

# 1. Introduction an Motivation

Over the last decades web applications for visualization and analysis of business data, called dashboards, became quiet popular. Dashboards offer different functions to gain transparency, control and to monitor the business information. There is also a number of different web systems, which allow to design dashboards in order to analyze business activities. Those tools are widely known as project cockpits. To develop dashboards and project cockpits as web applications has the advantage, that users can use the system without having to perform a complex installation process. From the view of the system developers, the benefits of a web tool lies in the easy way to update the system.

In order to provide optimal usability, the developers of project cockpits have to adhere not only to the common concepts of software system quality [25],[3], but also to the concepts of dashboard design [11]. Even though a project cockpit provides a high system quality and allows to create user-friendly and well-designed dashboards, it can be nonetheless inapplicable for inexperienced dashboard users. The reason is, that an inexperienced user might not be able to define, what information should be displayed on a dashboard and what metrics should be used.

The author of [14] explains, that an effective dashboard design process should start with the formulation of questions, which help to determine the stakeholder, the type of dashboard and the type of information, that should be displayed on the dashboard. Furthermore, it is suggested to define the goals of the new dashboard. According to this goals, metrics should be formulated. However, the author of [14] neither proposes a technical implementation of his suggestions nor did he define a structured approach to derive metrics from the goals.

Basili and Rombach developed a basic principle for the systematic goal-based generation of metrics, which is called Goal Question Metrics (GQM) approach [4]. According to the GQM measurement model, the project goals should be defined. The next step is to derive questions from the defined goals. At last, the metrics can be derived from the questions.

To integrate the GQM measurement model into a project cockpit, dashboard templates are used. These templates should provide initial predefined information like the possible user information needs, the metrics to measure the information needs and the possible metric visualizations. With the help of this templates, the user can create dashboards.

The idea to create dashboard templates in order to initialize a dashboard is not new. The authors of [22] state, that dashboard templates can be used for the development of metrics. They consider metrics as reusable dashboard elements, which can be applied to different business projects. A dashboard template is defined as an ‘accumulator’ of successful used metrics. In chapter 3 further papers are listed, that describe approaches, which use dashboard templates.

In this bachelor thesis, an approach for the dashboard initialization for inexperienced users is presented. The approach is based on the Goal Question Metrics concept, which is adapted for the creation of dashboards by using templates. Dashboard templates contain predefined question-answer pairs, which represent an information need of a user and a dashboard item for the data visualization respectively. In addition, the question-answer pairs can be defined according to a certain dashboard user group, the project type, the experience of the user with dashboard etc.

This bachelor thesis is structured in the following way: In chapter 2 the essential frameworks, techniques and theoretic principles, which build the technical and theoretical basis of this bachelor work, are described. As already mentioned, related work is considered in chapter 3. In chapter 4 the stakeholders as well as the functional and non-functional requirements are identified. Chapter 5 describes the rule-based dashboard initialization concept, its architecture and the essential aspects of the implementation. In the first part of chapter 6 the evaluation results of of the application are presented. Based on this evaluation results, further possible enhancements of the tool are listed. In chapter 7 the bachelor thesis is summarized.

## 7. Summary and Outlook

Due to the widespread need for project cockpit systems to create dashboards, different approaches for the implementations of dashboard creation tools can be found. The purpose of this bachelor thesis was to extend the approach of the Project Management Cockpit by a rule-based dashboard initialization using templates. As described in chapter 1, some authors also considered the application of templates in order to develop dashboard metrics. In chapter 3 other similar approaches were described. The presented approaches served as a motivation to develop another approach of a dashboard initialization tool, which is implemented within this bachelor thesis.

The development of the rule-based dashboard initialization concept, is an attempt to adapt the GQM approach to the project cockpit. However, the tool, presented in this bachelor thesis, does not provides an explicit definition of project goals. Instead of that, the tool allows to generate dashboard templates, which contain question-answer pairs. The creation of the question-answer pairs is left to the tool user, who also has to identify for whom and for what this question-answer pairs are relevant.

Through an evaluation of the tool it turned out, that the idea of the presented approach is meaningful for inexperienced dashboard users. According to the critique and suggestions, future tool enhancements were classified into three categories: the terminology used in the application, the navigation and the GUI design. Some of the listed recommendations for improvement are already implemented in the tool. Other enhancements could server as a motivation for further research on this topic.

A possible future thesis could deal with the further design and implementation of the setup page. For instance, the setup page has to provide functionality, that allows the user to managed information need and dashboard item lists, which are generated from templates. A further task is to integrate the implemented tool in the Project Management Cockpit. As a result of that integration, the imported user data should be visualized through the dashboard charts. This charts could be created according to the items from the dashboard item list.

