ($n = 432$, 43.6%) and females ($n = 557$, 56.3%) were similarly balanced. Statistical analyses were performed by two regression analyses (1) with health information sources (family members, friends, internet or social media, organizations, parishes, enterprises, social workers or public health nurses, doctors, from municipal information points or somewhere else) as an independent variable and (2) with the number of health information sources (0, 1 and 2 above health information sources) as an independent variable. There are several predictors that have been selected based on the previous studies, age, gender, have children, have grandchildren, sufficient financial means, living situation, club participation, changes (serious illness, operation, disability, accident or fall) that had taken place during the past two years, other changes (deterioration of hearing or sight), education level, marital status, high white collar job experience, experience as a stay or work from home mother or father, type of house, house location from nearest municipals center and frequent use of the Internet [5,8]. Predictors are binary variables of the original survey and data transformation. The data was coded and analyzed by SPSS (version 25). Multicollinearity tests were conducted to evaluate whether there were any multicollinearities in the data within each independent variable.

3 Results

The top three most frequently reported sources of health information were doctors, family members and a public health nurse/social worker, followed by friends, the internet or social media. The lowest reported source was organizations. The younger age group (60s) was more likely to seek health advise from the Internet or Social Media compared to the 70s group (odds ratio [OR] = 1.724, $p < 0.001$). Females were more likely to use online health information over males (odds ratio [OR] = 1.706, $p < 0.001$). High educated elderly people tended to seek online health information with odds more than 1.5 times lower than low educated elderly people. For elderly people who had a disability or illness, the most common health information sources were public health nurses and doctors with OR = 1.457, $p < 0.001$, and OR = 1,801, $p < 0.001$ respectively. In addition, elderly females that were ill and active internet users tended to have more than two information sources compared to the others.

4 Discussion

The results have shown several similarities from previous studies, such as the fact that frequent internet users, even within age groups such as 60s and 70s (and highly and poorly educated), tended to use internet-based information sources. Previous studies from the US have shown younger ages with wider spans from 18 to 99 [9]. Other findings have suggested that doctors and nurses (aside from family members) are the most popular information sources for the elderly. This phenomenon can be more crucial in the future due to limitation of health professional and it is worsened by individualistic living styles. Therefore, improving the utilization of the Internet might tackle the problem with connectedness between doctors, nurses and families through an online channel in the provision of health information to the elderly (at least as a complement for a conventional media channel) [10]. As it has been shown from this study's findings that active internet users tend to have more than one source of information. One important thing to note is that it should be a necessity to improve online health information design; this should be a major concern. For example, the WCAG 2.0 guidelines should be utilized in designing websites that provide practical aspects to improve the accessibility of the website for everyone, particularly vulnerable populations, such as elderly and disabled people) [11]. Additionally, other quality standards should likewise be upheld, such as HON, to assure more reliable and transparent information [12 – 13]. In addition, simplifying information by referring to acceptable readability levels for the elderly can affect the utilization of online information positively [12].

5 Conclusion and Recommendation

This study concluded that current online media channels still pose challenges for elderly people with health problems, older age users and males. This study recommends the promotion and utilization of digital online technology, as it has clear benefits (especially for people who lack mobility because of physical disadvantages, and features should be customized according to elderly conditions/needs).

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Health information-seeking styles and inequalities in health-promoting behavior

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Abstract. This paper presents some first results from an ongoing online survey about background factors, experience and behavior of users of an online diabetes risk test. Relations between information-seeking styles and health-promoting behaviors in case of elevated risk for type 2 diabetes were studied closer for 79 respondents who had taken the online diabetes risk test prior to responding to the survey. Three health information-seeking styles, active, moderate and passive, were assessed and tested against health-promoting information-related activities and health behavior. A significant link was found between information-seeking style and information-related activities but despite visible tendencies, no clear link was found for behavior change. Demographic variables showed no significant link to health-promoting behaviors, either. The link between information-seeking style and information-related activities might increase inequality as it might create the loop of the rich getting richer and the poor getting poorer in health information, while persons that actively seek information are often more healthy and this can lead to the healthy becoming healthier and the weak even weaker. Despite limitations, the results of this exploratory study opens up for further research about the role of information-seeking styles and health-related behavior.

Keywords: Diabetes risk test, e-Health services, Health-promoting behavior, Information-seeking styles, Online self-assessments.

1 Introduction

Diabetes is one of the leading causes of mortality in the world [1]. In Finland, the number of persons with diabetes type 2 is estimated to be 300,000 with an additional 150,000 persons being undiagnosed [2]. This paper presents some first results from an ongoing online survey about health-related online self-assessments, in particular an online diabetes risk test. The paper presents responses to a questionnaire that is published on the website of the Finnish Diabetes Association in connection with a diabetes risk test. The survey studies background factors, experience and behavior of users of this test. Although online self-assessments are anticipated to be useful and have benefits, these have so far been only little studied. For example, Kauer et al. [3] and Torrent-

Sellens et al. [4] have called for additional research on online services and self-assessments. This study aims at addressing this gap.

Online health information can influence users for instance to become more engaged during visits to physicians, to adhere better to advice from physicians, and to change their diet [5]. Studies on self-assessments show varying results, however. Using an online test for assessing the risk for breast cancer increased the interest in information about the disease [6] and an online screening test for anxiety disorders encouraged about half of the respondents to seek help [7]. Studies on online mental health services, however, showed that the users of these seldom sought help from professionals afterwards [3].

The interest in using e-Health services often depends on demographic variables. In a vast European study [4], it was found that women and respondents who had an upper secondary level education showed more interest in e-Health. More women than men use online tests and risk tests, as well [3, 8]. A higher level of education has also been linked to more frequent use of mobile health technology as well as to being more active at consulting health-related online rankings or reviews [9, 10]. Both education and digital skills have been found to be related to use of e-Health for self-care of type 2 diabetes [11].

Physical activity, eating in a healthy manner and abstaining from alcohol and tobacco products are often thought to promote health [e.g. 12]. Health-promoting behavior can, furthermore, include being active at seeking health information [13, 14]. Health information behavior, that is needing, seeking, and using information related to health, can be passive, moderately passive, moderately active, or active [15]. The way in which people seek information, or their information-seeking styles, can depend on, for example, personality traits or coping styles [16: 102-103] and styles related to health information seeking have previously been divided into either active, moderate or passive [17]. In this study, three different styles were identified, as well, but differing from previous studies, they are assessed based on actual information practices [18, 19]. The aim of the paper is to study closer the relations between information-seeking styles and behaviors that promote health, including information-related activities and health behaviors, in case of elevated risk for type 2 diabetes. Previous studies show that information behavior related to health can cause inequalities. Relationships between, for example, more active health information behavior or better health literacy and better health [17, 20, 21] or higher levels of health information literacy and healthier behavior [12] have been found. Information-seeking styles as assessed in this study, and their relationship to health-promoting behaviors have, however, to the best of our knowledge, not been studied before.

2 Methods

Data for the survey is currently collected online using a questionnaire on Webropol (www.webropol-surveys.com) that is presented next to a diabetes risk test on the website

of the Finnish Diabetes Association (<https://www.diabetes.fi/riskitesti>). The questionnaire is available in Finnish, Swedish, and English and contains a section for background information, as well as questions on user experience and health and information behavior. Statements were formulated based on the knowledge from previous studies and our own experiences. A 5-point scale (strongly agree - strongly disagree) was used to assess both information-seeking styles and behaviors promoting health. Five items contained statements assessing active seeking (“I seek health information that is important to me actively and systematically” and “I keep my eyes and ears open for health information that can be important for me”), moderately active seeking (“I accidentally find health information that is important to me without actively looking for it”) and passive seeking/avoidance (“I am sometimes told by people around me about health information that is important to me without asking for it” and “I avoid health information”). These items were developed based on different modes of information practices [cf., 18, 19]. Furthermore, seven items contained statements concerning what the respondents would do if the result of the risk test shows that they have an elevated risk of developing diabetes type 2. The statements concerning information-related activity were: “Check further information from different sources”, “Discuss with family or friends about the services”, and “Make an appointment to see a specialist”. The statements about health behavior were as follows: “I plan to increase the amount of physical activities”, “I plan to reduce the use of substances, e.g. tobacco or alcohol”, “I plan to change my diet behavior”, and “Do nothing”.

The three information-seeking styles were assessed in a manner similar to how everyday health information literacy levels have been calculated [12, 22]. For the analysis, the response ‘strongly agree’ was assigned 5 points, whereas 1 point was assigned for the response ‘strongly disagree’. For the two passive items opposite points were assigned. A summative score for the aggregated scores was, then, calculated, and the three information-seeking styles active (n=22), moderate (n=44), and passive (n=13) were assessed. In total 87 respondents had taken the survey by March 2nd, 2018 and 79 of them were included in this study as they had ticked all the five items measuring information-seeking style. Cross-tabulation, chi-square tests and a significance level of .05 were used for the analysis. For comparison, the background factors gender and education level, as well as calculated levels of health information literacy [cf. 18, 19], were also tested against behaviors promoting health.

3 Results

An active information-seeking style and active health-promoting information-related activities were significantly related, as shown in Table 1: the active information seekers most often strongly agreed with the statements that they would check further information in different sources (77.3% vs. 43.2% in the moderate group and 7.7% in the passive group), discuss with others (31.8% vs. 20.5% in the moderate and 0% in the passive groups), and make an appointment to see a specialist (40.9% vs. 15.9% and 15.4% in the moderate and passive groups, respectively).

Table 1. Relationships between an active information-seeking style and information-related activities in case of elevated risk for type 2 diabetes.

Information-seeking style	Information-related activity	Chi-square (p value)
Active	Check further information from different sources	26.338 (.000)
Active	Discuss with family or friends about the services	16.471 (.036)
Active	Make an appointment to see a specialist	15.975 (.043)

For health behaviors no significant relationships occurred, although the cross-tabulation showed that the active seekers more often than especially the passive ones strongly agreed to increase physical exercise, abstain from substances and change their diet. The active ones, furthermore, most often strongly disagreed with the statement that they would do nothing (Table 2).

Table 2. Percentages of respondents with different information-seeking styles strongly agreeing.

Health-promoting behavior	Active %	Moderate %	Passive %
I plan to increase the amount of physical activities	54.5	31.8	23.1
I plan to reduce the use of substances, e.g. tobacco or alcohol	36.4	25.6	23.1
I plan to change my diet behavior	54.5	43.2	15.4
Do nothing*	63.6	41.9	30.8

*Strongly disagree

The analysis of demographic background variables did not show any significant relationships with neither the information-related activities nor health behavior. Health information literacy level, on the other hand, was related significantly only with discussing with family and friends (Chi-square=17.860, p=.022). The relationship occurred mainly because of the fact that those with a low level of health information literacy were all neutral to the statement in question.

4 Conclusions

A link between information-seeking style and information-related activities was found. This possibly increases inequality as it might create the loop of the rich getting richer and the poor getting poorer in health information, as persons that actively seek information are often more healthy [e.g., 17, 20] leading to the healthy getting healthier and the weak even weaker. The information-seeking style of people might not easily be changed, but to avoid the negative spiral and to improve public health, more relevant information should be provided readily on the website of e-Health services. This could include links to information about diet or physical activities should be displayed after completing the online self-assessments.

Despite visible tendencies, no clear link was found for behavior change. Other variables than information-seeking styles, such as demographic background, internal beliefs, or health information literacy might influence how people take actions for their health conditions [12, 17, 20], but in the current population almost no significant links were found for these kinds of factors. This opens the question for future studies on the role of information-seeking styles. The study is not without limitations, however. Firstly, the number of respondents was at the time of writing limited, which can influence the trustworthiness of the analysis. The respondents were, furthermore, not random citizens but consisted of people who had taken the diabetes self-test, meaning they are prone to be more interested in and motivated to seek diabetes-related information than the average. This might explain the limited number of passive respondents. The method of assessing information-seeking styles is also new and not yet validated. The results are, thus, not generalizable, and further studies on larger populations should be conducted in order to, for example, test the suggested relationship.

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Comparison of food frequency questionnaire data and shopping records for the assessment of food intake

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Abstract. Questionnaires are typically used for collecting information describing health behavior in areas such as diet, physical activity and sleep. Utilization of the digital footprint, formed from an individual's unique digital activities, forms a potential new opportunity for describing lifestyle and health-related behavior. We studied if passively collected shopping data describes food intake when compared to food frequency questionnaire (FFQ) data providing information on food and beverage consumption. For 4 out of 21 food groups the results were comparable. Shopping information from only one department store chain gives only a partial picture of the food consumption and differing family sizes add noise to the estimate. If the whole digital footprint would be available, including detailed product-level shopping information from all stores and restaurants, the food intake could probably be estimated more accurately and applied e.g. in personalized coaching.

Keywords: Food intake assessment, shopping data, food frequency questionnaire, digital footprint

1 Background

Questionnaires are typically used for collecting information describing health behavior in areas such as diet, physical activity and sleep. Utilization of the digital footprint, formed from an individual's unique digital activities, forms a potential new opportunity for describing lifestyle and health-related behavior [1,2]. Digital footprint data can also be passively and automatically collected over a long period of time.

Ideally, with the use of digital footprint data, filling of questionnaires would not be needed when analyzing and monitoring health behavior. This could potentially improve usability and reduce inequality, provided that individuals understood how and for what purpose their data is used, and were able to give their informed consent.

2 **Goals**

We studied if passively collected shopping data describes food and beverage intake assessed using food frequency questionnaire (FFQ). Traditionally the validity and reproducibility of FFQs have been evaluated using food diaries [3] but very little research has been done on comparing FFQs against real shopping data. Hypothetically comprehensive shopping data could provide unbiased estimate of subjects' consumption habits. In this study our main goal was to find out if FFQ and shopping data show similar consumption patterns for different food groups in order to facilitate further research on the subject.

3 **Data**

Data utilized in this study is from a data set collected from 96 subjects (aged 25-59) during years 2015-2017 in the Digital Health Revolution (DHR) study conducted at FIMM (HiLIFE, University of Helsinki). Some of the shopping data collected dates back to 2014 before the start of the study. The DHR data set contains e.g. health-related questionnaire data, physiological and laboratory measurements and passive digital footprint data. We have applied FFQ which provides data on participants' consumption frequency for different types of foods and beverages. Some of the participants also gave a permission to utilize their shopping records from the department store chain S-Group, containing information on the times when products were purchased and categories of the purchased products, over a period of 16 months. Out of the 96 participants, both shopping and FFQ data was available for 35 persons (aged 28-59, 12 men and 23 female). Out of these participants, 16 were singles and 19 had family (2-7 persons).

4 Methods

A total of 21 food groups were defined and the food categories of the FFQ and S-group data were mapped into these 21 groups. We calculated from the FFQ data, how many times per month food from each group was consumed. From the shopping data the frequency of buying an item from each of the groups was similarly used to describe the consumption. In order to test if the mean consumption is similar when calculated from shopping data and FFQ, a two-sample t-test was used to perform power analysis. In this context power is the probability that the test correctly rejects the null hypothesis of equal means for the food consumption estimated from the FFQ and shopping data. Before testing, a Box-Cox transformation was used to normalize the data. Size of detectable effect was estimated using Cohen's d value providing standardized effect sizes used mainly in behavioral sciences. Cohen provides effect-size indexes and conventional values for operationally defined small, medium and large effects [4].

5 Results

Fig. 1 and Fig. 2 show boxplot-visualizations of the participants' consumption statistics based on shopping and FFQ data. Boxplot is configured to show the first (Q1) to third quartiles (Q3) of participants' consumption as a bar and whiskers indicate locations $Q3 + 1.5 \cdot IQR$ and $Q1 - 1.5 \cdot IQR$ where IQR denotes the interquartile range ($Q3 - Q1$). Outliers are marked as circles. Visual comparison of the consumption statistics indicates that largest differences in consumption appear at food groups coffee and spreads and oils.

The two-sample t-test indicates that for dairy products, fish and seafood, potatoes, and poultry the null hypothesis of equal means cannot be rejected ($p > 0.05$). Power analysis indicates that using data available for 35 participants a large difference in consumption means marked by Cohen's d value of 0.8 implicating a large effect size would be seen by the test with the power of 0.8 and significance of 0.05.

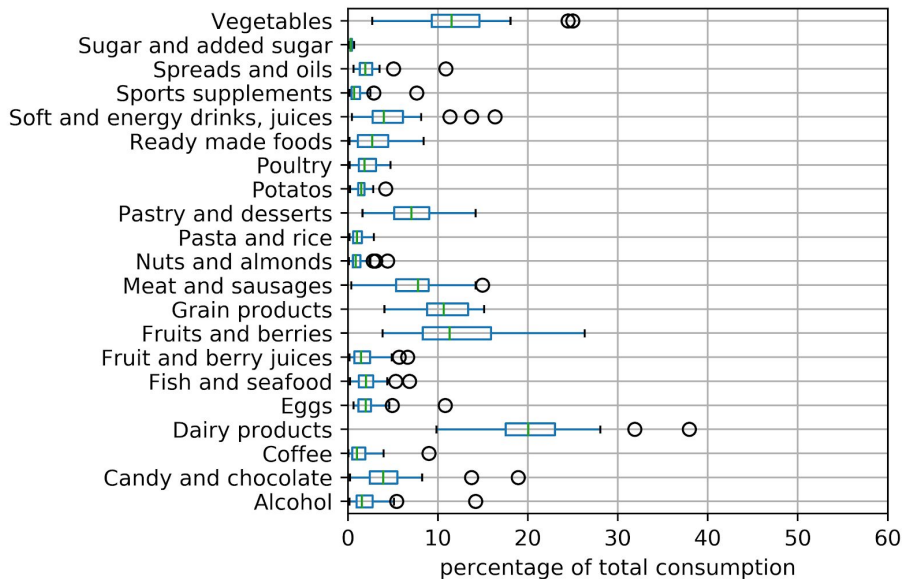


Fig. 1. DHR participants' consumption statistics derived from shopping data.

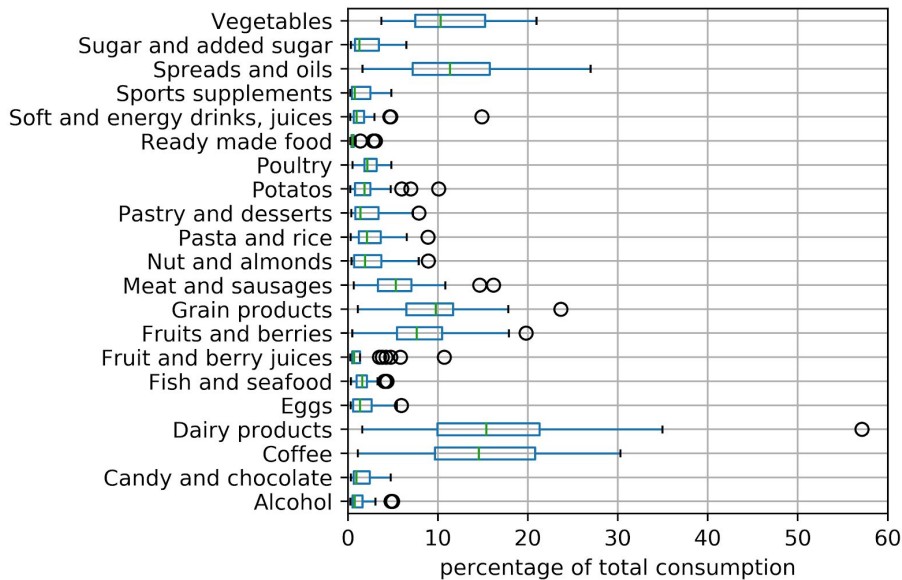


Fig. 2. DHR participants' consumption statistics derived from the FFQ data.

6 Discussion

For 4 out of the 21 food groups the food consumption based on the FFQ and shopping data was statistically comparable. Large consumption differences in food groups coffee and spreads and oils could be explained by the usage of buying frequency as a proxy for consumption at the shopping data. Items that are bought rarely and last for a long time like a coffee package appear to be consumed rarely when consumption is estimated using the buying frequency.

A key limitation of this study is that the shopping information was collected only from one department store chain. Thus the data gives only a partial picture of the food consumption. If the whole digital footprint would be available, including detailed product-level shopping information from all stores and restaurants, the food intake might be estimated more accurately. The sample size of 35 persons is quite small, and the differing family sizes also add noise to the estimate. Further studies with larger number of participants and a more comprehensive consumption footprint would be needed to further verify the results.

Potentially, passively collected shopping data could be used as a proxy for food intake. Filling in FFQs and food diaries is tedious and not all have the motivation and sometimes not even the skills to do that. Furthermore, faking the real consumption is much easier when filling a questionnaire compared to the use of the actual digital footprint. Automatically collected and well-presented shopping data could also be applied in personalized health coaching.

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Use of Data Cloud Services in Clinical Environment. Case: 2 x Video-Electroencephalography in different domains

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Abstract. The first cloud-based video-EEG system in the Nordic countries and the required cloud computing services have been implemented in two Central Hospital's operating environment in Finland. This combination of using clouds together with sophisticated software has increased usability and versatility of Video-EEG recordings/analysis/data archiving thus creating the possibility to streamline current processes.

Keywords: Video-EEG, Cloud computing, Process change.

1 Objectives

This is the second of two individual studies regarding same issue but with different research methods: Case study and Advanced Design Research. The aim was to find out how the new philosophy of the EEG system affects the workflow and effectivity at hospital's Clinical Neurophysiology facility. It is important to gather information on how the new method in hospital and at home can be utilized in a way that is both effective and useful. The change of methods and development of new functions while at the same time structure how to develop observation and knowledge activities.

2 Methods

In this abstract, two different studies are performed on the same topic, where one environment is a hospital, the other one is a home.

According to Peterson et al., an artefact can be specified as a specific bundle of hardware and software that is assembled to fulfil information needs [1]. In addition to this we find that especially in this study, the patient's research site, home or hospital, can be considered as part of artifact together with hardware and software.

The first study was conducted in a hospital where patients were studied with new equipment in a hospital environment. The research method used was case study as the aim of the study was to make new quizzes and describe the phenomena that arise when introducing a new type of hardware and operating methods [2].

The second study was carried out using *Advance Design Research* (ADR) method consisting of four different phases [3]

- 1) problem formulation,

- 2) building, intervention and evaluation (BIE),
- 3) reflection and learning,
- 4) formalization of learning,

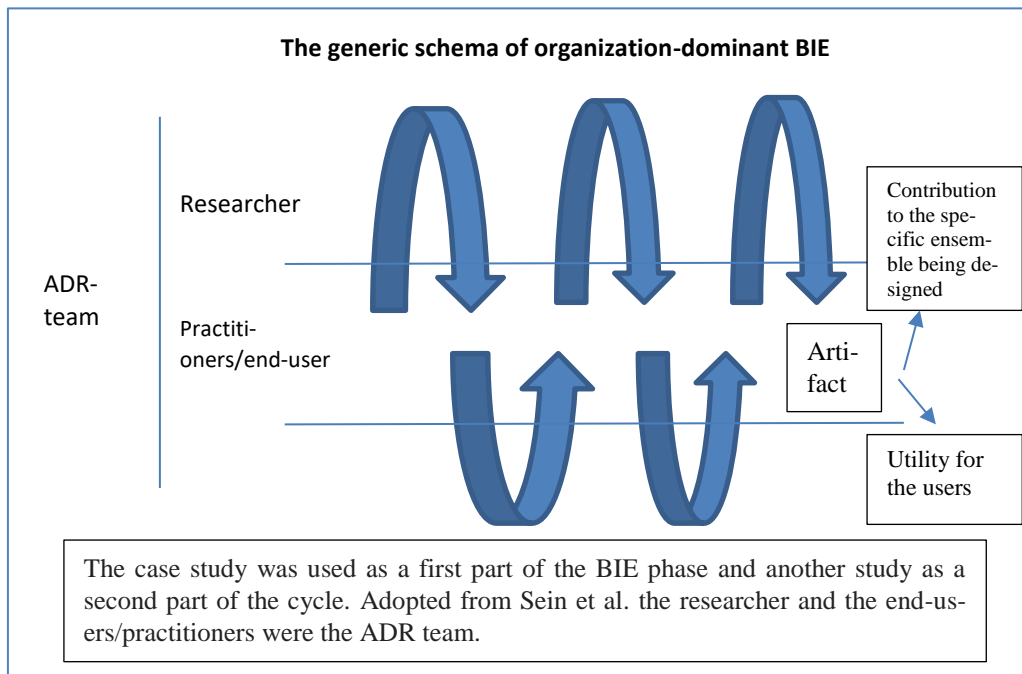


Fig. 1. The form of BIE adopted in the development of the concept generation method. Adapted from Sein et al. [3].

3 Results

A new operating system, wireless, cloud, remote surveillance by nursing staff may have triggered a fundamental change of possibilities to perform patient recordings and versatile use of the equipment. The hospitals participating in the study have just started using the equipment and the studies were done at the very beginning of the deployment of the hardware, so experience gained by methods evolves and gives a better picture of the benefits and disadvantages as the number of recordings increases.

4 Conclusions

The compact size, portability and wireless functionality combined with cloud services and availability of the recording for any authorized consultant for immediate analysis of the recording, makes it easy and streamlines the care and enables patient mobility. The analysis compares the EEG curve and video, whereof the doctor makes the

interpretation. The improvement of image quality simultaneously improves the quality of findings seen in the EEG curve (eye- / facial- / limb movements, twitches etc.). The recordings saved in a cloud can be analyzed anywhere in the world by authorized consultants. This technology, several-days of video-EEG recordings to be done at home, which is a significant improvement i.e. for children's recordings. The results are more realistic when the recording takes place in a familiar environment.

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Requirements Engineering as a Part of Business Process and Information System Development

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Abstract. Due to the all-pervading digitalization, the development of information systems (IS) has become a strategic issue in all kinds of organizations, and IS development knowledge is becoming important also in business areas that traditionally haven't been IT oriented, such as well-being. We investigated requirements engineering (RE) and other methods used in the IS development projects in one case company. Our results revealed that even though the selected methods were followed well, the success rate of the IS development projects varied a lot. The detected reasons for this result were the limited views of the outsourced IS developers combined with the unsuitability of used IS development methods, but also the lack of business involvement. We recommend centralized RE, more business involvement, project specific discussions about IS development methods used, and co-sourcing rather than outsourcing. As the biggest problems seem to be more social and organizational than technical, we regard the findings valuable to all kind of industries.

Keywords: Requirements engineering, Business process development, Project management, Information systems development.

1 Introduction

With digitalization, information systems (IS) has become an important part of all kinds of organizations' business strategy implementation [1], including well-being area as well. Therefore an important question is how the existing IS development practices ensure the alignment of IS and business process (BP) developments. Requirements engineering (RE) is, in a form or another, an important part of all kinds of IS development methods. The requirement management is often the only discussion forum between IS and BP development. However, the problems of RE are among of the most significant reasons for project failures [2].

The objective of this article is to study how useful a tool the requirements engineering between BP and IS development projects is, and what possible limitations affect its usefulness. To achieve our objectives, we conducted a case study in a large global corporation with five business units and close to 20 000 employees in more than 70 countries. Even though the case company is a mechanical technology corporation, we see that the results are also applicable in other business areas, such as in well-being area, where in Finland the regional government, health and social services reform will cause

big restructuring of health organizations and ISs related to them. Referring to the backdrop discussed above, we formulated two research questions:

RQ1: Is it possible to use RE as a tool to integrate BP and IS development projects?

RQ2: What challenges limit the use of RE as an integration tool between BP and IS development and what are the underlying reasons behind these challenges?

2 Requirements Engineering in IS Development Projects

IS development methods can be divided into plan-driven and change-driven methods. With plan-driven methods, all planning should be completed before the development stage [3, 4]. The best known plan-driven method, the waterfall method, is based on the software life-cycle concept, and it has a clear stage-gate structure [3]. The waterfall method has many known problems, e.g. early mistakes are discovered late, and they are costly to correct. The method also assumes that no changes in business needs or environment happen during the IS development [4, 5].

As alternatives to the plan-driven methods, change-driven (e.g. agile) methods are becoming more and more popular and, (at least) in theory, they solve many of the RE problems related to the waterfall method [4, 6]. However, the change-driven methods seem to have new kinds of problems [7], and the software life-cycle perspective is limited. It seems that it is possible to succeed, be troubled or fail with any method [8].

RE as a part of IS development has an essential role as a link between IS developers and business [5]. In the requirement elicitation phase, the objective is to find the real business needs and to discover all the requirements of the system. The aim is not just to describe the problem to be solved and ask people what they want, but carefully analyze the organization by considering the application domain, business context, and stakeholders' needs and constraints are considered. [9]

In addition, project management practices affect RE, as well. Traditional project management methods, such as PMBOK (Project Management Body of Knowledge), are of the waterfall-type, and they are based on the stage-gate model where the objective is to keep the project within the given timeframe, budget and deliverables. However, in some cases, the project management has been successful, but the results haven't been usable at all, and, in some successful projects, the budget and schedule may have exceeded extensively [10, 11]. So, it is important to separate the project success from the project management success [10].

Often the discussion between ongoing projects is very limited, which may cause "project silos". Project portfolio management, which is used to take care of prioritizing the objectives and allocation of resources, does not automatically solve conflicts between continuous process improvement needs and project silos.

Although IT has been seen as an important part of PBM [12], there is not much discussion on how to combine IS and BP development projects. BPM in itself does not automatically guarantee alignment between business and IT [13]. Enterprise architect-

ture (EA), and an engagement model in it, has been seen as a tool to improve co-operation. RE can be seen as a part of this engagement model. To make that kind of model work, IT should be like a strategic partner to a business rather than only a technology or service provider.[14]

3 Methodology

We conducted a case study in a large global corporation with five business units and close to 20 000 employees in 70+ countries. We used extensively three data collection sources of the Yin basket [15]: documentation, archival records and interviews. We conducted eight group-interview sessions and interviewed six persons individually after these sessions. Interviewees ranged from project to IT managers, and included the project owner and the responsible system architect. Altogether 95 different documents were analysed, including project management guidelines, project reports, process models, taxonomies and planning documents. The data collection was conducted during the fall 2009 and spring 2010.

4 Findings

The project management process in the case company is based on the PMBOK and the stage-gate models. The company's own IT personnel normally manage the IS projects, but the project team usually comes from an outside supplier(s). So, the requirements have to be specified quite precisely before the offers are asked. This easily leads to the plan-driven development, which is not optimal for all cases.

It seems that projects are easily done in “silos” without any views to other development undertakings done in the company. Especially as for the outsourced development projects, the project team might not have experience of the business area being developed nor do they have direct contact with the business people, so they have to rely on the requirement specifications. In addition, they are excluded from the other development projects, so it can be very difficult for them to get an overview of the other related ISs. Furthermore, in most cases, the owner of the operational level requirements is the IT department and the business side participation is limited.

In some cases, where the aim was only to automate an existing process, it was found out that the existing business process had been followed loosely. With the new IS, everyone was forced to follow the process, which caused operational troubles even though the official process itself had not really changed. The end-users experienced that the project was done only for IT's own purposes and, therefore, the new IS was not taken in use.

5 Discussion and Conclusions

As an answer to the research question 1 (RQ1), we state that, at a higher level, RE has an important role in integrating the BP and IS development in the case company. However, it is not enough at the project level; also other aspects, such as IS development method suitability for a project should be considered.

As an answer to the research question 2 (RQ2), we state that there are two kinds of problems. The first ones are due to unharmonized RE practices and limited business side participation. The other problems are related to the methods used in projects, such as limited transparency inside and between projects (project “silos”) due to rigid IS development methods and outsourcing practices. We recommend that outsourcing should be developed towards co-sourcing (see e.g. [16]), and a relevant IS development method (with RE practices) should be selected project specifically.

In addition, we recommend a BPM type of project objective and requirement management at the company level. The IT department, being a cross-organizational unit, could well be responsible for that. This would ensure that the project silos and overlaps in projects themselves could be handled in a holistic manner. However, the sponsorship, ownership, conception, documentation, and the analysis of the business requirements should belong to the business units; they are the best experts regarding their business needs.

Although the problems related to RE and project silos are already known, our study shows that the effects of outsourcing and IS development method selection should be considered in organizations and studied more. Even though we only had one case organization in mechanical technology area, the biggest problems seem to be more social and organizational than technical, and we regard the findings valuable to all kind of industries. The regional government, health and social services reform applies to large health organizations’ restructuration in Finland. Therefore, it is extremely important that the problems found and our suggestions are taken into account there before actually implementing any new organizational structures.

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Secondary School Nurse as an information source for Finnish Sexual and Gender Minority Youth

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Keywords: Adolescents, Sexual and gender minority, School nursing.

1 Introduction

Internet and other online resources are common in adolescents' lives. Previous literature shows that young people from sexual and gender minority backgrounds use online resources with several purposes: to seek information specific to their development of sexual orientation and gender identity, to find support for experiences of isolation, stigmatization and discrimination, and to connect with other sexual and gender minority people [1,2]. Sexual and gender minority (SGM) youth are adolescents whose sexual orientation is non-heterosexual and/or their gender identity cannot be defined within female/male binary [3].

Besides the online information sources, previous research indicates that SGM youth see health professionals as significant sources of information in their lives [4,5]. However, studies have also reported health professionals lacking knowledge about SGM youth, their health needs, and how to support SGM youth [6,7]. This may lead to SGM youth seeking for support and information elsewhere [2,4]. Finnish secondary school nurses meet SGM youth regularly [8], and nurses have opportunities to offer information that supports adolescents' sexual orientation and gender identity development. Previous studies indicate that Finnish SGM youth value school nurses from informational and supportive aspects [9,10], but SGM youth's experiences about secondary school nursing has not been studied thoroughly. The purpose of this study was to describe the perceptions of SGM youth about secondary school nurses as an information source for them.

2 Methods

A qualitative descriptive study was done to create an in-depth description of the topic [11,12]. Snowball sampling was used to reach Finnish GSM youth as a small and hard-to-reach group [13,14].

Eligibility criteria for participants were: self-identification as SGM youth, age 16-19 years, past experiences about the secondary school nursing, mother tongue Finnish or Swedish, and a voluntary participation.

Data collection method was a self-administrated online questionnaire with:

- **Demographic questions** (age, gender identity, identity as SGM youth)
- **Open-ended questions regarding I)** the competence and attitudes of secondary school nurses to meet SGM; **II)** given information about the development of gender identity and sexual orientation; **III)** desired information from the secondary school nurses.

3 Data collection

Data were collected in 2016 through social media of a national human rights organizations for sexual and gender minorities (SETA and Regnbåksankan) with Finnish and Swedish advertisements [15,16]. Participants were also encouraged to tell about the study to their peers [13,14]. Ethical approval was obtained from Turku University Research Ethics Committee. Participants received information about the study in the first page of the questionnaire, and the informed consent was defined as sending the final replies to the questionnaire. Parental consent was not requested from the participants under the age of 18 because of causing possible harm, if the participant was not out for their parents [17].

4 Data analysis

Data were analyzed inductively by following Braun & Clarke (2006) process of thematic analysis: 1) familiarization the data, 2) generation of codes, 3) interpretation and search for themes, 4) reviewing the initial themes, 5) defining and naming final themes and sub-themes, and 6) preparation of the final conceptual framework. [12] A conceptual framework was created to describe the significance of secondary school nurse as an informational source for SGM youth in discovering sexual orientation and/or gender identity.

5 Results

In total, 35 SGM youth completed the questionnaire. Participants' mean age was 17.2 years, and their identities were diverse e.g *genderfluid bisexual*.

During the development of sexual orientation and/or gender identity, GSM youth desired acceptance, support and information from secondary school nurses. For SGM youth, relevant topics of information to discuss with secondary school nurses were: **a.** *diversity in sexuality and gender and their development in adolescence*, **b.** *sexual health of SGM youth*, **c.** *the normality of SGM identities*, **d.** *places to meet other SGM youth*

(both physical and online), and e. *life as SGM people in Finland*. Furthermore, SGM youth mentioned that they desired secondary school nurses' guidance to relevant informational online sources and online places where to meet other SGM youth. The information SGM youth got from secondary school nurses did not always cohere with the topics relevant to them, since SGM youth described regularly that nurses lacked information about diversity in sexuality, the given information was heteronormative and awareness of gender minority youth was minimal. The relationship between SGM youth and secondary school nurses was sometimes imbalanced, because many participants felt receiving passive care, and secondary school nurses defined the information SGM youth needed.

6 Conclusions

Finnish SGM youth were sexually and genderly a diverse adolescent group, and they perceived secondary school nurses as a significant information source. SGM youth were willing to discuss about diversity in sexuality and gender and topics related to it with nurses. The secondary school nurses were also seen as a support to find relevant online information and online networking options. This may indicate that SGM youth do not always find the information they need from online by themselves, and secondary school nurses can support them through face-to-face discussion and guidance.

The results of this study strengthened previous understanding and indicated that secondary school nurses were not always acknowledged of diversity in sexuality and gender, and they encountered SGM youth with a heteronormative approach. Especially topics related to gender identity were uncommon for secondary school nurses, and SGM youth indicated they would like to get information from these topics from nurses.

More attention in research is needed to pay for what Finnish secondary school nurses know about diversity in sexuality and gender, and how they see this topic related to their work with adolescents' sexuality and gender development. More research is also needed to identify ways in which SGM youth can be best supported by secondary school nurses, since SGM youth did not always get desired information from nurses. It would also be interesting to explore how online sources of relevant information could support SGM youth and secondary school nursing with a conversation about diversity in sexuality and gender.

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Smoking cessation through online health communities: A social support perspective

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Abstract. Online health communities have been argued to play an important role in smoking quitting and maintenance from the social support perspective. But little is known about the character of online social support among Chinese smokers in online health communities. This study aims to explore what social support Chinese smokers share via online health communities. The data in a Chinese online community called Baidu Quitting Smoking Bar were crawled via programming. The content analysis was employed to analyze the content of messages. A pilot study was conducted to identify the classification of social support. Two threads with corresponding messages (N=835) were randomly selected and categorized based on the social support behavior code (SSBC). Findings shown that emotional support is the most widespread, following informational support, network and esteem support, while tangible support is rare. Surprisingly, self-disclosure is common in this online community. These messages only record smokers' cessation progress or personal accomplishment without seeking social support. Further study will be conducted based on this pilot study to identify social support for smoking cessation in online communities with the full data collected.

Keywords: Online Community, Social Support, Smoking Cessation.

1 Introduction

Tobacco has been one of significant threats to human health and causes 7 million deaths around the world every year (World Health Organisation, 2017). But such deaths are preventable. In order to deal with tobacco use and save lives, efforts have been made to reduce the harm caused by tobacco. For instance, smoke-free policy, bans on tobacco advertising, and warn about the danger of tobacco (World Health Organisation, 2017).

For individuals who want to quit tobacco, it is prolonged and difficult as nicotine is addictive (Henningfield & Heishman, 1995). It is common that former smokers have to make numbers of attempts to quit before success, and relapse is almost inevitable. In order to assist smokers to quit and maintain quit, many strategies and interventions have been developed, such as face to face counseling, and medications (Rigotti, 2012). However, many smokers who want to quit cannot be touched by these traditional methods because of time and geography limitation. Recently online health communities (OHCs)

for cessations have attracted a great attention from both Information Systems researchers and practitioners. These online communities provide a widely accessible communication and sharing channel where smokers can have chances to access to thousands of people who are struggling to get and maintain abstinence, and to interact with others at any time. Through these communities, smokers at all stages of the cessation process can post or comment to enable them to seek or offer information and peer support. These kinds of interactions may influence a smoker's quitting motivation, coping skills, and ability in buffering stressful events. Several studies have suggested that engaging in OHCs for cessation shows great promises, higher level of online interactions might lead to higher probability of quitting and relapse prevention (e.g. Graham, Papandonatos, Erar, & Stanton, 2015; Ramo, Thrul, Chavez, Delucchi, & Prochaska, 2015; Richardson et al., 2013; Schwarzer & Satow, 2012).

In order to acknowledge the nature of interactions among members in OHCs for cessation, several studies have analyzed the user-generated content from a social support perspective. Zhang et al. (2013) analyzed the messages in Quit-Net and found that more information support is shared through interactions while more emotional support is expressed in the messages. Struik & Baskerville (2014) studied Crush the Crave Facebook posts and found that messages related to supporting smoking cessation include seven themes: encouraging cessation, group stimulation, promoting social support, management of cravings, denormalizing smoking, providing health information, and exposing tobacco industry tactics. Rocheleau et al. (2015) examined Twitter activity for smoking cessation and found that informational support (62%) is the most prevalent support, following socioemotional support (24%) and encouraging/engagement (14%), but informational tweets have fewer followers while socioemotional and encouraging/engagement support are associated with increased number of followers. Cheung et al. (2017) analyzed the posts in WhatsApp and Facebook and classified messages into three categories: sharing views and experiences (55.5%), encouragement (28.7%), and knowledge and information (15.8%).

However, China, as the world's largest tobacco consumer and producer, has been largely ignored in prior literature on OHCs for cessation. There are over 300 million smokers. Smoking has been the leading cause of death in China, accounting for approximately 1 million deaths every year (World Health Organisation). Little is known about online social support for Chinese smokers. This study aims to examine the nature of social support in Chinese context, through a content analysis of a subgroup of Baidu Post Bar that focusing on smoking cessation: Baidu Quitting Smoking Bar¹.

¹ Baidu Quitting Smoking Bar Homepage, <https://tieba.baidu.com/?kw=%E6%88%92%E7%83%9F&ie=utf-8>, last accessed 2018/03/07.

2 Research Methods

2.1 Data Collection

Baidu Quitting Smoking Bar was established in 2006 by a volunteer. It has been one of popular forums for Chinese smokers to exchange information and support. There were already 9,424,058 threads and 506,322 members by March, 2018. In 2007, the creator developed a membership certificate system to promote member's contribution. According to this system, there are five different level threads, including non-certificate, bachelor, master, doctor and post-doctor level. The higher level, the more active interactions.

All messages can be accessed freely online by everyone. All postdoctoral level threads (N=102) data were obtained through a crawling program. A pilot study was conducted to identify the classifications of social support. Two threads with corresponding messages (N=835) were randomly selected.

2.2 Data Analysis

Content analysis was employed to study the category of social support within this OHC. The social support behavior code (SSBC) developed by Cutrona & Suhr (1992) has been adapted in this study. Several subcategories have been revised (see Table 1). For instance, "listening" was excluded as it usually happens in an offline environment. "Prayer" was also excluded as it not common in China. "Physical affection" was changed into "virtual affection" as people usually show their affection in a textual way in OHCs. "Presence" and "companionship" were merged into one as there are no distinguishable differences between them in OHCs. "Personal experience" was added as a new subcategory of informational support. In addition, some messages do not fit each subcategories, we regarded them as "others". In these messages, some of them are not related to smoking cessation, we regard them as "irrelevant". Some of them do not associate with social support directly, only describe personal actions relevant to cessation. For these messages, we regard them as "self-disclosure".

Table 1. Categories of social support in OHCs for smoking cessation.

Categories	Example
<i>Informational support</i>	
<i>Advice/suggestion</i>	<i>Providing suggestions to deal with challenges and difficulties related to quit smoking.</i>
<i>Referral</i>	<i>Referring recipients to other sources for further help.</i>
<i>Situation appraisal</i>	<i>Reassessing the current situation.</i>
<i>Teaching</i>	<i>Providing factual or technical information about various aspects of smoking.</i>
<i>Personal experience</i>	<i>Telling stories about personal experiences.</i>

Emotional support

<i>Relationship</i>	<i>Stressing the importance of closeness and love in relationship with the recipient.</i>
<i>Virtual affection</i>	<i>Offering virtual contact, including virtual hugs, kisses, shoulder patting.</i>
<i>Confidentiality</i>	<i>Promises to keep the recipient's problem in confidence.</i>
<i>Sympathy</i>	<i>Expressing sorrow or regret for recipient's situation or distress.</i>
<i>Understanding/empathy</i>	<i>Expressing understanding of the situation or discloses a personal situation that communicates understanding.</i>
<i>Encouragement</i>	<i>Providing each other with hope, encouragement and confidence.</i>

Esteem support

<i>Compliment</i>	<i>Expressing positive things about the recipient or emphasizing the recipient's ability.</i>
<i>Validation</i>	<i>Expressing agreement with recipient's perspective on situation.</i>
<i>Relief of blame</i>	<i>Trying to alleviate the recipient's feelings of guilt.</i>

Network support

<i>Access</i>	<i>Offering recipients with access to the new contacts, or inviting recipients in discussion or group activities.</i>
<i>Companionship</i>	<i>Emphasizing the availability of companions of other members.</i>

Tangible support

<i>Loan</i>	<i>Offers to lend the recipient money.</i>
<i>Direct task</i>	<i>Offers to perform a task directly related to smoking cessation.</i>
<i>Indirect task</i>	<i>Offers to take over one or more of the recipient's other responsibilities while the recipient is under stress.</i>
<i>Active participation</i>	<i>Offers to join the recipients in activities that help quitting.</i>
<i>Willingness</i>	<i>Expressing the willingness to help.</i>

Others

<i>Self-disclosure</i>	<i>Only describing personal actions.</i>
<i>Irrelevant</i>	<i>Do not associate with smoking cessation.</i>

3 Conclusion

Results shown that emotional support is the most widespread, following informational support, network support and esteem support, while tangible support is rare. Surprisingly, self-disclosure is common in this online community. These messages only describe smokers' personal actions without exchanging social support. For instance,

“One hundred days smoke free!” These messages act as a “punch clock” to record the cessation progress and personal accomplishments.

Findings in this study might bring insights into nature of online social support particularly for smoking cessation, which contributes to better understanding of users’ behavior of online cessation interventions. In addition, the investigation in Chinese context maybe help to understand social support differences among different cultures.

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An Investigation of The Health Tourism Website's Continuance Intention: A Case Study in China

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Abstract. The purpose of this paper is to explore what factors affect users' satisfaction and continued usage intention about the health tourism website and predict continuance intentions of multiple-type users. Multi-motive information systems continuance model (MISC) will be applied in this study as this model is a comprehensive model for predicting how expectations and motives influences user satisfaction and continuance intentions. Users of a Chinese health tourism website (www.chinamht.com.cn) will be investigated through an online survey. Moreover, the data will be analyzed in structural equation model (SME) approach and at least 200 effective answers should be collected as the validity of SME relies on large numbers of samples. The contribute of this work may be enhance the understanding of influence factors as well as in utilizing the websites to fit the expectations of users and attract more visit.

Keywords: Health Tourism Website, Continuance Intention, User Attitude, User Satisfaction

1 Introduction

Health tourism has become a popular topic among different countries. Many researchers pay attention to this issue to exploring what happens in this domain. Traveling to another country to obtain lower priced healthcare services or medical treatments is increasingly growing in popularity because of the long waiting list, high cost of elective treatment in home country, and the ease and affordability of traveling (Leggat, 2015). This movement of individuals across countries in the pursuit of well-being services and medical treatment has been defined as "Medical Tourism" (Turner, 2011). The rise of medical tourism creates a huge market as the estimated value of the global medical tourism market is \$ 100 million in and is growing at 20-30% each year (Bartold, 2014). Many countries, cities and hospitals have caught the business opportunities and made policies or strategies to reduce transportation costs, improve services, and develop competitive price of treatment to promote medical tourism. For instance, India (Gupta &

Das, 2012), Singapore(Gan & Frederick, 2011; Pocock & Phua, 2011), Thailand(Cohen, 2008; NaRanong & NaRanong, 2011), and China(Heung & Deniz, 2013) have been popular destinations.

In order to inform and attract tourists, numbers of websites promoting medical tourism have been developed and played a significant role in the development of health and medical tourism(Hohm & Snyder, 2015; Moghavvemi et al., 2017). Such websites are useful for tourists to seek information on countries, hospitals, doctors, treatment, and prices. According to the report of the Medical Tourism Association(Medical Tourism Association, 2009), 49% of American patients it surveyed find medical tourism information via internet and 73% of them use internet to seek information specifically on country destinations and hospitals.

In China, numbers of such websites have been developed but the users' participation is not active. Some of them even decline due to low level of visits. The continued usage of Information Systems (IS) by target users is critical to the survival and market success of IS(Bhattacharjee, 2001). Investigating the motivations that affecting the continued usage of such websites has attracted a great amount of attention from both researchers and practitioners in IS field.

Many studies have explained and predicted IS continuance behavior by employing different theories, such as the Theory of Reasoned Action (TRA) (Montaño & Kasprzyk, 2008), the IS Success Model(DeLone & McLean, 1992), the Satisfaction and Trust Model (SAT-TRU)(Chen, Jong, & Lai, 2014), and Expectation and Confirmation Theory (ECT)(Bhattacharjee, 2001; Chung, Lee, Lee, & Koo, 2015). However, few researches have studied the users' continuance specifically towards health tourism website in China.

In the healthcare field, studies have been conducted to investigate how to enhance websites' effectiveness or explore the alternative applications. The content quality, IS design features, ease of navigation and communication, and customer services have been identified as influence factors(Lee & Morrison, 2010; Loda, 2011; Moghimehfar & Nasr-Esfahani, 2011). However, to use websites or not use websites (use some other e-applications) is still in discussing and the websites varies in different countries. All these questions seem like big challenges and these factors maybe not enough to explain the continuance behavior in Chinese context. Thus, the study using MISC will be conducted to examine the continuance intention of health tourism website and test the functions of different factors. Finally, discussions, potential contributions and limitations will be presented.

Thus, this study will focus on following research questions:

RQ1: What factors drive users' continuance intention towards health tourism websites in China?

RQ2: How these factors affect users' continued usage?

2 Research Method

This study will use quantitative methods to explore antecedents of continuance intention. The multi-motive information systems continuance model (MISC)(Lowry, Gaskin, & Moody, 2015) will be applied in this work as this model is a comprehensive model for predicting how expectations and motives influences user satisfaction and continuance intentions. Comparing with the traditional models, this model adds some indicators to increase the explanatory power of continuance usage such as Design-Expectation Fit (DEF)(Lowry et al., 2015), Design Aesthetics. Meanwhile, the MISC model use three dominant forms like hedonic, intrinsic and extrinsic to display the different situations of expectations, performances and disconfirmation, which examine the difference between forward, looking and modified belief. These indicators increase the flexible and sufficient of model to explain how the multiple motivations affect the website satisfaction and how the affects improve the continuance attention of use better. There are three main hypothesizes of this research: (1) the optimize of DEF will contributes to the disconfirmation (a) and performance beliefs (b) respectively; (2) the optimize of ease of use will contributes to the disconfirmation (a) and performance beliefs (b) respectively; (3) the optimize of design aesthetics contributes to the disconfirmation (a) and performance beliefs (b) respectively.

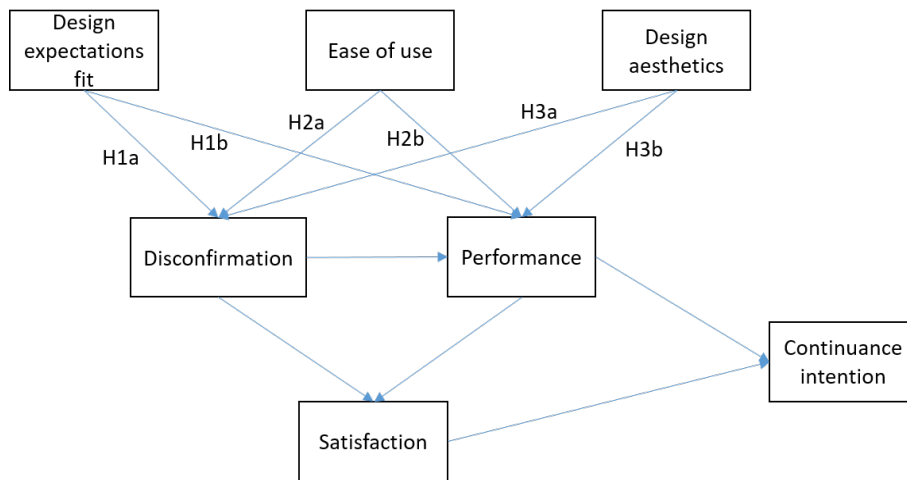


Fig. 1. Theoretical Model based on Multi-motive Information Systems Continuance Model (MISC)

In this paper, a plan will be formulated to investigate how the users' expectations and performances effect their continuance intention when visiting the websites based on the MISC model. A network questionnaire survey will be carried out via the help of the website called China Medical Health Tourism (CMHT) (www.chinamht.com.cn). This website is one of the biggest health tourism websites in China with a variety of medical health tourism information, it has a considerable visit volume as well. Moreover, this website is supported by the National Health Commission of the People's Republic of China. It will be an appropriate case to conduct the research about continuance

intention in visiting health tourism website in China. Dealing with the questionnaires, it will at least include two parts: the first part is about the demographics of the users, such as age, profession, education level and the like; the other part is about the users' continuance intention. Regarding with the second part, it will be designed follow the predecessors' research experiences which need a sufficient literature review about the similar researches. The questions such as what factors will influence the continuance use of the website will be proposed and 5-point Likert scales will be used to measure the different degree of cognitive and use the website. Besides, website features including design aesthetics, ease of use, and design expectation fit will be testified whether positively affect disconfirmation and performance beliefs. In addition, users' expectation, disconfirmation and performance will be also considered influencing users' attitude and satisfaction. The data will be analyzed in structural equation model (SME) approach and at least 200 effective answers should be collected as the validity of SME relies on large numbers of samples. The specific analysis will conduct via using Amos and the hypothesis will be testified at this process.

There will be six groups specific examine among the factors. H1a: DEF and disconfirmation, H1b: DEF and performance beliefs, H2a: ease of use and disconfirmation, H2b: ease of use and performance beliefs, H3a: design aesthetics and disconfirmation, H3b: design aesthetics and performance beliefs. These variations will reveal the affection of different promotions and could be used to test the utility of the MISC model through the statistical analyze. Meanwhile, the further results could be summarized to explain and predict the behavior of continuance attention to health tourism website.

3 Conclusion

There are many actions should be taken to explore the continuance behavior towards health and medical tourism websites in China, though. This case study is still on the way and the data collection work is under planning. This work might be helpful to develop the richness of data to obtain a deep understanding of users' continuance intention. The findings of this study may help business managers in better predicting users' intention to continue to visit health tourism websites, as well as in utilizing their websites to fit the expectations of users and attract more visit. In addition, the investigation of antecedents of this intention may support the targeted users to seek the information on health tourism effectively and enhance the interactions between users and websites. Furthermore, this re-search tries to use MISC model to explain the continuance attention to health tourism website, to some extent, it expands the application domain of this model in IS. This research perspective provides more information about Chinese health tourism market as well which could be benefit for cross-regional studies.

As the effects of this research lacks data support at the moment, either those variations could meet the entire research requirements or the MISC model is appropriate for this research still need further examining. More importantly, the widely use of homogeneous products from the mobile terminals poses a great challenge to the health tourism website, this really matters the continuance usage of the website.

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Fighting inequalities - whose battle is it? A literature review to explore paradigms and equality related topics in the HIS research arena

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Abstract. In this literature review based study we examine recent Health Information Systems (HIS) research from two perspectives: paradigmatic and thematic orientation. The objective is to create understanding of the dominant paradigms in the HIS arena and to reveal to which extent the current research contributes to the important task of reducing the equality gap. We analyze conference proceedings of two recent influential information systems related conferences for two consecutively years (2015-2016). According to the study, the majority of current research follows functionalist approach with lesser emphasis on equality related topics.

Keywords: Health information systems, paradigm, equality, digital divide, inclusive design.

1 Introduction

Inequality can take different forms. One form of inequality, which is particularly relevant to information systems science, is digital divide. Digital divide refers to the gap between ‘haves’ and ‘have nots’ – i.e. those well off in the new digital era, and those who are missing out [1]. This can be in terms of infrastructure and access to the digital services or, for example, between countries [2]. Other dividing factors can be demographic and social factors, and digital skills [3]

It can be argued that science has a part to play to reduce this gap through examining the phenomenon and outlining solutions. In this study we review recent articles in the area of health information systems (HIS) research and examine how they take on the fight against inequality, such as digital divide. We consider HIS a sub category of information systems science (ISS).

We study these articles from two perspectives, the paradigmatic and thematic orientations, and assess particularly whether the theme touch upon equality. The paradigmatic orientation may influence the research topics and questions, hence the two-fold approach was chosen.

It can be argued that ISS research follows broadly either descriptive or prescriptive approach [4]. The former aims at creating understanding about IT and its usage. The

latter aims at giving guidelines for IT practice. This dichotomy could be considered a starting point when considering paradigms within ISS. Other clues can be obtained when considering the qualitative – quantitative dichotomy.

In this study, however, we categorize the paradigmatic orientation based on a well-known framework developed by Burrell and Morgan [5]. This divides paradigms based on two dimensions: subjective vs. objective and change vs. regulation. It is clear there are significant epistemological and ontological differences between the different ends of these dimensions. Although Burrell and Morgan's focus was on social sciences and organizations, the framework suits our purposes given the social science foundation of ISS. Whereas we cannot provide a lengthy description of the framework in this account given the format of the article, it is fair to say the framework is influential and covered in many sources, also those relating to ISS research (e.g. [6]).

It was anticipated that the recent HIS research would dominantly combine objectivity and status quo seeking sociology of regulation, in other words follow the functionalist approach. The approach may influence research topics choices, e.g. being status quo seeking and managerial rather than radical. One can argue that status quo seeking research overlooks change that is needed to reduce inequalities.

To meet the other objective of the study, the recent research was analyzed in terms of their themes and topics. Specifically indication of topics such as digital divide and inclusive systems design were sought.

2 Method

Research papers from European Conference on Information Systems (ECIS) and Hawaii International Conference on System Sciences (HICSS) were inspected from the conferences held in 2015 and 2016. In the first phase HIS related articles were identified. In the second phase the articles were screened to identify research approaches and paradigms. Proceedings of HICSS are published by IEEE, and the IEEE portal was used to search 2015 and 2016 HICSS conference proceedings articles with the search term 'health'. ECIS research papers can be found in the conference web site. HIS articles were first manually identified through screening titles, and then a Google search was run on the web site with the keyword 'health'. The search covers abstracts.

In the second phase some articles were removed from the list as they were not HIS articles, and included for instance HICSS mini track introduction texts. Using a broad keyword obviously resulted in irrelevant results in the result set. All the abstracts were screened to find hints about the research paradigm, and given this was inconclusive, the full text was read. In practice, this was the case most of the times. In addition to clear indications of paradigms, research themes were screened too and equality related topics were identified. 136 articles in total were processed in this study. The process is depicted in figure 1.

We acknowledge the obvious limitation of this study: it is focusing only on two mainstream conferences, rather than taking a wider sample. These conferences have specific key themes, which inevitably have an impact on research topics and paradigms. However, as these are mainstream and influential conferences, it can be argued they

constitute an adequate representation of the current research in the field. Also, the themes indicate current trends in the research arena and gives a picture of the norm.

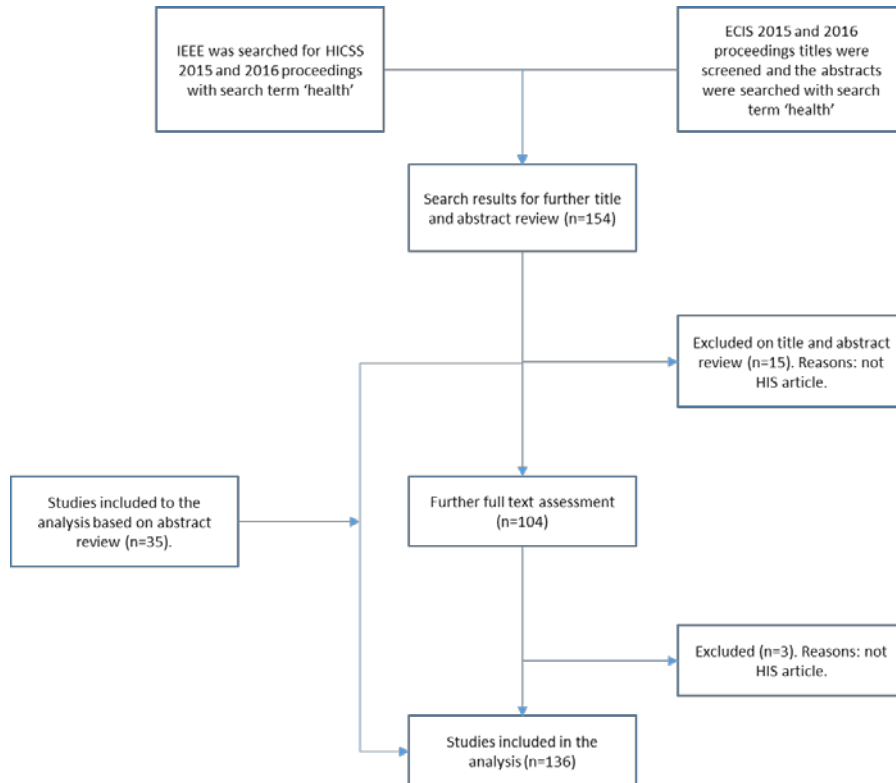


Fig. 1. The selection process in the literature research.

3 Results

Based on this literature review, it can be said that researchers in the HIS field seldom explain their paradigmatic inclinations. Rather, it seems that a pragmatic position is acquired and the paradigm follows the methods and study, rather than other way around. Many times it is difficult to determine whether the study is more functionalist or interpretive. We omitted radical schools from the analysis, as these are clearly not represented in ISS field, at least in the given conferences.

Furthermore, some studies are clearly quantitative, hard science based studies, which we have categorized into an own group. It can be argued that these belong to the functionalist camp as they are positivist and realist. More than every one in three articles are design oriented, following design science, action theory, or being otherwise outlining designs, such as ontologies or process models. We have categorized them into one separate group. Design pieces are somewhere in between interpretive and functionalist

paradigms; the researcher is taking actively part, i.e. the approach is therefore subjective, but the worldview is functionalist in terms of epistemology.

22 articles were excluded from interpretive vs. functionalist analysis as they were literature reviews and technical reports without empirical content. One article was categorized to ‘Other’ as it clearly stated following critical realism [7]. This was in fact the only article with a clear expression of the paradigmatic inclination.

To divide the remaining 40 articles into functionalist or interpretive camp, we utilized some further help from Burrell and Morgan [5]. They define subjective-objective dimension in terms of four factors: ontology, epistemology, human nature and methodology [5]. Most of the articles were not clearly subjective (i.e. interpretive), or objective (i.e. functionalist), but somewhere between. The category was determined assessing them against these factors. We have outlined findings in table 1.

Table 1. Paradigm and research approach.

Paradigm, research approach	n
Quantitative 32	32
Design oriented 41	41
Functionalist 24	24
Interpretive 16	16
Literature review 9	9
Report 13	13
Other 1	1
Total	136

As the table illustrates, a large portion of articles are quantitative or design oriented. There are slightly more functionalist articles than interpretive. Although the approach in these articles is qualitative, ontology and epistemology are inclined to objectivity. Cases in case studies are also often rather nomothetic rather than ideographic – this is manifested through semi quantitative data gathering and analysis methods whereby the researcher assumes a role of an external observer. Considering prescriptive-descriptive dichotomy presented in the beginning of this article, it seems that 72 articles are descriptive and 41 prescriptive.

Considering themes and topics, nine of the screened articles were touching upon technology adoption. Facilitating the adoption can be argued being equality related, as it may support to equalize the access, for example. Three of these articles were particularly focusing on elderly people’s usage of ICT. As age is one of the dividing factors, these were considered relevant.

Other equality related articles were scarce. One of the articles was studying diabetes related text message service, specifically from the perspective of underserved population and minorities [8]. Another article was focusing on facilitating health related innovations in low and middle income countries [9], and one was on accessible, inclusive design of an order picking system considering the impaired users [10].

4 Conclusion

According to the assessment it seems that HIS research has a strong functionalist inclination given a high number of quantitative and functionalist articles. Prescriptive design oriented articles form another main body of articles. According to this review it seems that interpretive approach has not gained traction in HIS research.

Equality is not a dominant topic in the analyzed articles. Only 12 out of 136 articles touch upon this theme, whereas topics, such as mobile solutions, social media EHR and EMR, dominate the arena. One can argue that equality as a topic is not a natural fit for the functionalist approach, which seeks to maintain the status quo [5]. More radical approaches would question the current state, potentially foster change and bring forward the perspective of those stakeholders, who are treated unequally in the current status quo.

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Video-based learning game – can it increase safety awareness among forklift drivers?

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Abstract. Logistics involve the risk of occupational accidents. In-house logistics accidents often involve forklifts. As working life changes, forklift drivers encounter new technology in their work environment. Our study project also focuses on developing learning through games. The purpose of the learning games is to promote forklift drivers' ability to recognize and predict hazards while driving. The 101 participants from six workplaces played video-based learning game and provided background information before participating and feedback afterwards. Most of the participants had the feeling that IT solutions can improve their working safety and fluency of work. Traditional measures for improving occupational safety in in-house logistics have been used and studied. However, based on accident statistics, in-house logistics still has high accident frequency. Thus new ways of safety promotion are needed and we consider a learning game as a possible way of improving occupational safety.

Keywords: Occupational Safety, Digitalization, Logistics.

Introduction

Logistics involve the risk of occupational accidents. In Finland, material transfers cause one quarter of all fatal occupational accidents [1]. In-house logistics accidents often involve forklifts [2]. As working life changes, forklift drivers encounter new technology in their work environment. However, although warehouse work contains new technology, the effect of this technology on occupational safety and the fluency of work has not yet been widely studied. The follow-up and feedback system of driving habits, however, has been developed and studied in road traffic [3], but the focus has been more on economical driving rather than safety.

Occupational accidents in in-house logistics have often been studied from the accident prevention perspective. Challenges and accident risks for forklifts arise from confined work environments. Drivers need to manage their work environment: to be aware of people moving in their work area and to control the movements of their vehicle [4]. 2013). Other risk factors in the work environment involve lighting, routes (maintenance, markings, tidiness, visibility, etc.), physical load, and psychosocial factors.

Our study concentrates on utilizing new technology in in-house logistics, which still involves a high risk of accidents regardless of traditional preventive actions. This study project focuses on developing learning through games. The purpose of learning games is to promote forklift drivers' ability to recognize and predict hazards while driving. Many forklift drivers' accidents involve excessive speed because of time pressure [4], which also reduces their ability to recognize risks in their work environment.

The objective of our intervention study is to estimate whether digital feedback and learning systems can improve the safety of forklift drivers and other in-house logistics workers. This paper focuses on experiences of a learning game that aims to assess its potential to improve for safety.

Materials and Methods

In addition to the use of existing technology, our study project also focuses on developing learning through games. The purpose of the learning games is to promote forklift drivers' ability to recognize and predict hazards while driving. The study material has been gathered from six workplaces during 2016–2018, using methods of document analysis, questionnaires and interviews. One of the interventions is a video-based learning game that focuses on the work environment of forklift drivers. The game includes video-clips from in-house logistics operations, like warehouses and terminal and the participants' task is to observe possible hazards on the screen.

Before participating in the learning game intervention, altogether 216 forklift drivers completed an extensive questionnaire that included questions on their attitude towards new IT solutions [5]. These were positive. These positive results showed the basis for the learning game surveys, in which 101 forklift drivers took part. In the beginning of June 2018 the learning game intervention was ongoing and 87 forklift drivers have finished the intervention by then. This paper introduces their responses.

The minimum number of games played was three and the maximum of different games was eight. The participants filled in a preliminary questionnaire before the first game and another after the intervention. Most of the participants were male and their age varied from under 20 to over 60. The background information on their present videogame activity varied from 'never' to 'more than 6 hours a week. Before playing the first game, altogether 93% of the participants considered that IT solutions could improve occupational safety.

After playing the last game, after a period of three months, the participants reflected on their experiences of the learning game. They gave their opinion on the physical and psychological load of the game and how they felt about their success in the game. The participants also answered yes or no to whether they felt the game was fun, easy, difficult, boring, useless, or useful. They gave their opinion on whether they had begun to see their work environment differently after the game. Here, we present the preliminary results of these experiences and reflect on the answers to the preliminary questions and the variety in the amount of games played by the participants.

Results

After participating the game intervention, the participants were asked whether they began to pay more attention on their working environment. 40% of the participants responded that they began to pay more attention on the risks of their working environment. They described the things they began paying more attention to especially other route users, bluespots of other forklifts and rear-view mirror.

The majority (83,3%) of the respondents agreed with the statement that IT solutions increase work safety and 90,6% agreed that IT solutions improve the fluency of work. Of the respondents who considered IT solutions improving working safety, 92% described the learning game as useful ($t=2.078$, $df=69$, $p<0.05$).

The majority (86%) of the participants who agreed with the statement of IT solutions increasing the fluency of work, also responded that after playing the game they began to observe their working environment differently ($t=1.167$, $df=63$, $p<0.005$). Similarly, majority (92%) of those participants who considered IT solutions improving working safety, also began observing their working environment differently ($t=1.925$, $df=63$, $p<0.001$).

The previous experience of computer games increased the feeling of success in the learning game, while the participants who responded playing computer games at least weekly felt that they succeeded in the learning game better than those who play less ($t=-0.846$, $df=71$, $p<0.005$).

Discussion

The first phase of our study project consisted of a survey for forklift truck drivers. The survey showed that forklift truck drivers regard new technology and IT systems as positive for improving safety and work fluency. This created a good basis for the learning game intervention.

The participants of the learning game intervention were asked background information before the intervention and numerical estimation of the experience afterwards. Basically those participants, who answered IT solutions having possibility to increase safety and fluency of work, also saw the possibilities of the learning game as most positive. This encourages us to consider a learning game as a possible way of improving occupational safety.

Traditional measures for improving occupational safety in in-house logistics have been used and studied. However, based on accident statistics, in-house logistics still has high accident frequency. Thus new ways of safety promotion are needed. As any measure for promoting workplace safety, taking into account new technology requires safety

communication. The way in which the positive attitude of our respondents towards digital systems is utilized will depend on practical communication, management's visible commitment to safety, and mutual understanding of the usefulness of the interventions.

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Supporting Employee Wellbeing through Digital User Services

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Abstract: Work is not anymore where it used to be – due to digitalisation. The possibility to work from anywhere and stay connected through digital tools and platforms has enabled employees to collaborate with their colleagues any time. Smart Working refers to the new ways of working made possible by advances in technology and made essential by economic, environmental and social pressures. Smart Working is a business-focused approach to flexible working that delivers more efficiency and effectiveness in work organisation, service delivery, and organisational agility, as well as benefits for working people. Key features are management by results, a trust-based culture, high levels of autonomy, flexibility in time and location, new tools and work environments, reduced reliance on physical resources, and openness to continuing change (Petrulaitiene et al. 2018) Changing ways of work challenges also employee well-being and the ways to support it both at organisational and individual levels.

Keywords: Employee wellbeing, digital user services, new ways of work

1 Introduction

Increasing number of research has shown that employee wellbeing plays an important role in organisations. Wellbeing at work is composed of safe, healthy, and pleasant environment which increases employee productivity, commitment to work, and reduces sick leaves, thus, affecting overall organisational performance. Provision of buildings and facilities that foster health, happiness, salutogenesis, biophilia, mindfulness, air, light, comfort are the basis of wellbeing and counted in to human-centric sustainability (Brown et al. 2018). According to Global Corporate Challenge (GCC) report (2013), on average, an employee costs around three months of lost productivity a year, which translates into a significant cost for any organisation.

Literature identifies several components of wellbeing – physical, social, physiological, economic, and environmental (e.g. Frey and Stutzer 2002; Diener 2000; Eid 2008; Lovell; 2014) which all have an effect to employee performance. Knowledge worker wellbeing can be supported by continuous independent learning and skill development. The organization can offer tools for managing and improving work efficiency. The knowledge worker is self-determined and goal-oriented and capability to interoperate and collaborate - social network and personal digital profile are a core resource and personalised own tools, practice and data are important. Mobility means organizational, functional and spaltial mobility and even multiple projects and organizations. It is important to support organizational memory building (Lehtiniemi et al. 2018).

A work environment that improves well-being and productivity is a dynamic combination of the physical, social, and digital places. The wellbeing demands of knowledge worker are supported by diverse wellbeing services: more and more workplace as service concept is increasing. (Petrulaitiene et al. 2018) In this paper, wellbeing is discussed in terms of digital work, new requirements for working conditions, and digital services for supporting wellbeing. The new potential for digital wellbeing offerings by organisation or service providers is in the focus of this paper.

2 Methodology

Through the analysis of newly developed services available in the global market, this paper aims at providing an overview of the current situation on how employees can be supported through digital user services and identifying the main directions where digital user services are moving. The research analyses service offerings of almost 200 services found on CBInsights tech market intelligence platform with keywords “well-being”, “wellness”, “workplace wellbeing”, and “employee wellbeing”. These services were analysed by following service design principles of identifying customer groups, needs that service is fulfilling and ways how it is done. Analysis describes patterns and development directions for wellbeing-related services.

3 Results

The results of the study show that wellbeing issues are getting increasing attention in digital user service sector. More and more technology-related solutions are trying to improve various wellbeing-related problems. A commonly found solutions relate to providing digital access to previously physically-locked services and also forming communities of peers for support in taking individual actions (for example, achieving fitness goals). The potential to use diverse data sources is integrating diverse stakeholders, e.g. traditional occupancy rate measures can provide data for individual work behaviour and serve as one source for wellbeing reflections. Additionally, e.g. data about mobility can be integrated in various ways to understand wellbeing related issues. All in all the

wellbeing of digital employee can be supported by digital services which integrate traditionally separate data from human resource management, facilities maintenance, and individual behaviour. The avenues for place-independent well-being services are opening up. Additionally, the topics connected to fluid worktime provide interesting insights to digital wellbeing.

The results of this study provide a comprehensive overview of digital wellbeing services that are available on the market for employees. These results are valuable for industry by either helping to identify the existing gaps for new service development or when taking into consideration for new service purchasing. For academic community, this research provides further ground for discussion on the topic how wellbeing is transformed in a digital society.

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Misinformation as a Barrier to Social Inclusion in the Context of Asylum Seekers in Finland

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Abstract. The paper discusses misinformation as a factor that influences the well-being and social inclusion of asylum seekers. Asylum seekers have complex information needs in a new information environment where information is often available fragmentarily and where their social and culturally established ways to seek information don't necessarily apply. This and the fact that they often acquire information through social networks and gatekeepers exposes them to misinformation that is inaccurate, uncertain, vague or ambiguous information. They encounter misinformation in different forms, such as rumours, inadequate official information or misinformation that gives them false hope, both via official and more unofficial channels. Their understanding of what is accurate information might also differ from the normative ways of thinking in the society. It is proposed that the term *perceived misinformation* should be used to understand the viewpoint of the information seeker. It is also important that in future empirical studies misinformation is seen as an inevitable part of information practices.

Access to accurate information is needed for asylum seekers to become socially included. Marginalized groups in the society don't always have access to mainstream information, which makes them socially excluded which again prevents them from accessing official information. This can also make the asylum seekers turn to disnormative information, through which getting misinformation is a bigger threat. Misinformation again decreases trust that is essential for social inclusion.

Keywords: Misinformation, Perceived Misinformation, Social Inclusion, Information Practices, Asylum Seekers

1 Introduction

A new information environment poses problems for asylum seekers as it is hard to know what information is needed, where to get it and who to trust in regard to it. This confusion exposes asylum seekers to unofficial channels where misinformation easily diffuses. Access to accurate and current information is, however, vital for being a member of a society, i.e. socially included. This paper discusses the role of misinformation in the information practices of asylum seekers, based on earlier studies.

It is identified which characteristics in their information practices contribute to the occurrence of misinformation. Misinformation is discussed as a factor that affects the well-being of asylum seekers and hinders their social inclusion. The focus is mainly on the Finnish context. The paper, for its part, aims to fill a research gap in understanding misinformation as a part of information practices, and it underlines that it is important to understand from whose point of view information is perceived when information practices are studied.

2 (Perceived) Misinformation

Misinformation is inaccurate, uncertain, vague, or ambiguous information [1]. It diffuses easily in social networks and online. The consequences of misinformation are increase of suspicion, fear, and worry [1], and people often continue to rely on it even after it has been corrected. Whether something is interpreted as accurate information, misinformation or disinformation (deliberately deceptive information) is, however, situational and influenced by social and cultural factors and our values and norms. The understanding of truth is thus not free from normative ways of thinking in the society [2]. With the concepts of normative (information regarded as official) and disnormative information (e.g. experiential knowledge, information distributed in social networks or media) it can be understood that not all information is either true or false but generally accepted or disregarded according to the dominant attitudes [3].

However, it is not often defined in information practices studies from whose point of view information is perceived, i.e. who defines if something is considered information, misinformation or disinformation. Therefore, it is here suggested that the terms *perceived information*, *perceived misinformation* and *perceived disinformation* should be used for understanding the viewpoint of information seekers. This is especially important in the context of marginalized groups, such as asylum seekers, who do not necessarily share the commonly accepted view in the society of what can be considered accurate and reliable information.

3 Misinformation and Information Practices of Asylum Seekers

Asylum seekers come from a different cultural background to a new information environment. They have complex information needs but ineffective information practices in the new setting. Information, also official, is often available fragmentarily. For asylum seekers, it can be hard to collect all relevant information, to form an overall picture of different services and the society at large and specially to evaluate what is credible and trusted information. This is also affected by the fact that the asylum-seeking process and migration situation in Finland have been under many changes in the past years. More and more information is available online and in social media where information in general, and especially misinformation, diffuse easily. Social networks are important information sources for asylum seekers. However, as a newcomer, it can be hard to assess which networks are quality networks, and thus credible sources.

Social networks are also sources of misinformation, in particular weak ties in them. These weak ties are often more informative, and in that way extremely valuable for asylum seekers, but also less reliable than strong ties.

Even though misinformation has not been studied as a part of information practices of asylum seekers, there are indications in earlier research [e.g. 4–6] that it is present. Asylum seekers encounter outdated information and official information that is inadequate or presented inadequately. Authorities may present a one-sided picture or not correct misinterpretations caused by lacking information. Asylum seekers come across rumours, which become distorted when they are disseminated in social networks. Asylum seekers often trust different gatekeepers or delegate information seeking to others, such as children. Here again is a risk of information being unreliable, vague or completely false, or becoming misinformation as once correct information changes its form when passed on word of mouth. Misinformation can also give false hope to the asylum seekers. This is connected to information avoidance as they may turn to alternative sources that confirm the desired outcome, especially when there are uncertainty and other psychological factors involved. Asylum seekers can also get a too rosy picture of the situation in Finland, which can even affect the migration decision. These can be seen as forms of misinformation or as occasions where misinformation is possible or likely to occur. Both normative and disnormative information can thus be misinformation even though the risk of getting misinformation is more likely when informal channels are used.

4 Social Inclusion as a Misinformation Problem

Information is a vital part of being socially included. Here, social inclusion is understood as the (even temporary) right to belong and participate in the society, having the physical and mental well-being that enables this participation and getting the necessary social support and access for this. Information is connected to several basic needs and rights, such as health: access to different services requires access to the information about them. Socially excluded do not necessarily have access to mainstream information sources, which makes them more excluded, and this again prevents them from accessing official information [7]. Misinformation is also a part of this vicious circle: lack of access can make people turn to alternative sources where misinformation is present. Misinformation decreases trust that is vital for social inclusion, and thus makes asylum seekers excluded. Social exclusion, again, forces the asylum seekers to rely on misinformation. Asylum seekers are in an interstitial position [e.g. 8], and their social inclusion or a sense of belonging to the society is a complex question. It is, nevertheless, beneficial for both the well-being of the asylum seekers and the surrounding society that asylum seekers are socially included.

5 Conclusions

It is possible that misinformation satisfies social needs and enhances a sense of solidarity inside a particular group, in the same way as sharing rumours [9], even though

it decreases social inclusion in the larger context in the society. Information via unofficial channels, i.e. disnormative information, may be highly useful for the asylum seekers. Therefore, it is important to understand the wholeness of the information practices of asylum seekers. Yet, it is vital that asylum seekers receive reliable information that is in an understandable, usable and culturally meaningful form for them, which enhances their social inclusion. Understanding the presence of misinformation in the lives of asylum seekers can help service providers make official and reliable information available in a suitable manner and at the right time for asylum seekers, also by using trusted mediators and more informal channels.

For the information practices and behaviour research, it is important to both see misinformation as an inevitable part of information practices and to understand the viewpoint of the information seekers, thus what is perceived as information, misinformation or disinformation. This view can be compared to the normative understanding of information in the society. In future research, concrete forms of misinformation and systematic ways to study misinformation should be identified. Further empirical work will be based on this theoretical framework and constitute a part of my PhD thesis.

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The eProfessionals as Promoters of Digitalisation in Social and Health Care

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Abstract: Fast technological development makes it possible to utilise new types of technology services in the social and health customer-acquired services. In order to promote the digitalization, new competence and development of know-how is required. This study describes the role and competence of eProfessionals in social and health care in the light of the material collected in DigiSote projects (ESF) in North Karelia and in Northern Savonia. According to the results, eProfessionals are needed in promoting digitalisation in social and health care organisations. The competence of eProfessionals in social and health care was seen as special competence that divides into seven fields. eProfessionals' competence is being studied through digitalisation and its continuous development will renew eProfessionals' competence in the future too.

1 Introduction

The social and health care system in Finland is undergoing a reform and digitalisation is an important tool in this reform. Fast technological development makes it possible to utilise new types of technology services and equipment in the social and health care work and in customer-acquired services. Artificial intelligence, robotics, virtual, added and augmented reality, and different applications are a set of new, intelligent tools used in digital services in a variety of ways. When introducing these new digital services, the related customer and service processes should be renewed at the same time.

There will be a great need for the new kind of digital competence [1] and for experts in the field [2]. Some general digital competences have already been defined [3,4], but digital competence in social and health care still needs to be defined more precisely [5]. The type of competence needed in social and health care has been studied and described

[5, 6] and the EU has also put forward a recommendation on the development of health care professionals' digital competence and on the contents of the competences of the different professional groups [7]. The development and introduction of digital services requires professionals with specific expertise in the prediction, innovation, development, training and guidance of digital services [5]. Professionals should have technological-social competence, i.e. the ability and creativity to "socialise" intelligently with digital appliances during a service development process [8]. In the future, there may also be a need for competence in so called boundary work, which means new social and health care qualifications or new competence modules for the existing qualifications [6].

Our earlier development project resulted in the creation of defined areas of competence and competence requirements for the use of electronic services. When defining the competence, different levels of competence and competence requirements were discovered, i.e. the competence of a novice, of an experienced professional, and of a developer. [9] When planning the DigiSote projects (ESF) in North Karelia and in Northern Savonia, the concept of "eProfessional" was created on the basis of earlier information [9]. Development work implemented in these projects aims at recognising the need for eProfessionals at work, defining the development paths for eProfessionals, and planning a training package for eProfessionals including a virtual learning environment. This article describes the nature of being an eProfessional and the competence required of eProfessionals in the reforming, more and more digital social and health care.

2 Material and methods

The purpose of the study was to describe the need for eProfessionals in social and health care as well as their duties and competences. The data for this study consisted of material produced in workshops (n = 9) implemented within the projects as well as of reports on digital service pilots (n = 7). The participants in the workshops included not only social and health care professionals, but customers, ICT professionals, social and health care teachers, and project staff (n = 257). Quick, digital experiments were also carried out in pilot organisations on a process-based basis [10]. The digitality- driven competence needs required of professionals were assessed at the different stages of the pilot, and these needs were listed in the pilot reports. In addition, theme interviews (n = 17) were conducted for representatives of the public, private and third sector leaders in the field of welfare. (Figure 1)

Future prospects and plans in the field of digitalisation and the need for eProfessionals in social and health care as well as their duties and competences were clarified at the interviews. Both the written data and the interview material were analysed by material-based content analysis. Content analysis is a commonly used method of analysis of qualitative data [11]. The material produced in the workshops, pilot reports and the interview material were in all written form. Expressions answering to the research questions were searched from the material and after that, the expressions were simplified.

Then, the same kind of expressions were grouped and named as subcategories and then further as top categories.

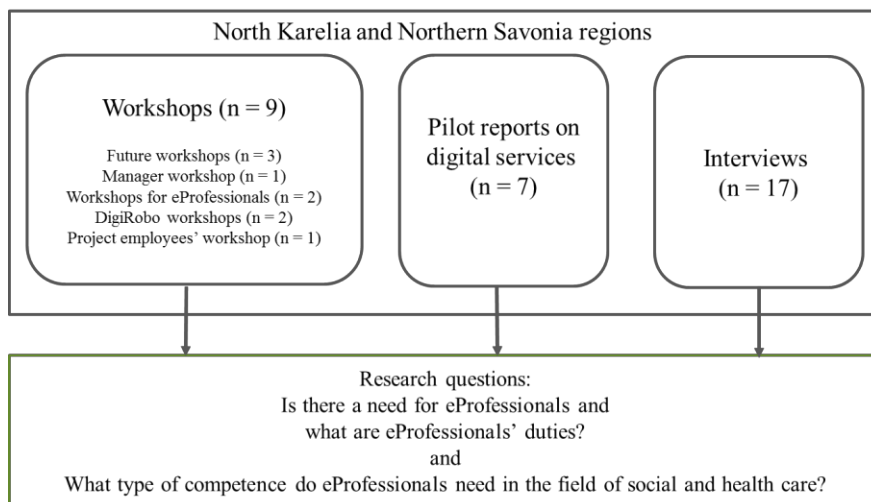


Figure 1. Research questions, material and analysis

3 Results

3.1 The need for eProfessionals and eProfessionals' duties

The interviewees and the participants in the workshops were quite unanimous about the need for eProfessionals as promoters of digitalisation in the field of social and health care and as preventers of digital exclusion. The interviewees were more critical towards the concept of 'eProfessional'. However, a more appropriate term could not be named. The participants stated that eProfessionals are advocates of digitalisation as well as change agents who encourage, inspire and support others and work as pacesetters for the development of digitalisation. One of the interviewees described the importance of eProfessionals as follows:

“eProfessionals are needed. Putting digitality into practice requires people who have the duty of advancing the issue, acting as trainers and mentors, and giving new dimensions to the work. It would be a low-threshold model for promoting digitalisation.”

The planning and development of user-oriented processes, supporting the introduction of digital services, training of customers and professionals to use digital solutions and supporting digital learning, and actively participating in the implementation of eServices were also considered important duties of eProfessionals. In addition, eProfessionals' duties were considered including multidisciplinary network cooperation, such as acting as an interpreter between the users of digital services and application

developers. eProfessionals' duties are new areas of responsibility in the work of social and health care professionals.

The availability of eProfessionals was considered important. Therefore, every unit or at least every field of operation should have its own eProfessional. The results of the study also show that a prerequisite for the work of eProfessionals is management support and managers' commitment to train eProfessionals and assign working hours for this work. The role of eProfessionals was seen as an important facilitator during this transition phase, but it was also questioned whether eProfessionals are only needed in this current transition phase or also in the long run. The profession of an eProfessional was seen as a profession of the future; both as a developer and as an expert.

3.2 The competence of eProfessionals is special competence

The competence of eProfessionals in social and health care was seen as special competence based on strong professional competence in the field of social and health care and basic knowledge of digitalisation. In this study, the competence was divided in seven fields of competence: technology and knowledge management competence, interaction and communication competence, guidance and counselling competence, competence in the development of services and applications, multidisciplinary collaboration and networking competence, ethical competence, and self-management competence. These fields of competence are not unconnected, but they form a flexible unity. eProfessionals' competence is being studied through digitalisation and digital operating and service environments, and its continuous development will renew eProfessionals' competence in the future too. (Figure 2.)

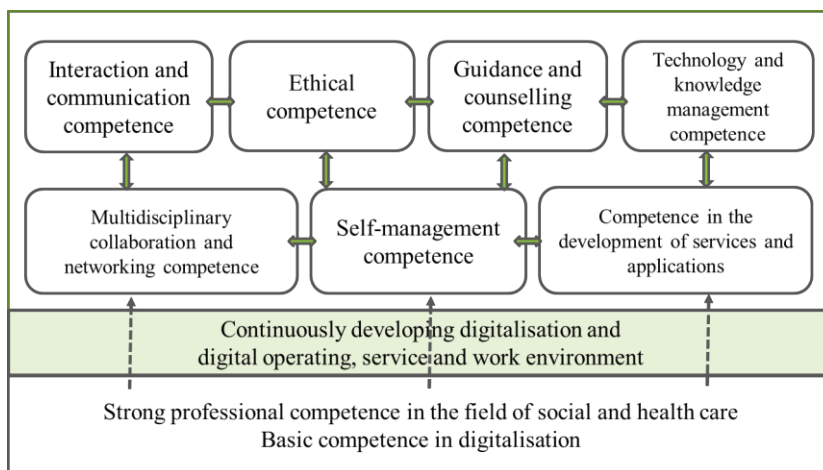


Figure 2. eProfessionals' competence in a digitalising environment

New technologies such as robotisation, artificial intelligence, added reality and block chains have also impact on social and health care technology and digital services in the field. Competence requirements related to the technology and knowledge management

include understanding the overall picture of digitalisation, the ability to apply technology in one's work, competence in knowledge management, and data protection, data security and cyber security skills. eProfessionals need to be able to evaluate the usefulness of digital services and tools in each type of situation and apply them in customer work. Another competence requirement is also the ability to solve different types of technology-related problem situations. Furthermore, eProfessionals must manage the acquisition of data from different sources (Big Data), and both analyse, interpret and use this data. eProfessionals also need to be able to apply the General Data Protection Regulation (GDPR) of the EU, to evaluate the risks related to data protection and data security, and to contribute to cyber security in multidisciplinary collaboration.

The interaction and communication competence consists of competence requirements for online communication and digital media. Digital solutions create new opportunities and challenges for interaction and communication that the eProfessional needs to know and put into use. The ability to promote the use of a variety of distance solutions and communal tools is emphasised in eProfessionals' work. The integrated use of digital media solutions such as videos and images makes the communication more effective and these solutions can also be used in guidance and counselling. The interaction and communication competence is also important in the development of digital services.

Competence requirements related to guidance and counselling include the ability to promote customer and employee involvement, guidance and counselling skills, competence in the marketing of digital services, and service management skills in digital environments. When introducing new digital services, the competence to use these services is important. Guidance and counselling is used to promote the use of digital services as well as the involvement of customers and professionals in the digital society.

Competence requirements related to the development of digital services and applications include the ability to develop services and service processes in a customer-driven and evidence-based way, skills in innovative and user-driven development of digital services and applications, and leadership skills in development and renewal. It is important that eProfessionals understand the impact of future technologies (e.g. artificial intelligence, robotisation) on work and on customer-acquired services already when preparing for the introduction of these services. The pilot report data highlighted the development competence of service processes and the competence in the deployment of digital services when the services are being introduced. The development of services also requires competence in the acquisition of technology and financial knowledge. Moreover, innovation and research methods and methods of impact assessment are utilised in the development activities and in the management of development.

Competence requirements for self-management include innovation capability and motivation to work as an eProfessional and as a promoter of digitalisation and new learning. Competence requirements for ethical competence include the ability to examine and raise the ethical issues of digitalisation and to actively participate in the development and in renewing ethical guidelines in the organisation as well as in the process of applying the new guidelines in practice. Competence requirements related to multidisciplinary collaboration and networking include the ability to engage in multidisciplinary collaboration with e.g. technology companies in application development and

deployment. Multidisciplinary collaboration between different professional groups and organisational units gives good prerequisites for developing service integration-based processes and digital services. Another competence requirement is the ability to create and utilise networks in the promotion of digitalisation.

4 Reflection

This study describes the role and competence of eProfessionals in social and health care in the light of the material collected in DigiSote projects. The different areas of competence as well as competence requirements of eProfessionals will be further defined once the development work within these projects has been completed and reported. According to the results, eProfessionals are needed in promoting digitalisation in social and health care organisations, at least during the digital revolution. The commitment of eProfessionals to their work was also considered important. Being an eProfessional was considered part of one's current work with, however, new duties and new competence requirements related to the promotion of digitalisation. Kangasniemi et al. [6] use the concept of competence in boundary work for professionals' new competence modules.

The relationship between man and machine needs to be reconsidered along with the development of technology and digitalisation [6, 8]. This need did not, however, directly emerge from the interview and workshop material. The topic was touched upon in the pilot reports, when describing the connection between the digital service or tool with a renewed service process and the result of the use of the digital tool being a natural part of the service and the related work. The duty of eProfessionals would be to raise the question on the relationship between technology and man in work communities, and to plan the introduction of a digital service as a technology supplementing a service provided by a professional and used by a customer.

Management and the importance of digital strategies is also emphasised in the promotion of digitalisation in social and health care. The promotion of strategy-based digitalisation would give the framework for and direction to the work of eProfessionals. Close cooperation with the supervisor and management support was considered important in this study. Good leadership practices in the deployment of digital services include a clear vision and communication about the aims, effective information distribution, management support, and allocation of resources [12].

Health care professionals are not yet fully acquainted with digital services and their benefits, or their role in the use of digital services [1]. The use of robotics and digital services in social and health care requires professionals having a new type of competence, and insufficient attention has been paid to the development of these skills so far [6]. Therefore, we are in a hurry to train eProfessionals. In order to develop the training, it is important to define the competence of eProfessionals that is based on strong professional competence and basic digital expertise. The competence of eProfessionals defined in this study can be utilised in the planning, implementation and development of eProfessional education.

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Contribution Data Mining in Promoting Public Health Care Reputation: Finding Harm Causing Factors in Patient Safety Records

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Abstract. Effective methods are needed to identify and manage risks in healthcare to improve patient safety and hence the reputation of health care. Analysing safety related records and learning from ‘touch and go’ situations as well as accidents is one possible way of preventing hazardous conditions from occurring in healthcare, both public and private. The eventuality of an incident or an accident may markedly be reduced if the risks connected to it are efficiently diagnosed. This paper explores how a data mining technique can be applied to healthcare in order to discover harm causing factors in vast amounts of patient safety records.

Keywords: Data Mining, Clustering, Public Health Care, Harm Causing Factor, Patient Safety.

1 Introduction

Reputation is based on clients’, employees’ and providers’ perceptions of an organisation. Organisational reputation is thus a mental and an abstract perception of an organisation and there is a view to emphasizing the necessity of controlling it. It follows that reputation management entails managing those perceptions that form an organization’s reputation [1]. In a public health care service system it has been uncommon to monitor citizens’ views on the state of service providers’ reputation [2]. However, the quality of health care services is highly valued and patients are aware of their rights to safe and secure care [3]. According to a Finnish legislation [4] in order to be informed about the freedom of choice and to serve the needs of the customer, the customer should be provided with the basic knowledge of the service provider, the location of the service, the availability and accessibility of services, the quality of care and the user feedback on the functionality of the service. Thus, it is interesting to find out whether there is a connection between reputation and high quality care, and how this connection will affect freedom of choice in health care.

This study adapts the inclusive definition of patient safety articulated as the prevention of errors and harm to patient associated with the process of care [5]. According to the Finnish Healthcare Act from 2011, all healthcare organizations must monitor patient safety incidents as a part of their patient safety program. The Finnish patient safety incident reporting system, HaiPro, has been developed during 2006 and is anonymous [6]. HaiPro system classifies incidents, including near misses, into 13 structured categories. A narrative text provided by a reporting professional clarifies the type, context, and circumstances. The reporting process stresses a goal of learning from mistakes and provides a great amount of information on the reported data, and how organizations have learnt from their incidents and improved their processes of care patient safety incidents [7].

2 Objective

The purpose of this study was to analyse patient safety reports, which personnel have assessed to cause harm for the reputation of organization. The objective was to find out what hazards are damaging the reputation by the estimation of health and social care professionals.

3 Methods

Patient safety reports, which are structured and free-text descriptions of safety events, were analysed from 2007 through 2016. Reports were retrieved from The Finnish Society for Patient Safety database, which collects reports from about 200 health and social care facilities in Finland. Reports were voluntarily entered to the HaiPro system by health and social care staff, mostly nurses, contributing the factors and categorization of effect on the patient. The approval of the University of Eastern Finland Committee on Research Ethics was required and then university hospitals and district hospitals management approved the study as a part of patient safety (and reputation) development.

Data were analysed using text mining, especially applying clustering method. Text mining is a sub-class of data mining. The exact definition of data mining is intractable because it is neither a single tool nor a method, but a combination of both methods and tools. Berry and Linoff [8] have described data mining as an analysis and exploration process, utilising automatic and semiautomatic means in order to discover the rules or meaning patterns. It is significantly easier to define its purpose as “*a decision support process in which we search for patterns of information in data*”. The user might just do the searching process or the user can apply assistance from some smart computational methods that through the automatic search of either one or several databases aims at finding significant patterns in the data [9]. These, often called “the nuggets of knowledge”, are hidden in vast amounts of data and according to Watson [10] they are practically undiscoverable with conventional techniques.

Clustering analysis identifies clusters embedded in the data, where a cluster is a collection of data objects that are “similar” to one another. The objects are grouped based on the principle of maximising intra-class similarity and minimising interclass similarity. Clustering can be used to generate labels for the classes of data objects, and for taxonomy formation, which is the organisation of observations into a hierarchy of classes that group similar events. Applying this method, structures in unstructured data can be discovered without explaining or interpreting the reasons for their existence [11] or having any preliminary expectations about the existence of these. The process may reveal a similarly occurring event which might indicate the existence of lethal trends in the data. Connected to the purpose of this study, a discovered recurring event may be harm causing factor damaging the reputation of public health care.

The operative mining process was carried out using the SAS Enterprise Miner Workstation 14.1 system applying clustering method. Category *Information flow and information management* (n=15 393) of patient safety reports were analysed. Clustering was focused on reports where ‘Not know’ or ‘Other’ category was chosen, or, the category field was left empty. The reports were mined with two rounds and the results were examined with care by health care specialists in order to achieve accurate information. As there are no hypotheses or any other predetermined ideas about the characteristics of the trends, the mining process requires iterative approach. The results of mining rounds need to be carefully analysed and specify the definitions for the next mining round in order to achieve more accurate results.

4 Results

The data consists of 82 353 patient safety reports from seven health and social care organizations. Every fifth (20.3%, n= 15 393) of the data reported an incident of communication. The incident of communication categorized in tree sub-classes: the organizational of care, the management of patient data and communication between people. Categories ‘Not known’ and ‘Other’ reports as well as those left empty revealed that management of the whole and communication were significant events which can regard damaging the reputation of organisations.

5 Discussion

Data mining does not give straight answers to the questions, as its role is purely a decision support system. This is why the process requires human participants with vast experience of the subject. However, it often provides indispensable supplementary information for the decision making processes, which was proven also by this study as ‘hidden information’ was extracted from vast amounts of unstructured health care data. Based on our findings, the 13 HaiPro-categories need further evaluation, adjustment and development. Future studies to test more specific standardized classi-

fications which are suitable specifically for voluntary incident reporting purposes are needed.

6 Conclusion

The data on patient safety incidents reporting presented in this study provides a sample of hazards well suited for identifying risks to harm the reputation of organization.

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How to measure Digital Health Literacy!

A study of diabetes patients in an inpatient setting

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Abstract: Chronic diseases like diabetes mellitus cause high and increasing health expenditures, due to the demographic change. To reduce these costs and to ensure high quality of services the health literacy of the people should be promoted by digital offers. Digital health literacy (or eHealth Literacy) is the ability of patients to find, understand and use health-related information based on digital devices.

Keywords: Digital Health Literacy, Health Literacy, Empow-erment

1 Study

The study took place at St. Franziskus Hospital Flensburg from 16 October 2017 until 21 November 2017. Target group were diabetes patient of both types. 28 students of the master programme eHealth made personal interviews with a paper-based survey. 72 patients completed their interviews. Of these, 40 participants used the Internet and are therefore relevant for the study. A comparison study with a similar setting in Tallinn was planned but could not completed so far.

2 Methodology

The study was designed based on standardized measuring instruments “eHeals Literacy Scale (eHeals)” added by three questions of the “Digital Health Literacy Instrument (DHLI)”. The group of students added one additional question, so 12 questions were used for the interviewing (presented in the conference).

Table 1. Items of the measuring instruments

Number	Item
1	I know how to find helpful health resources on the Internet
2	I know how to use the Internet to answer my questions about health
3	I know what health resources are available on the Internet
4	I know where to find helpful health resources on the Internet
5	I know how to use the health information I find on the Internet to help me
6	I have the skills I need to evaluate the health resources I find on the Internet
7	I can tell high quality health resources from low quality health resources on the Internet
8	I feel confident in using information from the Internet to make health decisions
9	When you search the Internet for Information on health, how easy or difficult is it for you to decide whether the information is written with commercial interests?
10	When you search the Internet for information on health, how easy or difficult is it for you to apply the information you found in your daily life?
11	When typing a message how easy or difficult is it for you to clearly formulate your question or health-related worry?
12	When you search the internet for information on health, how safe do you feel that your personal data is used only to your expectations?

3 Results

The results show that the study population has a median digital health literacy across all questions.

Referring to education the thesis was build that the higher the educational level the higher is the critical dealing with the quality of information. Questions 6 to 8 are aiming at the analysis. Answering these items with “agree” and “strongly agree” show a low digital health literacy, whereas answering the questions 1 to 5 should not show any differences between the educational level. The actual answers are shown in Figure 1 and two, with the result that the respondent with a lower educational level are dealing more critical with the quality of information they found on the internet.

The analysis shows more in detail that there is a relation between the digital health literacy and the indicators age, sex, diabetes type, duration of the disease and educational level, but the relation is not that much significant. The total number of participant was too low to make significant statements

The chosen measuring instrument turned out to be a good method and all questions were understandable. But it has to be discussed if more objective criteria could be find

out additionally. The study shows also, that professional groups in Health Care should be involved in the race to better digital literacy.

The study also shows that there is a need for further research in the field of digital health literacy – in all our countries in the best sense of comparison and collaboration..

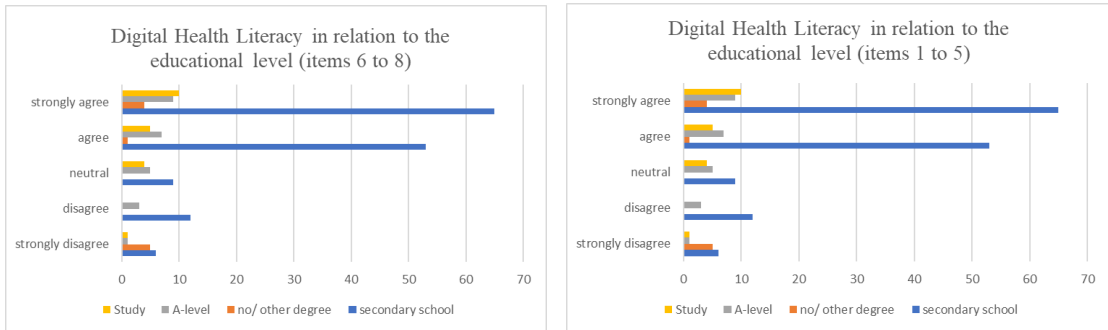


Fig. 1. and 2: Answers of the respondent of the items 1 to 5 and 6 to 8 regarding to the educational level

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The Challenge of Digital Divide and Diversity in Future Youth Information Work

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Abstract. The objective of this paper is to interpret the results of three qualitative studies that were implemented in the Erasmus+ project (Future Youth Information Toolbox) to foresee possible changes in the information landscape of 2030. To picture a plausible scenario of 2030, 34 young student, 7 experienced youth information workers, and 14 youth work experts and policy makers participated in these studies. The participants were asked to provide their opinion on the upcoming changes in the information behavior of the youth, challenges in the youth information work, format of youth information services, and skills that will be required in the future to provide the services. The findings of the studies indicate that the advancement of technology will create digital divide due to asymmetric access to technologies, differences in digital competencies, and declining reading skills. Therefore, an inclusive strategy in providing information services, and education on information and media literacy will be instrumental.

Keywords: Youth Information, Digital Divide, Diversity, Foresight Methods.

1 Introduction

This paper presents results from an Erasmus+ project (Future Youth Information Toolbox) where foresight activities were piloted with *the aim to predict future youth information behaviour as well as changes and challenges in youth information work*. Already in 1999 the need for more research in the area of youth and information-seeking behaviour was addressed [1] but still twenty years later the information behaviour of young people has not been studied to any large extent considering their number and importance. [2] Some work has been done in the area of youth and online information in relation to everyday life and some on youth information behaviour and their use of libraries. [3-5] There is a clear gap in researching young people's information needs and practices and especially with an aim to look into future challenges in this area.

2 Methods

In this study three foresight activities were conducted, involving 55 participants from different parts of Europe; three future youth information camps, one scenario planning webinar, and a Delphi survey.

2.1 Future youth information camps

Young people (15-23 yrs.) were engaged in three future youth information camps [6]. This pilot task was based on the Future Camp method developed by Finland Futures Research Centre, University of Turku (<http://www.utu.fi/en/units/ffrc/Pages/home.aspx>). The aim of the workshops was to generate intuitive and innovative knowledge about the future and presents alternative paths to the future. Futures workshops are particularly appropriate for the analysis of operational environments as well as for organisations searching for new directions and product development processes. The participants (n=34) discussed future youth information behaviour and visioned information technologies and the ideal youth information service in 2030. The panels produced quite concrete scenarios although the youth found it challenging to look almost 15 years ahead.

2.2 Scenario planning

A scenario planning webinar [7] was held with seven experienced youth information workers where key aims and skills of future youth information services were discussed. The workshop aimed at developing four scenarios in the area of future youth information and counselling services in 2030; how will young people's information behaviour change in the future (2030), what will be the aims and impact of future youth information and counselling services, what skills are needed by youth information workers in 2030, and what changes in society will affect youth information and counselling services. Being an online event the scenario planning webinar had less participants than is usual for face-to-face events and the duration, 2,5 hours, was also considered a maximum.

2.3 Delphi survey

A Delphi survey [8] was distributed to 14 youth work experts and policy makers. The Delphi technique is a widely used method for collecting data from respondents within their domain of expertise. In short it is an iteration process until consensus about the topic is reached. The Delphi process has been used in many different fields and is often connected to foresighting activities. A series of questionnaires are sent to the experts and between each round the researchers collect the answers, find similarities, and address different views of the participants in order to finally find a consensus. The rounds can be as many as needed, but usually 2-4 rounds are enough [8]. In this case three rounds were enough to reach the consensus.

3 Findings

3.1 Future youth information behaviour trends

The foresight pilots clearly predict that the information landscape will become increasingly complex, most of the information will be found online, and we will live in a constant information overload. Youth will mainly communicate through social media, but also traditional media (newspapers, magazines) will co-exist. Fake news and manipulation will clearly be an increasing problem in parallel with lack of critical thinking. Youth will face challenges in handling information privacy, security and safety. The education system will change towards online education and Internet will be required for studying in the future. All this means young people will need good skills in finding information, evaluating reliability, and validating where the information comes from. Areas of growing information needs are health and well-being, mobility and immigration, human rights, democracy, and data protection. Also, information needs on artificial intelligence and big data is growing, especially on how to use these tools and data. There are some concerns about information avoidance but at the same time young people have a growing responsibility in engaging.

3.2 Challenges in youth information work in the future

Young people will be more diverse than expected in 2030. This diversity will have many reasons and consequences, which means this aspect is one of the biggest challenges in future youth information work. A growing digital divide is not only because of access to technology, but lies in different levels of digital competencies, attitudes, interest, differences in socio-economic backgrounds, and declining reading skills. The consequences lies in growing isolation (social media bubbles), and too little attention on disadvantaged groups and groups with special needs. Youth information work will therefore need an inclusive strategy.

3.3 The format of youth information services in the future

Youth information services will be more often given via mobile applications, using bots and automated information. New social media tools will be developed and will be the main channel for communication. There will be a need for immediate services, meaning any time, and any place. However, there will still be a need for face-to-face counselling in addition to online and automated services. Regardless of format the services must be trustworthy, personalized and tailor-made. There will also still be a need for having the services in physical facilities, with a comfortable environment and with new technologies. Young people will be more creative in using new technologies and they will have support from fact check and fake news alert tools. Young people will probably want information counselling using speech recognition services, gaming and new streaming formats as well as video calls. It will be important knowing how to use new technologies and not leave the place for commercial actors.

3.4 Content and skills of future youth information services

One of the most important aims with future youth information counselling is to give guidance to navigate the complex information landscape that is educating young people in increasing their information and media literacy. Youth information services will have a bigger role in translating information to young people, making sense of difficult information to avoid a growing digital divide. Youth information workers will need more training and education in this area. There will be more peer to peer services, but it is important to be aware of the risk of passing on misleading information. There will be a growing competition between different kinds of information providers and therefore youth information will need increasing collaboration and more marketing initiatives. Youth information workers must know and be able to engage the youth, focusing a participatory and interactive approach. Collaborative skills will also be important. Co-operation between youth information services and other stakeholders and actors are needed (e.g. schools, business organizations). Mobility will grow and youth information workers will need more of an international perspective. They will also need skills in having quick reactions to change.

4 Discussion

The findings cover visions of future youth information behaviour, information landscape and technologies, changes and challenges connected to future youth information work. One key finding is that young people will be more diverse than expected in 2030. This diversity will have many reasons and consequences, which means this aspect is one of the biggest challenges in future youth information work. A growing digital divide is not only because of access to technology, but lies in different levels of digital competencies, attitudes, interest, differences in socio-economic backgrounds, and declining reading skills. The consequences lies in growing isolation (social media bubbles), and too little attention on disadvantaged groups and groups with special needs. From the perspective of youth information work this study contributes with insights about a need for an inclusive strategy and that youth information workers must know and be able to engage the youth, focusing a participatory and interactive approach. Furthermore, one of the most important aims with future youth information counselling is to give guidance to navigate the complex information landscape that is educating young people in increasing their information and media literacy. Especially the awareness of privacy and security issues must be supported. These insights have also been emphasized in a recent UNESCO report on privacy in media and information literacy [9]. Young people must be treated as the diverse group they are, also in relation to how information is presented. E.g. the importance of child-friendly information for children in migration is a question initiated by the Council of Europe in November 2017 [10].

5 Conclusions

The foresight activities in this project were pilots and therefore not a representation of the whole youth information field on a European level. Therefore the results are only

indicative. Following this piloting phase, the project will aim at finding new tools and techniques for youth information counselling. The project has also collected a substantial number of survey responses on a European level about youth information behaviour which will be used to study youth information behaviour and diversity on a deeper level.

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