

Public Summary Bachelor Thesis

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Title: The design of a digital healthcare platform to support physiotherapy exercises at home.

Company: Awear

Public Summary

During physical rehabilitation, people with musculoskeletal injuries are often limited in their freedom of movement, constraining them in their daily life. Physiotherapy plays a crucial role in recovery, and it is essential that patients fully adhere to their treatment plan to speed up the recovery, lower the risk of injury and achieve treatment goals. However, most patients fail to adhere to the prescribed exercises at home, which can be prejudicial to their recovery process.

This graduation assignment intended to design a digital healthcare platform to support the performance and increase adherence to prescribed physiotherapy exercises at home. The design solution includes wearable sensors and an app for patients and physiotherapists. The patient will use wearable motion sensors that analyse each move and provide real-time feedback on performance, ensuring the exercises are correctly performed. The digital healthcare platform allows the physiotherapist to monitor each session remotely with access to every detail; this way, he can adjust each exercise based on the patient's performance, provide feedback, and send messages. At the same time, the patient can check the physiotherapist's feedback and progress or exercise performance results.

The project followed five phases of the Design thinking process. In the Empathize phase, a user research study and literature review were conducted to gather information about the problem and the user's needs. User research's main findings showed that patients fail to adhere to physiotherapy exercises at home due to many factors, such as lack of support and guidance during the execution of the activities. The literature reviewed demonstrated that motion sensor technology is a potential solution to support physiotherapy at home. Motion sensor-based systems can provide real-time feedback and guide patients to execute exercises correctly.

Next, In the Define phase, the digital healthcare platform based on sensor technology was defined as the design opportunity to support people in their physiotherapy process at home. After that, the goal design, design brief, and functionality ideation were worked out in the Ideate phase. The result was a list of functions that the patient and physiotherapist app should include in addressing the main needs encountered during physiotherapy at home. The functions include real-time feedback, checking progress and exercise results, receiving feedback from the physiotherapist, and scheduling the physiotherapist sessions into the agenda. The physiotherapist app's functions include physiotherapy program setup and monitoring adherence, progress, and exercise results.

Based on this phase, an interactive prototype was developed in Figma in the Prototype phase and tested to evaluate the application's user-friendliness, usefulness, and design in the Evaluation phase. Results from the testing showed a positive response to the design of the digital healthcare platform and seem to be a potential solution to support and enhance adherence to physiotherapy exercises at home. However, due to technical and time constraints, it was not possible to evaluate some features of the application. Nevertheless, this insightful information was turned into design guidelines and recommendations for later work on the topic. Overall, the project tried to provide a solution by designing a digital healthcare platform based on sensor technology. Its principal

function makes it possible to receive real-time feedback on the correct exercise's execution. In this way, patients can perform guided sessions at home, thus enhancing their adherence to physiotherapy at home and experiencing a successful and fast recovery.