

App for taking Measurements of Historic Windows

Degree programme : BSc in Computer Science | Specialisation : Distributed Systems and IoT
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Century-old windows are far away from the modern standards regarding thermic and acoustic insulation. Preserving their historic look by keeping and restoring the wooden frames, and only replacing the old glass, is the specialty of Quadra Ligna AG. I made their measurement procedure with this app less cumbersome, so the carpenters can stay busy restoring windows instead.

Introduction

The windows of old historic buildings are often one of the main reasons for a building's bad energy efficiency. Restoring such windows while preserving the aesthetics is the purpose of the industry partner Quadra Ligna. Apart from the woodwork in their workshop, taking precise measurements of the windows is necessary for, among other things, ordering the new insulated glass. This measurement process was a manual, **tedious two-person task**. With the thesis, an app was developed to optimize the measurement process.

The main motivation for the app was to reduce the effort needed to take measurements so that they can be taken **singlehandedly**. Additionally, a digitized workflow and a defined data structure allow the integration of other tools. A parallel project at the BFH-AHB uses that data for a CNC machine for automating steps of the actual window restoration. [Figure 2]

App

The app [Figure 1] is operable from a smartphone wristband so that the worker can use a measuring tape or a ladder while taking the measurements. The app is designed in a way so that critical frequent user inputs can be done without using the smartphone keyboard. Speech recognition is used for inputting these measurements. The app is developed with **Flutter**, a cross-platform UI toolkit developed by Google.

Outlook

The field tests with the industry partner yielded positive results so that the App can be used in production. New feature requests may arise after the company uses the app more frequently. Additionally, the app is currently storing all its data locally on the mobile device. In the future, a centralized client-server infrastructure may be more practical. The necessary steps for handing over the app for future development by the team of Dr. Ulrich Fiedler were taken.



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Figure 1 - App Screenshot for measuring a window with 2 sash-bars



Figure 2 - Collaborating with the BFH/AHB using the measurement data for their projects