REVIEW PAPER

User experience and design thinking as a global trend in healthcare

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ABSTRACT

Human-centered design describes a process and methodology that begins and ends with accommodating the needs and desires of our end users — the patients, families, providers, and other stakeholders, who each play a crucial role in the innovative healthcare creation process. Based on the desktop research it was found that human-centered design methodologies and tools are trending in the different fields and areas of healthcare design systems. It was found that customer-centric approach is the key fact of innovation creation process whether it is product or service, technology or organization level. The conclusion is that it is time for healthcare to start solving real people problems by implementing the human-centered approach in order to achieve high results and create innovative solutions that will match their customers and stakeholders needs and desires.

Keywords: human-centered design, innovation, patients.

Introduction

Successful future healthcare systems should have the ability to innovate in delivering services that cut across organizational, political, geographical and sectorial boundaries, whether they are private or public. In the modern world, when the industries are falling, and rapid technology innovations are changing both business and social world, the need of flexibility and innovation in the sectors are the key for their long-term existence. The importance of constant innovation and improvement are also crucial for the healthcare system long-term persistence. The system has to change their archaic management and functional concepts and implement flexible and lean methodologies such as Design Thinking and User Experience Design. "The god news is that healthcare is not alone in facing this challenge of developing board-based competency and capacity to innovate within complex systems. High-ly competitive and rapidly evolving industries, such as customer electronics, have succeeded in doing so by identifying and understanding customers latent needs, and challenges as the basis for developing executive and marketable solutions that meet customer expectations" [1]. There is a strong believe based on facts and the history of the sectors that health care both in public and private sector has to apply technological, product or systematic innovative changes that will deliver seamless, compelling, and effective stakeholder and user experiences. In this article I will consider the current and potential future value that Design Thinking and User Experience Design may offer healthcare management to improve their flexibility and inattentiveness.

Definition

User Experience (UX) and Design Thinking are the common and popular concepts and theories

existing in both business and social world that are so closely related to the practical world, that researchers often says that there is no theoretical body staying behind these concepts. But every single concept has its own definition whether it comes from the theoretical or practical world. It is also crucial to realize that these three concepts are different, and nowadays in the modern world most of the people do not see and notify the difference between theme, using the theme as one core concept of human-centered design in every field of business and social life. There also is some true cause every single concept mentioned above is the part of a human-centered design.

To understand the difference between these concepts and their implementation in the real world it is key to understand the definition of every single one separately. As it was mentioned above, all of these concepts are mostly popularized as a part of human center design approach. In the ISO 9241–210 definition, human-centered design is „an approach to systems design and development that aims to make interactive systems more usable by focusing on the use of the system and applying human factors/ergonomics and usability knowledge and techniques" [2]. The definition focus on the interaction, system and human needs which are also a crucial part of user experience and design thinking. In his book Change by Design, Tim Brown, CEO of IDEO, leading Design Thinking consulting agency, describe Design Thinking as "a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity" [3]. On the other hand, professor of form theory and head of the Industrial Design department Paul Hekkert define user experience as "the entire set of affects that is elicited by the interaction between a user and a product, including the degree to which all our senses are gratified (aesthetic experience), the meanings we attach to the product (experience of meaning), and the feelings and emotions that are elicited (emotional experience)" [4]. The complexity of terminology and problems with its use, perfectly explain Don Norman, previous Apple Computer manager and world-famous designer and researcher. In his book, he explains his effort as follows: "I invented the term because I thought human interface

and usability were too narrow. I wanted to cover all aspects of the person's experience with the system including industrial design, graphics, the interface, the physical interaction, and the manual. Since then the term has spread widely, so much so that it is starting to lose its meaning… user experience, human centered design, usability, all those things, even affordances. They just sort of entered the vocabulary and no longer have any special meaning. People use them often without having any idea why, what the word means, its origin, history, or what it's about" [5]. As Don Norman marked in his vast definition of user experience, people often use different concepts to name the process of applying human centered design methods into business and social interaction processes and situations. The same situation is in the healthcare, there is no difference if the researchers using terms Design Thinking or User Experience Design, applying universal values from both concepts into real-life problems. The same sort of thinking is observed in the Design Thinking: Past, Present and Possible Futures article in which authors comment that "As social constructionists, we regard an approach that begins with the question, 'What is design thinking?' as an essentialist trap. We do not believe that there is a unique meaning of 'design thinking', and accordingly, we should not look for one. Instead, we look for where and how the concept is used in different situations, both theoretical and practical, and what meaning is given to the concept" [6].

Current situation

"In healthcare, Design Thinking has been carried out as a method for improvement work and innovation within different organizations in recent years, primarily in the United States. The purpose of using Design Thinking and how it has been implemented varies, but usually, the work is oriented towards product development, process improvement, or redesigning patient or employee experiences" [7]. Context of Design Thinking using in healthcare organizations is the very base for the trend in Design Thinking and User Experience Design approaches to solving problems in case of products, services, technologies and management. Following organizations that successfully implemented Design Thinking into their

roots, we can easily notice the key trends and functions of Design Thinking and User Experience Design approaches being implemented onto the organizations.

› Implementation of Design Thinking tools and methods into strategic and operational problem solving learnt by employees and managers. This approach has been made by GE Healthcare. The aim of the company was to equip the employees with tools to manage problem-solving with much more imagination and creativity than before. The organization has had much focus on Six Sigma as a method of improvement but want to change focus from only operations efficiency towards "imagination at work". The new approach implementation tends to be difficult for some, much due to the discomfort included in rethinking the ways of working and regarding yourself as a designer of the organization. The results from their increased design activity have been described as a booster of innovation and thus the bottom line [8].

› Creation of new business units and services in the organization using Design Thinking tools, and methods. This approach has been made by Memorial Hospital of South Bend. In 2002 they turned to IDEO (a worldwide known consulting agency in the field of Design Thinking) to get help regarding developing a new heart and vascular center for the hospital. In the first part they observed and analyze customers, technology and competition. In the second phase called "Deep Dive", series of three, two-day gatherings focused on brainstorming, visualising and ideation process. The "Deep Dive" activities acted as an eye opener for the involved from the hospital: "I look deeper and see things I've never seen before... how people really interact with each other." Finally, several problem/improvement areas were isolated and addressed, that incrementally help the Hospital in the creation of the new business unit of the organization [9].

› Creation of centers and incubators for new ideas to be evolved to become ready for incorporating into the care delivery. This approach has been made by Mayo Clinic. In 2008 they set up their very first bridge between Human Centered Design methodologies and medical practice. Their Center for Innovation uses

structured methodologies to increase the work of innovation and acts as an incubator for new ideas to be evolved to become ready for incorporating into the care delivery. The Center for Innovation has an in-house lab where observations, interviews and research of patients, relatives and "traditional consumers" are made. Further, they work with visualization, modelling, prototyping and testing of possible healthcare delivery solutions [10].

› Better patient needs and expectations understanding, assessment and implementation of the human-centered approach. This was the way Chief Andrew Isaac Health Clinic in Fairbanks used Design Thinking methodology to understand the patients as well as the problems and conditions. The designers went out to see how the people lived in order to understand their culture, sense of community and expectations for a healthcare provider. Further, they did extensive work on understanding the problems and conditions in the former facility. This work resulted in an entirely new model of how to deliver care to the patients in the new facility [11].

› Implementation of the Design Thinking methods as the basis for creating innovation oriented strategies. This approach has been made by Kaiser Permanente the largest managed care organization in the United States. Together with IDEO in 2003, their set up a small team working with a DT approach with the expressed purpose to develop better and more efficient processes for some of their high-value activities. Through appropriation of a human-centered design process closely related to IDEO's framework, they undertake carefully chosen projects and improvement areas aiming to improve the care experience for the patients and work experience for the employees [12].

› Empathy development by bringing together healthcare stakeholders, employees, managers and patients. This approach was made by Cleveland Clinic. They create an annual event "Patient Experience Summit" which brings together patient experience leaders, healthcare CEOs, innovators, nursing leaders, policy makers, major stakeholders, industry experts and patients who are committed to not just the patient or caregiver experience, but also

the human experience. The theme of this year's three-day inter-professional conference is Empathy Where You Are and features expert speakers, panel discussions and workshops representing multiple healthcare professions and disciplines engaged in exploring innovative ways to demonstrate empathy and provide value to patients and caregivers throughout their journey of care. As caregivers, improving the patient experience is our collective responsibility. Success comes from the ability to work together, network, share best practices and challenge each other to identify new ways to practice [13].

› Implementation of the Design Thinking methodology to planning and creation the whole new part of the organization (a new hospital). This approach was held at Stanford Hospital. SHC administrators have also incorporated design thinking into planning the new Stanford Hospital, scheduled to open to patients in 2018. Recently, SHC staff used design thinking to complete a plan to redesign two nursing units in the current hospital to serve only patients with cancer. "Patients and their families were involved from the start," said Helen Waters, a design and innovation leader with Stanford Health Care. "We wanted to know what they needed and what they felt was missing." The process included seven months of conducting interviews and tabletop exercises and simulating actual work routines in the proposed layouts of the nursing units to be redesigned [14].

› Using Design Thinking methodology to develop new tools and technologies that can help healthcare users getting knowledge and creating their own highest quality expected experience. This approach was made by MedStar Health working with a Bethesda-based tech startup firm, Mytonomy, to pioneer a novel approach to patient education that delivers individualized instruction through a unique microlearning software platform that can be accessed from anywhere via the internet. Based on a highly successful pilot with interventional cardiology patients at MedStar Washington Hospital Center, MedStar and Mytonomy announced today that they are expanding the project to cardiovascular patients across the system and will be adding

new learning modules to address other types of procedures and conditions [15].

› In order to innovate in health care, there is a strong need to redesign how medical universities train and teach doctors of the future. This approach was made at Thomas Jefferson University. As Stephen Klasko, an MD with an MBA, who is CEO of Jefferson Health System and Thomas Jefferson University says, "We take students during their first year of medical school, and we teach them design methodology. This involves empathy, rapid prototyping and iteration, and we teach them before they enter their pre-clinical years how to solve health care problems through design methodology — to really think outside the box and become creative problem solvers" [16].

All of the examples mentioned above show that Design Thinking and User Experience Design is a huge trend in the world healthcare nowadays. Unfortunately, when we would like to reach of these methods implementation examples in Poland it will be hard to find it. In our local healthcare systems, there are almost no examples information about successful implementation of Design Thinking or User Experience Design. There are only a few cases of Polish companies working on a product or service using Design Thinking methodology. One of the examples is Husarska Design Studio. Using Design Thinking methods and tools they designed in cooperation with rehabilitation specialists an innovative rehabilitation robot Luna EMG for a foreign contractor EGZOTech [17]. There is still huge perspective on implementation of this trend in Polish healthcare reality.

Future trend predictions

It is crucial to understand that in the near future Human Centered Design methodologies will become the main triggers of innovation in healthcare. These innovations will appear in three different sections:

› Products & services. Soon we will see more innovations created by Design Thinking approach than ever before. New products and services will be developed on the basis of the user center design approach. The users will be deciding, whether the product or service match their needs or not. As an example of

Design Thinking approach implementation in new products and services creation is an idea of a young Hungarian designer, Ádám Miklósi to redesign the traditional ECG Holte. He faced the challenge of using a great technology in minimum size and applying some kind of patches onto various skin types for a longer period of time. The result is a colorful, waterproof and minimally-sized wearable design called the Dab, which is easy to apply on the body and results in accurate measurements. The future will bring more and more solutions where designers and healthcare professionals work together. And as patients will be the point-of-care and people will take care of themselves better – we need the successful symbiosis of the two fields more than ever before.

› Teaching process. In the rapidly changing world, the need to innovate and change dramatically increase. There is a strong need in the medical university students teaching process change. According to Matthew Trowbridge, MD, an associate professor of emergency medicine at the University of Virginia School of Medicine, design thinking is one way to prepare students for a career characterized by change. "Health care is changing so fast that for a first-year medical student, it's almost impossible to predict what clinical care will look like during their career." He called it "almost irresponsible" to not provide students with a structured response to manage change [19].

› Technology. The technology will profoundly change how the modern healthcare and medicine is working on. This does not have to be advanced science. As an example of Thomas Jefferson Medical University students show, we can use the technology we have today to change the products and services of tomorrow. Dr Ku, an emergency medicine doctor, and his colleagues introduced a course that pairs medical students with architecture students. The group is using design thinking to develop a digital mapping tool that uses GPS-like software to understand how patients, doctors and nurses move about and interact in the emergency room, with the aim of improving communication and decreasing wait times [20].

› Organization. Hospitals and medical centers as an organizations are also forced to change by their patients and staff working there. The change is urgent, that is why developing patient-centered experience it the key step to change the entire organization. This tailored, human-centered approach to problem-solving is the foundation of design thinking. Hospitals versed in design thinking would identify this general challenge and then assign a team or task force (ideally a multidisciplinary one) to spend weeks or even a few months studying the patients it affects. The team would use qualitative research methods, such as surveys, focus groups, and observations, to better understand people's experiences [21].

Summarize

There is no doubt that Human Centered Design methodologies are significant trends in the healthcare system improvement and innovation. There are a dozen examples how Design Thinking and User Experience Design can make a positive and significant impact on the whole industry. There are many more examples that can be the finest proof of Human Centered Design methodologies as an innovation catalyst in healthcare. Cases mentioned in this article are just a few of the vast spectrum of methodology capabilities in innovation creation and implementation.

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