

A review of Human-Centred Design: ISO 9241-210

Introduction

User Experience (UX) “encompasses all aspects of the end-user’s interaction with the company, its services and its products” (Norman & Nielsen, n.d.). As part of the user experience, this report will explore human-centred design. The concept of human-centred design and its fundamental principles that will help enhance the user experience will be addressed in this report. To discover how human-centred design is applied to everyday technology and software, a case study will be examined.

ISO 9241-210: Human-Centred Design

The International Organisation for Standardisation (ISO) is an international, voluntary, non-governmental organisation with 165 standard bodies (ISO, n.d.). “ISO 9241-210 – Human Centred Design for interactive systems establishes guidelines for interactive computer-based systems over its life cycle. During the design processes, these guidelines are presented to designers in ways that both hardware and software components of interactive systems can improve human system interaction and perception” (ISO, 2019).

Also known as User-Centred Design, Human-Centred Design (HCD) can be described as an approach by designers that places users’ needs and behaviour at the heart and core of their products or systems at every stage of the problem-solving process (Babich, 2018). As a result, designing from a point of view also means that they will accept the concepts with positive feedback.

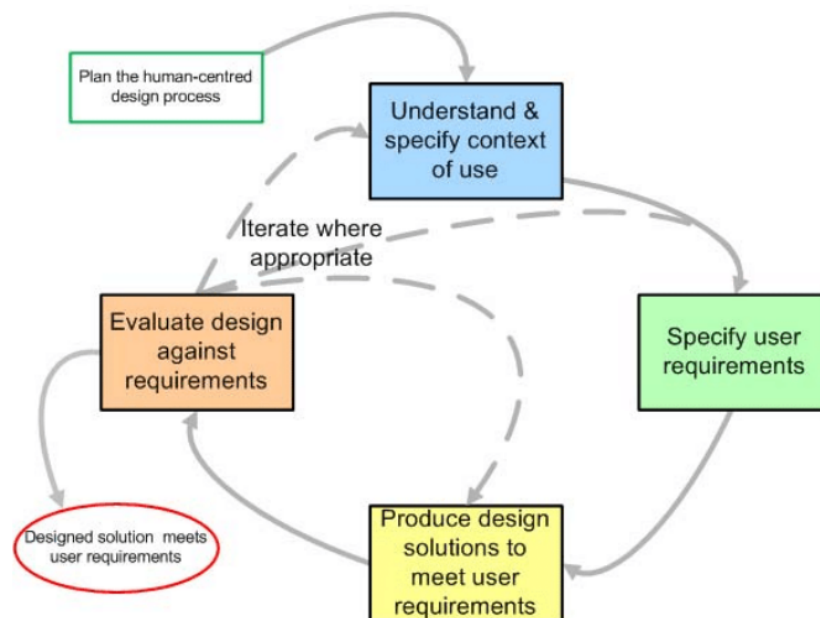


Figure 1: The human centred design process (ISO 9241-210)

Developing a design around users is one of the fundamental principles of Human Centred Design. This is because users are who interacts with designers’ product. As a result, it is

important that designers know who their audience are especially during the planning phrase. And helps in identifying the user journey and requirement. Finding the right problem is another fundamental principle of HCD. Donald A. Norman suggests that “designers need to focus their attentions on the cases where things go wrong, not just on when things go right.” (Norman D. A., 2013). Meanwhile, it is important to identify the problem that is worth solving. Alternatively, designers first need to spend time deciding what basic, fundamental issue needs to be dealt with. They only need a solution when the real problem has been identified and they need to explore a wide variety of possible solutions instead of addressing the issue immediately. This approach is known as design thinking (Norman D. A., 2013). It is important for the designer to test or review prototype by users to distinguish what aspect of features needs improving and finding potential problems. And to also ensure that it satisfies the requirement of the customer.

CNH Industrial

Before the products or systems are physically realised, digital emerging technologies can help simulation-based engineering for preventive research. The methodology allows the user experience to be evaluated based on the analysis of the communication between human beings and the virtual product or system. This is done by gathering data from a collection of metrics, appropriately chosen for the particular case study, on behavioural and cognitive responses (Grandi, Peruzzini, Zanni, Campanella, & Pellicciari, 2018, p. 703).



Figure 2: The simulation mock-up and integrated VR environment by motion picture (Grandi, Peruzzini, Zanni, Campanella, & Pellicciari, 2018, p. 707)

CNH Industrial is a global agriculture and industrial vehicle producer. In order to create an immersive mixed reality set-up to facilitate human-centred design of industrial goods, it uses digital simulation and virtualisation through the use of VR technologies.

Figure 2 shows a mock-up of a tractor cabin in front of a big screen to simulation a real-life condition. The focus of the study is to analyse the “user experience on tractors, with the final aim to support human-centred design. The study is based on the virtualisation of the cabin, where the tractor driver works and interacts with commands and controls, and the monitoring of driver’s physical and mental workload to understand the level of comfort, the

usability of the interfaces, the level of stress, and the perceived quality. As a result, improve the cabin design on the basis of human performance and users' feedback". (Grandi, Peruzzini, Zanni, Campanella, & Pellicciari, 2018, p. 707).

The CyClaDes Project

There have been ergonomic problems with the design of ships and on-board equipment recorded in the maritime industry. As a result, it hinders the performance of the crew and raises the probability of wrongdoing and, ultimately, leads to negative outcomes from maritime operations (Vu & Lützhöft, 2020). Accident investigations show that the majority of ship accidents are caused by human error in one way or another (Merwe, Kähler, & Securius, 2016, p. 1611).

The CyClaDes Project (Crew-centred Ships and Ship System Design and Operations) is an EU-funded project aimed at promoting HCD in the maritime industry. An HCD system design approach that takes into account of the user (crew) in order to make the equipment more accessible for them, taking into account the specific requirements of the crew, the on-board ship working environment and the sense of usage (Merwe, Kähler, & Securius, 2016, p. 1614).

Conclusion

Applying human-centred design is almost essential in this saturated digital world where people have become demanding and very sophisticated, in order to gain trust, loyalty and build brand recognition. Human-centred design is part of our daily lives and is embedded in everyday objects around us. All the HCD principles according to Figure 1 are essential at every step of the way to satisfy user requirements and, as a result, improve the user experience (Philips, n.d.). Overall, "Human-centred approaches to design contribute to innovations in engineering design and have been shown to increase productivity, improve quality, reduce errors, improve acceptance of new products, and reduce development costs" (Zoltowski, Oakes, & Cardella, 2013, p. 28).

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Images

Figure 1: By John Salatas - https://www.researchgate.net/figure/The-human-centered-design-process-ISO-9241-210_fig2_308883045

Figure 2: Grandi, F., Peruzzini, M., Zanni, L., Campanella, C. E., & Pellicciari, M. (2018). Digital Manufacturing and Virtual Reality for Tractors' Human-Centred Design. *International Journal of Computer Integrated Manufacturing*, p. 707. doi:10.3233/978-1-61499-898-3-702.

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