Order Management Tool für 3D-Druck Dienstleistungen

Graduate

Joel Sauvain

Noah Stalder

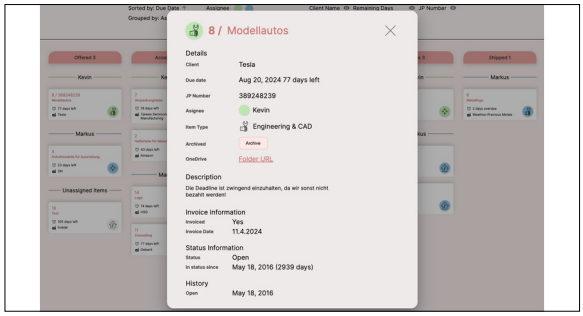
Problem: When a startup is founded, the focus is usually put on getting orders instead of implementing an adequate order management solution.
As the startup grows in orders and employees, the initial make-do solution may become insufficient and slow the business down in the long run. This was the case for our partners Change 3D, who provide various services in the 3D-printing environment. Their make-do solution consisted of printing out cards for each order. The printed cards were then filled in with details such as order number, title, and client name, and ultimately hung on a whiteboard.
As their business grew, the whiteboard became too full, making it more difficult to find orders and keep up with deadlines. This challenge led to the realization that a new solution is needed.

Approach / Technology: To solve the problems and alleviate the pain points of our partner, we set out to develop a tool that displays their orders on a kanban board. In close collaboration with our partners, we followed the principles of user-centered design that enforces an iterative process and focuses on an understanding of the users and their context in all stages. This enabled us to gain a deep understanding of their problem and allowed us to build an application tailored to their needs. Through a scheduler, written as a microservice in Kotlin, we integrated their Bexio where we fetch the orders from, to eliminate the necessity of manually creating an item for the board. The core of the application is a backend written in Kotlin, which receives the orders from the scheduler and stores them in a MongoDB. Additionally, the states and state transitions are managed in the backend, which automatically triggers actions on Bexio, further eliminating manual steps of the previous process. The frontend is written in Angular, communicating with the backend through a RESTful API, which allows for live updating using SSE.

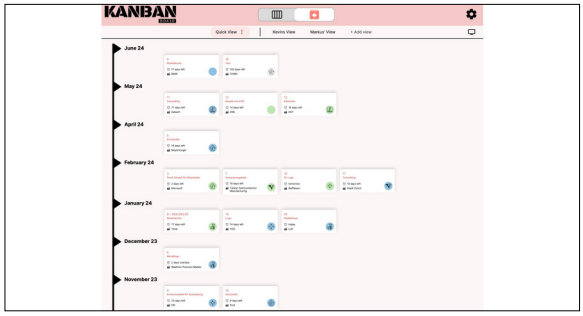
Result: The result provides a substantive improvement for the day-to-day business and order management of our partner, as determined by user tests. The core functionality is the board, which responsively displays the items in columns representing the states. Through drag and drop, an item can be moved into another state, which triggers the applicable action on Bexio. To improve the usability of the board and make it more practical for more use cases, there are various view options implemented, such as sorting, filtering, and grouping the items. On top of that, what is shown on each card is configurable and pieces of information can be hidden to further remove clutter from the board. Additional information can be stored and found on the detailed view of each card, such as assigning the item to someone, the history of the item, or an interactive 3D render of the piece that is being produced. After an item has gone through all the steps and the order is completed, it can be moved into the archive, which provides an insight into the orders that were completed across a timeline.

Board Grouped-By Assignee
Own presentment

Detail Information of an Item
Own presentment



Archive View
Own presentment



Advisor
Prof. Dr. Frieder Loch

Co-Examiner
Dr. Felix Ocker, Honda Research Institute Europe GmbH, Frankfurt am Main, HE

Subject Area
Application Design, Internet Technologies and Applications, Networks, Security & Cloud Infrastructure, Software Engineering - Core Systems

Project Partner
Change 3D, Siebnen, SZ