3. Related Work

In this bachelor thesis a rule-based dashboard initialization tool is implemented. The tool provides templates, which are created according to dimensions, selected by the user (like experience, project role, etc.), and template rules, defined by metric experts. The proposed method for the dashboard initialization intends to help inexperienced users to formulate their information needs and recommends metrics for the defined information needs. In this chapter approaches similar to the technique described in this bachelor thesis will be discussed.

One of the related approaches is described in [16]. The developers of the Specular approach apply the GQM model to a project cockpit. Similar to the approach of this bachelor thesis, the Specular approach defines characteristics of the environment in the setup phase. The information of the environment is used to set the control goals and derived metrics. According to this goals and metrics, a set of visualization items is composed. The authors also state, that the approach provides reusable components to define a measurement mechanism for a particular project. This components enable to select the right control elements for the data collection, interpretation and visualization.

The reusable components of the Specular approach can be compared to the dashboard templates of the rule-based dashboard initialization approach. Similar to the dashboard templates, the reusable components include goals, metrics and visualization items, which can be used for different projects.

In contrast of the rule-based dashboard initialization approach, the Specular approach offers more complex concepts. For instance, the Specular approach provides specific function instances, which allow to compute metrics from metric definitions. The approach also includes control mechanisms to examine the consistency and completeness of the generated visualization items.

The authors of [28] propose a model-driven framework for the design and deployment of dashboards, that is used to model business processes. According to this approach, the component flow of the dashboard design is initiated by the definition of the so called 'report templates'. Report templates can be selected from a template store or can be predefined by the user. They include the page information represented by a group of appropriate metrics (MetricGroup) and define the visualizations of the page items.

In the next step of the component flow the dashboard model will be generated. The framework provides four types of dashboard model artifacts: the

dashboard data model, the dashboard navigation model, the dashboard report template model and the dashboard access control model. The dashboard data model specifies the relationships between MetricGroups and dimensions, where a MetricGroup is a group of metrics, which is combined according to their relevance to other dashboard model artifacts. Note that in this case the term of the 'dimension' is defined differently from the term used in this thesis.

The dashboard report template model and the dashboard navigation model represent the abstract presentation layer of this approach. The dashboard navigation model includes the NavigationTree, Page and Menu classes and enables to define navigation paths of a page. The dashboard report template model is formed by using the report templates described above. The dashboard access control model provides principles for the dashboard access control organization, by the concept of user roles. Each user role has access to different pages, types of data and report templates.

The approach described above implements a concept, which is similar to the concept of this bachelor thesis. However, the described report templates do not include the information needs of the user. The purpose of the report templates is to predefine the visual design of dashboards without defining the questions, which the metrics of the report template have to answer. Also the meaning of *Dimension* and technical implementation differ from the approach of this bachelor thesis.

The authors of [23] developed a web tool, which is called 'Self-Organizing Dashboards for Visual Analytics'. This tool is used for large data input with inconsistent data types. Analog to the approach in this thesis, the system also provides automatic suggestions for an appropriate visualization of the data. In contrast to the approach of this bachelor thesis, the concept does not generate templates by using question-answer pairs. The technical implementation of the approach is also based on other technologies, than the technologies used for the implementation of the rule-based dashboard initialization approach.

In [7] a tool for the visualization of business processes for novice users was developed. This approach also provides automatic recommendations for visual templates. The user has to select the data attributes (for instance, sales, year of sale, etc.) and the categories, which describe the possible grouping of the data attributes. The system then executes an analysis of the data regarding to the selected elements. The output of the analysis are metrics. After the user selects an appropriate metric, the system proposes a 'visual template', which can be a chart, a gauges or a table.

The approach, considered above, seems to have a similar concept to the dashboard initialization tool. However, the authors do not describe the implementation of the analysis, which produces the metrics and the visual template recommendations.

From the paper presented in this chapter, the following conclusions can be

drawn. The first approach implements a very similar, but more complex concept. According to this concept, the GQM measurement model is adapted for the project cockpit setup. The approach provides reusable components, that are similar to the templates, which are implemented in the approach of this bachelor thesis.

There are several approaches, which use templates in order to help inexperienced users to initialize dashboards. Most of them concentrate on the visual design of dashboards, where the users have to select appropriate metrics, which is in contrast to the approach of this bachelor thesis. Similar to the approach of the rule-based dashboard initialization, the system described in [7] provides an analysis according to categories, which are preselected by the user. Unfortunately, the paper does not provide any information about the implementation of this analysis.