Needs to consider when adapting an IoMT solution to mixed home care

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Healthcare systems across the globe face extensive challenges and are simultaneously met with an increasing demand for long-term care from the aging population. Mixed home care, combining formal and informal care at home, is a growing market, where Internet of Medical Things (IoMT) solutions offer opportunities for efficiency and personalized care. This master thesis explores the needs to consider when adapting existing IoMT value propositions to the mixed home care market.

Introduction

Across the globe, healthcare systems are under pressure and challenged by increasing costs and workforce shortages (Malani, 2023). Simultaneously, a demographic shift and increasing prevalence of chronic diseases increase the demand for long-term care (Siegel, 2023). In addition, the elderly prefer to remain in their home as long as possible and receive home-based care when feasible (Lehnert, Günther, Hajek, Riedel-Heller & König, 2018) The increased demand for long-term care, the preference for home care and the budget restraints on the healthcare system drive the demand for mixed home care where formal and informal caregivers provide care side by side (OECD, 2023).

Amid the challenges in healthcare, technological advancements such as artificial intelligence and Internet of Medical Things (IoMT) offer promising opportunities to reduce the workload for healthcare workers and increase focus on patients and caregivers, not least in mixed home care (Wicklund, 2023). However, seizing these opportunities requires a comprehensive understanding of the evolving market and technological advancements.

Purpose

The thesis aims to identify, understand, and compare different needs to consider when adapting a value proposition for an IoMT solution for mixed home care.

The study is delimited to the Swedish market, and the healthcare domain of urinary incontinence (UI), as this is a condition strongly

connected to aging and highly prevalent among patients with mixed home care. Moreover, the study is limited to elderly patients (65+) receiving prescribed aids.

Method & Theory

The thesis takes an abductive and flexible approach, where empirics are altered with analysis. While the study has an overarching normative purpose, aiming to provide advice on needs to consider, it is divided into two distinct phases. The first phase is descriptive, aiming to describe the context, UI, care provision, and the actors involved. This phase provides necessary understanding and provides conclusions regarding whose needs are to be further explored. The second phase has a more explorative nature, where the unknown needs of the selected actors are explored through semi-structured interviews with open-ended questions. In total, the thesis utilizes qualitative data from 27 interviewees.

Case Study

Moreover, a case study of a specific IoMT solution within the UI domain is conducted, to draw conclusions regarding how an existing solution can better be adapted to mixed home care. The solution, called Solution X, consists of a wearable sensor connected to a digital platform. It has three main parts: the *assessment tool*, which assists in pad selection by measuring urine leakages for 72 hours, the *real-time monitoring tool*, which continuously monitors pads' moisture levels to inform when pad changes are necessary, and *overarching functions*, such as educational material and support functions. The current target segments of Solution X are *informal home care* and *formal nursing home care*, however, the case company wants to explore mixed home care as a potential segment, making it suitable for the thesis's purpose.

Marketing Frameworks

The thesis utilizes previous research and models in business marketing, healthcare system analysis, innovation, and value proposition design to guide data gathering and analysis. The different models construct the thesis's theoretical framework in figure 1, building on the two phases discussed in the previous section.

To analyze Solution X, research regarding value propositions as well as the *three levels of a product* by Kotler, Wong, Saunders, and Armstrong (2005) are utilized. The theory provides a fundamental understanding of Solution X's core value and the features and supporting benefits that deliver the core value. Moreover, *patient journey mapping* is utilized to describe the patient's UI care journeys, with the *swimlane map* chosen to emphasize the involved actors as suggested by Jun, Ward, Morris, and Clarkson (2009). This sets the basis for which actors to further analyze. Finally, to select which actors' needs to explore, the *buying roles* by Osterwalder, Pigneur, Bernarda, and Smith (2014) are combined with *stakeholder mapping* as described by Johnson, Whittington, Scholes, Angwin, and Regner Scholes (2017).

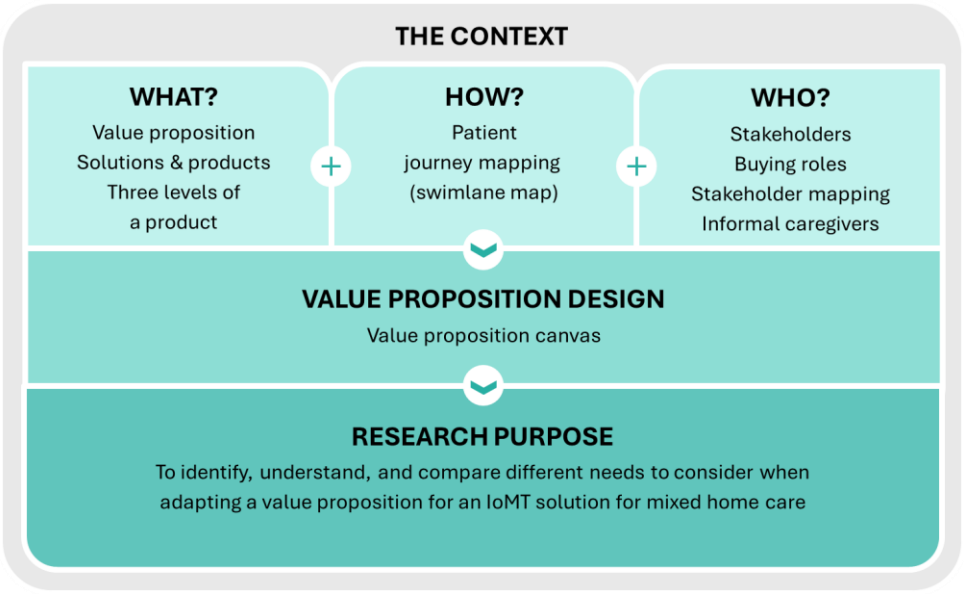

Figure 1: The thesis's theoretical framework.

Through an analysis of what role the actors have in the buying process of UI aids and their power and interest in the selection of UI aids, a final selection can be made of which actors needs to explore further.

Value Proposition Canvas

Having understood Solution X and selected actors to focus on, the *value proposition canvas* by Osterwalder et al. (2014) is utilized to identify and analyze their needs. Furthermore, the canvas guides the effective collection of insights on needs during interviews. Looking closer at the canvas itself it is two-sided to capture both the needs of the customer and the value the solution provides. The authors suggest creating *customer profiles* for different customer segments, where their *jobs* (what they want to achieve), *pains* (challenges in doing so), and *gains* (the best-case scenario) are identified. The other side consists of a *value map*, where a certain value proposition is analyzed based on its *products and services* (elements of the value proposition), *pain relievers* (how it aims to target customer pains), and *gain creators* (how it aims to achieve customer gains). The fit between the two sides can then be evaluated by studying how well the value map targets the needs of the customer profiles.

Comparative Analysis

Having identified and understood customer needs, a comparison is performed as per the thesis purpose. The comparison is two-folded, as illustrated in figure 2. First, the needs of actors in the different studied care scenarios (mixed home care and the two current target segments for Solution X) are compared, to identify how the needs in mixed home care stand out.

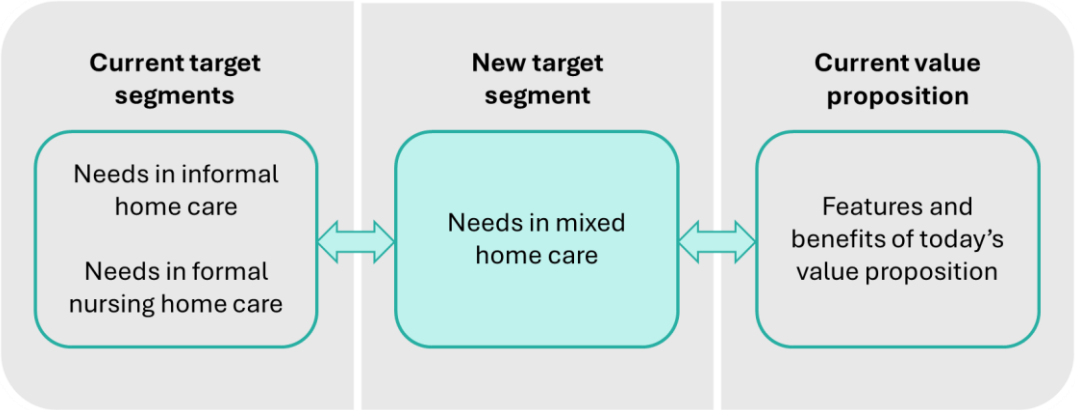

Figure 2: The comparative analysis.

Second, the needs in mixed home care are compared with the current value map of Solution X to identify which needs are unaddressed. The unique and unaddressed needs in mixed home care are the needs to particularly consider when adapting IoMT value propositions to suit this market.

Results

The UI care provision is similar across care scenarios, only the involved actors in each phase of the care journey differ. The actors identified as critical to study further are the patient, informal caregiver, care assistant, and prescribing nurse as these hold a high influence and interest in the prescription of UI aids and design of UI care plans.

While many fundamental and UI-specific needs are similar across care scenarios, four overarching needs to consider when adapting Solution X to mixed home care are identified. Looking beyond Solution X and the UI domain, conclusions can be drawn for general IoMT solutions for mixed home care.

Firstly, actors in mixed home care seek reassurance regarding the patient's well-being and the quality of care, which could be addressed through sharing selected data gathered by the IoMT solutions.

Secondly, IoMT solutions must be adapted to suit existing routines within mixed home care, acknowledging the inflexible schedules, the need for multiple users, and the difficulty in initiating new routines.

Thirdly, there is a significant need for convenient communication and documentation methods. IoMT solutions can help establish communication channels, provide data for fact-based decisions, and facilitate accessible, on-the-go documentation.

Finally, actors in mixed home care express an extensive need for knowledge and education, where IoMT solutions can incorporate accessible guides and educational material.

Summary

In summary, the thesis identifies four main needs to consider when adapting value

propositions for IoMT solutions to mixed home care: reassurance, routines, communication and documentation, and knowledge. This adds to the academia's and industry's understanding of needs to consider in mixed home care, facilitating effective adaption of value propositions to deliver the maximum value to users in the growing mixed home care segment. Additionally, it demonstrates how the value proposition canvas can be utilized in customer-centric innovation of existing value propositions.

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