



WG11 – Human Factors Engineering for Healthcare Informatics

2019 Report - June 2018 to June 2019

presented in Lyon, France for:

- **IMIA Board Meeting, August 25, 2019,**
- **IMIA General Assembly Meeting, August 26, 2019**

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Website for WG: <https://imia-medinfo.org/wp/human-factors-engineering-for-healthcare-informatics/> & www.cshi2019.org/ & <https://www.linkedin.com/groups/5161983>

Brief Background

- **Mission:** This working group explores methods for studying the human computer interaction in health, including optimal interface designs for health informatics software, to make the computer a welcome partner with both the clinician and the patient in empowered longitudinal care. It is our mission to enhance awareness, disseminate knowledge and build on rigorous scientific human factor principles for (re)design and evaluation of e- to improve its degree of efficiency, acceptability and safety.
- **Vision:** Our vision encompasses that Human factors are considered into e-health projects as a mandatory and integral part of design and evaluation practices to enhance acceptability and suitability of e-health in Healthcare. By studying and promoting methods and techniques devoted to the study of human factors in the field of biomedical informatics,

this working group will accumulate and disseminate knowledge on human factors practice for healthcare informatics to contribute to the development and enhancement of scientific knowledge in this field.

- **Objective:** The objective of this working group is to coordinate studies and actions in this domain and to develop standardization initiatives for usability studies and user-centered design in the healthcare domain. We thereby explore state of the art methods, models, innovations and results to create standards for the use of human factors engineering and usability testing in health. Our final objective is to build and maintain a registry of HFE and Usability studies.

Achievements - Events and projects conducted and publications completed

Events 2019/2019

1) Pre-MedInfo conference: Context Sensitive Health Informatics 2019 – CSHI 2019

Date: August 23rd and 24th 2019, website: <https://www.cshi2019.org/>

Background: The HFE4HI working group organized and promoted the pre-medinfo conference CSHI 2019, together with the working group “organizational and social issues” (HOFMI) of the European federation for medical informatics (EFMI). This conference will be held in Lille University August 23rd and 24th 2019 (France).

Context Sensitive Health Informatics is about health information technologies and their environments. Environments may be people in different roles such as users, designers, and evaluators, but also non-human constructs such as organizations, work practices, guidelines and protocols, buildings and markets.

The conference theme: The last decades have seen the development and the implementation of numerous innovations along with the emergence of the awareness that innovations and technologies should be sustainable. Innovative technologies are developed for and implemented in health facilities and national health systems to improve the patient experience of care, the overall health of populations, and to reduce the per capita cost of healthcare. Yet, health structures, systems, their users (patients, relatives, professionals), and their needs may change at fast pace: national and local health policies evolve, infrastructures and other technologies are upgraded or grow old, users’ profiles and their needs may change. In these moving sociotechnical contexts, how sustainable and context sensitive are healthcare innovations and our researches in the field? What level/temporal span of sustainability should we aim for and how to achieve it?

Invited keynote speakers : Dr. Pascale Carayon from Wisconsin-Madison University and Dr. Tommaso Bellandi from *Northwest Trust of the Tuscany’s Health Service, Italy.*

2) Workshop at MIE 2018: How to overcome barriers to user-based usability evaluations faced with older people? GA Wildenbos, R Marcilly, M Jaspers, L Peute.

This workshop invited experts in the field of elderly and eHealth, mHealth and mobile devices to explore the need and possibilities to enhance Human factor evaluation methods for elderly. The working groups results are currently submitted to a peer-reviewed journal.

3) Interventions to present human factors topics

- 1st French day on “health information technology: meeting of minds between researchers and practitioners”, Montpellier University, by R Marcilly (May 24th, 2019)

- “Composable systems for electronic health records - safety, efficiency, cognition, and redesign” at Lille university, by Y Senathirajah (April 29th, 2019)
- Design speaks, PhD presentation on Human Factor Methods for Elderly at Amsterdam UMC. (February 2019)

4) Organization of workshops

- Working group/ presentations of current projects in HFE in the Amsterdam UMC, location AMC and VU, and Delft University. Held at the University Hospital. Invited attendees: Dr. P Carayon, dr. Ing. Marijke Melles (chair of Dutch society for Human Factors). (31st of January 2019).
- Organization of two focus groups for the development of the University hospital research website (June 2019).

Projects

TRUE-HIT – Tool for reporting usability evaluations of health information technology

Background: There is no more need to prove that human factors and usability practice for health information technology should be supported by scientific evidence. The ideal way to achieve this evidence is to perform literature review. Unfortunately, currently human factors and usability studies of health information technology are poorly reported in journal papers. There is a need for standardization of those scientific publications. The aim of the TRUE-HIT project is to develop a framework to support the scientific reporting of Human Factors and Usability studies of Interactive Healthcare Technologies. Several phases consisting in searching the literature, Delphi study, and workshop led to a list of items that should be included in human factors and usability studies with the ultimate goal to get material. The formal presentation of the framework is under construction.

Publications (excerpts)

2019

1. How to approach user-based testing of eHealth with older adults: insights from an expert-based workshop. Windenbos GA, Marcilly R, Jaspers MW, Peute L. Journal of Biomedical Informatics. (revision)
2. The validation of a new online cognitive assessment tool: The MyCognition Quotient. Domen AC, van de Weijer SCF, Jaspers MW, Denys D, Nieman DH. Int J Methods Psychiatr Res. 2019 Feb 13:e1775. doi: 10.1002/mpr.1775. [Epub ahead of print]
3. Building Usability Knowledge for Health Information Technology: A Usability-Oriented Analysis of Incident Reports. Marcilly R, Schiro J, Beuscart-Zéphir MC, Magrabi F. Appl Clin Inform. 2019 May;10(3):395-408. doi: 10.1055/s-0039-1691841. Epub 2019 Jun 12.
4. Usability and Usefulness of a Mobile Health App for Pregnancy-Related Work Advice: Mixed-Methods Approach. Van Beukering M, Velu A, van den Berg L, Kok M, Mol BW, Frings-Dresen M, de Leeuw R, van der Post J, Peute L. JMIR Mhealth Uhealth 2019;7(5):e11442. URL: <https://mhealth.jmir.org/2019/5/e11442>. DOI: 10.2196/11442. PMID: 31094353. PMCID: 6532337
5. Mobile health for older adult patients: Using an aging barriers framework to classify usability problems. Wildenbos GA, Jaspers MWM, Schijven MP, Dusseljee-Peute LW. Int J Med Inform. 2019 Apr;124:68-77. doi: 10.1016/j.ijmedinf.2019.01.006. Epub 2019 Jan 15.
6. EHR Usage Problems: A Preliminary Study. Wawrzyniak C, Marcilly R, Baclet N, Hansske A, Pelayo S. Stud Health Technol Inform. 2019;257:484-488.

7. Strategies in Electronic Medical Record Downtime Planning: A Scoping Study. Walsh JM, Borycki EM, Kushniruk AW. *Stud Health Technol Inform.* 2019;257:449-454.
8. Describing Telenurses' Decision Making Using Clinical Decision Support: Influential Factors Identified. Tuden DS, Borycki EM, Kushniruk AW. *Stud Health Technol Inform.* 2019;257:424-429.
9. Next Generation EHRs - What Problems Are These Systems Aiming to Solve? Schmidt T, Nøhr C, Vingtoft S, Turner P. *Stud Health Technol Inform.* 2019;257:370-374.
10. Modeling Keyword Search Strategy: Analysis of Pharmacovigilance Specialists' Search of MedDRA Terms. Marcilly R, Douze L, Bousquet C, Pelayo S. *Stud Health Technol Inform.* 2019;257:298-302.
11. Improving Access to Healthcare with On-Line Medical Appointment System. Leung W, Nøhr C. *Stud Health Technol Inform.* 2019;257:271-276.
12. Updated Mapping of Telemedicine Projects in Denmark. Kristensen MBD, Høiberg L, Nøhr C. *Stud Health Technol Inform.* 2019;257:223-228.
13. Canadian Validation of German Medical Emergency Datasets. Koczerginski J, Ho K, Golby R, Borycki EM, Kushniruk AW, Born J, Juhra C. *Stud Health Technol Inform.* 2019;257:212-217.
14. Use of Agile Project Methodology in Health Care IT Implementations: A Scoping Review. Goodison R, Borycki EM, Kushniruk AW. *Stud Health Technol Inform.* 2019;257:140-145.
15. Effects of Telenursing Triage and Advice on Healthcare Costs and Resource Use. Gidora H, Borycki EM, Kushniruk AW. *Stud Health Technol Inform.* 2019;257:133-139.

2018

16. The equity paradox: older patients' participation in patient portal development. Wildenbos GA, Jaspers M, Peute L. *Int J Qual Health Care.* 2018 Dec 20. doi: 10.1093/intqhc/mzy245. [Epub ahead of print]
17. How do patients value and prioritize patient portal functionalities and usage factors? A conjoint analysis study with chronically ill patients. Wildenbos GA, Horenberg F, Jaspers M, Peute L, Sent D. *BMC Med Inform Decis Mak.* 2018 Nov 21;18(1):108. doi: 10.1186/s12911-018-0708-5.
18. Qualitative Evaluation of the Barriers and Facilitators Influencing the Use of an Electronic Basal Bolus Insulin Therapy Protocol to Improve the Care of Adult Inpatients With Diabetes. Helmle KE, Edwards AL, Kushniruk AW, Borycki EM. *Can J Diabetes.* 2018 Oct;42(5):459-464.e1. doi: 10.1016/j.jcjd.2017.10.059. Epub 2018 Feb 1.
19. Older adults using a patient portal: registration and experiences, one year after implementation. Wildenbos GA, Maasri K, Jaspers M, Peute L. *Digit Health.* 2018 Sep 2;4:2055207618797883. doi: 10.1177/2055207618797883. eCollection 2018 Jan-Dec.
20. Findings from the 2018 Yearbook Section on Human Factors and Organizational Issues. Pelayo S, Kaipio J; Section Editors for the IMIA Yearbook Section on Human Factors and Organizational Issues. *Yearb Med Inform.* 2018 Aug;27(1):79-82. doi: 10.1055/s-0038-1667074. Epub 2018 Aug 29. Review.
21. Evidence-based usability design principles for medication alerting systems. Marcilly R, Ammenwerth E, Roehrer E, Niès J, Beuscart-Zéphir MC. *BMC Med Inform Decis Mak.* 2018 Jul 24;18(1):69. doi: 10.1186/s12911-018-0615-9.

22. Aging barriers influencing mobile health usability for older adults: A literature based framework (MOLD-US). Wildenbos GA, Peute L, Jaspers M. Int J Med Inform. 2018 Jun;114:66-75. doi: 10.1016/j.ijmedinf.2018.03.012. Epub 2018 Mar 27. Review.

Participation - Engagement and participation in IMIA and health informatics events and activities by members of your WG/SIG

Organization of a successful workshop on "Artificial Intelligence Applications Enabling Clinical Decision Support" with several IMIA HIS WG members: Christian Lovis, Carlos Parra Calderòn, and myself at the EFMI STC in Zagreb in October 2018.

Organization of a successful workshop at the Medinfo 2017 conference: "Unstructured Clinical Data Reuse for Precision Medicine". Details at <https://sites.google.com/view/unstructured-data-reuse/>

Outreach - Recruitment and engagement of new members and target communities, publicity and representation at major events and/or on social media

Recruitment: The LinkedIn page we created for WG members communication is still regularly used. Search for new WG leadership was realized in mid-2018, unsuccessfully, and is again ongoing for 2019.

Current number of members: 35

Collaboration - Working with other IMIA WG/SIGs or external organizations or institutions (Please state the types of the collaborations and achievements of each collaboration attempted)

Collaborations with the AMIA, as submissions of proposals for a panel and a workshop focused on clinical data reuse at the fall 2016 annual conference and 2017 TBI/CRI summit; both submissions were unfortunately not accepted.