# Improving the User Experience of User Experience Methodologies in Digital Health Tool Development

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**Abstract.** This workshop addresses the gap in knowledge and application of usability evaluation methods and user experience techniques in digital health tool development. Participants will explore the landscape of user experience and usability evaluation methodologies, engage in group discussions to uncover practical barriers and facilitators, and are presented with an overview of tools for real-life applications. Aimed at medical informaticians and other interested participants, this session aims to demystify some of the user experience disciplines, terms and methodologies, enhance practical skills, and foster an environment of shared learning and discussion. The insights gained might contribute to a position paper on advancing user experience and usability evaluation methodologies in digital health tool development.

**Keywords.** User-centered design, Digital health technology

## 1. Topic

The importance of User eXperience (UX) and Usability Evaluation Methods (UEMs) are particularly pronounced in Digital Health Tools (DHTs), where the stakes are high and the challenges are significant. As DHTs proliferate, integrating Artificial Intelligence (AI) promises solutions but also demands the rigorous application of methods and techniques to accurately measure and design for usability. Additionally, the introduction of the Quality and Reliability Assessment of Health Apps (ISO/TS 82304-2) highlights the importance of highly usable DHTs [1]. In practice, however, the amount and application of different UX and UEM methodologies steadily grows and such methods can easily be applied without truly grasping the underlying theories of these methods. Furthermore, discrepancies in application and a lack of alignment across various disciplines—such as human-computer interaction, human factors engineering, and user experience—further complicate matters. Terms and methodologies often get muddled, with varying interpretations and implementations across different fields. Conducting UEMs and UX methods in DHTs can be confusing and overwhelming, marked by a lack

of clarity about which methods are appropriate for different scenarios and how to effectively implement them [2,3]. There is an abundance of literature offering a variety of methodologies, yet practical application remains a challenge that requires specific expertise—expertise that is often lacking. This workshop aims to demystify these complexities by exploring the methodologies and frameworks currently in use in DHT development, identifying facilitators and barriers, and discussing the discrepancies in their practical applications. The workshop will focus on advancing the application of UX methodologies to foster the development of highly usable DHTs, thereby supporting healthcare practices in improving patient care through better digital tools.

## 2. Rationale and outcomes

In this interactive workshop we want to equip participants with a clearer understanding of the terminologies and disciplines related to user experience and usability, and how these can be applied in practice to optimize user interaction and functionality. Furthermore, the workshop will provide attendees with an overview of tools for setting up a real-life study design. In addition, we hope to learn about various viewpoints and experiences with UX approaches throughout this hour, as well as the facilitators and barriers that participants have faced or that prevent them from utilizing these methods in real-life settings. These findings could be used to help write a position paper on the current landscape of UEM and UX methodologies for DHT development and what is needed to equip Medical Informaticians better in the future when venturing out into UX research.

## 3. Program

This interactive workshop will be organized in four parts (Table 1). First, the evolving landscape of UX and UEM disciplines, frameworks and methodologies for DHT development will be introduced. Participants will then be divided into guided smaller groups depending on their previous experiences with UX/UEM in DTH and/or IT development. In these groups a guided discussion will take place based on a set of predetermined questions to uncover perceptions, facilitators and barriers for the application of such methods. The group discussion aims to compare the answers of the group and categorize lessons learned from the discussions and what is needed to help further improve the user experience of such methodologies. Lastly, at the wrap up we will inventorize the lessons learned and close off with tools and tips to advance the application of these methods for different DTHs and provide a closing statement.

**Table 1**. Workshop schedule and activities

| **Duration** (min) | **Activity** | **Description** |
|---|---|---|
| 15 | Introduction UX/UEM disciplines, frameworks and methodologies | Introduction to the scope of associated disciplines with user experience and applications thereof in digital health technology development. |
| 20 | Discussion in small groups | The audience will be divided into small groups based on experiences with UX/UEM methodologies. Each group will be presented with a |

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| | | number of questions about their (lack of) experience. |
| 15 | Overall group discussion | Guided group discussion comparing answers, application of methods and test plan barriers and facilitators previously discussed in each group. |
| 10 | Wrap up | Inventory of lessons learned and to provide tools and tips to advance the application of these methods for different DHTs and a closing summary. |

## 4. Workshop team

**Liesbeth van den Berg** is a Medical Informatics lecturer and researcher at the Amsterdam UMC, location University of Amsterdam, for the eHealth Living & Learning Lab. She coordinates courses on the subjects of eHealth user experience design/research and management communications. She will introduce the topic of UX/UEMs, disciplines, methodologies and its applications in DHT development, and assist in the wrap up of the workshop.
**Romaric Marcilly** is a researcher at Lille academic hospital and Lille university. His research focuses on the evaluation of the usability and the usage of health technologies. He also works on the evaluation of the impact of technologies on the professional and domestic work systems and on how the work system impacts the usage of technologies. He will facilitate one of the group discussion groups.
**Thomas Engelsma** is an assistant professor in Medical Informatics at the Amsterdam UMC, and coordinates courses on eHealth design and evaluation. His research focuses on inclusive design and usability evaluation of digital technologies for and with vulnerable patient populations. He will facilitate one of the group discussion groups.
**Linda Peute** is associate professor and director of the eHealth Living & Learning Lab of the Amsterdam UMC and manages the research Center on Human factors Engineering in Health Informatics. She coordinates the electives program on sustainable eHealth in the Master's program of Medical Informatics. She will facilitate one the discussion groups and lead the group discussion and wrap up.

## References


[1] Health software - Part 2: Health and wellness apps - Quality and reliability (ISO/TS 82304-2:2021) [Internet]. [cited 2024 May 13]. Available from: https://www.iso.org/obp/ui/en/#iso:std:iso:ts:82304:-2:ed-1:v1:en

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## Endorsement

The IMIA working group on Human Factor Engineering (HFE) and the EFMI working group on Human and Organizational Factors in Medical Informatics (HOFMI) endorse this workshop.