Discovering Potentials in Enterprise Interface Design: A review of our latest case studies in the enterprise domain

User interfaces in enterprise systems are primarily based on visualizations such as tables and forms, which are state-of-the-art since the middle of the 1990s. Additionally, most information is presented in a textual way and offers little capabilities to change the mode of presentation or the level of detail. The authors argue that these deficiencies are a major reason for existing usability problems related to the graphical user interface. Hence, this contribution presents four case studies, which aim to establish innovative visualization and interaction modalities in the field of enterprise systems.

MOTIVATION

Latest research in the field of enterprise resource planning (ERP) has primarily focused on technological concepts to keep up with a steadily increasing complexity of business processes and the volatile market needs. In contrast, innovation concerning human-computer-interaction in the field of ERP is present, but significantly less considered. Whereas the majority of current enterprise systems still utilizes modalities that are state-of-the-art since the middle of the 1990s (e.g., forms, tables, standard diagrams, mouse and keyboard interaction), the potentials which arise from other domains – such as interactive and scalable visualizations or multi-touch and tangible interaction – are not considered so far.

Graph-based Bill of Materials (BOM in ERP)

The bill of materials (BOM) is a central element in manufacturing-related ERP systems and lists all materials, resources and operations, which are needed to fabricate the final product. The BOM seems to be very appropriate to illustrate the dependencies of the final product, its required raw materials, their intermediate goods and the conjunctive operations in a visual manner. All information of the manufacturing order is accessible via the BOM. Thereby, it can be used as a central entry point to guide the user to the underlying and more detailed system forms. In contrast to current tabular presentations, the concept offers an interactive graph showing the dependencies via edges, availability information via a colour scheme and an adjustable level of detail (see Figure 1).

Spatial Data Landscape (SCM)

The major benefit of the data landscape is an explicit and direct comparability of calculated production planning alternatives. Whereas conventional systems usually illustrate the simulation results in a tabular manner, the data landscape approach has the ability to give an impression of the result set's quality at once. Each peak represents a concrete production plan, whereas plans with similar properties can be found within the same area. The height of the peaks is determined by key performance indicators (KPI), which illustrate the production plan's degree of optimization objective fulfillment. For the refinement of selected and promising production schedules, the user selects the desired region of interest (see Figure 2).

Tangible Floor Plan (APS)

Nowadays, production planning is customarily based on spreadsheets supported by planning and simulation tools that are limited to textual or diagram output. Some tools visualize the planned tasks as a Gantt-chart, but direct interaction is not supported. A user's routine production planning workflow basically consists of two steps: (1) planning of upcoming processes with the help of optimization algorithms and (2) handling of deviations or interruptions during runtime. The suggested user interface is based on a floor plan that depicts the machines at their topological positions instead of the conventional textual presentation. Current and upcoming tasks for selected machines are visualized in the interactive Gantt-charts beneath. On top of these views, and in addition to standard touch gestures, tangible objects on a tabletop system are used for selection and adjustment tasks (see Figure 3).

Touch-enabled Mobile Dashboard (BI)

In this specific scenario, field managers are coaching their car dealers according to available contract types and disposal strategies. To assist the communication and to ease the traceability of the presented data (e.g., quarterly figures) a mobile solution has been prototypically implemented. It combines information from customers, contracts, staff and social communities to valuable mobile services. These services cover meeting preparation, performance analysis, forecast simulation, coaching and protocol management. In addition, peripheral services allow for status tracking and route management. All services are accessible through the start screen, which shows the main functional categories. It supports the retrospective investigation of the business performance by revenue and the simulation of a contract setting in a "what-if"-scenario (see Figure 4).