Modeling Context Factors for the Adoption of Marketing Dashboards: An E-Commerce Study

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Executive Summary

The generation and collection of data increased exponentially over the years, and organizations hunger to retrieve useful insights from vast amounts of unstructured data. In the field of marketing, a dashboard is one of the means to measure performance which transforms the unstructured data into critical insights related to its business and market by simple visualizations. These marketing dashboards might offer a remedy to the information overload problem by providing an all-inclusive package into a manageable solution (Yigitbasioglu & Velcu, 2012). However, the ability of an organization to use the right metrics and take effective action on the collected insights is a huge challenge (Pauwels, 2015). This implies that technology adoption is a complex, inherently social, and developmental process (Straub, 2009). Nevertheless, the complicated aspects of technology adoption are not supported in prior literature, which describes the process of technology adoption only with generalized models such as the Technology Acceptance Model (TAM) without any related context. If a study applied the TAM in a different environment than the original, it would potentially provide evidence of the TAM's generalizability (Fayad, 2015). Successfully facilitating technology adoption must address cognitive, emotional, and contextual concerns (Straub, 2009).

This study tries to gain a more contextual understanding of the marketing dashboard adoption process and aims to develop an appropriate context-driven model that helps anyone to understand the adoption process and to steer their own organization. The primary purpose of the study is to identify factors that contribute to the adoption of marketing dashboards. In doing so the following research question is pursued; ***What factors influence the adoption of marketing dashboards amongst marketers in the e-commerce industry?***

To answer this research question a conceptual model was developed based on prior literature. The factors found during the literature study were then validated by conducting eight semi-structured interviews amongst marketing experts active in the e-commerce industry. The next step is enriching the context-driven model for adoption of marketing dashboards with new factors frequently mentioned by the interviewees. Lastly, as an addition to the interview, a ranking-type study is conducted with the marketing experts to operationalize the factors based on perceived importance. The results of these interviews are used to update the conceptual model.

During these interviews, various new factors were found and added to the context-driven adoption model. Factors such as; user characteristics, customizability, financial constraints, the complexity of software, and quality of data links were perceived as popular factors contributing to the adoption of marketing dashboards. In total 15 new factors were added to the context-driven model and 4 literature-based factors were perceived as irrelevant and eventually removed. Furthermore, many factors from the literature study got supported by the interviewees, where information content quality is perceived as the most important one contributing to the adoption of marketing dashboards. During the study relationships between the different factors in the model were explored. The final context-driven factor model could be used by other researchers as preliminary study who research technology adoption from a more contextual perspective.

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1. Introduction

The purpose of this first chapter is to introduce the reader to the topic and its related issues. The first section introduces the reader to the topic and a research motivation is provided describing the reasons why research in this field is needed. The introduction explains the need for clarification on the factors that determine a successful adoption of marketing dashboards. Section 1.2 explains the objective of the study and its related research questions. In addition, a description of the thesis outline is provided. The final section describes the practical and scientific relevance of the study.

1.1 Introduction and Research Motivation

The instability of the global economy, intense competition, and rapid technological changes have heightened the importance of marketing measurement and analytics (Krush et al., 2016). The generation and collection of data increased exponentially and organizations hunger to retrieve insights from vast amounts of unstructured data. With these rapid developments, more organizations are shifting their focus to exploring and exploiting all this unstructured data. This phenomenon is called "Big Data" and the intelligent use of data is considered as a key to competitive advantage. However, little literature emphasizes the tension between the abundance of marketing data at our disposal and the lack of actionable insights that derive from it (Pauwels et al., 2009). In the field of marketing, there have been regular calls for marketing practitioners to develop and enhance their ability to account for marketing's contribution to firm performance (O'Sullivan & Abela, 2009). Marketing performance measurement (**MPM**) is the assessment of the relationship between marketing activities and business performance (Clark & Ambler, 2001). A marketing dashboard is one of the means to measure performance which transforms the raw data into critical insights related to its business and market by a simple visualization. O'Sullivan & Abela (2009) justified the assumption that developing and applying MPM ability leads to both greater status for marketing at the board level and improves firm performance. A marketer without the means or capacity to use marketing analytics and measurement systems, such as marketing dashboards, may create a negative perception regarding marketing accountability within the respective firm (Krush et al., 2016). In addition, a negative perception regarding marketing's abilities can undermine the credibility of marketing efforts, diminish marketing's role within strategic dialogues, and even threaten marketing's existence as a distinct capability (Rust et al., 2004).

Industry investment in marketing measurement and analytics is substantial with total global expenditures in marketing dashboards, analytic software and other marketing software systems were estimated at approximately $24 billion annually (Krush et al., 2016). This demonstrates the interest in effective measures of marketing performance, managerial perceptions toward marketing performance and the marketing productivity. To deal with the complexities of MPM, practitioners reach to marketing dashboards as they are a valuable tool in advancing toward market performance (Pauwels et al., 2009). Marketing dashboards might offer a remedy to the information overload problem by providing an all-inclusive package for performance management, incorporating various concepts and applications such as strategy maps, scorecards, and business intelligence (BI) into one manageable solution (Yigitbasioglu & Velcu, 2012). A dashboard can be regarded as a data-driven decision support system, which provides information in a particular

format to the decision-maker (Yigitbasioglu & Velcu, 2012). The strategic value of marketing dashboards lies in their ability to provide marketers a better understanding of the marketing processes that are relevant to their business (Pauwels et al., 2009). An organization's marketing dashboard efforts directly and positively influence its sensemaking (Krush et al., 2013). However, the ability of a firm to use the right metrics and take effective action on the collected insights is a huge challenge (Pauwels, 2015). Marketing dashboards are a response to the increasing complexity and diversity of market data faced by senior management in the information age (Pauwels et al., 2009). Hence, the adoption and use of marketing dashboards is a complicated process which involves many uncertainties regarding the accountability of marketing data. Technology adoption models described in the literature are often general models lacking a contextual perspective. As marketing dashboards are a response to increased diversity and complexity, this study aims to provide a more context-driven model for the adoption of marketing dashboards.

The primary purpose of this study is to identify factors that drive the adoption and use of marketing dashboards and, particularly, which factors contribute to the adoption. Since most technology adoption models in literature are general models without specific context, this study aims to provide a context-driven success factor model. This context-driven model should provide extensive and context related factors that makes the reader understand the process of adoption and able to steer the organization based on these factors. Furthermore, another interest of this study is to operationalize the factors based on perceived importance to the adoption process. The focus of the study lies on SMEs within the e-commerce industry, as these organizations are heavily dependent on the online performance of their organization. Therefore, e-commerce organizations often have a higher reliance on marketing dashboards, which informs them about the current marketing performance in a quick and convenient way. Dashboards are expected to improve decision-making by amplifying cognition and capitalizing on human perceptual capabilities (Yigitbasioglu & Velcu, 2012). The employees will make decisions based on the information interpreted from the dashboards. Relying on marketing dashboards for decision-making makes the adoption process of marketing dashboards highly critical for these organizations.

1.2 Research Goal and Research Question

The main goal of this study is to identify critical success factors (CSFs) influencing the adoption of marketing dashboards amongst marketers in the e-commerce industry. A context-driven success factor model is formed by collecting critical success factors from literature. The first step of the study is to enrich the model for adoption of marketing dashboards by semi-structured interviews with marketing employees. Second, a ranking-type study with the marketing experts will be conducted to operationalize the critical success factors. Furthermore, another interest of this study is to identify and operationalize perceived benefits from using marketing dashboards. The end-result of the study should be an instrument which can be used to measure adoption processes of marketing dashboards. The research question that fits the goal of the study is as follows:

What factors influence the adoption of marketing dashboards amongst marketers in the e-commerce industry?

- According to literature, what is an appropriate model for the marketing dashboard adoption process?
- According to experts, what is the perceived value of the success factor model derived from literature?
- How do marketing experts rank the critical success factors influencing the adoption of marketing dashboards?

1.3 Framework for Marketing Dashboard Adoption

For this study two frameworks are used as a basis for developing the conceptual framework which describes many critical success factors (CSF) that could influence the adoption of marketing dashboards. First, **Wierenga et al. (1999)** established a framework for evaluating the potential and success of marketing management support systems (MMSS). Second, later **Pauwels et al. (2009)** extended this framework by focusing in particular on marketing dashboards. The article outlines five stages of dashboard adoption and discusses the relationships among demand for dashboards, the supply of dashboards, and the implementation process in driving adoption and use of dashboard systems. As explained, the framework of dashboard adoption consists of five stages. First, the demand and supply side of the dashboard is examined, where the demand side reflects the decision processes to be supported and the supply side describes the functionality of the dashboard. Thereafter, the fit between demand and supply is determined, exploring which factors of the demand side complement factors on the supply side. The next stage in the framework is the implementation context, which describes factors that could support the implementation of marketing dashboards. Next, the predisposition towards the dashboard is determined by the results from the prior stages in the framework. Finally, the adoption and use of marketing dashboards result in several net benefits. During the theoretical section, a conceptual framework will be established primarily based on the work of these two studies and some slight adjustments will be made based on the context of this study.

The framework developed by Wierenga et al. (1999) and Pauwels et al. (2009) helps us in answering the research questions related to this study in several ways. First of all, the framework describes what drives the adoption of marketing dashboard systems. This study incorporates both frameworks (Wierenga et al., 1999 & Pauwels et al., (2009)), which means that this study will have the strong points from both frameworks merged into a new conceptual framework and with a focus on both MMSS and marketing dashboards in specific. Furthermore, by including a demand and supply side in their frameworks, it also examines reasons for the development of marketing dashboards. Finally, the framework is a good starting point for research questions related to the adoption and use of marketing dashboards.

1.4 Scientific & Practical Relevance

Scientific Relevance

Adoption models such as the Technology Acceptance Model (TAM) contain generalized factors that contribute to the adoption of technologies without taking the context into account. This study tries to conceptualize a marketing dashboard adoption model that contains extensive and context-related factors that can be used in organizations to understand the adoption process better and to steer their own organization in the field of dashboard adoption. Creating a more extensive model for dashboard adoption will be done by interviewing eight marketing experts in the field of e-commerce to make the model more accurate and related in the context of marketing in the e-commerce industry. At the end, this context-driven model can be used by other researchers as a preliminary study who research technology adoption from a more contextual perspective.

Practical Relevance

Developing marketing dashboards means working in-depth and with great attention to detail. During the process of developing the most suitable dashboards, one could simply forget about peripheral issues such as visual design or user involvement. This study tries to map all contextual factors related to the process of marketing dashboard adoption, which could help different parties with their own dashboard projects. Organizations with activities such as dashboard development could benefit from this context-driven model, where the organization should be aware of all contextual factors related to the process of dashboard adoption, which helps them to build more sophisticated marketing dashboards. Furthermore, software developers of dashboards could benefit from this context-driven model by understanding the needs and wishes of several marketing experts active in the e-commerce industry. The interviewees will provide their individual experiences with marketing dashboards, which could lead to useful insights for the software developers. Lastly, marketing agencies could benefit from this context-driven model too by developing more understanding of the process of dashboard adoption which benefits both the agency and its clients.

2. Theoretical Framework

The purpose of this chapter is to provide a theoretical foundation for the thesis. This chapter provides an overview of prior knowledge on which factors play a role in the adoption of marketing dashboards. In the first section, an overview of all literature used in the theoretical section is given. Section 2.2 outlines how the rapid digitalization changed the use and adoption of marketing dashboards. Section 2.3 defines the marketing dashboards and describes the different types of dashboards. Section 2.4 introduces the conceptual framework of Pauwels et al. (2009) and Wierenga et al. (1999) used as a basis for this study. Section 2.5 describes the decision processes to be supported by marketing dashboards (demand side). Section 2.6 describes the success factors related to the functionality of the marketing dashboard (supply side). Section 2.7 explains the importance of the factor fit between demand and supply. Section 2.8 describes the critical success factors related to the implementation context of marketing dashboards. Section 2.9 describes the predisposition towards marketing dashboards and its relation to the TAM model. Finally, section 2.10 describes the perceived benefits of marketing dashboards mentioned in the prior literature.

2.1 Overview Literature

Concepts	Total # (%) of Papers	Papers
Marketing Performance Measurement in the Digital Age	13 (16%)	(Adler, 1967); (Järvinen & Karjaluoto, 2015); (Gao, 2010); (Dekimpe & Hanssens, 1995); (Pavlou & Stewart, 2000); (Ambler & Roberts, 2008); (Morgan et al., 2002); (Vakratsas & Ambler, 1999); (Järvinen, 2016); (Wilson, 2010); (Frösén et al., 2016); (Chaffey & Smith, 2012); (Ambler, 2000)
Defining Marketing Dashboards	11 (14%)	(Rust et al., 2004); (Arnott & Pervan, 2005); (Yigitbasioglu et al., 2012); (Mone et al., 2013); (Pauwels et al., 2009); (Klipfolio, 2017); (Clark et al., 2006); (Wiersma, 2009); (Morgan et al., 2003); (Patterson, 2007); (TrackMaven, 2017)
Conceptual Framework	5 (6%)	(Pauwels et al., 2009); (Wierenga et al., 1999); (Arnott, 2004); (Rogers, 1995); (Davis, 1989)
Demand Side of the Marketing Dashboards	11 (14%)	(Kumar, 2004); (O'Sullivan & Abela, 2007); (Popovič et al., 2012); (Pauwels et al., 2009); (Wierenga et al., 1999); (Mason & Mitroff, 1973); (Vessey & Galletta, 1999); (Umanath et al., 1990); (Markus, 1983); (Yigitbasioglu & Velcu, 2012); (van Bruggen, 1989)

Supply Side of the Marketing Dashboard	8 (10%)	(Wierenga et al., 1999); (Yigitbasioglu & Velcu, 2012); (Popovič et al., 2012); (Larcker & Lessig, 1980); (Pauwels et al., 2009); (Card et al., 1999); (Heylighen, 1999); (Oliva et al., 2004)
Fit Between Demand and Supply	11 (14%)	(Lim & Benbasat, 2000); (Yigitbasioglu, 2012); (Vessey & Galletta, 1999); (Yigitbasioglu & Velcu, 2012); (Goodhue & Thomspon, 1995); (Card et al., 1999); (Franklin et al., 2017); (Zhang & Norman, 1994); (Wilbanks & Longford, 2014); (Krush et al., 2013); (Arnott, 2004)
Implementation Context of the Marketing Dashboard	10 (12%)	(Pauwels et al., 2009); (TechTarget, 2015); (Straub, 2009); (Rogers , 1995); (Kilsdonk et al., 2017); (Yusof et al., 2008); (Ahmad & Cuenca, 2013); (Hawking, 2013); (Krush et al., 2015); (Sarker et al., 2012)
Predisposition Towards the Marketing Dashboard	7 (9%)	(Pauwels et al., 2009); (Bach et al., 2016); (Porter & Donthu, 2006); (Speier & Venkatesh, 2002); (Lippert, 2002); (Lempinen & Rajala, 2014); (Davis, 1989)
Adoption and Success of the Marketing Dashboard	5 (6%)	(Lempinen & Rajala, 2014); (Alpar & Schulz, 2016); (Pauwels et al., 2009); (O'Sullivan & Abela, 2009); (Wanda & Stian, 2015);

2.2 Marketing Performance Measurement in the Digital Age

"A well-known caricature of marketing practitioners is that they love to spend money and hate to assess the results of that spending (Adler, 1967)." This illustrates the increasing pressure for marketers to demonstrate their contribution to firm performance. Therefore, the problem is the inability to account for marketing activities and specific interest increases in marketing's ability to assess their contribution. Therefore, the question that will be handled by this section is: What challenges are encountered in measuring digital marketing performance?

Challenges of (Digital) Marketing Performance Measurement

Research on digital marketing performance measurement (DMPM) is scarce and theoretically underdeveloped (Järvinen & Karjaluoto, 2015). The lack of (empirical) literature on the topic of MPM is due to several universal challenges encountered in measuring marketing performance. MPM suffers from our limited knowledge of causal relationships and time lags between marketing input and resultant changes in output (Gao, 2010). Measuring the impact of marketing actions is generally considered to be one of the most challenging tasks for marketers. Consequently, there are three universal MPM challenges that marketing productivity has not yet solved: (1) linking marketing activities with long-term impacts (Dekimpe & Hanssens, 1995), (2) isolating the impact of specific marketing activities from other influences (Pavlou & Stewart, 2000) and (3) the emphasis on using

short-term financial measures which have been proved inadequate to explain the total impact of marketing actions (Rust et al., 2004).

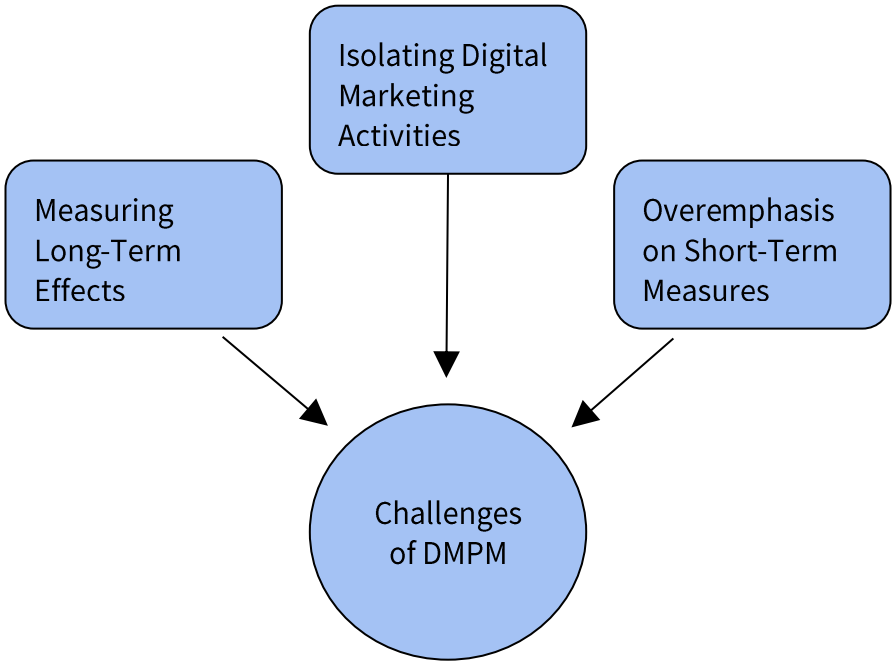

Figure 1: Challenges of Digital Marketing Performance Measurement

Linking Marketing Activities with Long-Term Impacts

Strong emphasis on financial metrics exists in the current literature. However, the bottom line is that financial metrics largely ignore the long-term effects of marketing activities and may, therefore, lead to incorrect conclusions (Ambler & Roberts, 2008). The reason for management's desire to assess and evaluate marketing performance with financial metrics is that scholars have been unable to provide actionable ways to quantify the long-term impacts of marketing investments (Morgan et al., 2002). Linking marketing activities directly with long-term sales is case-sensitive and thus largely dependent on the specific situation. In addition, linking marketing activities directly with behavioral outcomes is problematic given that marketing activities are known to result in cognitive effects that are only indirectly linked to sales (Vakratsas & Ambler, 1999). As a result, measuring marketing performance leads to a multidimensional assessment of marketing productivity (Ambler & Roberts, 2008). Moreover, it is unclear which measures are most relevant for measuring cognitive effects, especially, linking cognitive effects with financial outcomes is problematic (Dekimpe & Hanssens, 1995). Digital analytics may facilitate the linkage between marketing activities and long-term market outcomes by tracking the exposure (i.e., the number of people exposed) and their responses (e.g., website traffic, search behavior, mentions) to digital marketing activities more accurately (Järvinen, 2016).

Isolating Marketing Impacts from other Influences

The second MPM challenge is related to difficulties separating the impact of an individual marketing activity from other effects (Järvinen, 2016). It is hard to determine what portion of sales increase resulted from a particular campaign and what portion can be explained by other factors. Some of the "other factors" are exogenous (i.e., effects unrelated to the firm's own actions) while others are endogenous (i.e., effects related to the firm's own actions). Controlling for exogenous effects can be done by measuring performance against the competition. However, it might be difficult to obtain timely data on competitors' performance. The endogenous effects result from other firm-related activities that are conducted during the same period as the specific marketing activity under investigation (Järvinen, 2016). If the product/service got promoted through several marketing communications channels, it is hard to assess the effectiveness of each channel in terms of sales impact (Pavlou & Stewart, 2000). Assessing the effectiveness of each channel is even more complicated for digital marketing, as the number of digital touchpoints during the customer journey has increased compared to traditional marketing. On the other hand, digital analytics allows firms to link a customer's exposure to a specific digital marketing activity to website behavior and resulting outcomes (Wilson, 2010).

Metrics Selection

One of the most difficult tasks in designing MPM systems relates to the selection of metrics. There are no clear standards for building a set of metrics that fit the needs of all firms, nor does an explicit formula exist that a firm might use to evaluate the suitability of marketing metrics for its particular needs (Järvinen, 2016). The selection of metrics depends on the context in which the firm operates (Frösén et al., 2016). First of all, it is important to align marketing metrics with digital marketing strategy (Chaffey & Smith, 2012). Second, the metrics must be clearly defined to an actionable metric that is clearly communicated (Ambler, 2000). Third, the metric selection should be multidimensional, which includes both short- and long-term results as well as financial and non-financial results (Järvinen, 2016). Finally, the structure of the metrics set is another important consideration (Järvinen, 2016). The key is to adopt a comprehensive but manageable set of metrics, where too few will not be multidimensional, while too many will likely lead to confusion. Often marketers do not need more metrics but rather a better understanding of the interrelationships among them (Pavlou & Stewart, 2000).

Conclusion

The long-lasting challenges of digital marketing performance measurement have been addressed by several scholars (Rust et al., 2004; Järvinen, 2016; Pavlou & Stewart, 2000). Determining the ultimate value of marketing is considered important, because it is the only way of making the marketing impact understandable and comparable, and that is what the top management is typically willing to see (Stewart, 2009). The three most common challenges encountered in measuring digital marketing performance are: (1) measuring the long-term marketing effects, (2) isolating the impact of specific marketing activities from other effects, and (3) the emphasis on short-term financial measures. These challenges are highly related to the development and analysis of marketing dashboards, as the goal of a marketing dashboard is to measure digital marketing performance in a fast and convenient way. Moreover, the challenges need scrutiny whenever a successful adaptation of marketing dashboards is desired.

2.3 Defining Marketing Dashboards

"The effective dissemination of new methods of assessing marketing productivity to the business community will be a major step toward raising marketing's vitality in the firm and, more important, toward raising the performance of the firm itself. (Rust et al., 2004) "Assessment of marketing's performance is performed often via data visualization with marketing dashboards. In this section, the following question will be answered: "What are marketing dashboards and why are they so important?"

Definition

Dashboards in general are a particular type of **decision support systems** (Arnott & Pervan, 2005) and can be defined as "a visual and interactive performance management tool that displays on a single screen the most important information needed to achieve one or several individual and/or organizational goals, allowing the user to identify, explore, and communicate problem areas that need corrective action" (Yigitbasioglu et al., 2012). Marketing dashboards are a visual assemblage of marketing indicators and metrics, arising from the business intelligence area (Mone et al., 2013), which collect and present various marketing performance metrics to managers. Marketing dashboards avoid potential problems such as data overload, scattered data locations, managerial biases, lack of transparency and accountability, as well as the need for firm-wide integration (Pauwels et al., 2009). Marketing dashboards exist in all aspects of digital marketing, such as the following presented in the table below. See Appendix C for a visual representation of the described dashboards.

Dashboard Example	Description
Digital Marketing	Digital marketers need to track metrics across channels like lead generation, website, e-mail, advertising, and social media.
Marketing Performance	Designed to provide an in-depth view of the conversion funnel to help inform marketing decision makings and campaign spending.
E-Commerce Marketing	Fanatic use of for dashboards, because with the vast majority of the business being digital, there is an open opportunity to leverage the power of this data.
SEO	A central meeting place for all these data sources so that digital marketers can get a full understanding of SEO performance from a number of perspectives through metrics.
Web Analytics	Let's you track the performance of your website real-time, and answer the critical question, "how is your website performing with respects to your marketing objectives?"
CMO Marketing	Dashboard meant for the chief officer marketing, which requires pulling together metrics from multiple sources to weave together a complete story of your marketing performance.

AdWords Campaigns	Closely track your campaign ROI and the KPIs that influence ROI.
Email Marketing	Displays key metrics to demonstrate the performance and ROI of your email campaigns, and includes metrics such as list growth, open and click rates, and the number of leads generated.
Social Media	Designed to show the relationship between social campaigns and overall marketing performance.
Web & Social Analytics	Examines the correlation between website performance and social performance.

Table 1: Types of digital marketing dashboards (Klipfolio, 2017)

Different Purposes of Marketing Dashboards

According to Pauwels et al. (2009), there are several purposes of using dashboards: (1) consistency, (2) monitoring (3) planning, and (4) communication. Consistency relates to the alignment of metrics and measurement procedures used across departments and business units. Monitoring is the dashboard's most fundamental function and is referred to as the day evaluation of metrics that should result in corrective action. The planning purpose relates to scenario analysis feature which is present among dashboards. Finally, a dashboard communicates both performance and the values of an organization to its stakeholders through the choice of the metrics. All purposes, except consistency, are confirmed by Clark et al. (2006) in their survey conducted by professional organizations. Balanced scorecard (BSC), which is closely related to dashboards, have similar purposes. Wiersma (2009) identified three purposes regarding the use of BSC: (1) decision-making, (2) communication and consistency, and (3) self-monitoring, which are consistent with the purposes identified by Pauwels et al. (2009).

The Importance of Marketing Dashboards

The knowledge-based view (KBV) focuses on knowledge formation and considers knowledge as the most significant firm resource and a key variable in predicting performance (Morgan et al., 2003). The firm's knowledge management processes are strategically valuable because they provide the firm with an ability to develop and utilize a base of intellectual assets in ways that impact the achievement of strategic goals (Morgan et al., 2003). Following the KBV, marketing dashboards are to be considered as an informational resource. Marketing dashboards facilitate the acquisition and dissemination of vital information and provide assistance in strategic decision-making, resource deployments and strategic alignment (Patterson, 2007). Marketing dashboards are argued to be important informational resources (Morgan et al., 2002), that (1) provide the means for acquiring and disseminating data, (2) enable learning opportunities (Pauwels et al., 2009), and (3) aid in decision-making and ensure strategic alignment with business goals (Patterson, 2007).

For this study, the marketing dashboards are even more important, because in e-commerce firms without highly specialized data scientists, marketing executives do not necessarily have the time to research and interpret marketing analytics (TrackMaven, 2017). They rely on the high-level insights that marketing dashboards provide to stay on top of their team's progress.

2.4 Demand Side of the Marketing Dashboard

"Marketers' inability to account for the function's contribution to firm performance is recognized as a key factor that has led to marketing's loss of stature within organizations (Kumar, 2004). This inability is reflected in increased demand for greater accountability (O'Sullivan & Abela, 2007). The call for decision support systems (DSS) like marketing dashboards has returned in a positive impact of information provided by decision support systems on decision-making, particularly when organizations operate in highly competitive environments (Popovič et al., 2012). Therefore, in this section, the following question will be handled to get deeper insights into this specific call for such systems: What are driving factors of the demand side of marketing dashboards mentioned in prior literature?"

To explore the demand side of marketing dashboards, studies related to the demand for decision support systems (DSS) and information systems (IS) are considered as well, since studies specifically focused on marketing dashboards are limited. For describing the demand-side of the marketing dashboard in this study, a combination of success factors is used from both Pauwels et al. (2009) and Wierenga et al. (1999). Where Pauwels et al. (2009) is more specific on marketing dashboards, Wierenga et al. (1999) have a more general approach by focusing on the decision support systems (DSS). However, there are many overlapping success factors which are mentioned in both studies. The demand side of decision support systems is defined as the decision processes to be supported (Wierenga et al., 1999). In other words, the context of problem-solving activities of (marketing) decision-makers. The factors of the demand side described below are categorized along the three basic categories of a decision situation (Mason & Mitroff, 1973). These are (1) the ***problem*** that must be solved, (2) the ***environment*** in which the problem is solved, and (3) the ***decision maker*** who must solve the problem.

Decision Problem

We start within the context of problem-solving activities of (marketing) decision-makers, i.e., the demand-side of decision support. The problem being solved can be characterized by its degree of **structuredness as used by Wierenga et al. (1999)**. In the field of marketing, we face problems which vary tremendously along this characteristic. For example, sales-force allocation and media planning are relatively structured problems, while designing a marketing communication are less-structured problems. The following success factor is the **tasks**. The tasks are aligned with the degree of structuredness as spatial tasks are dealing with less-structured problems than symbolic tasks. Different tasks require different forms of information representation. Spatial tasks require include making associations or perceiving relationships in the data, and therefore, require different forms of information representation (Vessey & Galletta, 1999). On the contrary, symbolic tasks involve extracting discrete, and therefore precise, data values (Umanath et al., 1990). These tasks require more numerical forms of information representation. Another critical success factor that determines the problem being solved is the **depth of knowledge**. A high level of knowledge about the current decision problem supports the adoption marketing dashboards. The following critical success factor is the **availability of data**, which is an essential factor in providing the information that is required for successful decision-making.

Decision Environment

The decision-environment can be characterized by the level of **market dynamics**. For example, when organizations are operating in stable markets it is relatively easy to perform optimization or to build up scenarios. However, in more turbulent markets decision-makers are forced just to understand and interpret what is going on and building scenario dashboards are not that trustworthy. The next critical success factor that belongs to the decision-environment is the **interdepartmental relations or organizational culture**. The interdepartmental relations deal with the dynamics of the internal environment, as where the market dynamics are more external. If relations between departments are cooperative, goal congruence is easier to achieve and the dashboard will be used for that purpose. However, in a situation of rivalry and mistrust among departments, the dashboard runs the risk of being (mis-)used for the interests of individual departments at the cost of other departments or organizations (Markus, 1983). In addition, departments may also try to prioritize particular metrics in the dashboards that give a favorable picture of their own activities or criticize other departments. The last success factor that concerns the decision-environment is the **time constraints**. This factor is mostly self-explanatory, as time constraints are imposed by management and thus the environment.

Decision Maker

The third factor that characterizes the decision situation is the decision maker's **cognitive style**, i.e., the process through which a (marketing) decision-maker perceives and processes information. The most common classification of this cognitive style is the analytical decision-making versus intuitive or non-analytical decision-making. A dashboard that is successful for an employee with an analytical decision style is not automatically successful for an employee with a more intuitive decision style. Intuitive decision style is perceived to be more creative and insightful during decision-making processes, whereas analytical decision style concerns gathering data from facts and observations (Yigitbasioglu & Velcu, 2012). However, van Bruggen et al. (1998) found out that a decision support system (DSS) can reduce the difference between high- and low- analytics, as the DSS supports the low-analytics in making the right decision. Another critical success factor associated with the decision-maker is his or her **experience**. The experience with the decision support system or experience with similar decision problems are skills which are likely to be helpful in making the marketing dashboard a success.

2.5 Supply Side of the Marketing Dashboard

"During the past years, software vendors such as Qlik, Microsoft, Google, and Open Source competed in developing cutting-edge dashboard solutions. In this competitive environment, the development of dashboard solutions in terms of its features improved drastically. The counterpart of the demand side is the supply side, i.e., the type of decision support offered by the vendor. Some factors are more important to the end-user in a particular situation than other factors. Therefore, the question that will be handled by this section is: What are the driving factors of the supply side of marketing dashboards mentioned in prior literature?"

The supply side of marketing dashboards can be defined as the functionality of the management support system employed (Wierenga et al., 1999). Together with the demand side of marketing dashboards, the actual fit is determined, which is the most important driver of the potential success of a marketing dashboard. The marketing dashboard can support the end-user and decision-maker in different ways. For example, it can help the marketing manager to calculate actual calculations (e.g. optimal value), it can support the analysis of a specific situation (e.g. country-specific marketing), or it can come up with new suggestions for solutions (Wierenga et al., 1999). Moreover, most importantly, it can help frame important issues and uncertainties associated with the problem at hand (Wierenga et al., 1999). In this study, we distinguish between two types of supply features: **functional** features and **visual** features. Functional features are the features that relate indirectly to visualization but describe what the dashboard can do (Yigitbasioglu & Velcu, 2012). On the other hand, the visual features refer to the principles of visualizing data, i.e. how efficiently and effectively information is presented to the user (Yigitbasioglu & Velcu, 2012).

Functional Features

In measuring the success of business intelligence systems, Popovič et al. (2012) used **information content quality** and **information access quality** as the two indicators for the use of information in the organization's business processes. As the main goal of a marketing dashboard is to provide information that eventually is used in the business processes of the organization, we can note that these two are important indicators of information quality in marketing dashboards. Information is perceived to be qualitatively good when it is sufficiently important (relevant, informative, meaningful, helpful or significant) and usable (unambiguous and clear) (Larcker & Lessig, 1980). The second factor that drives the success of marketing dashboards is the accessibility of information, which is reflected through the ease of access to an information source, its availability, and convenience of information provision (Popovič et al., 2012). The third functional feature of success is the **drill-down capabilities** of the marketing dashboards. Drilling-down means that one goes from a more general to a more detailed level of the information, including point and click interactivity that allows users to view information in a dimensional analysis (Pauwels et al., 2009; Yigitbasioglu & Velcu, 2012). The drill-down feature in marketing dashboards appears important to allow variances to be explained and specific users to obtain the level of detail they need at their levels in the organization (Pauwels et al., 2009). In addition, drill-down features make inconsistent measures more transparent as these inconsistencies can be spotted while making the data more detailed in the graphs and tables. The fourth functional feature of successful marketing dashboards

from the supply side is the **type of presentation format** (i.e. table or graph). The underlying principle is that graphical and tabular representations present the same type of information but in fundamentally different ways: graphical representations are spatial information and tabular representations are symbolic information (Yigitbasioglu & Velcu, 2012). The fifth functional feature that contributes to a successful adoption of marketing dashboards is **scenario analysis**. This feature is especially useful when the dashboard is intended to be used as a planning tool. Users can utilize scenario analysis as a decisions support tool to see how changes in certain variables impact other variables, highlighting and communication the importance of leading variables to its users (Yigitbasioglu & Velcu, 2012). The last functional feature is **automated alerts**, which is necessary so that corrective actions can be triggered as soon as the measures deviate from predefined targets (Yigitbasioglu & Velcu, 2012). These alerts can be implemented relatively easily by distinct colors, flashing and/or audio signals.

Visual Features

Dashboards convey information through visualization, where information visualization refers to the use of interactive visual representations of abstract, non-physically based data to amplify cognition (Card et al., 1999). The process of visualization is described by two distinct phases: encoding and decoding. Visualization techniques encode the data into visual shapes and colors, while the user of a visualization decodes those values. Visualization is effective if the decoding is done correctly, where perceived data quantities and relationships between data reflect the actual data (Yigitbasioglu & Velcu, 2012). Visualization is efficient if the maximum amount of data is perceived in a minimum amount of time (Yigitbasioglu & Velcu, 2012). Hence, dashboards can be evaluated according to how well they facilitate the encoding and decoding of information. The complexity of the visual features might increase the range and quantity of objects as well as with varying material and format styles (Heylighen, 1999). On the contrary, repetitive and similar patterns on current knowledge of the objects in the scene reduce the visual complexity (Oliva et al., 2004).

The first visual feature is the **use of colors**. It is well-known that dashboards often make use of colors to discriminate objects from one another to recognize and identify them. However, the use of colors may improve the visualization, excessive color use can distract the user and may have an adverse effect on decision-making. Likewise, redundant visual information such as non-value adding 3D objects can distract the user. The second visual feature is a **single page**, where it is strongly suggested that a marketing dashboard should fit on a single screen. The drill-down feature ensures that the information displayed on the marketing dashboard is open for additional information with the point and click interactivity.

Supply Side of the Marketing Dashboard	
Functional Features	**Visual Features**
Information content quality (Popovič et al., 2012)	Clarity of overall visual display (Pauwels et al., 2009)
Information access quality (Popovič et al., 2012)	Use of colors (Yigitbasioglu & Velcu, 2012)
Drill-down capabilities (Pauwels et al., 2009)	Single page (Yigitbasioglu & Velcu, 2012)
Type of presentation format (i.e. graph or table) (Yigitbasioglu & Velcu, 2012)	
Scenario analysis (Yigitbasioglu & Velcu, 2012)	
Automated alerts (Yigitbasioglu & Velcu, 2012)	

Table 2: Summary of the Supply Side drivers for successful marketing dashboard use

2.6 Fit Between Demand and Supply

"The fit between demand and supply is critical for dashboard success (Lim & Benbasat, 2000). The type of information provided should match with the decision responsibilities of the users and the metrics should be those that are crucial for the industry or the firm. There are multiple factors from demand and supply which complement each other and result in a match. As the research goal of this study is to explore the interrelationships among the factors that determine the success of dashboards, the purpose of the literature study is to find which interrelationships are mentioned in the prior literature. Therefore, the question that will be handled during this section is: What interrelationships between demand and supply result in a fit are mentioned in prior literature?"

Dashboards draw on theories from a variety of disciplines including cognitive psychology (Yigitbasioglu, 2012). The **cognitive fit theory** focuses on the fit between an individual's decision-making skills, the information presentation format and the task at hand (Yigitbasioglu, 2012). The theory provides useful guidelines to the choice of presentation formats to be applied within the organization. For example, graphs as a presentation format are well suited for spatial tasks that involve forecasting and comparisons as well as for tasks that require multidimensional data analysis and pattern recognition (Yigitbasioglu, 2012). On the other hand, tabular information is more appropriate for symbolic tasks, including users who are more numerical such as accountants or financial analysts (Vessey & Galletta, 1999). The same rule applies for the different organizational decision style, where an analytical decision style requires more tabular information based on facts and observations and an intuitive decision style requires a more graphical information presentation to build more creativity and insight during a decision-making process. In addition, organizations with a more intuitive decision style will be more likely to make use of the scenario analysis as a functional feature. To achieve the desired fit, it is essential to design the characteristics of the dashboard to the cognitive style of the decision-maker. However, it is

important to note that the due to the diversity of dashboard users' knowledge, skills, and cognitive profiles it is recommended by other studies to have some level of flexibility in terms of drill-down capabilities and presentation format flexibility (Yigitbasioglu & Velcu, 2012). Therefore, for each cognitive style should be a designed dashboard available. The cognitive fit theory gets supported by the task-technology fit theory (Goodhue & Thomspon, 1995), which focuses on the fit between individual abilities, task requirements, and the functionality of the technology. The theory explains that certain kinds of tasks require information from different organizational units, and therefore, require technological functionality under the form of integrated databases throughout the organization (Goodhue & Thomspon, 1995). In other words, the functional features should enable the cognitive fit throughout different organizational units, as where the visual features amplify the cognitive fit (Card et al., 1999) by improving the encoding and decoding of information. The amplifying role of the visual features is supported by Franklin et al. (2017) stating that visualization tools are specifically designed to assist our visual system to more efficiently process detail that might otherwise require significant cognitive effort. Visualizations support the data decoding process by providing information that can be readily perceived (Zhang & Norman, 1994).

Visualizations can also provide short-term or long-term memory aids so that the overall memory load can be reduced (Wilbanks & Longford, 2014). Such support can make complex information more readily consumable by its users. In addition, content quality and drill-down capabilities are critical in monitoring different aspects of the organization. When speaking of interdepartmental relations on the demand side it is important to consider the information access quality of dashboards. In a situation of mistrust or rivalry among departments, the dashboard runs the risk of being misused against other departments or organizations. Eventually, a business unit's capabilities and marketing dashboard efforts positively influence its sensemaking (Krush et al., 2013). Enabling sensemaking is the desired goal with using marketing dashboards. Therefore, it is essential, especially for less skilled marketers and data scientists, to have the demand side and supply side of the dashboard fit well. We can posit that the match between the demand side (the decision processes to be supported) and the supply side (the functionality of the management support systems employed) is the primary driver of the potential success of a marketing dashboard. A match between the decision situation and the support a system such as a marketing dashboard provides is key to the organization's ability to leverage that system to achieve success (Arnott, 2004).

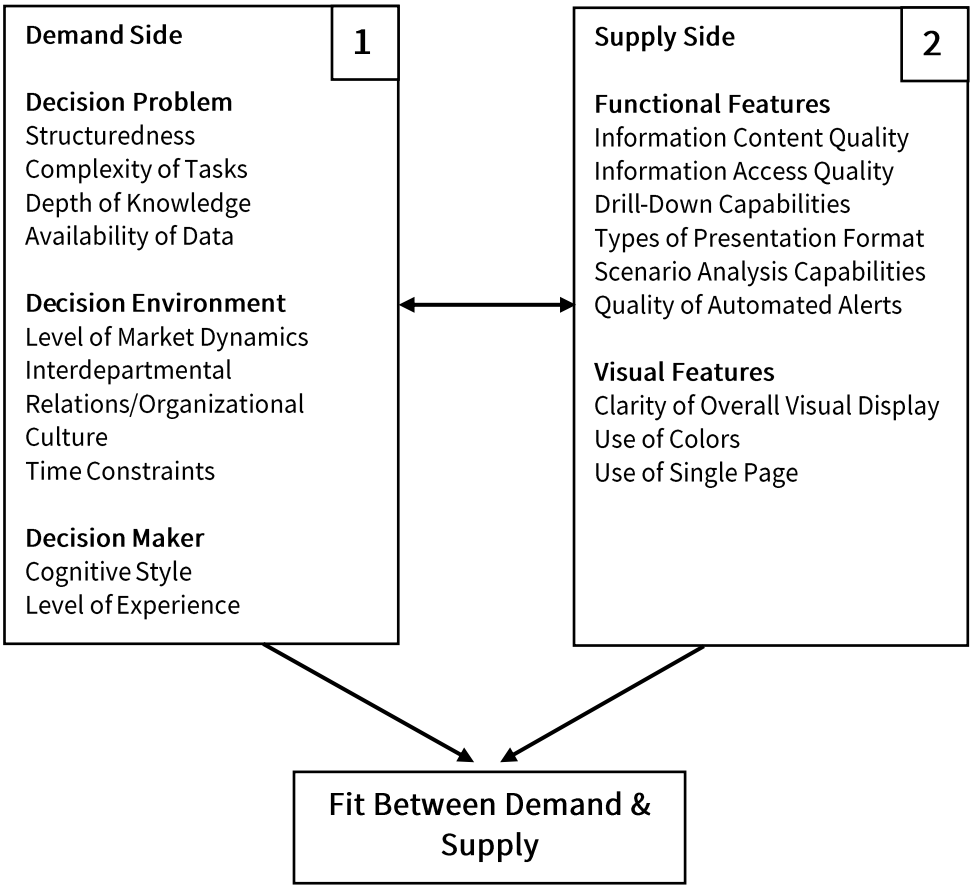

Figure 2: Fit between Demand and Supply Side of Marketing Dashboards

2.7 Implementation Context of the Marketing Dashboard

"The implementation of the dashboard involves many people and processes, with many errors on the way. The process of implementation in the organization has a moderating role in determining the success of marketing dashboards (Pauwels et al., 2009). Therefore, during this theoretical section, several theories will be discussed which describe the key success factors of successfully implementing decision support systems like marketing dashboards. The question that will be handled by this section is as follows: What are the key success factors in the implementation context of marketing dashboards described in prior literature?"

Implementation is the carrying out, execution, or practice of a plan, a method, or any design, idea, model, specification, standard or policy for doing something (TechTarget, 2015). Therefore, implementation is the action that follows after any preliminary thinking about the decision support system, which is in our case the marketing dashboard. Successfully facilitating technology adoption must address cognitive, emotional, and contextual concerns (Straub, 2009). Many studies emphasize the focus on contextual factors in the process of technology adoption (Straub, 2009; Rogers, 1995). Rogers (1995) suggests that understanding or controlling any factor will not guarantee success, contextual factors can even lead to non-adoption. Therefore, the HOT-fit framework is used to find out what exactly the appropriate context is for integrating marketing

dashboards within organizations. The HOT theory is about the factors influencing the implementation success of decision support systems is the **human, organization, and technology-fit** (HOT-fit) framework (Kilsdonk et al., 2017). The HOT-fit framework has been validated based on several case studies and a systematic review (Yusof et al., 2008). A fit between human, organizational and technological factors is required to ensure a successful implementation of decision support systems like marketing dashboards. The HOT-fit framework can be mapped onto seven interrelated dimensions; human factors to the dimensions *systems use* and *user satisfaction*, organizational factors to the dimensions *environment* and *structure*, and technological factors to the dimensions system quality, information quality and service quality (Kilsdonk et al., 2017). The concept of fit here concerns the alignment of the human, organizational and technological factors as a prerequisite for a successful decision support system implementation. For example, the success of marketing dashboards can be attributed to the fit between flexibility (technology), knowledge and expertise of users (human). Pauwels et al. (2009) support the HOT-fit model by describing several key success factors with more focus on the dashboard in specific, where Kilsdonk et al. (2017) describe the general dimensions of successful decision support system implementation. Nevertheless, the key factors described by Pauwels et al. (2009) are in line with the dimensions in the HOT-fit model. The first key success factor described is **top management support and commitment**, which is also the most frequently mentioned success factor presented within literature (Ahmad & Cuenca, 2013). The support and commitment of management are critical in ensuring the successful implementation of marketing dashboards, as without the support and commitment of top management the implementation of decision support systems will result in a failure. This key success factor can be categorized along the organization dimension described in the HOT-fit framework. Second, the next key success factor described by Pauwels et al. (2009) is the **user involvement**, which includes the level of involvement by the users within the organization. This factor is obvious when only a small number of employees is using the dashboard, a logical result is that the level of success of the dashboard is low as well. User participation and involvement are supported as a critical success factor in BI implementations by Hawking (2013). When comparing this success factor with the HOT-fit framework, it can be categorized along the human dimension. Third, the following factor described by Pauwels et al. (2009) is **prototyping**, where regarding marketing dashboards users should begin with a prototype of the dashboard and test usage and intuitive comfort, instead of one-shot implementation. Technological uncertainties and errors with the designed prototype can arise during the testing and after evaluating the prototype, a corrected dashboard can be developed. As a side effect, developing prototypes will create enhanced collaboration between marketing and the IT department and, therefore, will create involvement from the side of the users (Pauwels et al., 2009). Furthermore, while building prototype(s) of dashboards can help to get the dashboard accepted and to remove possible organizational resistance. On the other hand, it might extend implementation from months to years. As the purpose of the prototype is discover potential technological errors, the success factor can be categorized along the technology dimension of the HOT-fit framework. Fourth, the next success factor in the implementation process is the **communication**. Clear communication is required in developing decision support systems like the dashboard, especially, between marketing and IT. Despite the awareness of the problems associated with dashboard implementation, still, the majority of organizations failed due to the lack of their consideration of organizational factors such as interdepartmental communication and

cooperation and management support (Ahmad & Cuenca, 2013). This factor clearly belongs to the organizational dimension of the HOT-fit framework. Fifth, the next success factor in the implementation process is the **training and knowledge** of its users. The level of knowledge the dashboard users possess is critical to the eventual success of the dashboard, as the users are required to make decisions based on the information they retrieve from the dashboard. The knowledge-based view (KBV) suggests that two forms of knowledge integration mechanisms are applicable: capabilities and decision-making (Krush et al., 2015). This view applies to knowledge factor, where the capabilities of the user to decode the required information from the dashboard and quality of the decisions made based on the knowledge retrieved. Therefore, proper training of the potential dashboard users is required to ensure the success of the dashboards. The factor training and knowledge belongs to the human dimension of the HOT-fit framework. Finally, the last key success factor described by Pauwels et al. (2009) is the support of the **IT department**. This support of an IT department can come from an internal department or an external party, which is hired by the organization to deal with IT related issues. Whenever the organization encounters IT related issues, which cannot be solved by its own employees, the IT department should provide the solutions. In this view, value is co-created in business-to-business (B2B) relationships between an organization and external technology suppliers (Sarker et al., 2012). As dashboards are built upon IT-based knowledge, this factor can be described as critical. This key factor can be categorized along the technology dimension of the HOT-fit framework.

Critical Success Factors in Implementing Dashboards	
CSF	**HOT-fit Dimension**
Top Management Support and Commitment (Pauwels et al., 2009); (Ahmad & Cuenca, 2009)	Organization
User Involvement (Pauwels et al., 2009); (Hawking, 2013)	Human
Prototyping (Pauwels et al., 2009)	Technological
Communication (Pauwels et al., 2009); (Ahmad & Cuenca, 2009)	Organizational
Training & Knowledge (Pauwels et al., 2009); (Krush et al., 2015)	Human
IT department (Pauwels et al., 2009)	Technological

Table 3: The Critical Success Factors in Implementing Dashboards with their matching HOT-Dimension

2.8 Predisposition Towards the Marketing Dashboard

"A marketing dashboard with a good fit between demand and supply, carefully implemented, should generate a positive predisposition among its potential users. The predisposition towards marketing dashboards is the last step in the framework for the adoption of marketing dashboards (Pauwels et al., 2009) and is the logical result of the prior stages in the framework. This predisposition of the organization is determined to have many key elements. Therefore, the question that will be handled by this section is as follows: What are the key elements of the predisposition towards the (marketing) dashboard described in prior literature?"

As literature regarding the predisposition towards (marketing) dashboards is scarce, the focus is more on the theories referring to the acceptance and adoption of decision support systems at the firm level. The first key element of the predisposition towards the dashboard described by Pauwels et al. (2009) is the **attitude**. Attitude is defined as a predisposition or a tendency to respond positively or negatively towards a certain decision support system (Bach et al., 2016). The Technology Acceptance Model (TAM) suggests that perceived usefulness and perceived ease of use are beliefs about a new technology that influence an individual's attitude toward and use of that technology (Porter & Donthu, 2006). Therefore, a certain attitude towards marketing dashboards is developed by the perceived usefulness and perceived ease of use by its users. The decision-makers need to be convinced that the organization will perform better with the use of the dashboard. Both perceived usefulness and perceived ease of use are found to be of direct influence on the intention to use a certain decision support system (Bach et al., 2016). The second key element of the predisposition towards the dashboard described by Pauwels et al. (2009) is **trust**. It is of great importance as the decision-makers need to be able to trust that the numbers are reliable and not manipulated. The dashboard should not be seen as an attempt to monitor or control the (marketing) employees or as an infringement on their professional autonomy (Speier & Venkatesh, 2002). Lippert (2002) examined trust placed in various organizational decision support systems and found evidence that predictability, reliability, and technical utility (which is comprised of perceived usefulness and perceived ease of use) are each positively correlated with trust in an IT artifact. This evidence suggests that the elements attitude and trust and highly correlated since they are both comprised of perceived usefulness and perceived ease of use and highly correlated. The last element mentioned by Pauwels et al. (2009) is the **expectations of management**. In a situation of low expectations, management is likely to reduce acceptance of the dashboard. On the other hand, high expectations help generate initial use but backfire when the experience does not (immediately) live up to those expectations (Pauwels et al., 2009). For example, users of the dashboard should be prepared for bugs and initial problems when a dashboard is just installed. To develop a proper performance dashboard, it is required from management to clearly communicate these expectations, as such, that the IT-related party has a clear understanding of what is needed (Lempinen & Rajala, 2014). To conclude, the predisposition towards (marketing) dashboards is comprised of three major elements: attitude, trust and management's expectations.

At the end of the framework, the process of adoption results in a predisposition towards marketing dashboards which is derived from the **Technology Acceptance Model (TAM)** (Figure 3). TAM is an adaptation of the Theory of Reasoned Action (TRA) introduced by Davis (1989) and aims to predict user acceptance of IT and explain the behavior of individuals in IT acceptance. TAM

describes that IT adoption has two perceived attributes that influence user adoption, namely 'perceived usefulness' and 'perceived ease of use' (Davis, 1989). The predisposition towards marketing dashboards in our framework is based on TAM. Attitude as a critical success factor in the predisposition is derived from perceived usefulness and perceived ease of use. These two are a result of prior external variables in TAM. This view applies to our framework too, where the predisposition towards dashboards is determined by the prior stages of the framework. The predisposition stage tells us whether the marketing dashboard was perceived as enhancing, free of effort and trustworthy.

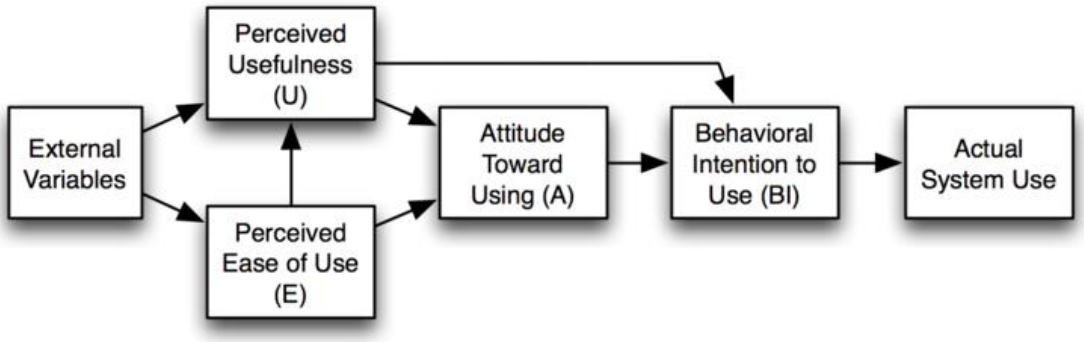

Figure 3: Technology Acceptance Model (TAM) (Davis, 1989)

2.9 Successful Adoption of Marketing Dashboards

"The extent to which the organization can learn to facilitate the interaction between the essential factors in an IT service system and leverage user-perceived value throughout the service process will ultimately determine its success or failure (Lempinen & Rajala, 2014). In the end, the success of a marketing dashboard is thus determined by the user-perceived value of the dashboard. Therefore, within this study the last additional section of the conceptual framework, which determines if the marketing dashboard was successful, will be the perceived success of the marketing dashboard. The goal of this theoretical sections is to answer the following question: What are the factors of perceived success of dashboards, or in general decision support systems, mentioned in prior literature?"

The simple provision of data and analytical functionalities to many users does not lead automatically to success (Alpar & Schulz, 2016). The adoption and success of a marketing dashboard depend on many interrelated factors mentioned in the previous theoretical sections. Eventually, the marketing dashboard should help the organization and its individual users, therefore, the user-perceived value of the dashboard is at the core of determining the success of the dashboard. To determine the user-perceived value, we must identify the perceived benefits to be gained from marketing dashboards. The first benefit identified by Pauwels et al. (2009) is the **increased accountability**. The measurement of marketing performance (MPM) had greater attention in the last years, as there have been regular calls by marketing practitioners to assess the contribution of marketing to firm performance (O'Sullivan & Abela, 2009). Improving the accountability of

marketing efforts and marketing investments is one of the key purposes of a dashboard (Pauwels et al., 2009). Therefore, the adoption of marketing dashboards could lead to a more increased accountability of the marketing department within an organization. Second, the **improved effectiveness and efficiency of marketing efforts** have been identified by Pauwels et al. (2009) as an important benefit of the use of marketing dashboards. As marketing efforts and investments should not only be better monitored but also better deployed, which will lead to gains in terms of effectiveness and efficiency in marketing efforts. Furthermore, a study by Wanda & Stian (2015) came up with potential benefits gained from computer-based decision support systems presented in the table below. Some of these benefits, like cost savings, are relatively easy to calculate. However, others such as increased accountability are more challenging because of the intangible nature. The potential benefits identified by Pauwels et al. (2009) and Wanda & Stian (2015) could determine the user-perceived value of marketing dashboards and eventually the perceived success of the dashboard.

Perceived Benefits of Marketing Dashboards	
Perceived Benefit	**Article**
Increased Accountability	Pauwels et al. (2009)
Improved Effectiveness and Efficiency of Marketing Efforts	Pauwels et al. (2009)
Better Decisions	Wanda & Stian (2015)
Support for the Accomplishment of Strategic Business Objectives	Wanda & Stian (2015)
Time Savings for Users	Wanda & Stian (2015)
More and Better Information	Wanda & Stian (2015)
Cost Savings	Wanda & Stian (2015)
Improvements in Other Business Processes	Wanda & Stian (2015)

Table 4: Perceived benefits of marketing dashboards determining the user-perceived value

2.10 Conceptual Framework

In the upcoming theoretical sections, the literature on the adoption of (marketing) dashboards is outlined. The work of **Pauwels et al. (2009)** and **Wierenga et al. (1999)** focused on the success factors in adopting marketing dashboards or marketing decision support systems is used as the basis for the proposed conceptual framework. Besides that, every stage in the adoption framework is studied in more detail, as a result, every stage is developed by gathering more insights from studies related to decision support systems (DSS), information systems (IS) or business intelligence (BI). The extensive literature review on these domains contributed in identifying more capturing success factors. The model presented below in Figure 4 is the proposed conceptual framework.

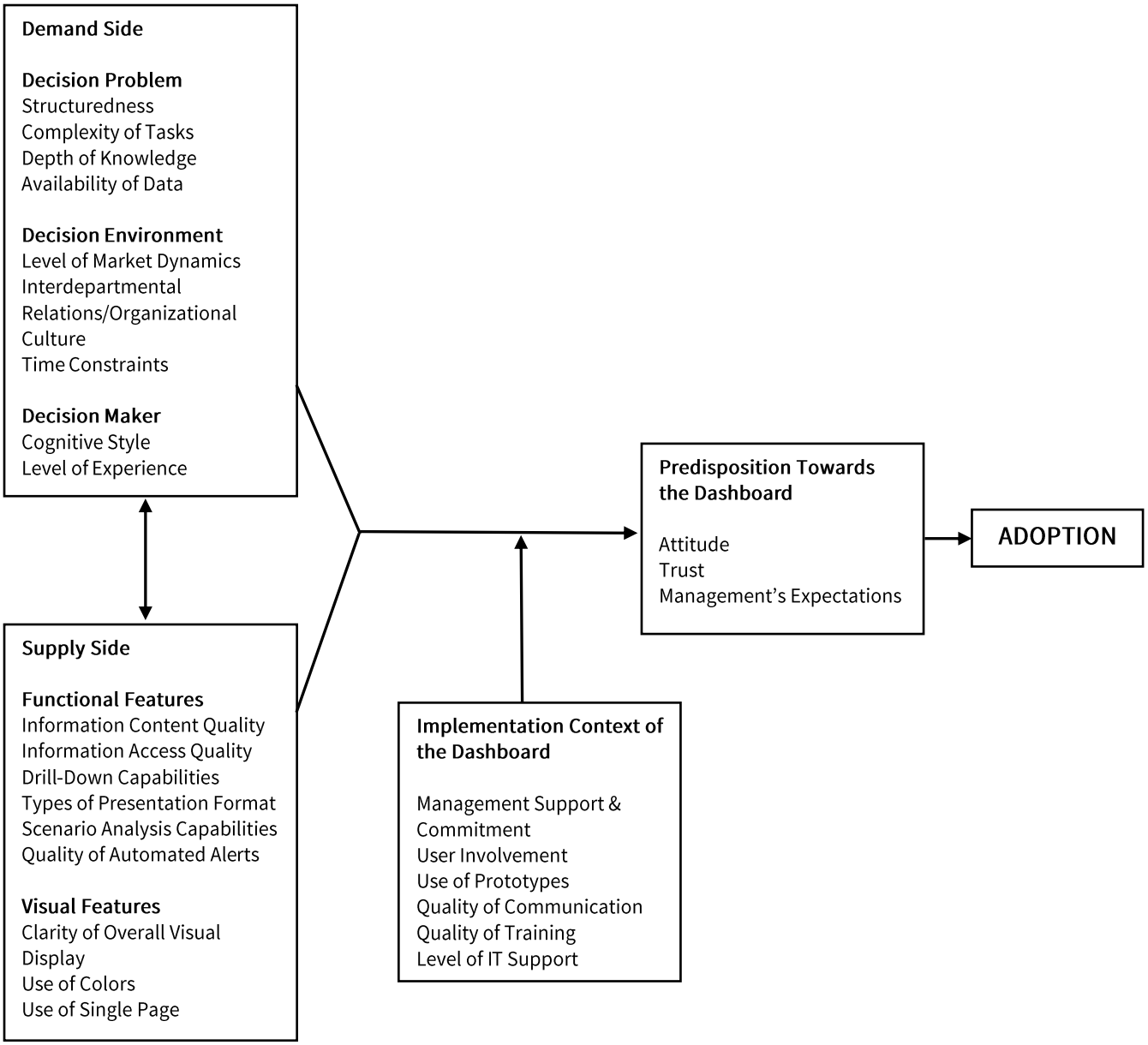

Figure 4: Framework for the adoption of marketing dashboards derived from literature.

The proposed conceptual framework focuses on five stages in the adoption of (marketing) dashboards. Each stage, except the adoption, presents multiple critical success factors, which are all determinants of a successful adoption mentioned in the prior literature. However, the fit between the demand and supply side is determined by interrelationships between the success factors and to what extent they complement each other. A match between the decision situation (demand) and the support a system (supply) such as a marketing dashboard provides is key to the organization's ability to leverage that system to achieve success (Arnott, 2004). The implementation context stage follows the demand and supply side describing all success factors that are relevant during the phase of implementation. After successfully implementing a marketing dashboard, the users develop a certain predisposition towards the dashboard, which is described in the next stage. After the evaluation and developing a predisposition, the marketing dashboard is completely adopted in an organization. This stage represents the final stage in the success factor model.

3. Methodology

The purpose of the methodology section is to describe the chosen methodology and it includes information regarding the steps taken, data gathering tools, operationalization for the thesis. In section 3.1, a short overview will be given of the used procedures and the collected sample. Section 3.2 describes the operationalization, which involves defining the measurement of the phenomenon and its reliability. Finally, in section 3.3 the used data collection tools and the data analysis method will be described.

3.1 Methodological Considerations

The goal of this study is to identify the critical success factors influencing the adoption of marketing dashboards within e-commerce organizations. In other words, to enrich the conceptual framework outlined in the theoretical section and an operationalization of the critical success factors. Given the nature of this research objective, it was determined that qualitative research techniques would contribute to an in-depth understanding of marketing experts' perceptions on the determinants of marketing dashboard adoption. Therefore, a qualitative research approach will be adopted using one-to-one semi-structured interviews with marketing experts or IT professionals of 8 small and medium-sized enterprises (SMEs) within the e-commerce industry, who were directly involved in introducing marketing dashboards within their respective organization. As the aim of qualitative research is to understand a phenomenon rather than measure them, it appears qualitative research is more suitable to for understanding the business activities of SMEs (Gilmore et al., 2001). Qualitative research is exploratory research used to gain an understanding of underlying reasons, opinions or motivations. These in-depth interviews result in detailed discussions with busy managers and focus on understanding the driving forces behind the adoption of marketing dashboards. The operationalization of the CSFs is performed by ranking the list of factors based on perceived importance. In the results section, the expert opinions are processed by discussing the perceived factors per adoption stage and see whether consensus was reached among the interviewees regarding particular CSFs. Based on the expert opinions the critical success factor model derived from the literature will be modified by amplifying, removing or adding CSFs that were mentioned regularly by the interviewees. Furthermore, the results from ranking the CSFs by the experts will be processed. In the discussion section, the research questions will be answered based on new insights from the interviews.

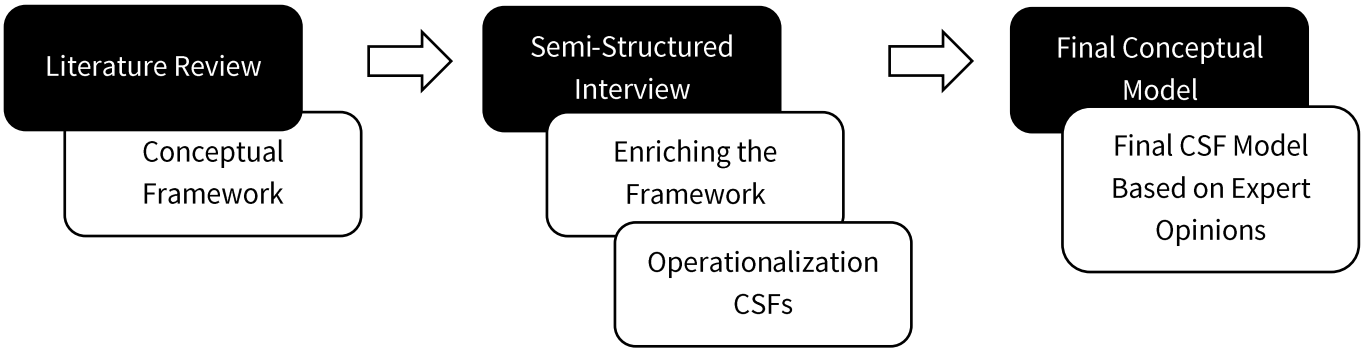

Figure 5: the Methodological process of the study

3.2 Selecting Interviewees

Participants for this study are selected based on their knowledge and experience related to marketing dashboards. In addition, the respective organization is required to have adopted marketing dashboards recently. Examples of ideal participants would be marketing experts or IT professionals. By selecting these participants, the sample interviewees should be homogenous and share critical similarities related to the research question. The participants are contacted via the network of the external supervisor and my personal network. For confidentiality reasons, the names of the participants are replaced by pseudonyms. For the same reason, company names are replaced by company information which reflects the organization as good as possible.

Pseudonym	Interviewee Position	Company Information
Oliver	Marketing Manager	Webshop for Labels & Printers
Jack	Marketing Representative	Predictive Marketing Bureau
Harry	Owner	Online Shoe Retailer
Charles	Head of Digital Commerce	Marketing Agency
Thomas	Digital Advertising & Analytics Marketeer	Marketing Agency
George	Owner	Webshop Developer
William	Conversion Specialist	Webshop for Games
Max	Online Marketer	Webshop for Fireworks

Table 5: Overview of selected interviewees

3.3 Interview Process

The semi-structured interviews will be held face-to-face. Telephone interviews are only appropriate for short interviews (Sturges & Hanrahan, 2004). As the interviews are in-depth and only semi-structured the best way is to conduct them face-to-face. The interviews will be held in Dutch, since this is the mother tongue of the researcher and all interviewees. By doing so, the questions can be understood and interpreted better by the interviewee and the answers provided can be understood better by the interviewer. Translations will be made carefully and considered. The interview framework presented below suggests that the interview consists of 4 parts. First, the participant will be asked some general questions regarding marketing dashboards. Second, the next part is created with the research goal to enrich the conceptual framework. The participant is asked per stage what factors are expected to influence the adoption of marketing dashboards. Then the critical success factors from the framework are presented to the participant and he/she is asked to give his/her opinion on the CSFs. Third, the participant is asked to rank the list of critical success factors and perceived benefits. Finally, a short evaluation is conducted, where the participant is asked about the interview process and his/her opinion on the results of this study in the form of a CSF checklist.

3.4 Interview Framework

As discussed above, a **semi-structured interview** approach is used whereby structured topics make it possible to follow a guideline but the interviewer is also able to follow topical trajectories in the conversation that may stray from the guide when it seems appropriate. The questions of the interview aim to enrich the framework presented in the theoretical section by assessing the driving forces behind the adoption of marketing dashboards per stage from the expert's perspective. Hereby, new driving forces can be identified or eliminating the unnecessary ones, in other words, necessary changes towards the framework can be identified. Furthermore, the questions also aim to operationalize the critical success factors by identifying and ranking the critical success factors based on the perceptions of the marketing experts. During the interview, the marketing experts are asked to rank the list of critical success factors based on perceived importance. The outcomes of these steps will strengthen the conceptual framework and provide an operationalization of the critical success factors presented in the framework. The complete interview framework can be found in Appendix A.

3.5 Data Analysis

The data used in the next chapter consists out of transcripts from the interviews and the recorded interviews as a back-up. During the interviews, notes were made and the complete interviews were recorded as well. The semi-structured interview (framework presented in Appendix A) is a guideline with structured topics, however, the interviewer is also able to follow topical trajectories. The transcripts are written based on the structured topics and with the support from notes and recordings. The interviews were conducted in Dutch, but the transcripts are translated into English for the purpose of this study. The qualitative content analysis is used as a method for structured text analysis. The qualitative content analysis is a generic form of data analysis in that it is comprised of an atheoretical set of techniques which can be used in any qualitative inquiry in which the informational content of the data is relevant (Forman & Damschroder, 2007). The qualitative content analysis examines data that is the product of open-ended data collection techniques aimed at detail and depth, rather than measurement (Forman & Damschroder, 2007). As the aim of the study is to understand phenomena rather than measure the phenomena, this method of data analysis suits the goal of the study. Reporting the findings will be done by presenting and discussing the quotes from the interviewees. The most reflective and representative quotes will be chosen to illustrate the reasoning. The table presented in Appendix D one of the matrices for data analysis with the corresponding analysis questions. The supply side matrix is here used as an example. The remaining data matrices can be found in Appendix E. The interview transcripts will be clustered into matrices.

The data matrices are then analyzed according to the analysis questions by noting patterns/themes, seeing plausibility, counting, making comparisons, clustering, and noting the relations between variables (Miles & Huberman, (1994). One can expect patterns of variables involving similarities and differences among categories, and patterns of processes involving connections in time and space within a bounded context (Miles & Huberman, 1994). Pattern finding can be very productive in this study as the number of cases or data overload is severe. As people are meaning finders, plausibility can easily become the refuge of analysts who are too ready to

jump to conclusions (Miles & Huberman, 1994). Clustering is done to understand a phenomenon better by grouping and then conceptualizing objects that have similar patterns or characteristics (Miles & Huberman, 1994). With counting one identifies a theme or a pattern by isolating something that (a) happens a number of times and (b) consistently happens in a specific way (Miles & Huberman, 1994). Making comparisons is done by drawing a contrast or make a comparison between two sets of things – persons, roles, activities, variables, cases as a whole – that are known to differ in some other important respect (Miles & Huberman, 1994). Moreover, the basic analysis tactic behind noting relations involves trying to discover what sort of relationship exists between two (or more) variables (Miles & Huberman, 1994).

4. Results

The purpose of this chapter is to present the results of the qualitative interviews. First, the results of the eight expert interviews are outlined per stage of the success factor model. The results are presented in data matrices and analytical commentary is written which describes similarities and differences in the data and summarizes the findings that emerge from this cross-matrix analysis. The interviews assess the experts' perceived value of the success factor model derived from literature. Second, the ranking results of the CSFs are presented with analytical commentary. Lastly, the ranking results of the perceived benefits are presented.

4.1 Perceived Value of the Conceptual Framework

During this study, eight experts were interviewed. All experts are active or have experience in a marketing function within the e-commerce industry. The interviews started with three general questions to get in the sphere of the subject. Next, questions were asked regarding the organization's demand side of marketing dashboards, the supply side of marketing dashboard, the implementation context, and the predisposition towards marketing dashboards. To assess the experts' perceived value of the success factor model, a number of analysis questions are developed, which are slightly adjusted based on the particular stage of the success factor model.

- Before showing the success factor model, what CSFs are mentioned by the interviewees concerning *"name of the stage"*?

  >Conceptual model is showed to the interviewee<

- Do the interviewees show understanding of the CSFs presented in the model?
- According to the interviewees, which CSFs could be added or removed to *"name of the stage"*?
- Do the interviewees show understanding of the CSFs' place in the model?

4.1.1 Perceived Value of the Demand Side of Marketing Dashboards

Perceived Success Factors

The full data matrices are too big to include here in the results section. The data matrix related to the demand side can be found in Appendix E. Therefore, per analysis question the results will be summarized in smaller tables. Before showing the CSFs derived from the literature study, the interviewees were asked to fill in the stage with CSFs themselves. Table 6 below presents the CSFs mentioned by the interviewees. The first factor that stands out is that all eight interviewees mention the importance of the *user-perspective* on the demand side. Even before showing the CSFs derived from literature, all interviewees agree on the importance of considering the decision-maker's perspective in designing marketing dashboards. Addressing the personal and functional characteristics of the users helps to amplify their cognition. The last quote of Harry illustrates the drawback when all user characteristics are to be considered in designing marketing dashboards. Nevertheless, the interviewees agree upon the fact that the dashboards must be aligned with the needs and wishes to its full extent.

"Address the personal characteristics in the process of dashboard design." (Jack, Interview 2)

"From a business perspective, I think it is important in developing dashboards that people clearly define to what extent to want to perform micromanagement. In other words, to what extent they want to go in-depth with their available data on the dashboard." (Thomas, Interview 5)

"This implies that the design of a dashboard is very bounded to the personal or functional characteristics." (Thomas, Interview 5)

"Design is in my opinion very important, but from experience, I can say that it is hard to create a dashboard that fulfills everybody's needs." (Harry, Interview 3)

Another success factor that is mentioned frequently by the interviewees is the *availability of data* within an organization. The exact phrase "availability of data" was mentioned four times by the interviewees. The quality of data sources was mentioned by one interviewee too, which is perceived to be interpreted in a similar way. *"Without the proper data sources, you will get nowhere (William, Interview 7)."* The information required for successful decision-making based on marketing dashboards is perceived as essential. The interviewees argued that there must be enough *actionable information* available in the organization to steer marketing objectives. The extent to which *KPIs are defined* within an organization's marketing department is perceived as critical too. By defining KPIs properly everybody within the organization will understand exactly what is measured. Another CSF that was not incorporated in current literature on the demand side of marketing dashboards was the *financial constraints*. This factor was mentioned twice by the interviewees. This factor should be taken into consideration on the demand side, as this factor is important determining the quality of factors on the supply side. From a business perspective, often budgets are allocated to projects like this. Furthermore, concerning the organization's internal and external environment some interviewees mentioned CSFs such as *external factors (twice),*

organization's purposes, open management, organization's problems, and level of management support. This indicates that the decision environment is perceived as important in the level of dashboard adoption.

Expert ID	Perceived CSFs
1: Oliver	Actionable Information, Automated Alerts, User-Perspective, Scenario/Solutions, External Factors, Customization Features, Visual Elements.
2: Jack	Management's Expectations, User-Perspective, Actionable Information, Quality of Data Sources, Organization's Purposes.
3: Harry	Design Features, User-Perspective, Communication, User-Involvement, Financial Factors, Open Management.
4: Charles	Accessibility, User-Perspective, Availability of Data, Defining KPIs, Define Organizational Problems, Knowledge, Communication.
5: Thomas	User-Perspective, Financial Factors, Availability of Data.
6: George	User-Perspective, Customization, Actionable Information, Availability of Data.
7: William	User-Perspective, Motivation, Management Support, Availability of Data.
8: Max	Visual Features from User-Perspective, Customization, External Factors, Motivation.

Table 6: Perceived CSFs on demand side before showing success factor model.

The clustering of CSFs (Figure 6) is done by categorizing the factors based on the categories provided by literature; decision problem, decision environment, and decision-maker. By clustering the CSFs mentioned by the interviewees into categories it appears that factors concerning the decision environment of the organization are mentioned most frequently (13). The decision environment can are characterized by CSFs such as; external factors, organization's purposes, financial constraints, motivation, expectations, the openness of management, communication, and management support. The decision problem category (10) can be characterized by CSFs such as; the degree of actionable information, quality of data sources, availability of data, quality of KPI definitions, and knowledge. The last category decision-maker (9) can be characterized by CSFs such as; user-perspective and visual elements. All categories were addressed by the interviewees. The category called "misplaced" contains factors that are mentioned on the demand side while they clearly belong to a different stage of the model. The following misplaced factors were mentioned by the interviewees: automated alerts, scenario analysis, customization features, design features, and accessibility. However, as misplaced factors are mentioned 7 times, it seems that there exists some confusion about the demand side. It is remarkable that the misplaced factors involve mostly factors that belong to the supply side of the marketing dashboard. The table presented in Appendix F contains citations from the interviewees displaying their misunderstandings of particular factors.

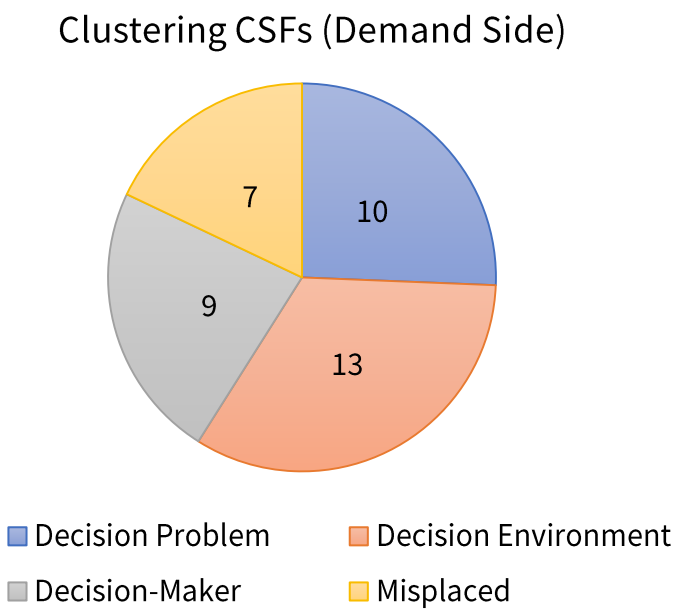

Figure 6: Clustering the perceived CSFs (demand side)

Modifications to the Success Factor Model

The interviewees suggested a lot of modifications to the demand side of marketing dashboards. Table 7 below presents the success factors that are added and removed by the interviewees. When the success factor was mentioned more than once it is described as the frequency number between brackets. The *financial constraints* imposed by management was mentioned twice by the interviewees. Budgets imposed by management are there to be considered by the project team when choosing the dashboard software (supply side). Furthermore, two interviewees mention that they see the success factor *motivation* on the demand side. They argue that the level of motivation among employees is important in achieving the desired fit between demand and supply. One of these two interviewees added the *role of management support* to steer motivation. Another remarkable result is that two interviewees think the abundance of user-related factors could be merged into one clear factor. The factor *user-perspective* is recommended by them to replace all user-related success factors. They argue that describing user characteristics could be done with one factor. One interviewee mentioned the role of *organization's product/service range* on the demand side. A bigger product range means more data layers and more complicated dashboards. For the demand side, the interviewee considers the amounts of data in an organization as important. The *early involvement of users* is mentioned too by one interviewee. The process of user involvement should occur as early as possible to achieve the best marketing dashboard that fulfills everybody's needs. Lastly, the *reliability of data sources* and the *accessibility* were mentioned once. Dashboard development projects should always start with clear data management according to one interviewee. The reasoning behind the accessibility sounds familiar with user involvement, where the interviewee notes that needs related to accessibility must be incorporated in an early stage for development purposes.

On the other side, market dynamics was the success factor that was criticized the most by the interviewees. It is remarkable that most factors that are misunderstood by the interviewees all

fall under the category *'decision environment'*. Environmental influences, internally or externally, on the adoption of marketing dashboards is difficult to understand by the interviewees. Furthermore, the depth of knowledge is mentioned twice. According to the interviewees, the dashboards must be easy to interpret for everyone.

CSFs Added	CSFs Removed
Financial Constraints (2x)	Market Dynamics (6x)
Motivation (2x)	Time Constraints (4x)
Communication (2x)	Depth of Knowledge (2x)
User Perspective (2x)	Experience
Organization's Products/Service Range	Organizational Culture
User Involvement	
Reliability of Data Sources	
Accessibility	
Management Support	
Customization	

Table 7: Modifications made by the interviewees to the success factor model demand side

Perceived Understanding of the Place in the Model

Many interviewees emphasized the great interrelationships between success factors of the demand and supply side. Five out of eight interviewees mentioned the interrelationships between success factors when asked about the place within the model. *"The factors between the demand and supply side should end up in the desired fit. (Oliver, Interview 1)"* Striving for a fit between these two phases of the success factor model is in line with the findings from the literature. In addition, two interviewees already addressed the interrelationships between all success factors within the model. *"All factors will eventually determine the predisposition towards the dashboard, so all factors will interrelate with one another. (Jack, Interview 2)"* Another remarkable result from this interview question was that many interviewees mentioned that demand-side factors could also play a role in the phase of implementation. For example, Harry mentioned that the problem always stands at the core of the process, so factors related to the problem that needs to be solved with using dashboards will play a role at almost every phase. Furthermore, Charles emphasized that the users' perceived usefulness and ease of use will determine the predisposition towards a dashboard, as this solely deals is based on the users' personal experience with a dashboard. This result is mentioned by more interviewees, as they think that the users' experience is key in determining the success of a dashboard. There were other success factors that were described as important through the whole process, such as availability of data, time constraints, cognitive style, user involvement and complexity of tasks. One interviewee had difficulties with defining relationships with other phases, as all CSFs are somehow interrelated with each other. Two interviewees agreed with the place of understood factors.

4.1.2 Perceived Value of the Supply Side of the Marketing Dashboard

Perceived Success Factors

The full data matrix of the supply side can be found in Appendix E. Before presenting the interviewees with the gathered success factors from the literature review, they were asked to come up with success factors themselves. As this phase concerns the supply side of the marketing dashboard, more emphasis was placed on the specific dashboard features related to the functionality. In addition, which specific features/factors are expected to have an influence on the adoption of marketing dashboards.

Table 8 below presents the CSFs mentioned by the interviewees themselves. *Quality of information* is definitely perceived as the most important success factor on the supply side. Six out of eight interviewees mentioned this success factor. The next most frequently mentioned success factor is the perceived *ease of use*. However, it is arguable if this success factor clearly belongs to the supply side of the marketing dashboard. The most logical place for this factor would be the predisposition towards marketing dashboard, as here at this phase the final users' perceptions on the dashboard are determined. These perceptions are a result of factors from the whole process. *Trust* was mentioned by four interviewees too. However, the same reasoning applies here as trust in a dashboard is determined at the end of the process.

Visual elements were mentioned by almost all employees, but different definitions exist; visual design (3x), legibility, customization features (2x), single page, and presentation of data. The number of *functional features* mentioned is large. The following functional features are perceived to be of value by the interviewees; quality of information (6x), validity of KPIs (3x), comparison values (2x), target inclusion (2x), customization features (2x), drill-down capabilities (2x), security (3x), quality of software, real-time data, references to data, speed, automatic notifications, decomposition of data, cumulative insights, quality of data links (2x), and customer funnels. A part of these functional features is perceived as essential elements in terms of the dashboard's functionality, such as; quality of information, security, access, real-time, drill-down capabilities, etc. On the other hand, some of these functional features are perceived to increase the speed at which a user can scan and understand a dashboard. In other words, these functional features help in amplifying the user's cognition. Examples of such features are; comparison values, validity/defining KPIs, automatic notifications, decomposition of data, cumulative insights, customization features, etc. For example, clearly defining your KPIs in a dashboard result in "context and quality (George, Interview 6)" for the less experienced dashboard users. Furthermore, William mentioned that with his experience as a conversion specialist in the e-commerce it is very important to have customer funnels, which describes the journey a customer takes through an advertising or search system, navigating an e-commerce website and finally converting to a sale. Dashboard software that includes developed conversion funnels is perceived to be on the high end of dashboard suppliers according to William.

Expert ID	Perceived CSFs
1: Oliver	Ease of Use, Validity of KPIs, Quality of Data, and Visual Display of Information.
2: Jack	Validity of KPIs, Visual Design, Quality of Information, and Security of Information.
3: Harry	Dashboard Speed, Ease of Use, Legibility, Access to Dashboard, Trust, Drill-Down, Single Page, Automatic Notifications, and Security.
4: Charles	Possibility to Compare Data, Possibility to Relate External Factors, Trust, Quality of Information, Possibility to Decompose Data, Inclusion of Targets, Ease of Use, Visual Design, and Cumulative Insights.
5: Thomas	Quality of Software, Quality of Data Links, Real-Time Data, Access to Information, Ease of Use, and Security of Dashboard.
6: George	Quality of Information, Trust, Quality of Data Sources, Definition of KPIs, Drill-Down Functions, References to Data, and Presentation of Data.
7: William	Customization Features, Periodically Comparisons, Geographical Comparisons, Quality of Information, and Customer Funnels.
8: Max	Target Inclusion, Inclusion of Responsibilities, Possibility to Compare, Quality of Information, Trust, and Customization Features.

Table 8: Perceived CSFs on the supply side before showing success factor model

The clustering of CSFs (Figure 7) is done by categorizing the factors based on categories provided by literature; functional and visual features. By clustering the CSFs it appears that the interviewees were able to come up with fare more functional features than visual features. Further subcategories could be developed by dividing the functional features into indispensable features and amplifying features. The success factors belonging to each group are explained above. The category called “misplaced” contains factors that are mentioned at the supply stage, while they clearly belong to a different stage. Misplaced factors mentioned by the interviewees are trust and ease of use. These factors clearly belong to the predisposition stage, as during this phase the users’ final perceptions are determined. The table presented in Appendix F contains citations from the interviewees displaying their misunderstandings of particular factors from our success factor model.

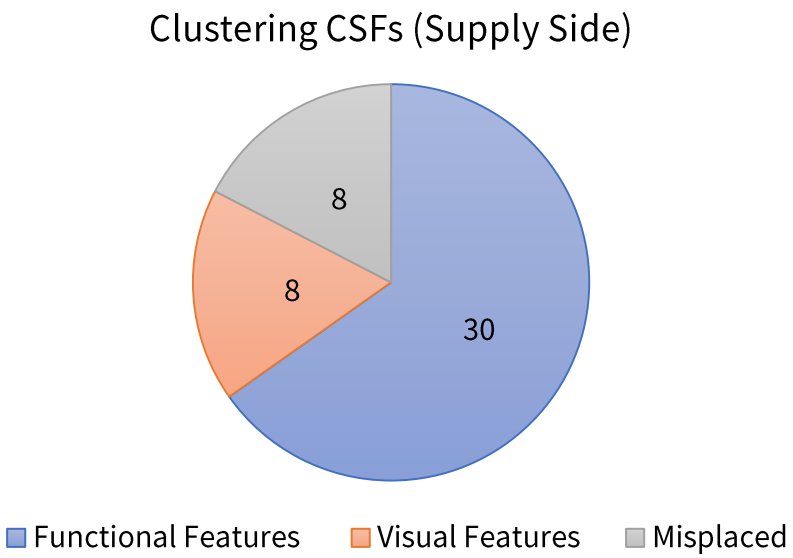

Figure 7: Clustering the perceived CSFs (supply side)

Modifications to the Success Factor Model

The interviewees suggested a lot of modifications to the supply side of marketing dashboards. Table 9 below presents all success factors added or removed by the interviewees. In case the CSF was mentioned more often it is described as the frequency number between brackets. As mentioned in the first section of the supply side, the CSF ease of use cannot be considered as a factor for the supply side. Similar to the demand side, the interviewees suggested creating a compound factor for the *visual features* of the dashboard. This complements with the user perspective as a suggested compound factor at the demand side. One interviewee took it a step further by dividing the supply side into two sub-categories; user experience (UX) and usability. According to Harry, the *user experience (UX)* factor should combine all visual factors into one and the *usability* should explain all features associated with the core technique of the software. Furthermore, another remarkable result is that *quality of data links* is mentioned by three interviewees, because these links to your sources form the base of data quality assurance. Another visual feature that was added to this question was the *display of numbers*, which in the ideal situation involves both absolute and relative numbers. Other success factors added are already covered during the first interview question in the prior sections.

Almost half of the interviewees would like to see the *single page* factor to be removed. These interviewees do not see added value to recapitulated data into a single page. Moving to another dashboard for more in-depth data was not an issue to them. One interviewee mentioned that the quality of automatic notifications could be removed. “A dashboard must outline alarming numbers by itself.” *Scenario analysis* is misunderstood by one interviewee. The interviewee does not recognize the applicability of scenario analysis for marketing dashboard software. There were four interviewees who did understand the factor scenario analysis, but addressed that it was more for future potential as ‘predictive marketing’.

CSFs Added	CSFs Removed
Quality of Data Links (3x)	Single Page (3x)
Ease of Use (4x)	Scenario Analysis
Validity/Definition of KPIs (3x)	Use of Color
Customization Features (2x)	Quality of Automatic Notifications
Visual Clarity (compound factor) (3x)	
Complexity of Software	
User Experience (UX) (compound factor)	
Usability (compound factor)	
Comparison Values (2x)	
Display of Numbers	
Competitor Values	
Real-Time Data	
Security (3x)	
References to Data	
Conversion Funnels	
Target Inclusion (2x)	
Speed	
Decomposition of Data	
Cumulative Insights	

Table 9: Modifications made by the interviewees to the success factor model (supply side)

Perceived Understanding of the Place in the Model

Comparing the results with the demand side it can be said that less confusion exists on the supply side. Almost all interviewees agree that the success factors mentioned are at the right place in the success factor model. They also agree that many CSFs interrelate with the factors from the demand side. Nevertheless, the interviewees argue about which factors could play a role in a different phase. In determining the predisposition towards the dashboard many CSFs are mentioned by the interviewees. Especially, visual features are emphasized by the interviewees in determining the predisposition. "Visual clarity of a dashboard determines the personal experience with a dashboard (Jack, Interview 2)." Functional features classified as indispensable by the interviewees are perceived to play an important role throughout the whole process of adoption. Examples of CSFs mentioned here are; information content quality and information access quality.

4.1.3 Perceived Value of the Implementation Context of the Marketing Dashboard

Perceived Success Factors

The full data matrix for the implementation context phase can be found in Appendix E. The implementation context phase concerns all success factors that play a role in the context of implementation. The implementation is carrying out, execution, or practice of a plan, a method, or any design, idea, model, specification, standard or policy for doing something (TechTarget, 2015). As mentioned before, the first question asked to the interviewees was before presenting them the CSFs derived from the literature review. The CSFs mentioned here by the interviewees are credible results as they were unaware of the model's CSFs. Table 10 below presents the CSFs mentioned by the interviewees. The most frequently mentioned success factor is the *use of mockups* (6x). Within the literature review, this CSF is described as the use of prototypes. To make the success factor model more precise and appropriate it is wise to replace the use of prototypes by the use of mockups. During the phase of implementation, the use of mockups is described by the interviewees as important to assess the ease of use of particular dashboard types. By using mockups one has more possibilities to adjust the dashboard according to the feedback provided by users. Charles recommended starting the project with a simple mockup. Potential users could give you feedback at an early stage and the initial mockup could easily be updated to a more in-depth dashboard. When a developer starts immediately with a complicated first version it is more difficult to adjust this version according to the needs and wishes of the users. *User involvement* is another frequently mentioned CSF (4x) by the interviewees. The interviewees recommend implementing user involvement as early as possible.

"The larger the organization, the earlier decision-makers need to be involved in the process. (George, Interview 6)"

George argued that organization's size is related user involvement. This is an important finding suggesting that larger organizations have more complicated dashboards due to their size. A

marketing dashboard for an organization like Amazon will have more data layers and more complicated data structure than a startup in the e-commerce. Therefore, user involvement is achieved most optimal when it is implemented at an early stage. Providing software *training* to the dashboard users is another emphasized success factor by the interviewees (5x). New dashboard software will never be easy to understand, therefore, proper training should be provided by software courses, manuals, or online tutorials. Especially, the combination with the *quality of communication* (3x) is addressed by the interviewees. These two success factors combined are perceived to be great determinants of accomplishing user involvement with your dashboards. Moreover, the factor communication should go both ways according to the interviewees. Top-down by emphasizing the goals and expectations from management, and bottom-up by clarifying the needs and wishes related to the dashboard's features.

"Quality of communication and proper training are for me the most important factors during the phase of implementation. These two success factors combined one is able to achieve the best user involvement. Your employees definitely need support with correctly using the dashboards and being able to play with the customization features. (Oliver, Interview 1)"

Motivation is another frequently mentioned CSF (4x) during the phase of implementation. However, this success factor is quite similar to user involvement or at least heavily related. High user involvement in the process of dashboard adoption results in more motivated users, as they feel more involved in the process and its decision-making. *Knowledge* is addressed quite often as well by the interviewees (4x). This is again a success factor that is interrelated with another, as knowledge of software is the result of the combination training and communication. According to the interviewees, many success factors are found to be interrelated during this phase of the model. It is remarkable that only one interviewee mentioned the achieved fit between demand and supply as CSF that plays a role during the phase of implementation. According to theory, this is a large determinant of the following phases in the model. *Management's role and support* are perceived as crucial during this phase. The role of management expressed by other success factors too, for example, communication, training, motivation, time constraints, financial constraints, etc. These are all responsibilities which must be taken care of by management. Success factors that ensure *data structure* are mentioned as well, such as; quality of backups, documentation of activities, and consistency. One interviewee described a remarkable success factor to steer motivation called: organization's success. He suggests that the organization's success relates to the users' motivation to consistently use marketing dashboards.

"Dashboard users will feel more motivated when the dashboard displays mostly positive results. (Thomas, Interview 5)"

Expert ID	Perceived CSFs
1: Oliver	User Involvement, Training, Motivation, Consistency, Feedback, Use of Mockups, and Trust.
2: Jack	Accessibility, Use of Mockups, and Quality of Information.
3: Harry	Organizational Culture, Attitude of Management, Mockups, Knowledge of IT, Motivation, and Training.
4: Charles	Accessibility, Real-Time Display, Financial Constraints, Complexity of Software, Time Constraints, Knowledge of Software, and Use of Mockups.
5: Thomas	Achieved Fit, Management's Expectations, Use of Mockups, User Involvement, Motivation, and Organization's Success.
6: George	User Involvement, Training, IT Support, and Top-Down Communication.
7: William	IT Knowledge, Backups, Documentation of Activities, Use of Mockups, Software Knowledge, Training, and Communication of Goals and Needs.
8: Max	User Involvement, Communication of Goals and Wishes, Management's Role, Motivation, Training, and Software Knowledge.

Table 10: Perceived CSFs concerning the implementation context before showing success factor model

The clustering of CSFs is done in Figure 8 based on the HOT-fit theory described in the literature review as the categorization of factors influencing the implementation success of decision support systems (Kilsdonk et al., 2017). By clustering the CSFs we note that most success factors mentioned by the interviewees belong to the human category. Therefore, most emphasis is placed on factors related to the systems use and user satisfaction. Next, the organizational and technological factors are equally spread with both twelve factors.

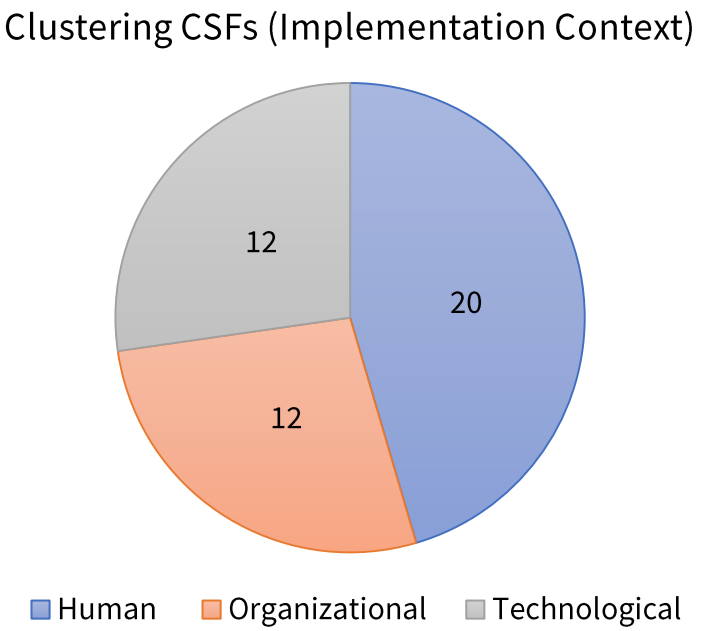

Figure 8: Clustering the perceived CSFs (implementation context)

Modifications to the Success Factor Model

The interviewees suggested a number of modifications to the success factor model. All suggested modifications are presented in Table 11 below. As described in the first section of the implementation results it is clear that the use of mockups is favored over the use of prototypes. Furthermore, the success factor motivation is also mentioned frequently and is perceived as critical to implementing marketing dashboards. The consistent use of marketing dashboards was mentioned by one interviewee, where he addressed that in order to make the implementation of dashboards successful it is recommended to make your employees/clients use the dashboards in a consistent way. On the other side, the removal of the success factor prototypes is made very clear by the interviewees. Quality of training is mentioned once as well by one interviewee saying that the dashboard must speak for itself. The interviewee has a strong point here, however, the users must be able to work efficiently with dashboard software. Therefore, not skilled employees must be trained. The removal of the use of prototypes is also mentioned twice in a different perspective. These two interviewees described that the customization features already allow users to make a dashboard their own and testing different types of dashboards is unnecessary. Lastly, according to one interviewee, the CSF level of management support & commitment could be removed. He described that if a dashboard is properly designed, no management support is needed to steer its use.

CSFs Added	CSFs Removed
Use of Mockups (6x)	Prototyping (replaced by mockups) (6x)
Motivation (4x)	Quality of Training
Knowledge (4x)	Use of Prototypes (2x)
Accessibility (2x)	Level of Management Support & Commitment
Consistency	
Feedback	
Organizational Culture	
Financial Constraints	
Software Complexity	
Time Constraints	
Achieved Fit	
Documentation of Activities	
Organization's Success	
Quality of Information	

Table 11: Modifications made by the interviewees to the success factor model (implementation context)

Perceived Understanding of the Place in the Model

The phase of implementation context is perceived as very clear by the interviewees. Especially, when comparing the results with the prior two phases. Nevertheless, many interrelationships were described by the interviewees at this phase. User involvement and organization size was described as interrelated. The larger the organization, the more complicated the data structure, the earlier users are needed to be involved in the process. An important driver for knowledge is the combination of training and communication within an organization. The success factor user involvement was mentioned often as a factor that could play a role in other phases as well. Many interviewees argued that users need to be involved as early as possible. In addition, user

involvement is also described as an important determinant of a predisposition towards the marketing dashboard.

"When a dashboard user feels involved during the process, he or she will be more likely to perceive a dashboard as positive. (Charles, Interview 4)"

According to the interviewees, a strong level of management support and commitment is a result of strong communication. As communication goes both ways (bottom-up & top-down) management must be aware of the employees' issues and the other way around. One could place IT support on the supply side as well. As an extra offering from the software supplier. From experience, one interviewee can say that they are often the suppliers of IT knowledge.

4.1.4 Perceived Value of the Predisposition Towards the Marketing Dashboard

Perceived Success Factors

The full data matrix of the predisposition can be found in Appendix E. The predisposition towards marketing dashboards concerns the last step before the final adoption where success factors are described that determine positive or negative feelings towards the dashboard. There are a lot of factors that determine the users' positive or negative feelings towards a marketing dashboard. Results from the interview display a variety of factors, but there exists some consensus among the interviewees as well. Table 12 below presents the CSFs described by the interviewees. The first thing that stands out is that the factors determining attitude in literature are often mentioned, namely *perceived ease of use and usefulness*. According to the Technology Acceptance Model (TAM), attitude towards using a decision support system like marketing dashboards consists the user's perceived usefulness and perceived ease of use. It is remarkable that these two factors are together mentioned nine times and the composing factor attitude is not even mentioned once. This indicates that the interviewees value factors from a more user-perspective instead of a too generally composed factor attitude. In the end, many interviewees describe that the perceived usefulness and ease of use are the biggest determinants of a positive or negative feeling towards a marketing dashboard. Thomas described the CSF perceived usefulness perfectly, saying that "when a user sees that the dashboard has an impact on the organization, he or she will perceive the dashboard as valuable." In addition, Oliver experienced the perceived usefulness closely with the following example.

"Thanks to the link we developed between the automatic notifications and e-mail, the department noticed its usefulness by providing them with the right information real-time. This resulted in a positive attitude towards the dashboard software." (Oliver, Interview 1)

This example perfectly describes how the perceived usefulness of the department results in a positive attitude towards the dashboard. It confirms the TAM theory saying that perceived usefulness is an important predecessor of the CSF attitude. However, to create a success factor model from the user-perspective it is recommended to include perceived usefulness and ease of

use in the model. Another frequently mentioned success factor is the user's *trust* in a marketing dashboard (5x). Most of the interviewees described trust here as an important determinant arguing that when users lose the trust they will immediately produce a negative predisposition towards the dashboard. The CSFs related to the user-perspective clearly stand out here at this phase, as the success factors user involvement (3x) and user-perspective (2x) are also frequently mentioned. Where the user-perspective concerns more the considerations on the demand side of marketing dashboards and user-involvement is addressed to have an impact throughout the whole process of adoption. The interviewees emphasized earlier that the users and decision-makers should be involved in the process of data visualization as early as possible. The users are the ones that make the data-driven decisions, therefore, the marketing dashboard should be meaningful to them. Visual clarity (2x) is a success factor that appears to have a similar relationship with ease of use and usefulness. Variables such as color and layout are simple but very important factors from the user-perspective according to the interviewees. These data visualization tools make sure that the dashboard does not give them a headache when looking at it. The other success factors mostly relate to the functionality of the dashboard, such as; access to dashboards, quality of content, the definition of KPIs, drill-down capabilities, and functionality. This indicates that the factors from the supply side are also perceived to be of great importance in determining the positive or negative predisposition. Lastly, some CSFs are addressed by the interviewees that relate to the phase of implementation, namely; IT support, motivation, training, management's support, knowledge of software, management's satisfaction, and quality of communication.

Expert ID	Perceived CSFs
1: Oliver	Perceived Usefulness and Trust.
2: Jack	Achieved Fit, Visual Clarity, Drill-Down, Trust, and Management's Satisfaction.
3: Harry	Functionality, Trust, Ease of Use, User Involvement, and Quality of Communication.
4: Charles	All prior CSFs, Motivation, Visual Clarity, User-Perspective (ease of use & usefulness), and Access to Dashboards.
5: Thomas	Usefulness and User Involvement.
6: George	User Involvement, Trust, Quality of Information, and Management's Support.
7: William	Ease of Use, Usefulness, Trust, User-Perspective, and Definitions of KPIs.
8: Max	Ease of Use, Knowledge of Software, and Training & Support.

Table 12: Perceived CSFs concerning the predisposition before showing success factor model

The clustering is done in Figure 9 by categorizing the CSFs based on the descriptions above. The visual presentation below clearly shows that user-perspective related factors are the most frequently mentioned success factors. This illustrates even more that the user's experience with a dashboard is the most powerful determinant in developing a positive or negative predisposition.

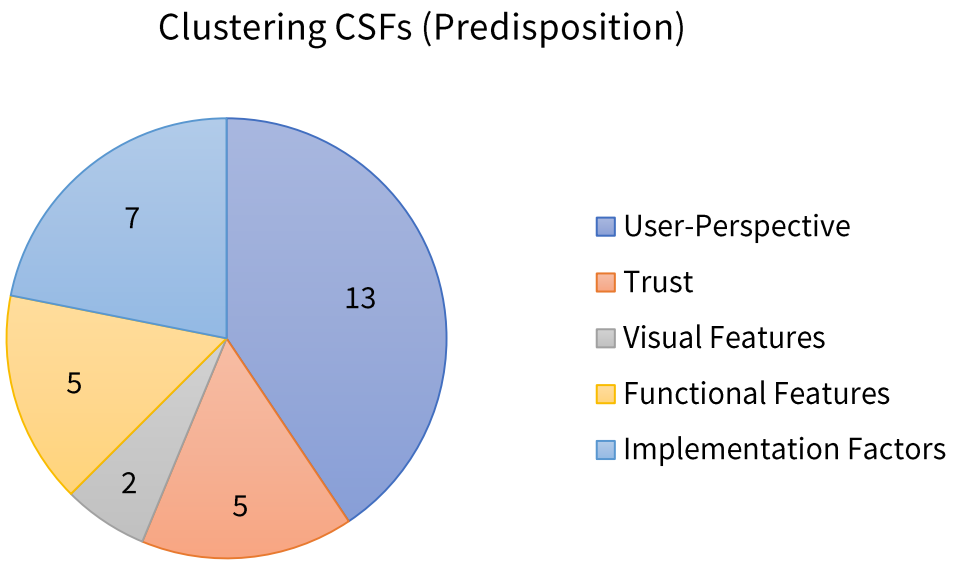

Figure 9: Clustering the perceived CSFs (predisposition)

Modifications to the Success Factor Model

It is clear that that the interviewees want to see attitude get replaced by perceived ease of use and perceived usefulness. Furthermore, just a few success factors are added since the first interview question concerning the predisposition phase. The context of KPIs should be added according to William in order to provide understanding for everyone. In contrast to prior phases, all interviewees remained to their CSFs mentioned at the first question.

CSFs Added	CSFs Removed
Perceived Ease of Use (4x)	Attitude (4x) (replaced by PE & PU)
Perceived Usefulness (4x)	Management's Expectations
Visual Clarity	
Achieved Fit	
Functionality	
User Involvement (3x)	
Quality of Communication	
Motivation	
Quality of Information Access	
Context to KPIs	
Training & IT Support	

Table 13: Modifications made by the interviewees to the success factor model (predisposition)

Perceived Understanding of the Place in the Model

All interviewees agree that the major CSFs determining a predisposition towards the marketing dashboard are a result from prior CSFs. The most important CSFs determining the predisposition according to the interviewees are described above. In accomplishing a positive predisposition towards marketing dashboards, the project team responsible for the implementation of

dashboards must consider the user perspective throughout the whole process, since this consideration perceived to be of biggest importance in adopting marketing dashboards. Management´s expectations are addressed to return earlier in the model as well by Thomas to have the expectations clear from the start of the dashboard project.

4.2 Results of Operationalization

4.2.1 Operationalization of CSFs

This section of the results answers the question how the experts rank the CSFs that influence the adoption of marketing dashboards. To find out which CSFs are perceived to be most critical in adopting marketing dashboards, the experts are asked to rank the twelve most important CSFs on the list (literature based CSFs). Starting with the one which is believed to be most important to the adoption of marketing dashboards down to number twelve. The list provided the experts with twenty-eight literature-based success factors. The results from this ranking procedure will be enlightened from different perspectives; categories, personal perspectives, composed perspective.

Critical Success Factor (CSF)
CSF 1: Structure of the Problem
CSF 2: Complexity of the Tasks
CSF 3: Depth of Knowledge
CSF 4: Availability of Data
CSF 5: Level of Market Dynamics
CSF 6: Organization Culture
CSF 7: Time Constraints
CSF 8: Cognitive Style
CSF 9: Level of Experience
CSF 10: Information Content Quality
CSF 11: Information Access Quality
CSF 12: Drill-Down Capabilities
CSF 13: Presentation Format
CSF 14: Scenario Analysis Capabilities
CSF 15: Quality of Automatic Notifications
CSF 16: Clarity of Overall Visual Display
CSF 17: Use of Color
CSF 18: Use of a Single Page
CSF 19: Level of Management Support & Commitment
CSF 20: User Involvement
CSF 21: Use of Prototypes
CSF 22: Quality of Communications
CSF 23: Quality of Training
CSF 24: Quality of IT Support
CSF 25: Attitude
CSF 26: Trust
CSF 27: Management's Expectations

Table 14: List of CSFs for ranking

CSF/Expert ID	Oliver (1)	Jack (2)	Harry (3)	Charles (4)	Thomas (5)	George (6)	William (7)	Max (8)	Frequency	%	Average
CSF 10	1	1	7	11	2	1	4	1	8	100	3.5
CSF 26	3	4		3	1	4	1	6	7	88	4.4
CSF 4	7	10	4	1	5	2	2		7	88	5.5
CSF 11	6	9		5	4		5	2	6	75	7.1
CSF 12		8	8	2		3	10	11	6	75	8.5
CSF 16	12	7		6	6	12	6		6	75	9.4
CSF 23	5		11		11	11	12	4	6	75	10
CSF 20	2			7	8	5	7		5	63	8.5
CSF 19		6	2	10	10			8	5	63	9.4
CSF 22	8	5	10			10		12	5	63	10.5
CSF 27	4	3			3	8			4	50	8.8
CSF 3	9		9				3	3	4	50	9.5
CSF 2		11		8			8	10	4	50	11.1
CSF 13					9	6	11		3	38	11.4
CSF 14	10					7		9	3	38	11.4
CSF 8			5	12	12				3	38	11.8
CSF 24			12				11	7	3	38	11.9
CSF 15		12	10	9					3	38	12
CSF 1		2		4					2	25	10.5
CSF 5			6				9		2	25	11.7
CSF 6			1						1	13	11.5
CSF 7			3						1	13	11.8
CSF 9								5	1	13	12
CSF 21					7				1	13	12.3
CSF 18						9			1	13	12.5
CSF 25	11								1	13	12.8
CSF 17			12						1	13	12.9

Table 15: Results of Ranking the CSFs by the Experts

Table 15 above presents the results of the ranking process per interviewee. The most popular CSF is the *information content quality*, which was mentioned by all interviewees in their top twelve success factors. In addition, this success factor scored the highest on the mean rank as well. This indicates that the quality of information displayed on the marketing dashboard is perceived to be of biggest importance to the dashboard users. Wrong information results eventually in decisions made based on false information. The second most popular CSF is the *trust* in marketing dashboards. Interviewees argue that trust is an important factor, because the whole marketing department needs to trust the dashboards, otherwise, there will be no motivation among the

employees to work with the dashboards. This success factor can be linked to the quality of information, as we wonder what specific factor result in trust in a dashboard. During the interviewees, the participants mentioned that the quality of information is a big determinant of a person's trust in dashboards. With a mean rank of 5.5 the *availability of data* comes in third place in terms of popularity. Together with trust, this success factor was mentioned by 7 out of 8 interviewees in their top twelve. Trust only scores higher on mean rank compared to availability of data. The high rank of this success factor is not surprising as this CSF is perceived to be the foundation of a successful marketing dashboard. Early data mining theories already describe that in the process of data mining and discovering patterns in large data sets, data visualization methods such as dashboard software is perceived to be one of the data mining tasks (Shaw et al., 2001). Therefore, the availability of data is one of the foundation blocks in building a successful marketing dashboard and this is perceived in a similar way by the interviewees. The fourth most popular success factor is the *information access quality*. Similarly to the information content quality, the dashboard users expect the overall quality of dashboard software to be excellent in order to make trustworthy decisions based on dashboard information. The interviewees indicate that the ways to access dashboard information must be secured in a structured way. On the other hand, the ways to access dashboard information must be convenient to the users as well. Interviewees addressed the convenience in accessing dashboard in multiple ways, such as; mobile, desktop, tablets, at home and at work, etc. The most popular functional feature of the marketing dashboard is by far the *drill-down capabilities*. The drill-down is a capability that takes the user from a more general view of the data to a more specific in one click. Together with customization features, drill-down capabilities is perceived to be one of the big functional features determining ease of use. It is clear that in the process of dashboard adoption the users should have the central focus. Therefore, user involvement is also scoring high in the ranking with a mean rank of 8.5. End-user involvement is found to be of significant importance in dashboard projects. Management's expectations is ranked in seventh place based on mean rank (8.8). The interviewees all have experience in dashboard adoption in the e-commerce industry and address the fact that one always have to satisfy management's expectations as with these type of projects there is always a bounded financial budget. Management expects satisfying returns on their investments. In eight place comes the *visual aspect* of the marketing dashboard. Visual features are perceived to be important in amplifying the user's cognition. By incorporating proper visual features, the users will be able to understand the information more easily and quickly. *Management support and commitment* in the process of adoption also gets a place in the top 10. During the interviews it has become clear that management support and commitment is perceived as important for steering the employees' motivation to consistently use the marketing dashboards. The last CSF that earned a place in the top 10 is the *depth of knowledge* of the users. Having people in your organization with knowledge of the dashboard software and its data is perceived to be good to have. Otherwise, the organization must consult external organizations for specific knowledge, which obviously costs them more money. Lastly, another remarkable result confirming results from earlier sections is that the CSF attitude is ranked on one of the last places only mentioned once by an interviewee in his top twelve. This indicates even more that the success factor attitude is perceived as too general. Level of market dynamics is described by the interviewees in earlier sections as too vague, this has translated in low ranking score mentioned only by two interviewees in his top twelve.

Critical Success Factor (CSF)	Mean Rank
CSF 10: Information Content Quality	3.5
CSF 26: Trust	4.4
CSF 4: Availability of Data	5.5
CSF 11: Information Access Quality	7.1
CSF 12: Drill-Down Capabilities	8.5
CSF 20: User Involvement	8.5
CSF 27: Management's Expectations	8.8
CSF 16: Clarity of Overall Visual Display	9.4
CSF 19: Level of Management Support & Commitment	9.4
CSF 3: Depth of Knowledge	9.5

Table 16: Top 10 CSFs based on mean rank

4.2.2 Operationalization of Perceived Benefits

The second ranking procedure that took place is the ranking of perceived benefits from using marketing dashboards. This as an interesting extension to the study, which investigates in what ways the dashboards are adding value to the business processes within an organization. The perceived benefits are composed of two studies written by Pauwels et al. (2009) and Wanda & Stian (2015). Table 17 below presents the results of the ranking procedure. The most significant benefit of using marketing dashboards is the *improved decision-making*. This benefit scored a mean rank of 1.9, which is extremely high. Visually displaying the measurement of your marketing campaigns leads to improvements in decision-making. In addition, better decision-making results lead to cost- and time savings. The second most popular benefit from the interviewees' perspective is the *improved effectiveness and efficient marketing efforts* with a mean rank of 2.6. More accurate reporting and analyses are perceived to be one of the biggest benefits of BI (BI Survey, 2017). This result confirms with current literature on dashboard benefits. In third place comes the benefit *support for the accomplishment of strategic business objectives* with a mean rank of 3. The high score of this benefit indicates that within marketing people value its strategic business objectives and that marketing dashboards help them to achieve these objectives. *More and better information* is the next benefit that follows in fourth place with a mean rank of 4.9. One can note here the big difference (1.9) between the mean ranks of the third and fourth benefit. This implies that the top three benefits are quite solid. Nevertheless, more and better information is achieved by visualizing the organization's data. The interviewees perceive simple data visualizations of their data as 'better information', simply because these forms of information presentation are easier to understand for everybody in the organization. A remarkable result is that the increased accountability is not scoring very high (7th place). In the field of marketing, there have been calls for marketing practitioners to develop and enhance their ability to account for marketing's contribution to firm performance. Therefore, this result conflicts with literature suggesting that marketers are looking for more ways to display marketing's contribution to firm performance.

Benefit/Expert ID	Oliver (1)	Jack (2)	Harry (3)	Charles (4)	Thomas (5)	George (6)	William (7)	Max (8)	Average
Better Decision-Making	1	5	1	3	1	2	1	1	1.9
Improved Effectiveness & Efficient Marketing Efforts	2	2	2	1	4	1	5	4	2.6
Support for the Accomplishment of Strategic Business Objectives	6	1	4	2	3	3	2	3	3
More and Better Information	7	4	6	8	2	7	3	2	4.9
Time Savings for Users	5	6	3	4	6	4	7	5	5
Cost Savings	4	3	5	7	7	8	6	6	5.8
Increased Accountability	3	7	7	5	8	5	4	8	5.9
Improvements of Business Processes	8	8	8	6	5	6	8	7	7

Table 17: Results of ranking the perceived benefits

4.3 Summary: Enriching the Success Factor Model

During this section, we will summarize the results related to the modifications to the success factor model. This implies that the CSFs will be discussed which are new to the model and have perceived added value. In addition, success factors that are perceived as irrelevant by the interviewees are discussed as well. Success factors that are confirmed to be important will be discussed in the next section. Starting with the demand side of marketing dashboards, the results indicate that the interviewees valued the user-perspective the most as a CSF at this stage (8x). In the conceptual model, it is now classified as cognitive style and level of experience. Cognitive style describes the way individuals think, perceive and remember information. As for where the level of experience describes the individual's level of knowledge on the dashboard software. To address the personal and functional characteristics more in the success factor model the factor **user characteristics** will be added to the decision-maker category. By adding this CSF we also address the interviewees´ call for more user involvement at an earlier stage. The degree of **actionable information** available within an organization is also perceived as decisive in determining the success of a marketing dashboard. This success factor is mentioned three times by the interviewees with supporting arguments. In making the marketing department and its dashboards successful it is important that the information available within the organization is actionable. Marketing employees are expected to steer marketing objectives with meaningful data and make decisions and solving problems based on these numbers. Therefore, this success factors will be added to the final success factor model. Another CSF that was not incorporated in current literature on the demand side of marketing dashboards is **financial constraints**. These contain budgets imposed by management to projects like dashboard development. Financial constraints will always play a role in project management as management wants to see returns on their investments. This CSF is related to the decision environment of the organization. A CSF that is clearly misunderstood by the interviewees is market dynamics. 6 out of 8 interviewees displayed problems in understanding the importance

of market dynamics in dashboard adoption and described it as vague. Dashboards are nowadays mostly built for internal purposes only and external data is incorporated minimally. Therefore, we will remove this CSF from the success factor model.

The supply side of the marketing dashboard resulted in many new insights and less confusion among the interviewees. Functional features were most frequently mentioned by the interviewees representing two-thirds of the success factors mentioned. **Quality of data links** was mentioned three times as an important success factor on the supply side. The quality of these links to your data sources is vital for the validity of your real-time dashboard information. **Customizability** (2x) appears to be important for the ease of use since all the user's needs and wishes cannot be met with one dashboard design. The **complexity of dashboard software** is a good point mentioned by the interviewees. For the simple ease of use and business purposes, it is essential that the software must be understandable for everyone and not only for IT specialists. **Comparison values** and **display of KPIs** are two success factors mentioned by the interviewees that could amplify cognition quickly. Especially within marketing, the interviewees argued that comparing campaigns against time, countries, seasons, or other campaigns is essential for further improvement. The display of KPIs involves the context or definition of KPIs and the display of numbers (absolute and relative). A KPI is meaningless without the right context for determining action. Therefore, we will include these two success factors. The **real-time display** is also addressed as very important for the e-commerce organizations. Employees want to see the current state of the situation and not the one from yesterday. The **speed** of the dashboard is emphasized as people do not want to wait forever for a dashboard to load. For the purposes of e-commerce, **conversion funnels** will be included too. One CSF that will be removed from the model is single page, as the interviewees describe this factor as unnecessary.

Regarding the implementation context of the marketing dashboard, the most outlined result is the **use of mockups** instead of prototyping. In the field of marketing, it is common to use mockup tools to test certain dashboard designs. 6 out of 8 interviewees addressed this matter, so it is obvious to replace prototype by mockups. Furthermore, the success factor **motivation** was mentioned four times during the interviews. Where during the phase of implementation motivation is a large determinant of the dashboard's adoption success according to the interviewees. Consistency in using the dashboard was also mentioned here, but this factor could be allocated to the CSF motivation, as motivated employees will be more consistent in using a particular dashboard. The factor that will be removed from the success factor model is thus the use of prototypes.

The last phase of the success factor model is the predisposition towards marketing dashboards. Here the interviewees indicated that they would like to see the **perceived ease of use** and **perceived usefulness** (TAM model) replace attitude, as these factors determine the attitude towards a dashboard. Perceived ease of use and perceived usefulness are described as less vague and general than the CSF attitude. These two CSFs are combined mentioned nine times and the composed factor attitude is not even mentioned once. The interviewees addressed many prior success factors as the major determinants of a predisposition such as; visual clarity, user involvement, quality of communications, training and IT support, etc.

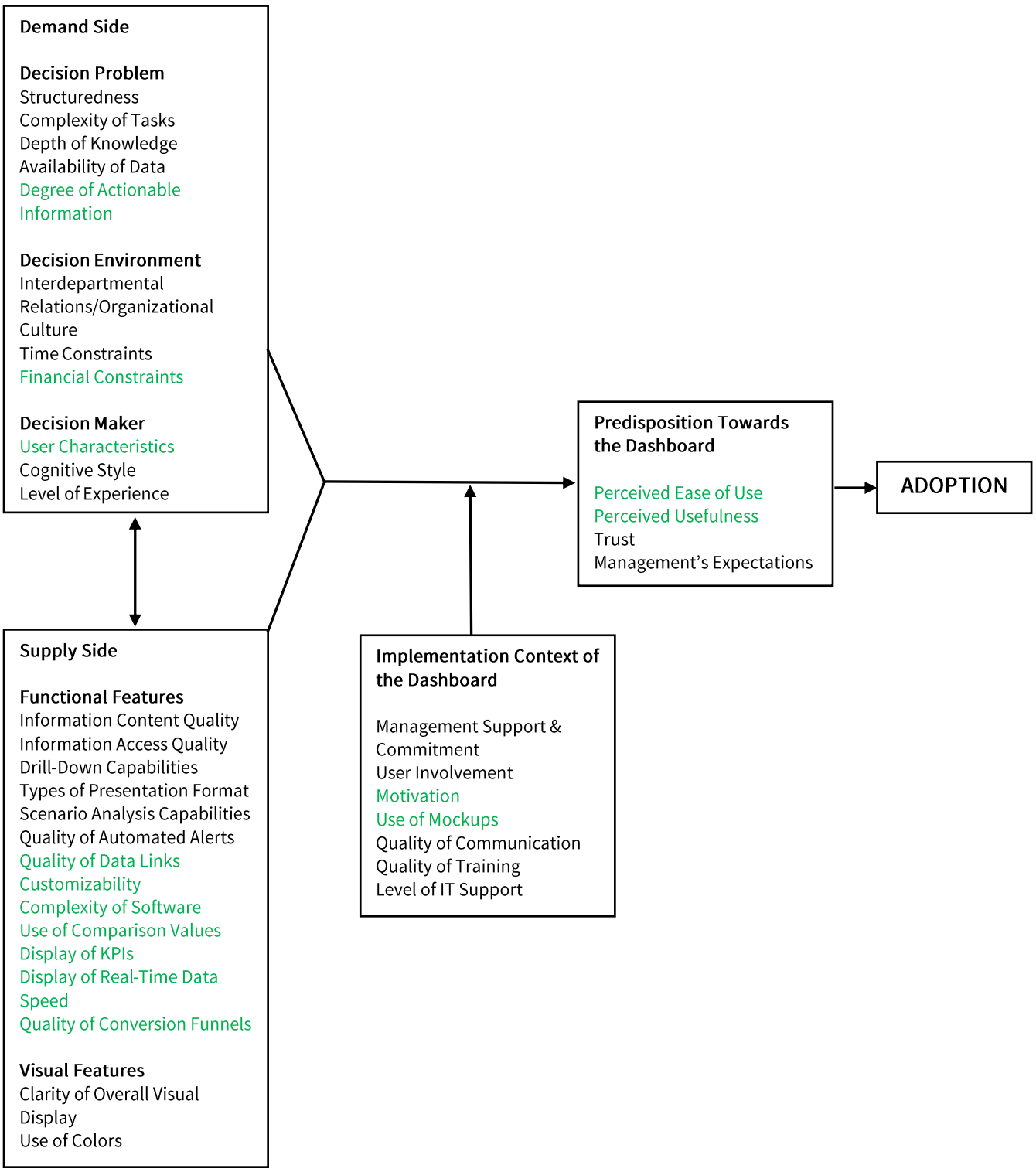

Figure 10: Final Context-Driven Success Factor Model After the Interviews. Marked in Green are the New CSFs.

5. Conclusion & Discussion

In the first section, the research questions outlined in chapter 1 will be answered and the final framework will be discussed. Next, a discussion about the results is held. The third and fourth section of this chapter will discuss the practical and theoretical implications of this study. In the final section of this chapter, the limitations of this study will be discussed and suggestions for future research on this topic will be outlined.

5.1 Conclusion

The main goal of this study was to identify critical success factors (CSFs) influencing the adoption of marketing dashboards in the e-commerce industry. The research questions were formulated as follows:

What factors influence the adoption of marketing dashboards amongst marketers in the e-commerce industry?

- According to literature, what is an appropriate model for the marketing dashboard adoption process?
- According to experts, what is the perceived value of the success factor model derived from literature?
- How do marketing experts rank the critical success factors influencing the adoption of marketing dashboards?

5.1.1 Success Factor Model derived from Literature

In section 2.10 is outlined what the conceptual success factor model looks like. For the success factor model, the work of Pauwels et al. (2009) and Wierenga et al. (1999) is primarily used as a basis. These two studies focused on the success factors in adopting marketing dashboards or marketing decision support systems. Besides these two studies, more insights from the fields of decisions support systems (DSS), information systems (IS) and business intelligence (BI) are incorporated. The proposed success factor model consists of five stages. Each stage, except for the adoption, presents several CSFs, which are described in the literature as determinants of a successful adoption of marketing dashboards. An important note is the relevance of the fit between demand and supply, which is determined by the interrelationships between the success factors and to what extent they complement each other. Arnott (2004) described this fit perfectly stating that a match between the decision situation (demand) and the support system (supply), such as marketing dashboards, provides is key to the organization's ability to leverage that system to achieve success. The implementation context stage follows the demand and supply side describing the CSFs relevant during the phase of implementation. After successfully implementing a marketing dashboard, the users develop a certain predisposition towards the dashboard, which is described in the next stage of the model. Finally, the evaluation and developed predisposition are followed by the completed adoption of the marketing dashboard in the organization.

5.1.2 Enriching the Success Factor Model

Based on the semi-structured interviews with eight marketing experts active in the field of e-commerce, we now have structured their opinions on the success factor model presented in section 2.10. The final success factor model, which incorporates the experts' opinions, can be found in section 4.3.

The demand side of the marketing dashboard was perceived as the vaguest stage within the success factor model, where the most confusion existed about particular success factors such as; market dynamics, time constraints, and organizational culture. However, besides the confusion about several success factors, the experts named many CSFs that were mentioned in literature too and their importance is therefore confirmed by the experts. These so-called confirmed success factors are; availability of data, knowledge, organizational influences, and the personal characteristics. New success factors that were frequently mentioned by the interviewees are user characteristics (including both personal and functional), the degree of actionable information, and financial constraints. The clustering of CSFs was done by categorizing the factors based on literature; decision problem, decision environment, and decision-maker. This clustering resulted in the following results: 13 to decision environment, 10 to decision problem, and 9 to decision-maker. The fact that confusion existed among the interviewees is displayed by the number of misplaced success factors (7) mentioned by the interviewees. Lastly, many interviewees emphasized the importance of the interrelationships between the demand and supply side, which complement each other resulting in a fit. Several CSFs were also described as influential at the implementation stage.

The supply side of marketing dashboards presents factors related to the functionality of the dashboard. Success factors derived from literature that were supported during the interviews are; information content quality, information access quality, drill-down capabilities, scenario analysis, automated alerts, and visual aspects. Clustering the success factors into categories tells us that functional features are mentioned most frequently, representing two-thirds of all success factors. Visual features were mentioned eight times. The last category 'misplaced' contains success factors that clearly belong to a different stage in the model. Trust and ease of use are success factors mentioned mostly here, which belong to the user's predisposition stage. New functional success factors added to the model are; quality of data links, customizability, the complexity of software, use of comparison values, display of KPIs, display of real-time data, and speed. The interviewees emphasizing the functional features of the marketing dashboard tells us that they believe a dashboard must be foremost functional. It is only logical that the design elements are present to enhance this functionality. One interesting finding was that some interviewees suggested creating compound factors such as; user experience (UX), usability, and visual clarity. One CSF that was perceived as not important is the single page, as the interviewees do not mind to switch between dashboard tabs in order to keep a clear data structure.

Concerning the implementation context of marketing dashboards, the most remarkable finding was that 6 out of 8 interviewees preferred the using ´mockups´ instead of prototypes, as this word is more suitable in the situation of marketing dashboards. The interviewees recommend to start with a simple mockup and continue work on this mockup with updates based on received feedback. Motivational factors are mentioned 4 times and are perceived to be of big importance during the phase of implementation. However, the interviewees address that this CSF could be

interrelated with other success factors such as; user involvement, management support, quality of training, etc. Success factors derived from literature that were supported during the interviews were user involvement, quality of training, quality of communication, and management support. Furthermore, all factors mentioned by the interviewees have again the focus on the users' perspective. Clustering the success factors resulted in the following distribution; technological (20), organizational (12), and human (12). Similar to the supply side, the interviewees emphasize the technological aspects of the dashboard and the related technological support. This indicates that technological aspect has a high priority for the interviewees. The interviewees had no problems with the place in the model of the success factors, where they indicate that this stage was easy to understand.

The predisposition towards marketing dashboards is the last stage of the success factor model, which describes the users' state to behave in a particular way towards the dashboard. The most striking finding here was that the interviewees prefer to see the perceived usefulness and perceived ease of use instead of attitude. These two success factors describe the attitude more precisely, as the success factor attitude was perceived as too general. These two factors were together mentioned nine times, as the CSF attitude was mentioned not even once. When a user notes that the dashboard has an impact on the organization, he or she will perceive the dashboard as valuable. The user-perspective is again perceived as important to consider, as factors such as user involvement and user-perspective are mentioned frequently. Another important finding is that CSFs from the supply side are mentioned often as determinants of a positive predisposition. The interviewees think that the functionality and visual clarity are important determinants of a positive predisposition. Furthermore, the other two CSFs derived from the literature are supported by the interviews. Clustering the CSFs shows that a successful implementation is also essential for a positive predisposition from the users. The interviewees emphasize that the factors described at this stage are mostly the result of the cohesion between all prior success factors in the model.

5.1.3 Operationalization of the CSFs

To find out which CSFs are perceived to be most critical in adopting marketing dashboards, the experts are asked to rank the twelve most important CSFs on the list (literature based CSFs). Starting with the one which is believed to be most important for the adoption of marketing dashboards down to number twelve. The table below presents the top ten success factors based on mean results. The results show that the success factor information content quality is perceived to be most critical for the adoption of marketing dashboards with a mean rank 3.5 and mentioned by all interviewees in their top ten. False information immediately leads to wrong decisions. The purpose of marketing dashboards is to provide the users with fast and correct information at the right moment. The top ten success factors contain CSFs from all stages of the model. Nevertheless, one stage overrepresents the top ten, namely the supply side of marketing dashboards with five CSFs. This gives us again evidence that the functional and visual features of the dashboard are very important for a successful adoption of marketing dashboards. The least popular CSF is the use of color, which suggests that the interviewees care about the visual features but only as a compound factor, as the general factor visual clarity is ranked on place eight. The second least popular CSF is the factor which was perceived as too general, namely attitude. This low score is again evidence suggesting that the interviewees do not value this CSF in the model. The table 19 below presents

the overall mean scores per stage of the model. Factors allocated to the implementation context of the dashboard score the highest. This supports earlier evidence suggesting that together with the supply side of the dashboard, these two stages are perceived to be the most important ones in the adoption process. The worst scoring stage is the demand side, which also matches with earlier results from the interviews. At this stage, the most confusion existed among the interviewees. Some success factors were perceived as too vague and irrelevant by interviewees.

Critical Success Factor (CSF)	Mean Rank
CSF 10: Information Content Quality	3.5
CSF 26: Trust	4.4
CSF 4: Availability of Data	5.5
CSF 11: Information Access Quality	7.1
CSF 12: Drill-Down Capabilities	8.5
CSF 20: User Involvement	8.5
CSF 27: Management's Expectations	8.8
CSF 16: Clarity of Overall Visual Display	9.4
CSF 19: Level of Management Support & Commitment	9.4
CSF 3: Depth of Knowledge	9.5

Table 18: Top 10 CSFs based on mean rank.

Stage of the Model	Mean Rank
Implementation Context	12.6
Supply Side	13.3
Predisposition	13.7
Demand Side	17.4

Table 19: Mean rank per stage of the model.

5.1.4 Operationalization of the Perceived Benefits

The most popular perceived benefit from the interviews was better decision-making (mean rank of 1.9). This finding matches with the results from Wanda & Stian (2015) who studied the benefits of business intelligence in Norwegian firms. Ranked second in our study is the improved effectiveness and efficient marketing efforts (mean rank of 2.6), which is an expected result as the interviewees in our study are all marketing experts in the field of e-commerce. Ranked third in our study is the support for the accomplishment of strategic business objectives which especially within the e-commerce is very important, as all departments of the organization must co-operate together to achieve the most optimal online webshop. Marketing dashboards are tools to illustrate the marketing results to other departments of the organization in a simple way. A result that can be described as remarkable is the low score for the increased accountability. This low score was not expected as literature described that without the means or capacity to use marketing analytics,

such as marketing dashboards, may create a negative perception regarding marketing accountability within the respective firm (Krush et al., 2016). The lowest ranked benefit is the improvements of business processes, which in this situation is described by the interviewees as a too general benefit.

5.2 Discussion

The purpose of this study was to identify critical success factors influencing the adoption of marketing dashboards. In the field of marketing, there have been regular calls for marketing practitioners to develop and enhance their ability to account for marketing´s contribution to firm performance (O'Sullivan & Abela, 2009). The most important means to enhance their accountability to the rest of the organization is by marketing dashboards. However, the ability to use the right metrics and take effective action on the collected insights is a huge challenge (Pauwels, 2015). Limited research exists on how to effectively adopt marketing dashboards or marketing measurement support systems (MMSS) and what factors must be considered to increase marketing's accountability in the rest of the organization. Therefore, this study collected factors concerning the adoption of marketing dashboards in a context-driven success factor model. This study focused on enriching this success factor model with new CSFs and eliminating irrelevant ones. Furthermore, this study examined the perceived importance of the factors to find out which factors are considered most important and which ones less important. Lastly, this study examined the perceived importance of the benefits derived from using marketing dashboards.

The factors that influence the adoption of marketing dashboards can sometimes be difficult to interpret as they are all considered from their individual perspective. All interviewees in this study are responsible for marketing related activities within an e-commerce organization. Employees active in other functions can experience marketing in a different way. Therefore, the results presented in this study are highly relevant for marketers active in the e-commerce and less relevant for other professions.

In assessing the perceived value of the success factor model derived from the literature we asked the interviewees three questions per stage. First of all, we asked the interviewees what success factors they could come up with before showing them the model. Here many success factors from the literature were supported by the interviewees. Second, the interviewees presented with the CSFs from literature and asked with an explanation which ones they would retain, add, or remove. During this question, the interviewees' understanding of the success factors was examined as they gave their individual perspectives on the success factors. Finally, the last question was aimed at finding relations between the factors and processes in the success factor model. Here the results show that the process of adoption is not perceived as linear and that moments of reflection and feedback occur regularly during the adoption. Taken together, the analysis shows that many interviewees underlined the importance of the user-perspective during all stages of the adoption process. Therefore, it is highly recommended to incorporate the potential users of the dashboards through all phases of the adoption. The supply side and implementation context stage were definitely the most frequently addressed stages in the adoption process. At the supply side, the interviewees addressed many functional features and less visual features, which indicates that the quality of software and its features have a high

priority for the interviewees. In determining the user's predisposition towards marketing dashboards, the interviewees mentioned mostly CSFs from the supply side and implementation context stage. The popularity of these two stages is confirmed at the operationalization of the CSFs, where these two stages are overrepresented in the top 10 success factors and score the highest averages.

5.3 Practical Implications

This study offers insights for the marketing department interested in adopting new marketing dashboards. In addition, this research has its specific focus on the e-commerce industry, which enhances the practical relevance as e-commerce organizations conduct their business completely online with their webshop. An organization dependent on their online results are as a result increasingly dependent on digital marketing tools like dashboarding to provide them with the information. The success factors presented in this study can be used as a checklist for marketers or business analysts who are planning to create new dashboards or a new data structure in the organization. The success factor model developed can be used to raise awareness within the organization about the factors that could influence the adoption of new marketing dashboards. By being aware of these success factors in advance, the organization will be able to adopt more easily. Especially, the functional features that are perceived to be important to have in good quality. Managers accountable for choosing new dashboard software benefit from considering the highly rated functional features presented in this model on the supply side. On the other side, the results can have implications for other parties such as marketing agencies or software developers. The context-driven model can be used to create an understanding of the contextual factors influencing the adoption of marketing dashboards. By doing so, these organizations can adjust or customize their products/services to fulfill the needs of their customers. This study has a more contextual approach to the adoption of marketing dashboards. Therefore, the factors provided in the final context-drive model can be used to gain a more individual and contextual understanding of the adoption process instead of generalized factors in models like TAM. The more contextual approach could lead to insights that could not be obtained by studying generalized factor models.

5.4 Theoretical Implications

This study focuses on the factors influencing the adoption of marketing measurement support systems (MMSS), such as marketing dashboards. All success factors mentioned eventually lead to a predisposition towards such a marketing dashboard, which reflects back on the Technology Acceptance Model (TAM) introduced by Davis (1989). The results from this study are an extension on the current literature available around the topic of MMSS adoption. In addition, the results from this study can be applied to studies related to business intelligence (BI), information systems (IS), and big data as these fields have similar characteristics. As the marketing evolution continues and current literature on MMSS or marketing dashboard adoption is limited, this study can be seen as a useful extension on current literature, which adapted to the most recent trends in the field of marketing. In addition, this study focused on a specific model for the adoption of marketing dashboards in the e-commerce industry. Pauwels (2015) noted that the ability to use the right metrics and take effective action on the collected insights is considered as a huge challenge, the

final success factor model from this study can be seen as a useful extension to make dashboard adoption more understandable.

5.5 Limitations & Future Research

During this study, it was attempted to gain clarity over the contextual factors influencing the adoption of marketing dashboards in the e-commerce industry. This was done by conducting a literature study and semi-structured interviews with marketing experts in the field of e-commerce. These semi-structured interviews resulted in many new insights from an individual perspective. Therefore, the new success factors added to the final model can be interpreted from an individual perspective and do not apply to everyone. Due to the small sample size of eight interviewees, it is possible that not all contextual factors are identified during the interviews. The small sample size also caused difficulties in deciding which frequency was considered as appropriate. Furthermore, the literature study was used to form a conceptual model of factors influencing the adoption of marketing dashboards. It is possible that the gathered factors steered the interviewees into discussing these known success factors. The literature study was conducted on a larger scale than the semi-structured interviews. During the literature study a total number of 81 articles were used, whereas for the interviews eight cases were used. Another limitation is that this study was solely exploring factors that influence the adoption of marketing dashboards. This study did not test whether or not these factors are found to be successful to the adoption of marketing dashboards. This study can be used as a pre-study for researchers who want to research the topic of marketing dashboard adoption. Future research could use this study as a basis for their research by testing the success factors of the final model in organizations. Another idea for future research is testing the relationships between the factors of the model. In doing so, more clarity can be obtained on which factors are interrelated with one another. Lastly, more studies focused on the contextual aspects of dashboard adoption are preferred instead of generalized models such as TAM. These contextual focused studies provide more practical relevance for future marketers. By continuously researching the topic of dashboard adoption and dashboard design, we can strive towards the optimal dashboard for organizations.

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Appendices

Appendix A – Interview Framework

Subject	Estimated Time
Introduction to the study	5 min
Defining Marketing Dashboards 1. *What types of marketing dashboards did you come across within the e-commerce?* 2. *To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?* 3. *What is in your opinion a successful marketing dashboard?* - *What features/functions?*	5 min
Introduction to the framework	5 min
Demand Side: the decision processes to be supported 4. *Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!* - *Which factors are important in achieving a positive predisposition towards marketing dashboards?* <u>Present the critical success factors from conceptual framework.</u> 5. *Which critical success factors would you:* - *retain?* - *eliminate?* - *add?* 6. *Are the critical success factors in the right place on the framework concerning the adoption of marketing dashboards? Motivate your answers!* - *Which factors would you place elsewhere?*	5 min
Supply side: the functionality of the marketing dashboard in place 7. *Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!* - *What features of the marketing dashboard are important in achieving a positive predisposition?*	5 min

Present the critical success factors from conceptual framework. 8. *Which critical success factors would you:* - *retain?* - *eliminate?* - *add?* 9. *Are the critical success factors in the right place on the framework concerning the adoption of marketing dashboards? Motivate your answers!* - *Which factors would you place elsewhere?*	
Implementation Context of the Dashboard 10. *Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!* - *What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?* Present the critical success factors from conceptual framework. 11. *Which critical success factors would you:* - *retain?* - *eliminate?* - *add?* 12. *Are the critical success factors in the right place on the framework concerning the adoption of marketing dashboards? Motivate your answers!* - *Which factors would you place elsewhere?*	5 min
Predisposition Towards the Dashboard 13. *Which factors form the predisposition towards the marketing dashboard? Motivate your answer!* Present the critical success factors from conceptual framework. 14. *Which critical success factors would you:* - *retain?* - *eliminate?* - *add?*	5 min

15. *Are the critical success factors in the right place on the framework concerning the adoption of marketing dashboards? Motivate your answers!* - *Which factors would you place elsewhere?*	
Operationalization of the Critical Success Factors (CSFs) 16. *Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to number 12.*	10 min
Operationalization of the Perceived Benefits From Marketing Dashboards 17. *Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.*	5 min
Evaluation 18. *Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?* 19. *Would you like to add something as a closing to the interview?*	5 min
	55 min

Appendix B – Transcripts of the Interviews

Interview 1: Oliver, Marketing Manager, Webshop for Labels & Printers

What types of marketing dashboards did you come across within the e-commerce?

For every marketing channel we use dashboards. The current marketing channels within our organization are the following:

- E-mail Marketing
- SEO
- SEA
- Affiliate

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

Lately, the use and adoption of new marketing dashboards becomes more and more part of our marketing strategy. For example, formerly we wrote an e-mail first and thereafter we analyzed the achieved revenue as a form of e-mail marketing. Currently, we added forecasting to our dashboards in e-mail marketing. Based on forecasting we are now able to categorize e-mails and we can anticipate better what the e-mail will yield. Previously, we only used general dashboards provided by Google Analytics and AdWords. Now we also added dashboards for other marketing channels like e-mail and affiliate marketing. Furthermore, we also make use of Qlik Sense as a tooling for new business intelligence, where we combine all internal data sources into a new platform. By using Qlik Sense, we have more options in creating new dashboards and opportunities are provided in linking marketing to other business activities outside marketing. For example, we created a dashboard with Qlik Sense where we assign a 'heartbeat' to every customer based on their order frequency. Most customers order constantly in a particular pattern. When the customer deviates from the order pattern he or she will automatically get a red color as a marker. In addition, Qlik Sense is linked to our e-mail marketing program in a way that the red-marked customers will automatically receive an e-mail to remind them of their last order. Moreover, the e-mail askes the customer why they have not placed an order recently. Customers who do not respond to this e-mail will automatically come in a list for our customer service.

What is in your opinion a successful marketing dashboard?

- **What features/functions?**

Recently, I watched an online lecture which formulates a successful dashboard accurately. A dashboard must be seen as like in the automotive industry. Within a couple of seconds the client must be able to see and understand everything displayed on the dashboard. This is also the case for our organization. Our employees must be able to interpret a dashboard quickly. Ease of use is therefore on of the most important elements of a successful dashboard. Besides, in my opinion a proper definition of your KPIs are also very important. Knowing what you want to measure is essential for making dashboards actionable.

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

You could also see if from a different perspective. A dashboard often shows you what the problem is and the users of dashboards are the ones responsible for taken action and coming up with a solution. Therefore, the next step in the evolution of dashboards is that the dashboards come up with a solution themselves. In our case, the 'heartbeat' of the customer is alarmed with a red

marker and the dashboard comes up with possible scenarios/solutions. The problem here is that the customer has not ordered for an unusual amount of time and deviates from his or her order pattern. The solution provided by the dashboard and the link with e-mail marketing is the automatic e-mail sent to the customer in case. In my opinion, external factors could also play a role in the adoption of new marketing dashboards. For example, AdWords in Great Britain was not performing sufficiently last months. The reason could be the fact that Great Britain left the European Union at that time. Due to external factors we looked at other dashboards and found out that the SEO revenue remained constant. In this case, you can say that due to external factors we consulted other marketing dashboards in order to rule out the effect of Great Britain leaving the EU. Within marketing you face different challenges every day and these challenges make you compare numbers on different dashboards. As said before, the ideal situation would be that dashboards could make connections like these themselves and provide you with solutions or suggestions. Lastly, I would like to add that dashboards need customization options to fulfil the needs of different employees. Every employee has different needs in term of visual elements or the way numbers are displayed.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

Experience is in my opinion less important, because experience does not equal knowledge of statistics. Somebody could have the experience with using dashboards, but when that person does not have the knowledge of the statistics displayed in the dashboard, he or she is useless. I think that time constraints is an important factor. Dashboards provide the user with a quick and clear overview, which enables the user to interpret and understand the information correctly. Organizational culture is in my opinion a less important factor, because people within marketing often customize their own dashboards. Managerial pressure is not often used. The availability of data is of high importance in the adoption of dashboards. Depth of knowledge is depending on the type of dashboard used. General dashboards require less knowledge than detailed dashboards. The possibility to click through in your dashboard is perceived as useful by my employees. Especially, with general dashboards where you are able to click through in order to find detailed information. The organization's product range is also important in designing dashboards, as organizations with many products and organizational layers will have more complicated dashboards than organizations with just a few products. AdWords is a good example of a dashboard where the user gets more in-depth knowledge regarding the specific campaigns. The structure of the problem is very important. You will face different problems whilst working on SEO compared to SEA. Finally, the cognitive style of the user is an important factor as well, where a dashboard with multiple visual elements is the best solution to satisfy all needs.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Generally, but I think that many factors are interrelated with each other. Especially, the factors between the demand and supply side as they should end up in a fit.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What features of the marketing dashboard are important in achieving a positive predisposition?**

First of all, I would say that general ease of use is one of the most important features of a dashboard. Like said before, I think that using correct statistics is very important, however, this can vary per channel. With correct statistics I mean that you clearly define up front what you want to measure and make sure that the KPI displayed on the dashboard is valid. The validity of your KPIs are essential, since decisions are made based upon these numbers. Making sure the numbers are valid is also one of the most crucial elements in developing a dashboard. For example, ´paid´ options in Google Analytics include both AdWords campaigns and Display advertising. However, the performances of these two channels are not comparable, where display advertising does not really generate revenue, but AdWords clearly does. Therefore, you cannot measure the success of display advertising with a ROI. You can measure display advertising by the costs per session. That is why we split these two channels in our dashboards to avoid confusion. This example shows that validity and reliability of your KPIs are very important. The advantage of using AdWords is that you can dig deep into your revenue streams, as AdWords is easy to measure. For example, with SEO you have no costs, therefore, one can measure the conversion rate of organic searches. With e-mail marketing you measure the average revenue per e-mail. It is also possible to look at trends in transactions, where the revenue can have outliers. With other words, the quality of information is for me one of the most important factors on the supply side.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Quality of information is for the most important factor in the list by far. When the information is not trustworthy, you have a complete useless dashboard. Access to information is also quite important, by making the information accessible to everyone in a user-friendly way. Drill-down functions are important in combination with access to information. By applying simple drill-down functions, the user can find specific information easily and in a convenient way. The essence in presentation format depends on the goal you have with using dashboards. A general dashboard has a simpler format than a more in-depth dashboard. On the one hand, I think that it is useful to have different kinds of presentation formats available within the dashboard software. On the other hand, I think that your employees should be able to work with one standard theme. The most ideal situation is when a dashboard gives a general overview at the start and becomes more in-depth by simply clicking through or drill-down functions. Furthermore, you have to deal with specific work places and atmospheres where dashboards are presented to fellow colleges. Scenario analyses has in my view great potential, but is now difficult to achieve. The possibilities become bigger in a couple of years when software will be more developed. At the moment, we only use internal data

for our analyses. For specific scenario analyses which are able to compare data with competitors and incorporates external factors, data links should be developed with external data sources. The automatic notifications are expected to be of 100% quality and validity. Overall visual display and cognitive style are quite important, but differ per person. Although these needs cannot be fulfilled at all times. The developer of the dashboard has to make certain trade-offs between the use of graphs, tables and text. Small dynamic changes with a customization tool would be ideal. This way employees are able to adjust the dashboard to their taste. Use of color is important for the simple persuasion of your employees. For example, assigning a red color to a not achieved target makes your employees easily note that they are not on schedule. Therefore, the use of colors gives a simple motivation to your employees, because they are easy susceptible for colors. The use of a single page is not that important.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes, same applies here that many factors are interrelated with one another.

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

The first factors that pops up is the involvement of your team in developing proper dashboards. To achieve team involvement, explanation and training regarding the use of specific dashboards is required. Next to that, it is important during this phase to instruct your employees to use the dashboard on a continuous basis. As a marketing manager you could achieve this by asking your employees for weekly updates. Hereby, your employees are required to check the marketing dashboard at least once a week. To avoid confusion it is recommended to be consistent in using your KPIs. When you regularly change your KPIs your employees will be confused. Make sure that every component of your marketing is consistent in using KPIs. Furthermore, I think that the involvement of your employees is important in the process of creating the dashboards. Since they are the final users of the dashboard, it is wise to ask them for feedback. Hereby, you give them the feeling that they are appreciated and have a voice in the decision-making. Lastly, I would like to address the use of mockups, these are prototypes of dashboards. We present these mockups to our employees and they can pick the best one.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Quality of communication and training is for me the most important factor during the implementation phase. With these two factors you achieve involvement of your employees with the dashboards. Especially, because of the fact that most employees definitely need support in correctly using the dashboards. Moreover, the remaining factors are in my opinion all interrelated. Some factors are a consequence of another factor, like involvement is a result of the right communication and training. IT support is of course very important when facing issues with one of your dashboards, but most important is that your dashboard is 100% trustworthy before implementation, otherwise you will lose the trust of your employees quickly. Use of prototypes or mockups are important in deciding which version is the right one.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes, this phase clearer than the previous two phases. I have to say that these factors are very interrelated.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

When your employees understand its usefulness, it will result in a positive predisposition towards a marketing dashboard. For example, the automatic notifications linked with our e-mail marketing is very useful for all of our employees, as we do not have to keep an eye on our customer's order pattern ourselves. As a result, everyone within our organization is lyrical about the dashboard and its link with e-mail marketing. Moreover, I would say that trust is a very important issue in developing a positive predisposition. When bugs or problems arise people tend to lose trust and motivation. For me as marketing managers it is important to keep everybody motivated.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

Trust comes at number one for me. When information on a dashboard is not correct, motivation will drop very quickly. A positive predisposition towards a marketing dashboard is achievable by creating assignments where these dashboards are needed in order to fulfil these assignments. When people get used to the dashboard, it will be easier for them to use and interpret the information. Expectations of management are in line with proper communication. When your expectations are communicated properly, your employees will not be surprised in the end. Attitude is in my opinion a too general definition, instead use perceived usefulness and ease of use from the TAM model.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes, although these factors are mostly a result of factors mentioned in prior phases.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Many factors are in my opinion obligated to take into the list of 12. Other factors are still hard to accomplish, and therefore difficult to assign a rank (e.g. scenario analysis).

Critical Success Factor (CSF)	Rank
Structure of the Problem	
Complexity of the Tasks	
Depth of Knowledge	9
Availability of Data	7
Level of Market Dynamics	
Organization Culture	
Time Constraints	
Cognitive Style	
Level of Experience	
Information Content Quality	1
Information Access Quality	6
Drill-Down Capabilities	

Presentation Format	
Scenario Analysis Capabilities	10
Quality of Automatic Notifications	
Clarity of Overall Visual Display	12
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	
User Involvement	2
Use of Prototypes	
Quality of Communications	8
Quality of Training	5
Quality of IT Support	
Attitude	11
Trust	3
Management's Expectations	4

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	3
Improved Effectiveness & Efficient Marketing Efforts	2
Better Decision-Making	1
Support for he Accomplishment of Strategic Business Objectives	6
Time Savings for Users	5
More and Better Information	7
Cost Savings	4
Improvements of Business Processes	8

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

I consider a framework with success factors definitely as useful. During the process of developing dashboards you often go very deep into detail with the validity of KPIs. Other peripheral issues are checklist based on your research which presents the critical success factors in a user-friendly way, I would definitely perceive that as useful. Continuity is hereby very important and do not forget to mention that. Moreover, I would suggest to categorize the factors in phase, like; pre-adoption, adoption, and post-adoption.

Would you like to add something as a closing to the interview?

Clear and simple interview structure. You have immersed into the topic and the factors that play a role in developing dashboards. Categorization and allocation of the factors was also clear.

Interview 2: Jack, Marketing Representative, Predictive Marketing Bureau.

What types of marketing dashboards did you come across within the e-commerce?

With my experience at two organizations active in the e-commerce industry I have faced these types of marketing dashboards:

- SEO/SEA
- E-Mail Marketing
- On-Side → specific website dashboards
- General Channel Overview Dashboard
- Offline Marketing
- Affiliate

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

Marketing strategy within the e-commerce industry actually involves the activities related to making your marketing efforts measurable. This is mostly done by the means of marketing dashboards. Therefore, the adoption of marketing dashboards should be a big part of your marketing strategy. Since an e-commerce organization has to deal with multiple channels, a logical result is multiple dashboards.

What is in your opinion a successful marketing dashboard?
- **What features/functions?**

A successful marketing dashboard combines multiple results and KPIs from different data sources. In my opinion, the most effective dashboard is a dashboard that combines all channels from

different data sources with the possibility to get more in-depth per channel. Another important characteristic of a successful dashboard is that it clearly shows the costs and revenues per channel, as this is an important factor for businesses. A successful dashboard applies multiple techniques, such as several visual elements (graphs, text and tables).

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

Expectations of upper management is here very important, since these are your executives to whom you must report and account. The question arises: What does my boss want to know with a dashboard? The goal here is to create a dashboard to display information to your executives. A dashboard must clearly give insights which are actionable. I consider a dashboard with multiple data sources as effective. Otherwise, you have to log in on different platforms in order to see the results. A simple assessment of your personnel is also important before designing dashboards. Address the personal characteristics in the process of dashboard design. Furthermore, within big organizations it is important for executives to simply see the performances of all your employees. Who is accountable for which revenue decreases or increases? The information within a dashboard must be matched with the eventual users.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

The following success factors I consider as **useful**:
- Structure of the Problem → This is the reason for the use of dashboards. People face different problems every day within an organization and these dashboards are tools which provide more clarification.
- Complexity of Tasks → A dashboard must simplify your tasks by providing the right information in a clear way. By doing so, the right knowledge will be gathered quickly.
- Availability of Data → One of the most important factors. Without the right data sources you will get nowhere. Besides, you have to be able to push the data in the right direction.
- Organization Culture → Depends a little bit on how you define culture, but the use of dashboards obviously different within every organization. Here culture can play a role in the adoption process.
- Time Constraints → Dashboards give the users a lot of time savings and are therefore very important on the demand side.

- Level of Experience → Experienced users can come in handy. Not only for their own effectiveness, but also in navigating the rest of your colleagues.
- Cognitive Style → This must always be a combination of different elements (graphs/text/tables).

The following factors I consider as **not useful** in the process of adoption:
- Depth of Knowledge → A dashboard must be easy to interpret for everyone.
- Market Dynamics → Dashboards are intended for internal activities. External factors are not yet incorporated.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Complexity, availability of data and time constraints would play a role in during the phase of implementation as well.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!
- **What features of the marketing dashboard are important in achieving a positive predisposition?**

In my opinion, a dashboard should contain the following features:
- Clarification on KPIs
- Simple in design
- Quality of information must be 100%
- Secured → dashboard should not be hackable

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would **retain** the following elements:
- Use of Color → This factor has to deal with the clarification for the users.

- Clarity should be a compound factor of; use of color, clarity of overall visual display and use of a single page.
- Quality of Automatic Notifications → Very important, since upper management wants to be notified with automatic messages saying what is alarming at the moment.
- Scenario Analysis → Could be very important in the future. At the moment, this feature is not really incorporated in software.
- Drill-down Capabilities → Important for the in-depth information on a dashboard.
- Information Access Quality → Security of dashboards and deciding who has access to what information.
- Information Content Quality → Priority number one!
- Presentation Format → the way people present the dashboard information.

I would delete the following factors:

- Clarity of overall visual display, use of color and use of single page → instead create a compound factor called: CLARITY .

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

- Information Access Quality → could play a role at implementation and predisposition.
- Drill-Down Capabilities → could play a role at implementation and predisposition.
- Information Content Quality → Important in achieving a fit between demand and supply. When the information is not valid, your co-workers will lose motivation.
- Clarity of Overall Visual Display → predisposition.

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

Accessibility of data, so that your co-workers are able to access the different platforms at any time they want. Furthermore, I would advise to make use of mockups and show your co-workers or clients what the dashboard will look like and which information it will display. Quality of information must be guaranteed before implementation.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would retain the following success factors:
- Level of Management Support & Commitment → Co-workers must be supported by management during the phase of implementation. This also applies for later stages where your co-workers must feel involved and motivated with the dashboard, especially for the long-term.
- User Involvement → Definitely of importance during this phase, but also at the demand side, in order to receive some early insights and feedback from the users.
- Use of Prototypes → mockups.
- Quality of Communication → The communication of your goals top-down and bottom-up are very important during this process.
- Level of IT Support → When facing bugs and issues it is essential to have the right IT support as backup.

I would delete the following factors:
- Quality of Training → This should not be necessary, since the dashboard must speak for itself in terms of content and design.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

- User Involvement →This factor should play a role at the predisposition → The more people get involved with your dashboard, the higher their satisfaction.
- Quality of Communication → Important in achieving fit between demand and supply → Very important that there is a good communication about the goals and expectations. Bottom up, there must be good communication about the level of satisfaction with the dashboard.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

The following factors will eventually form the predisposition towards a marketing dashboard:

- The match between demand and supply
- Clarity
- Drill-Down Capabilities
- Trustworthiness of Data
- Satisfaction of Upper Management

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Answers given at the previous question match the list here.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes, although these factors are mostly a result of factors mentioned in prior phases.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Critical Success Factor (CSF)	Rank
Structure of the Problem	2
Complexity of the Tasks	11
Depth of Knowledge	
Availability of Data	10
Level of Market Dynamics	
Organization Culture	
Time Constraints	
Cognitive Style	
Level of Experience	
Information Content Quality	1
Information Access Quality	9
Drill-Down Capabilities	8

Presentation Format	
Scenario Analysis Capabilities	
Quality of Automatic Notifications	12
Clarity of Overall Visual Display	7
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	6
User Involvement	
Use of Prototypes	
Quality of Communications	5
Quality of Training	
Quality of IT Support	
Attitude	
Trust	4
Management's Expectations	3

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	7
Improved Effectiveness & Efficient Marketing Efforts	2
Better Decision-Making	5
Support for he Accomplishment of Strategic Business Objectives	1
Time Savings for Users	6
More and Better Information	4
Cost Savings	3
Improvements of Business Processes	8

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Such a checklist could definitely be useful. Hereby, the designer could incorporate elements from multiple perspectives. Use the literature as a basis for your checklist and complement this with factors from your study. Which factors are addressed in non-empirical marketing articles? Think about this, since this is an issue that we are facing today and therefore not that many scientific articles will cover this topic.

Would you like to add something as a closing to the interview?

No.

Interview 3: Harry, Owner, Online Shoe Retailer

What types of marketing dashboards did you come across within the e-commerce?

Within the e-commerce industry I have faced these types of marketing dashboards:

- E-Mail marketing
- SEO/SEA
- Sales dashboards linked with marketing
- Affiliate marketing
- Back-office → back-end of the website
- Dashboards for monitoring servers
- Conversion dashboards
- User experience (UX) dashboards

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

Very important, measuring your activities is the knowing what you are doing and how you are performing in the field of marketing. Besides, the design of dashboards becomes a hot topic as well. For example, more and more pre-designs are presented to me in the form of mockups. This gives me a certain indication and the developer has his feedback. Measuring is knowing within the e-commerce industry. Dashboards are therefore essential in tracking down what direction the organization is heading.

What is in your opinion a successful marketing dashboard?

- **What features/functions?**

A successful dashboard contains the following features in my opinion:

- Clarification
- Single Page

- Definition of KPIs → must be mentioned for simple recognition of subject.
- Drill-Down Functions
- Real-Time Representation

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

Design is in my opinion very important, but from experience I can say that it is hard to create a dashboard that fulfills everybody's needs. Eventually, the goal is to create a dashboard which contains a combination of all opinions in the organization. For this job one designer will be responsible. Communication from bottom-up and top-down is very important, so that all opinions are collected and taken into account. A dashboard for every problem or for every channel is ideal. A dashboard where you are able to compare KPIs from different periods in time is experienced as useful (periodic/seasonal/internal). My experience tells me that design is the most difficult part to manage. Therefore, user involvement is very important in order to achieve the desired dashboard and listen carefully what his or her co-workers have to say. Financial factors also play a role on the demand side, because the designer is often limited to a certain budget for a dashboard. Knowledge of management is another factor. Management should be open for criticism and other opinions in the organization.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would retain the following factors:
- Time Constraints
- Structure of the Problem → marketing instrument
- Depth of Knowledge → little knowledge means limited interpretation
- Availability of Data
- Complexity of Tasks
- Cognitive Style
- Level of Experience
- Organization Culture

I would add the following factors:
- Financial Constraints → one on the demand side has to deal with certain financial constraints imposed by management.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

- Structure of the Problem → This should play a role in multiple phases, since the problem that needs to be resolved stands is central.
- Complexity of Tasks → Plays a role in multiple phases, same reasoning applies here.
- Depth of Knowledge → Everywhere, knowledge of the activities has refers to all phases.
- Cognitive style → This is important in all phases. How people interpret your dashboard is vital.
- Organization Culture → A dasboard does not need to be correct the first time. Therefore, mockups can be presented during multiple phases.
- User involvement → This factor can play a role here too. Different insights from your co-workers can be collected in an early stage.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What features of the marketing dashboard are important in achieving a positive predisposition?**

In my opinion, the following features/functions of a dashboard lead to a positive predisposition:

- Speed
- Ease of use
- Legibility → refers to visual aspects
- Functional on multiple platforms (mobile/pc/tablet)
- Trustworthiness of data
- Drill-down functions
- Single page
- Automatic notifications
- Access and security

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would retain the following factors:
- Clarity of Overall Visual Display → design aspects
- Drill-Down Capabilities → in-depth information
- Information Access Quality
- Information Content Quality
- Quality of Automatic Notifications → Quality of these is essential → When conversion deviates from the patterns, people want notifications to keep them posted.
- Scenario Analysis → Not yet incorporated in software, but very potential for the future. Possible actions to take could be feature that can be incorporated into a dashboard. Possibility to track the performances of your personnel is important too. Scenario analysis can play a role here by providing the employee with possible points for improvement.
- Presentation Format → the way people present dashboard information.

I would add the following factors:
- Complexity of the System → Deals with the complextiy of the tool used for creating dashboards.
- User Experience (UX) → combine all visual factors into one (ease of use, color, display, etc).
- Usability → core of the technique → people should be able to trust the quality of the technique and software.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

- Information Content Quality → everywhere
- Information Access Quality → everywhere
- Ease of use → through all layers
- Organizational Culture → defines the quality of a dashboard
- Financial Constraints → limits the quality of a dashboard in all layers

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

Organizational culture is perceived as important during the implementation phase. Mistakes can be made and management should have an open attitude. I see the use of mockups as important too in order to test which version of the dashboard is perceived as the best one. Knowledge of IT is useful when bugs in the dashboard are faced. Furthermore, it is important to motivate your employees with the use of dashboards. Your employees should be prepared with lectures and courses regarding the software. A documented manual could be useful too. With a manual, your employees could search for the solutions themselves instead of continuously asking.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

The following factors should be retained in the model:

- Level of Management Support & Commitment
- Quality of an (open) Communication
- Level of IT Support
- Quality of Training
- User Involvement → Linked to the role of management here, it is the job of managers to involve the employees.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

User involvement should appear early in the success factor model. Users must be able to give their input in an early stage.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

In my opinion, the following factors create a certain predisposition from the user's perspective:

- Functionality (supply side)
- Trust
- User-friendly
- User involvement
- Quality of communication

These factors are perceived to be decisive in creating a positive or negative predisposition towards the marketing dashboard.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Generally, these will be the factors. As a result from all prior factors.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Many factors are in my opinion obligated to take into the list of 12. Other factors are still hard to accomplish, and therefore difficult to assign a rank (e.g. scenario analysis).

Critical Success Factor (CSF)	Rank
Structure of the Problem	
Complexity of the Tasks	
Depth of Knowledge	9
Availability of Data	4
Level of Market Dynamics	6
Organization Culture	1
Time Constraints	3
Cognitive Style	5
Level of Experience	
Information Content Quality	7
Information Access Quality	
Drill-Down Capabilities	8
Presentation Format	
Scenario Analysis Capabilities	10
Quality of Automatic Notifications	
Clarity of Overall Visual Display	12
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	2
User Involvement	
Use of Prototypes	
Quality of Communications	10
Quality of Training	11
Quality of IT Support	12
Attitude	
Trust	
Management's Expectations	

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	7
Improved Effectiveness & Efficient Marketing Efforts	2
Better Decision-Making	1
Support for he Accomplishment of Strategic Business Objectives	4
Time Savings for Users	3
More and Better Information	6
Cost Savings	5
Improvements of Business Processes	8

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Certainly yes.

Would you like to add something as a closing to the interview?

Great interview. You showed that you are interested in the topic.

Interview 4: Charles, Head of Digital Commerce, Marketing Agency

What types of marketing dashboards did you come across within the e-commerce?

With my experience as head of digital commerce at a marketing agency I faced these types of marketing dashboards:

- SEO/SEA
- General dashboard containing all channels
- Advertising → real-time bidding
- Social media dashboard
- Organic search results
- Dashboard linked with sales
- Affiliate marketing
- E-Mail marketing
- Marketplaces (e.g. Amazon)

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

The adoption of marketing dashboard is always key in the strategy, especially within the e-commerce industry. It is essential that you can track your marketing efforts. You can steer on this within the organization.

What is in your opinion a successful marketing dashboard?

- **What features/functions?**

A successful marketing dashboard contains for me the following characteristics:

- Legible and understandable
- Not too complicated
- Mix of all visual aspects
- Trustworthy data
- Customer-focused
- Clearly displayed targets
- Information must be relatable
- Real-time data

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

Who precisely will have access to the dashboard? For every function within the organization one has access to different dashboards. Not everyone can or may have access to the information displayed on dashboards. What kind of person makes use of your dashboard? With designing dashboards one has to look carefully at the personal characteristics of the user(s). Are these people data analysts or marketers? Which data do you need? The availability of data within the organization is of great importance. A social marketer must have access to all social dashboards with links to Facebook, Instagram, LinkedIn, etc. Besides, exposing the problem is core with the design of dashboards. Which numbers should be included to show the users marketing related issues within the organization? Furthermore, an organization must be able to properly define what the problems are they are facing. This information could be of great use when designing dashboards. Knowledge of your employees to present problems and to communicate to the rest is also important.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

I would retain the following success factors:

- Availability of Data
- Structure of the Problem
- Depth of Knowledge

I would add the following success factors:

- Trustworthiness of Internal Data
- Accessibility of Data

I would delete the following success factors:

- Time Constraints → This should not be of influence, otherwise, people will take hasty decisions.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Time constraints could play a role everywhere, but in my opinion this role should be as small as possible. Time constraints often lead to hasty decisions. I have experienced this multiple times with clients. Experience and cognitive style could be placed at the predisposition towards the dashboard. These factors determine the personal experience of the user. Availability of data is very important in achieving a desired fit.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What features of the marketing dashboard are important in achieving a positive predisposition?**

The following features/factors are in my opinion important in achieving a positive predisposition towards the marketing dashboard:

- Possibility to compare data (periodic/seasonal)
- Cumulative insights
- Possibility to relate to market dynamics (external organizations)
- Trustworthiness of data
- Quality of information
- Seasonal influences
- Possibility to decompose the data → referring back to KPIs
- Referring data to targets
- Clarity
- Visual simple design

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would **retain** the following success factors:
- Information Content Quality
- Information Access Quality
- Drill-Down Capabilities
- Presentation Format
- Quality of Automatic Notifications
- Clarity of Overall Visual Display

I would **add** the following success factors:
- Periodic Comparisons (year/month/week/day/season)
- Display of Numbers (absolute to relative)

I would **delete** the following success factors:
- Scenario Analysis
- Use of Color
- Single Page

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

At the predisposition towards the dashboard I would place the following success factors:
- Factors related to the visual display → determines the personal experience
- Drill-down capabilities

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!
- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

The following factors are in my opinion of importance during the phase of implementation of dashboards:
- Accessibility to Data
- Real-Time Display

- Financial Constraints → costs of dashboard adoption compared to budget
- Complexity of the Software (user-perspective)
- Quality of the Software
- Time Constraints
- Experience and Knowledge of the Software
- Use of Mockups

I would advise to start with something simple during the implementation. Do not come up with a complicated dashboard as a first mockup, but start with a simple dashboard containing the key elements. People could give you feedback on the base dashboard in an early stage. When you create a complicated dashboard and people start giving you criticism on many aspects, it will be hard to completely change it again. Winning trust of your employees/clients is key here. After creating an initial dashboard, you could easily build a more complicated on by providing updates.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would keep them all in the implementation phase. Just add the factors explained at the previous question.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

User involvement plays a role in determining the predisposition towards the dashboard. When the user feels himself involved during the process he or she will eventually be more likely to perceive the dashboard as positive.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

Prior to this question I mentioned a lot of factors, so please take them into account. Insights into performances of particular processes or campaigns. Motivation could play a big role as well. When

co-workers feel getting closer to the set target, it will work motivated. Acknowledging and recognizing problems is important too. Why is a process or campaign not going well? Visual aspects are also important to incorporate, since this determines most of the personal experience from the user-perspective. Moreover, the perceived usefulness and ease of use are great determinants of the final predisposition. To what extent are dashboards available for your employees? Do they have access at home as well?

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

These factors are good! In general, the play a big role, but there are many issues determining trust

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

and attitude for example.

Yes, although these factors are mostly a result of factors mentioned in prior phases.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Critical Success Factor (CSF)	Rank
Structure of the Problem	4
Complexity of the Tasks	8
Depth of Knowledge	
Availability of Data	1
Level of Market Dynamics	
Organization Culture	
Time Constraints	
Cognitive Style	12
Level of Experience	
Information Content Quality	11
Information Access Quality	5
Drill-Down Capabilities	2
Presentation Format	4

Scenario Analysis Capabilities	
Quality of Automatic Notifications	9
Clarity of Overall Visual Display	6
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	10
User Involvement	7
Use of Prototypes	
Quality of Communications	
Quality of Training	
Quality of IT Support	
Attitude	
Trust	3
Management's Expectations	

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	5
Improved Effectiveness & Efficient Marketing Efforts	1
Better Decision-Making	3
Support for he Accomplishment of Strategic Business Objectives	2
Time Savings for Users	4
More and Better Information	8
Cost Savings	7
Improvements of Business Processes	6

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Yes, definitely. I think it is useful for designers/developers to know what has an impact on the eventual success of the dashboard. Hereby, you can see the aspects from multiple perspectives with your data.

Would you like to add something as a closing to the interview?

No.

Interview 5: Thomas, Digital Advertising & Analytics Marketer, Marketing Agency

What types of marketing dashboards did you come across within the e-commerce?

Within our marketing agency I fulfil tasks related to advertising and analytics. This implies that I usually manage campaigns and develop dashboards for our clients. Dashboards that I have developed for clients are the following:

- SEO/SEA
- General Dashboards → including quick overviews off all active channels
- Dashboards displaying targets and revenues
- Affiliate Marketing Dashboards
- E-Mail Marketing Dashboards

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

In my opinion not enough. Marketing agencies like ours often have to deal with a specific target audience. These often involve SMEs who are often losing in terms of marketing and therefore require our help. These organizations do not have a good understanding of what their online performances are. Big organizations often have their marketing in order and have acquired the adoption of dashboards in their marketing strategy. In-depth insights are the most common goals with the development of new dashboards for our clients.

What is in your opinion a successful marketing dashboard?

- **What features/functions?**

A successful marketing dashboard must provide a quick overview of the current status of their online marketing activities. One should not need too search a long time for finding the any outliers or downsides within their results. In addition, there must be good options processed in the dashboard to ensure that you can compare data from multiple time periods. This can be done periodically by comparing targets with revenues or by filtering out seasonal influences. Furthermore, a dashboard always needs a little bit of context by including short definitions for

example. Context what outlines the current situation concise. With the help of drill-down functions and segmentation options people could go deeper into detail with the data on the dashboard.

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

From a business perspective, I think it is important in developing dashboards that people clearly define to what extent to want to perform micromanagement. With other words, to what extent they want to go in-depth with their available data on the dashboard. It is important here that clear boundaries are set for the development and design of the dashboard. For example, to what extent do marketers want to have in-depth information on order level within the e-commerce. What information concerning a particular order do you want to have on your dashboard? Besides, the specific dashboard must be equipped by the needs and wishes of the user. So, clearly develop a dashboard from the users' perspectives. For example, the owner of a webshop wants to have a quick overview of all active marketing channels, where a marketing manager wants to see if he is on schedule with his or her marketing campaigns. This implies that the design of a dashboard is very bounded to the personal or functional characteristics. Dashboards are often used as internal accountability within organizations. The data displayed on a dashboard shows what the employee is actually working on. Therefore, dashboards are a tool for accountability towards upper management. A dashboard is thus equipped from a user perspective. Another factors that is important from a business perspective is the financial side. An organization often has a budget bound to particular projects like the development of dashboards.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would most certainly remove time constraints from your success factor model. This is something that dashboards do not benefit from. When there is a hurry or time pressure is exerted, there will be some mistakes made in data management. Eventually, this is the most important factor in the success of particular dashboards, whether or not the information displayed is valid and correct links are set. I would definitely retain the availability of data. This factor is quite obvious, since there must be enough data available to develop proper dashboards.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

I would interpret time constraints differently and place it on the supply side. Data is often time-bounded. You cannot display numbers when you do not have them yet.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What features of the marketing dashboard are important in achieving a positive predisposition?**

On the supply side I think it is important to what extent the software allows you to link data sources and to what extent you are able to automate these links in order to get real-time information. Furthermore, the access to information is an important factor. Which employees get access to what kind of information? Which possibilities are provided by the dashboard software to share particular dashboards? Functions and features of the software which guarantee the ease of use. The final predisposition towards a dashboard derives often from perceived ease of use. The possibility to use visual features within the software is also important. Within our organization we often use two tools for the development of dashboards, namely: Klipfolio & Google Data Studios. Klipfolio is used for the development of dashboards of bigger projects, since this software provides us with more possibilities in terms of linking data sources. I perceive Google Data Studios as very user-friendly. The graphical elements are within seconds integrated in the dashboard and the visual design is very simplistic. Security of your dashboards is also an important feature. Are the data sources secured appropriately?

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Drill-down capabilities are very important to me, since the user could decide to what extent he or she wants to go in detail with the data. I would merge the last three visual factors into one factor called: visual display. The remaining factors are all of importance and I would definitely retain those.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

I think that most of the factors from these two phases are very interrelated. Factors from the demand side are supplemented with factors from the supply side.

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!
- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

The extent to which a particular fit is achieved between demand and supply is very important for a successful implementation. Management's expectations must be considered during the phase of implementation. During the implementation it is possible to present multiple mockups to your client/employees in order to assess the ease of use. For us as a marketing agency, it is very important that the client has thought about what particular information he or she wants on the dashboard and that he or she comes up with small mockups. Any issues with the dashboard must be dealt with in an early stage. User involvement is during this phase of big importance, so that the user could provide you with feedback. In addition, the user will feel involved and motivated when you ask him or her about their opinion. In determining the success of a dashboard, motivational factors play a role here as well. Besides, the role management plays in managing the project is also important. Furthermore, the success of the organization also plays a small role here, because when the dashboard only displays bad results their employees will feel demotivated in using the dashboard.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

These factors are reasonably similar with what I just explained at the prior question. When expectations of management are taken into consideration and uses particular mockups, it will result in a strong level of communication. The other factors listed here are in my opinion all important for a successful implementation.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

I would place level of IT support on the supply side. From my own experience I can tell you that clients do not have this kind of support in-house, but do have access to dashboards. IT knowledge is missing at our clients, which makes sense since we are a marketing agency providing them with help and support in these fields. From our perspective, this factor plays a role at the supply side, since we are the suppliers of dashboards and the level of IT support is part of our offerings. Furthermore, I think that user involvement could be placed on the demand side. It is important that developers of dashboards receive feedback at an early stage of the process. The earlier users are involved, the more motivated they are.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

People will get a more positive predisposition when they see that dashboards actually have impact on the organization. Like mentioned before, I think that user involvement is a very important factor in determining the final predisposition towards the dashboard from a user perspective. Motivation to use the dashboard is important too. For example, motivation within our organization increases when we have a little internal competition with account scores per employee displayed on the dashboard. This implies that we show account scores that we achieve per account. This results in a little motivation and experience.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

Management's expectations does not belong here. If you are satisfied with a dashboard must return earlier in the success factor model, at the demand side for example. What is expected from the dashboard must be clear from the start of the dashboard project.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Besides the expectations of management, the other two factors are correctly placed.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Critical Success Factor (CSF)	Rank
Structure of the Problem	
Complexity of the Tasks	
Depth of Knowledge	
Availability of Data	5
Level of Market Dynamics	
Organization Culture	
Time Constraints	
Cognitive Style	12
Level of Experience	
Information Content Quality	2
Information Access Quality	4
Drill-Down Capabilities	
Presentation Format	9
Scenario Analysis Capabilities	
Quality of Automatic Notifications	
Clarity of Overall Visual Display	6
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	10
User Involvement	8
Use of Prototypes	7
Quality of Communications	
Quality of Training	11
Quality of IT Support	
Attitude	
Trust	1
Management's Expectations	3

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	8
Improved Effectiveness & Efficient Marketing Efforts	4
Better Decision-Making	1
Support for he Accomplishment of Strategic Business Objectives	3
Time Savings for Users	6
More and Better Information	2
Cost Savings	7
Improvements of Business Processes	5

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Yes, I would perceive such a checklist as useful during the development of new dashboards. A checklist clearly shows what could be of importance with new dashboards from multiple perspectives.

Would you like to add something as a closing to the interview?

No.

Interview 6: George, Owner, Webshop Developer

What types of marketing dashboards did you come across within the e-commerce?

With my experience in the e-commerce I faced the following type of marketing dashboards:

- Dashboards with all standard marketing channels including simple KPIs
- Cost per click dashboards & cost per conversion
- First click, last click
- Customer journey dashboards (online & offline)
- Dashboards linked with customer database (big data)
- Dashboards with specific customer profiles
- Customer satisfaction dashboards
- General dashboards with key parameters intended for higher management

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

From my own experience I can say that a the adoption of marketing dashboards has become a large part of marketing strategy. The information displayed on the dashboards is meant to be actionable. Especially, within large organizations you see that all decisions are made based upon data displayed on these visual dashboards. SMEs are often organizations that lack in terms of data management. These organizations are also clients of ours, since we are an organization developing webshops. SMEs often have not thought about clear data management and data structure. This could be the result of the maturity of the organization.

What is in your opinion a successful marketing dashboard?
- **What features/functions?**

A successful marketing dashboard features a proper balance between the unnecessary information and the core information that is actionable. This contains information that could be acted upon immediately. The question here is: what is actionable and what not? On which KPIs can I make quick and valid decisions? Information that is useless must be left out. For top management of bigger organizations you have one simple version of reality. So, clearly align who the users are of your dashboards. Furthermore, a successful dashboard must contain clear definitions of the KPIs. From my own experience I can say that defining your measures (KPIs) is one of the most important aspects in determining the success of a dashboard. Presentation towards the rest of the organization is important too. Validity of numbers has of course priority one. Furthermore, trends must be observed from the data quickly, so include graphical elements in your dashboard. Dashboards are also snapshots of one moment in time, therefore, I think it is essential that you are able to compare data within a dashboard. This can be done periodically (day/week/month/quartile/year) or by filtering out seasonal influences.

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

From a business perspective, it is important that dashboards are aligned with the users. This implies on the supply side that the user's characteristics are taken into consideration. You have multiple departments and professions within an organization. All these different layers and professions in an organization need a different level of detail. Advertising specialists need clear details on their marketing campaigns and these results could be coupled with the related targets. Departments require detailed information concerning their business unit. Managers are responsible and are the head of a business unit, therefore, they need more general information what can be related back to detailed information. When employees do not receive personal dashboards, they will find a way to create it themselves. Dashboards must be aligned with the knowledge possessed by your employees. Do not include information which they do not understand. Moreover, there must be enough data available within the organization to use for dashboard purposes.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

I just mentioned availability of data, which I perceive as very important. Dashboards created to deal with structured and complicated issues is also a good point. For example, I have experienced large complexity with measuring the impact of a shop catalog. Catalogs trigger a visit to you webshop, however, this trigger occurs offline and is therefore hard to measure. What is the final impact of a catalog? How do you allocate revenue to a shop catalog? This example explains the difficulty in measuring online and offline marketing efforts. Offline could be measured here with noticeable increases in direct URL visits. These involve people who enter your web address after seeing the catalog. Market dynamics can be interpreted within the field of marketing as media dynamics. For example, customers see a commercial on TV and order afterwards on your webshop. How do you allocate revenue here?

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Difficult to define at this phase. Too many interrelationships.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What features of the marketing dashboard are important in achieving a positive predisposition?**

I perceive the following functions/features as important concerning the supply side:

- Quality of Information
- Trustworthiness of data → very important
- Quality of the source of data
- Definition of KPIs → Clear definitions result in context and quality. Especially, when you have multiple definitions of one construct that your measure.
- Filtering functions → To compare data on multiple levels of detail.
- References of data
- Presentation of data

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Many factors match with what I mentioned at the prior question. I would definitely retain the ones I mentioned at the prior question. Scenario analysis has great potential, but is not yet properly developed in today's software. An opportunity here is scenario analysis for the budgeting process. For example, when a SEA specialist invested 5.000 euros in a particular campaign. What would happen when this specialist invests another 10.000 euros? Quality of automatic notifications are linked with e-mail marketing and I perceive these as very useful. With these notifications employees are informed immediately when the data shows any outliers.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

I would merge the visual factors into one new factor. Furthermore, the CSFs placed on the supply side clearly belong to the supply side.

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

First of all, I would involve the users of the dashboard as early as possible in the process. User involvement is the key to success. Eventually, they are the ones who have to work with the dashboards. Therefore, the users need to be satisfied and feedback from them is vital for the final success of a dashboard. The larger the organization, the earlier decision-makers need to be involved in the process. Furthermore, the employees need to be trained and possess sufficient knowledge to properly use the dashboards. People with sufficient knowledge of IT are required as well during the phase of implementation. These people could solve bugs and IT related issues. The top-down communication of your needs and goals are also important.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Many factors listed here match the ones I mentioned at the previous question. The use of prototypes is not mentioned, but I do think is of great importance by testing different versions of the dashboard. Customization features allow users to make it their own.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes, this phase is very clear.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

The most important issue here is user involvement and winning the trust of your employees by convincing them of the high quality dashboard. Trust is a logical result of customer satisfaction. Support of management is important here as well, as top management makes the big decisions.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would retain all factors.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes, but many factors are a result of prior factors.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Critical Success Factor (CSF)	Rank
Structure of the Problem	
Complexity of the Tasks	
Depth of Knowledge	
Availability of Data	2
Level of Market Dynamics	
Organization Culture	
Time Constraints	
Cognitive Style	
Level of Experience	
Information Content Quality	1
Information Access Quality	
Drill-Down Capabilities	3
Presentation Format	6
Scenario Analysis Capabilities	7
Quality of Automatic Notifications	
Clarity of Overall Visual Display	12
Use of Color	
Use of a Single Page	9

Level of Management Support & Commitment	
User Involvement	5
Use of Prototypes	
Quality of Communications	10
Quality of Training	11
Quality of IT Support	
Attitude	
Trust	4
Management's Expectations	8

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	5
Improved Effectiveness & Efficient Marketing Efforts	1
Better Decision-Making	2
Support for he Accomplishment of Strategic Business Objectives	3
Time Savings for Users	4
More and Better Information	7
Cost Savings	8
Improvements of Business Processes	6

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Yes, but I would be more concise with many factors. You can do this by providing examples with the factors. A checklist could be a good addition to the process of development, by simply checking the boxes with factors. However, it is important that the checklist equipped more practically. For example, I would make attitude more concise and take some examples from marketing literature.

Would you like to add something as a closing to the interview?

Try to illustrate a little bit more.

Interview 7: William, Conversion Specialist, Webshop for Games

What types of marketing dashboards did you come across within the e-commerce?

Google Analytics dashboards for e-commerce values. Besides, I use VWO (Visual Website Optimization) as a tool for website statistics concerning the click behavior for buttons and pages. Furthermore, this tool provides heatmaps of the website as well. With Google Analytics and AdWords I use standard dashboards for SEO, SEA, E-Mail and Affiliate. The link here is often made with the customer database by the means of business analytics software, such as Qlik.

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

The adoption of marketing dashboards should be a big part of the strategy, especially within the e-commerce, since this business occurs only via your webshop online. Without dashboards you can do nothing within the e-commerce sector. You want to measure everything that happens on your website in order to gather new insights.

What is in your opinion a successful marketing dashboard?
- **What features/functions?**

Clearly defining the KPIs is very important here. My profession is website conversion, so the most important KPI in my field is obviously conversion. Visual aspects are less important in my opinion. Furthermore, I think that clarity is important on a dashboard. A simple Excel output is substandard. Trustworthiness and quality of the information displayed is very important and must have number one priority.

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

Every user has other needs and wishes regarding dashboards. Therefore, it is important that the information on the dashboards must be aligned with the needs and wishes of the users. Managers want different information and probably more general dashboards, where specialists like me need more specific and detailed information. So, carefully look at the users' characteristics before designing dashboards. Motivation to use dashboards is also important from the user-perspective. Hereby, it is crucial that management guides its employees in order to steer motivation. Availability of data within an organization is important too. Without the proper data sources you will get nowhere.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

I would **retain** the following success factors:

- Structure and complexity of problems
- Depth of knowledge
- Availability of data
- Organizational culture
- Experience
- Cognitive style

I would **remove** the following success factors:

- Time constraints → This factor could only have a negative impact on the final success of the dashboard.
- Market dynamics → No role for external factors.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes, I agree with the place on the framework.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What features of the marketing dashboard are important in achieving a positive predisposition?**

Customization features are in my opinion very important. Here you will have a standard dashboard for conversion and extra customization features to play with visual elements. By including customization, you do not have to design a dashboard for every specific user and the users can create a dashboard according to their needs. Furthermore, I think that periodically compare your data is important to get meaningful insights. You want to compare of course the results of this month with last year's month. These comparisons can occur on many levels (daily/weekly/monthly/yearly). Geographic comparisons are for our organization important too. The webshop is internationally focused, so you want to know which countries are performing good and bad. For me as a conversion specialist, I think it is important to have customer journey funnels in a dashboard. These funnels interest me, because they tell you a lot regarding the customer journey on your website. You could exactly see which route the customer took on your website before ordering a product. For me it is interesting to see where the customer makes the decision to order or drops out.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

I would **retain** the following success factors:

- Information content quality
- Information access quality → the right information for the right people
- Drill-down capabilities → segmentation and filtering
- Scenario analysis → predictive marketing is very interesting but not yet developed
- Clarity of overall visual display
- Use of color → achieved targets could be marked green and failed targets marked red.

I would **remove** the following success factors:

- Quality of automatic notifications
- Use of single page

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes, this phase was clear to me. I have to note that most factors from supply complement the factors from demand. For example, the visual factors (supply) complement with the cognitive style (demand) of a dashboard user.

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!
- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

During the phase of implementation I consider knowledge of IT as very important, because bugs and IT related issues need to be addressed immediately. Furthermore, saving backups of your data is very important, so that you always have a raw data set on which you can rely on. Good documentation of your activities is important during implementation. This way you can exactly retrieve what mistakes were made. For me as a conversion specialist, Google Tag Manager is important as well for testing multiple versions of websites. This could be the case for dashboards as well by providing users with mockups. Having the right knowledge concerning the software is important too. Training of the users could be provided by simple tutorials online, but for more specific knowledge regarding your own situations you will need trained IT specialists. The communication of needs and goals is important during the implementation. These goals and needs should be translated back into the dashboard.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would retain the following success factors in your model:
- User involvement
- Quality of communication
- Training

- IT support
- Use of prototypes

I would remove the following success factors in your model:

- Level of management support & commitment → if the dashboard is properly designed, no support or commitment of management is needed to steer use of the dashboard.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

I think that user involvement has to return earlier in the model. You could place this factor at the demand side. Input from your employees is important in an early stage of dashboard adoption.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

Users of dashboards get a more positive predisposition when they have trust and perceive as user-friendly. During this phase, the user-perspective stands for me at the core. Furthermore, a good definition of the KPIs to provide a little context to the situation is recommended in order to avoid confusion.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

All factors are generalized. Nevertheless, they are very important in determining the predisposition towards marketing dashboards. These general factors are a result of prior factors mentioned in the model.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes, but they are the result of prior factors.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Critical Success Factor (CSF)	Rank
Structure of the Problem	
Complexity of the Tasks	8
Depth of Knowledge	3
Availability of Data	2
Level of Market Dynamics	9
Organization Culture	
Time Constraints	
Cognitive Style	
Level of Experience	
Information Content Quality	4
Information Access Quality	5
Drill-Down Capabilities	10
Presentation Format	11
Scenario Analysis Capabilities	
Quality of Automatic Notifications	
Clarity of Overall Visual Display	6
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	
User Involvement	7
Use of Prototypes	
Quality of Communications	
Quality of Training	12
Quality of IT Support	11
Attitude	
Trust	1
Management’s Expectations	

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	4
Improved Effectiveness & Efficient Marketing Efforts	5
Better Decision-Making	1
Support for he Accomplishment of Strategic Business Objectives	2
Time Savings for Users	7
More and Better Information	3
Cost Savings	6
Improvements of Business Processes	8

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Yes, you will get to new insights during the design and development of new dashboards. The perspectives from multiple people will be taken into account.

Would you like to add something as a closing to the interview?

No.

Interview 8: Max, Online Marketer, Webshop for Fireworks

What types of marketing dashboards did you come across within the e-commerce?

I am an intern here at this organization, currently studying commercial economics. I have experience with dashboards for SEO and SEA, especially with Google Analytics and AdWords.

To what extent is the adoption and use of marketing dashboards part of the strategy of the organization/department?

Very important, within this e-commerce sector all business is done online. The complete business model is based on webshops. Marketing dashboards are here essential, especially within larger organizations who intensively make use of tooling software to get their information visually displayed. I used to work for a technical wholesale, but here the use of dashboards was not that big. At that time I was responsible for the marketing tooling. Therefore, the organization's size is related to the extent to which they use marketing dashboards.

What is in your opinion a successful marketing dashboard?
- **What features/functions?**

This depends on what profession you have within the organization. However, within marketing you always have a few measures which are common to use:
- Sessions and Transactions
- Conversion Percentages
- Financial Overview

Furthermore, I think that the validity of your KPIs has priority number one in your organization. When the data is not trustworthy, you will have nothing. Real-time data in dashboards is also key to success. The more concise, the better.

DEMAND SIDE: the decision processes to be supported.

Which factors related to the demand side do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **Which factors are important in achieving a positive predisposition towards marketing dashboards?**

From a business perspective, I say that it is important that people look how they want to have the data visually displayed. This can be done by graphs in a visual way, but also in tables in an absolute way. Moreover, dashboards need to be matched with the users or the users need to have specific customization options. External factors and internal culture of the organization are also important. With this I mean to what extent people get pushed to use these kind of tooling methods.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would definitely retain the following factors:
- Depth of Knowledge
- Structure and Complexity of the Problem
- Availability of Data
- Market Dynamics
- Organizational Culture
- Level of Experience

I would remove the following success factors:
- Time Constraints → This will never have a positive effect on the development of dashboards.

However, the four top bullet points are in my opinion the strongest ones.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes.

SUPPLY SIDE: the functionality of the marketing dashboard

Which features/factors related to the functionality of the marketing dashboard do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!
- **What features of the marketing dashboard are important in achieving a positive predisposition?**

Concerning the functionality of a marketing dashboard, I think that the following features/functions will lead to a positive predisposition:

- Translation of goals and responsibilities in the dashboard
- Short and long-term comparisons (periodically)
- Quality of information
- Trust in information
- Customization features

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

I would retain the following success factors:
- Information Content Quality
- Drill-Down Capabilities
- Quality of Automatic Notifications
- Information Access Quality
- Scenario Analysis

I would remove the following success factors:
- Use of Color
- Clarity of Overall Visual Display
- Use of Single Page

For me personally, I would say that visual features are not that important, but I am a more textual-oriented person. This could definitely differ per person.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes, this phase is more clear to me.

Implementation Context of the Dashboard

Concerning the implementation context of the marketing dashboard, which factors do you expect to have an influence on the adoption of marketing dashboards? Motivate your answer!

- **What factors concerning the implementation context of the marketing dashboard are important in achieving a positive predisposition?**

First of all, the final users need to be involved in the process of design. They will provide the developers with input and insights. It is important to do this in an early stage. The communication of your goals and wishes need to be clear before starting the project. This depends on the managers. Furthermore, agreements must be made for the use of dashboards and employees need to be pushed and motivated by the managers. The users must use the dashboard the right way, so training and knowledge regarding the software is important too.

Which critical success factors would you:

- **retain?**
- **eliminate?**
- **add?**

Many factors match with the ones mentioned at the previous question. The use of prototypes is important too. Nevertheless, a good tooling software has its customization features in place. People should agree on the standard simple design of the dashboard. This simple starting dashboard can thereafter be upgraded with other features. With this customization options, the users should be able to play with the visual elements. Quality of communication is a strong point for me.

Are the critical success factors in the right place on the framework? Motivate your answer!

- **Which factors would you place elsewhere?**

Yes, most of these factors clearly belong to the phase of implementation.

Predisposition Towards the Dashboard

Which factors form the predisposition towards the marketing dashboard? Motivate your answer!

Ease of use is an important determinant for the predisposition towards a dashboard from the user-perspective. Furthermore, a little knowledge on the tooling software is essential too. When your users do not know where to look for some help or explanations, they will be get a more negative predisposition. So, make sure tutorials or manuals are in place. I think that the users need to be convinced that the dashboards are an efficient way of working.

Which critical success factors would you:
- **retain?**
- **eliminate?**
- **add?**

These factors are really general, but of importance when the bigger picture is considered. However, these factors are a result of other factors from the model.

Are the critical success factors in the right place on the framework? Motivate your answer!
- **Which factors would you place elsewhere?**

Yes, but see explanation above.

Operationalization of the Critical Success Factors

Please rank the 12 most important factors of the list. Start with the one you believe is most important to the adoption of marketing dashboards as first ranked, down to

Critical Success Factor (CSF)	Rank
Structure of the Problem	
Complexity of the Tasks	10
Depth of Knowledge	3
Availability of Data	
Level of Market Dynamics	

Organization Culture	
Time Constraints	
Cognitive Style	
Level of Experience	5
Information Content Quality	1
Information Access Quality	2
Drill-Down Capabilities	11
Presentation Format	
Scenario Analysis Capabilities	9
Quality of Automatic Notifications	
Clarity of Overall Visual Display	
Use of Color	
Use of a Single Page	
Level of Management Support & Commitment	8
User Involvement	
Use of Prototypes	
Quality of Communications	12
Quality of Training	4
Quality of IT Support	7
Attitude	
Trust	6
Management's Expectations	

Operationalization of Perceived Benefits from Marketing Dashboards

Please rank the list of 8 perceived benefits from marketing dashboards. Start with the one you believe is most important as first ranked, down to the one which you believe is least important as 8th ranked.

Perceived Benefits from Marketing Dashboards	Rank
Increased Accountability	8
Improved Effectiveness & Efficient Marketing Efforts	4
Better Decision-Making	1
Support for he Accomplishment of Strategic Business Objectives	3
Time Savings for Users	5
More and Better Information	2
Cost Savings	6
Improvements of Business Processes	7

Evaluation

Do you consider a success factor model or a checklist with success factors as useful during the adoption of new marketing dashboards?

Definitely, I would use it when developing dashboards myself.

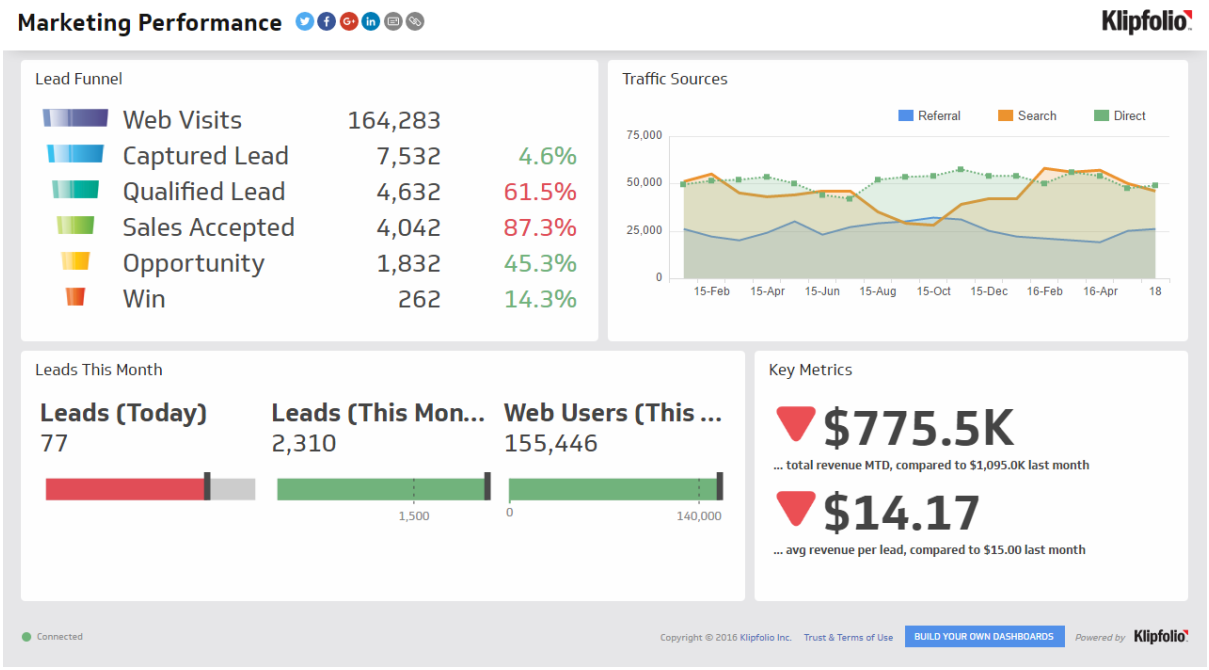
Would you like to add something as a closing to the interview?

No.

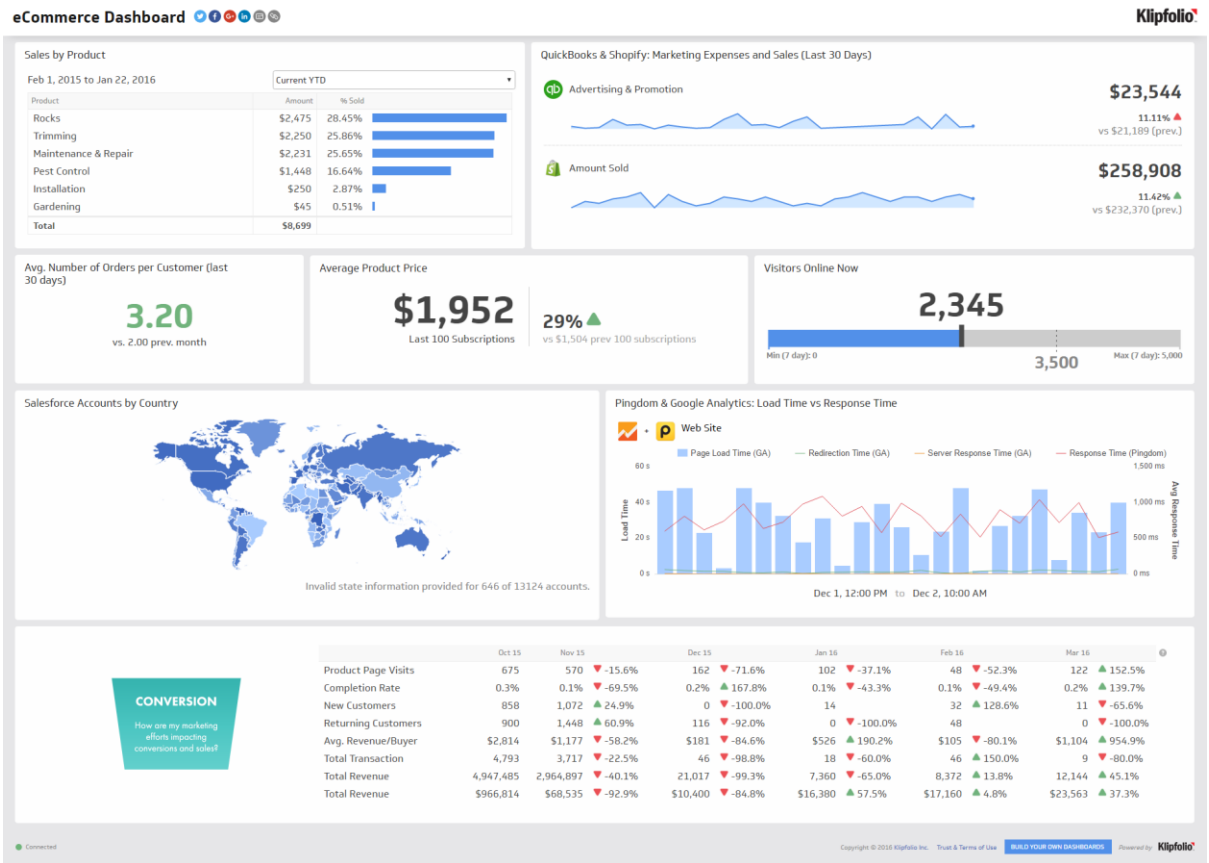
Appendix C - Dashboard Examples

Digital Marketing Dashboard

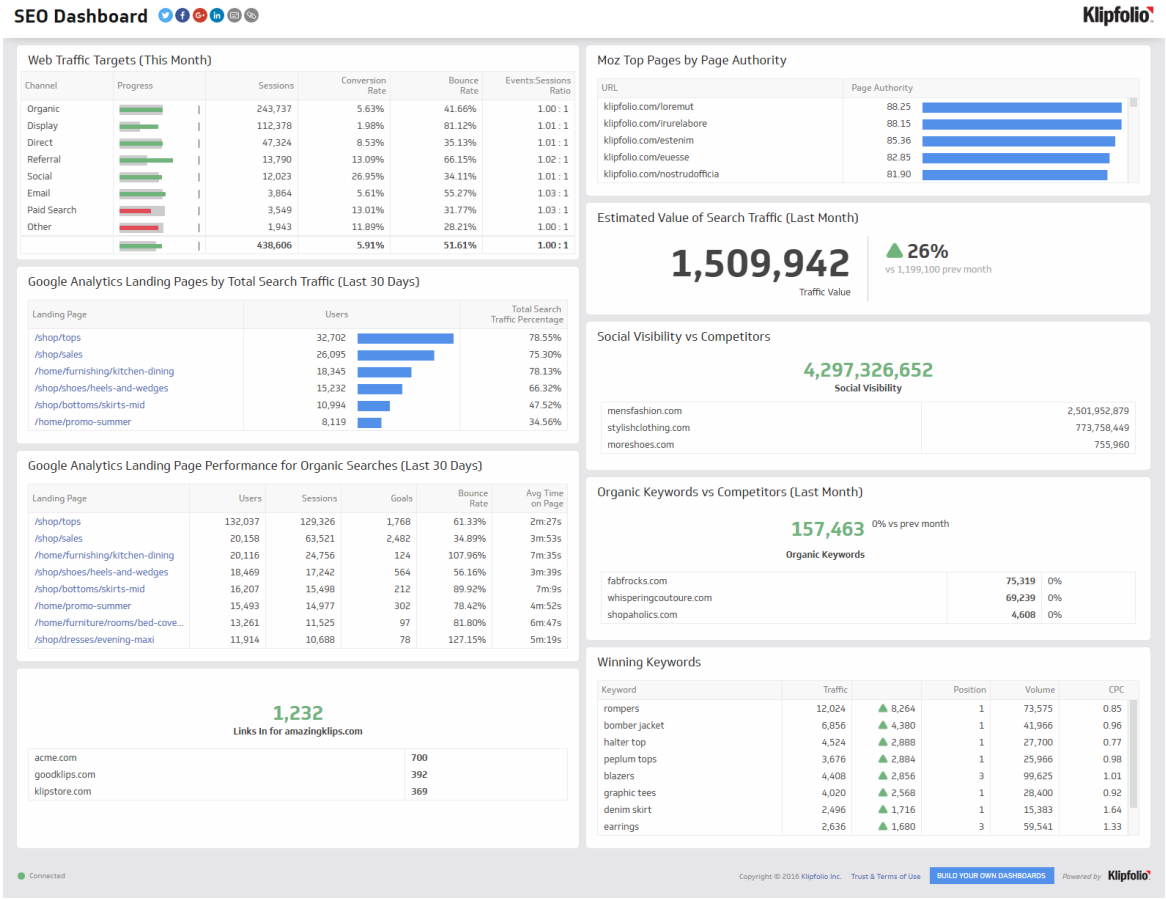
Marketing Performance Dashboard



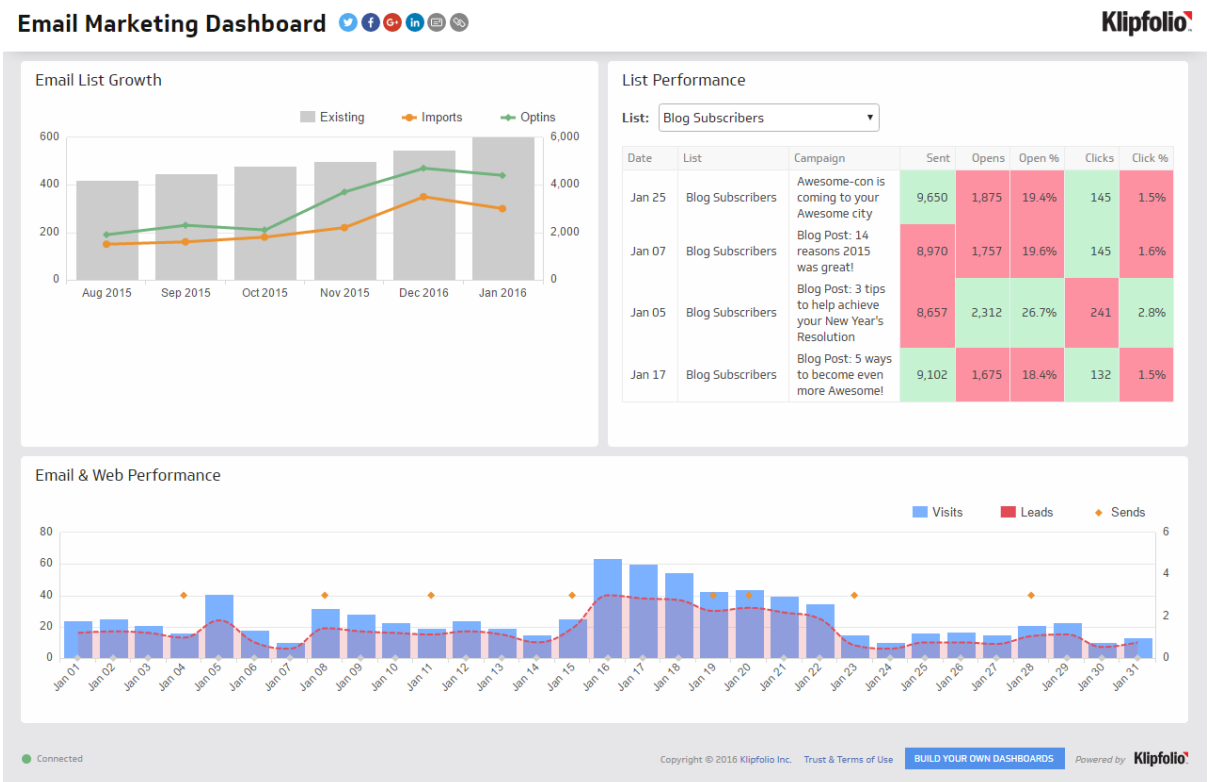
E-Commerce Dashboard



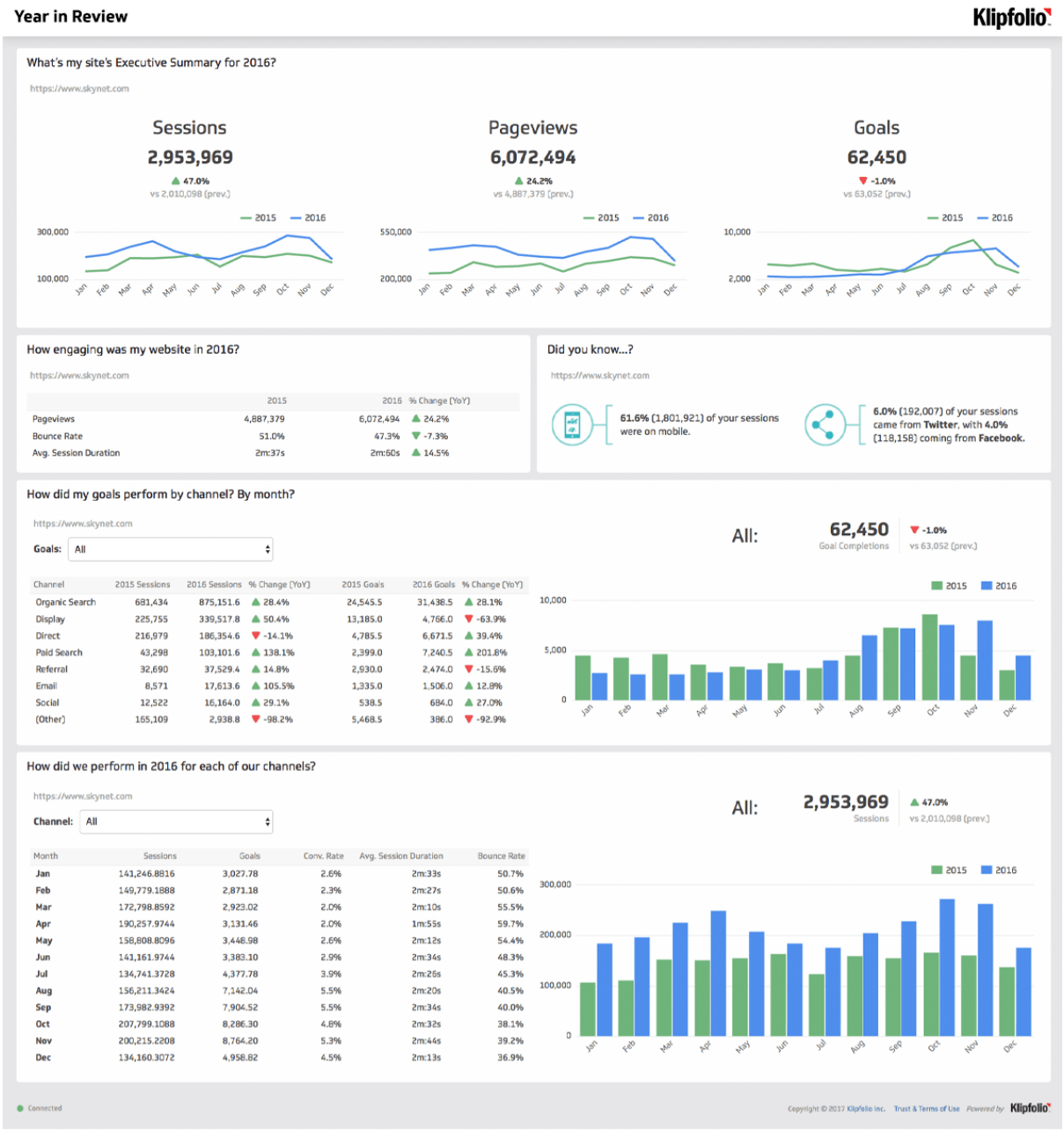
SEO Dashboard



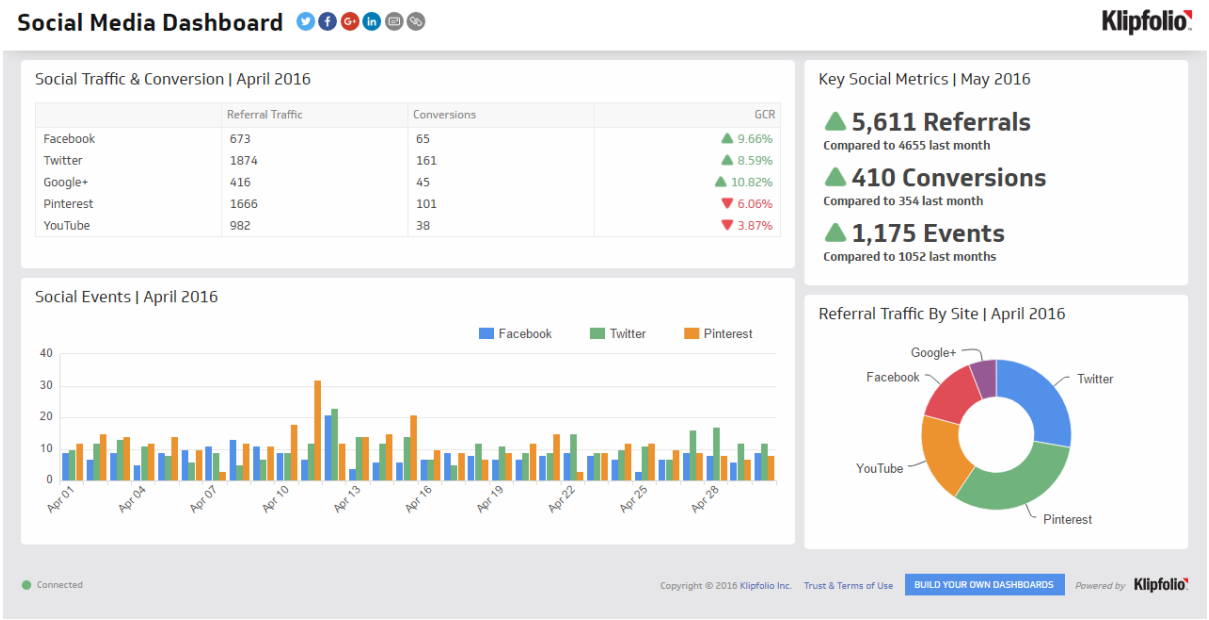
E-Mail Marketing Dashboard



Web Analytics Dashboard



Social Media Marketing Dashboard



Appendix D – Example Data Matrix (Supply Side)

Analysis Questions:

- Before showing the success factor model, what CSFs are mentioned by the interviewees concerning the supply side of marketing dashboards?
- Do the interviewees show understanding of the CSFs presented in the model?
- According to the interviewees, which CSFs could be added or removed to supply side?
- Do the interviewees show understanding of the CSFs' place in the model?

	Perceived Success Factors	Perceived Understanding of Success Factors	Success Factors Added/Removed	Perceived Understanding of Place in the Model
1: OLIVER				
2: JACK				
3: HARRY				
4: CHARLES				
5: THOMAS				
6: GEORGE				
7: WILLIAM				
8: MAX				

Appendix E – Matrices for Data Analysis

Data Matrix 1: Strategy & Perceived Successful Marketing Dashboard

Analysis Questions:

- According to the interviewees, what is the meaning of dashboard to marketing strategy?
- What is for the interviewees a successful marketing dashboard?

	Meaning of Dashboard Adoption to Strategy	**Perceived Successful Dashboard**
1: OLIVER	Great importance. Future potential in forecasting. Forecasting done with big data and 'customer heartbeats'. Big data linked with e-mail marketing.	Comparison with automotive industry → within couple of seconds data must be understood. Ease of use is addressed. Proper KPIs.
2: JACK	Great importance. Online marketing includes making your efforts measurable. For e-commerce even more significant → online business.	Combines data sources. At the start general and possibility to go more in-depth by drill-down features. Addresses financial aspects and visual features.
3: HARRY	Great importance. Measuring is knowing. Design is hot topic. Emphasizes use of mockups as pre-design and feedback possibility. Dashboards track down direction of the organization.	- Clarification - Single page - Proper definition KPIs - Drill-Down - Real-Time
4: CHARLES	Great importance. For e-commerce even more significant. Ability to steer the organization.	- Legible and understandable - Simplicity - Visual aspects - Trustworthy data - Customer-focused - Translation of targets - Information must be relatable - Real-Time
5: THOMAS	Great importance, but experiences as an agency the opposite. Clients, often SMEs, require more help with dashboards. Big organizations often have their marketing in order.	Must provide a quick overview. Outliers in data must be presented immediately. Periodic comparisons perceived as important. Dashboards always needs little bit of context. Emphasizes drill-down and segmentation.

6: GEORGE	Great importance. Dashboards are tools for action. Notes the difference in strategy between large organizations and SMEs. SMEs often have low quality data management. Maturity of organization influences strategy adoption.	Dashboard must contain actionable information only. Dashboard must be designed from user-perspective. Emphasizes clear definitions of KPIs. Presentation format perceived as important. Validity of numbers. Trends in a graphical form. Comparisons over time (day/week/month/etc.).
7: WILLIAM	Great importance. Especially for the e-commerce. The website is your business. So, you want to know all points for improvement.	Clearly defining KPIs. Visual aspects perceived as less important. Clarity is perceived as important. Trust in the quality of data has priority number one.
8: MAX	Great importance. Addresses importance for e-commerce as an online business. Notes importance of maturity for strategy adoption.	Addresses the importance of KPIs. Financial overview important for high management. Real-time information.

Data Matrix 2: Demand Side

Analysis Questions:

- Before showing the success factor model, what CSFs are mentioned by the interviewees concerning the demand side of marketing dashboards?
- Do the interviewees show understanding of the CSFs presented in the model?
- According to the interviewees, which CSFs could be added or removed to demand side?
- Do the interviewees show understanding of the CSFs' place in the model?

	Perceived Success Factors	Perceived Understanding of Success Factors	Success Factors Added/Removed	Perceived Understanding of Place in the Model
1: OLIVER	Actionable information Automated Alerts User-Perspective Scenarios/Solutions External Factors Customization Features Visual Elements	**Understood correctly:** Structuredness Complexity Depth of Knowledge Availability Org. Culture Cognitive Style Level of Experience **Misunderstood:** Time Constraints → interpreted differently → more from supply perspective Market Dynamics → did not understood the role of market dynamics on demand side of dashboard.	**Added:** Organization's products/services → bigger range means more layers and complicated dashboards (e.g. AdWords). **Removed:** Experience → experience does not equal statistical knowledge. Org. Culture → users decide themselves in terms of customization.	Emphasizes the great interrelations between the demand and supply side factors. "The factors between the demand and supply ide should end up in a fit."
2: JACK	Management's Expectations User-perspective → employees' preferences	**Understood correctly:** Structuredness Complexity Availability of Data	**Added:** none **Removed:**	The following factors are perceived to be important at the implementation phase:

	Actionable Information Quality of Data Sources Organization's Purposes	Level of Experience Cognitive Style Knowledge **Misunderstood**: Org. Culture → did not see the essence of culture in using dashboards Time Constraints → more from supply perspective instead of managerial pressure Market Dynamics → did not see the importance of external factors	Depth of Knowledge → "Dashboard must be easy to interpret for everyone." Market Dynamics → "Dashboard are intended for internal activities."	Complexity of Tasks Availability of Data Time Constraints Furthermore, interviewee addressed that interrelationships will occur between all factors.
3: HARRY	Design Features → hard to fulfill everybody's needs User Perspective → incorporate personal characteristics & purposes Communication → bottom-up & top-down Early User Involvement Financial Factors → financial constraints (budget) Open Management	**Correctly Understood:** Time Constraints Structuredness Depth of Knowledge Availability of Data Complexity Cognitive Style Level of Experience Org. Culture **Misunderstood:** Market Dynamics → did not see the importance of external factors in dashboard adoption.	**Added:** Financial Constraints → budgets imposed by management Communication User Involvement **Removed:** Depth of Knowledge → "Dashboard must be easy to interpret for everyone." Market Dynamics → "Dashboard are intended for internal activities."	Structuredness → "This should play a role in multiple phases, since the problem stands at the core." Complexity → same reasoning applies here Depth of Knowledge → "Knowledge of activities refers to all phases." Cognitive Style → Especially at the implementation phases. User Involvement → "User perspectives must be incorporated in all phases." A lot of CSFs should be incorporated through the whole process of adoption.
4: CHARLES	Accessibility User Perspective → who is using the dashboard? Availability of Data Defining KPIs Define Organizational Problems Knowledge Communication	**Correctly Understood:** Availability of Data Structuredness Depth of Knowledge Cognitive Style Level of Experience Misunderstood: Market Dynamics → external factors not perceived as important in dashboard adoption	**Added:** Reliability of Data Sources → clear data management at the start of the process is vital. Accessibility → incorporating needs in terms of accessibility important in an early stage. Communication → clear communication of needs and wishes important at the start. **Removed:** Time Constraints → should not be of	As an agency, the interviewee experienced time constraints to play a role everywhere, but this should be as small as possible. Experience and cognitive style determine the predisposition as the users' personal experience. Availability and reliability of data most important through all phases.

			influence → leads to hasty decisions	
5: THOMAS	User Perspective → "Clearly define to what extent micromanagement is desired." "Design of the dashboard is very bounded to the personal and functional characteristics." Financial Factors Availability of Data	Showed understanding of all factors except from market dynamics and time constraints, where the interviewee mentioned that external factors do not play a role. "Dashboards are for internal purposes." The interviewee suggested to interpret time constraints differently, where data is time-bounded and understood from a supply perspective.	**Added:** Financial Constraints **Removed:** Time Constraints → "Time pressure results in mistakes in data management."	Time Constraints → data is time-bounded and could be interpreted from the supply perspective.
6: GEORGE	User Perspective → "Important that the dashboards are aligned with its users." Customization → visual features available through customization Actionable Information Availability of Data	**Understood correctly:** Availability of Data Structuredness Complexity → catalog example → online and offline impact Knowledge Time Constraints Cognitive Style Experience Market Dynamics interpreted a little different → in online marketing, market dynamics can be seen as media dynamics.	**Added:** User Perspective → merged multiple factors: cognitive style, experience, functional characteristics. **Removed:** none	Interviewee experienced difficulties in defining relations with other phases. All CSFs are somehow interrelated with each other.
7: WILLIAM	Interviewee emphasizes user perspective → information in dashboard must be aligned with needs and wishes. Motivational Factors Management Support Availability of Data	**Understood correctly:** Structuredness Complexity Knowledge Availability of Data Org. Culture Level of Experience Cognitive Style **Misunderstood**: Market Dynamics → interviewee does not	Added: Motivation Management Support User Perspective → merge cognitive style, experience, knowledge **Removed:** Time Constraints → negative impact on the success of a dashboard Market Dynamics → does not see the role of	Agrees with the place of understood factors.

		see the essence of market dynamics in adopting dashboards.	external factors in adopting marketing dashboards.	
8: MAX	Visual Features → from a user perspective (graphs/tabular) Customization Features External Factors Motivation	**Understood correctly:** Structuredness Complexity Knowledge Availability of Data Market Dynamics Org. Culture Level of Experience Cognitive Style Misunderstood: Time Constraint → perceived from supply perspective 4 top bullet points perceived as most important.	**Added:** Customization Motivation **Removed:** Time Constraints	Agrees with place in the framework.

Data Matrix 3: Supply Side

Analysis Questions:

- Before showing the success factor model, what CSFs are mentioned by the interviewees concerning the supply side of marketing dashboards?
- Do the interviewees show understanding of the CSFs presented in the model?
- According to the interviewees, which CSFs could be added or removed to supply side?
- Do the interviewees show understanding of the CSFs' place in the model?

	Perceived Success Factors	**Perceived Understanding of Success Factors**	**Success Factors Added/Removed**	**Perceived Understanding of Place in the Model**
1: OLIVER	Ease of Use Validity of KPIs Quality of Data Visual Display of Information	**Understood correctly:** Information Content Quality Information Access Quality Drill-Down Functions Scenario Analysis → not yet incorporated, but great potential Automated Alerts Visual Display Use of Colors **Misunderstood:** Presentation Format → depends on goals	**Added:** Quality of Data Links Ease of Use → important that software provides easy to use dashboards → important driver for predisposition Validity of KPIs Customization Features **Removed:** Use of Single Page → data must not be limited to one page	Correct place for all factors. However, many factors interrelate with demand side.

2: JACK	Validity of KPIs Simple Design Quality of Information Security of Information	**Understood correctly:** Use of Color → helps to achieve clear design Quality of Automatic Notifications → upper management wants to be simply informed by automated messages. Scenario → future potential Drill-Down → in-depth info Access Quality Content Quality → priority number one **Misunderstood:** Presentation Format → interpreted by the way people present dashboard information	**Added:** Visual Clarity → should be a compound factor of; use of color, clarity of overall visual display and single page **Removed:** Clarity of Overall Visual Display Use of Color Single Page All three merged in a compound factor: Visual Clarity	Access Quality → play a role at implementation and predisposition Drill-Down → plays a role at implementation and predisposition Content Quality → everywhere Visual Clarity → predisposition → determines the personal experience
3: HARRY	Addresses CSFs that lead to positive predisposition: Speed Ease of Use Legibility → visual aspects Access → multiple platforms Trust in Data Drill-Down Single Page Automatic Notifications Security	**Understood correctly:** Visual Display → design aspects Drill-Down Access Quality Content Quality Automatic Notifications → essential for quick response Scenario → future potential **Misunderstood:** Presentation Format → interpreted from people's perspective	**Added:** Complexity of Software → complexity of tool used for creating dashboards User Experience (UX) → combines all visual factors into one (ease of use, color, display, etc.) Usability → core of the technique → trust in the quality of technique and software **Removed:** None, only combines factors into new ones.	Content Quality → through whole process Access Quality → through whole process Ease of Use → all layers
4: CHARLES	Addresses CSFs that lead to positive predisposition: Possibility to Compare Data (periodically/seasonal) Possibility to Relate External Factors (competitors) Trustworthiness of Data Quality of Information Possibility to Decompose Data → referring back to KPIs Target Data Ease of Use Visual Simple Design Cumulative Insights	**Understood correctly:** Content Quality Access Quality Drill-Down Presentation Format Automatic Notifications Visual Clarity **Misunderstood:** Scenario → did not recognize the usefulness and applicability of scenario analysis for marketing dashboards.	**Added:** Possibility to Periodically Compare Data Display of Numbers (absolute/relative) Possibility to Relate to Competitors Ease of Use **Removed:** Scenario Analysis Use of Color Single Page	In determining the predisposition these CSFs essential: Visual Clarity → determines personal experience Drill-Down Capabilities

5: THOMAS	Quality of Software Quality of Data Links Real-Time Data Access to Information Ease of Use → mentioned as important driver for predisposition Security of Dashboard Klipfolio → bigger projects Google Data Studios → user-friendly with many visual elements	Interviewee mentions that he understands and sees the value of the CSFs on the supply side. The CSF drill-down capabilities is emphasized by the interviewee as an important feature.	**Added:** Visual Display → merge the three visual CSFs into one. The factors related to visual display are perceived to be coherent under one factor. The remaining CSFs are perceived as important and can be retained. Quality of Data Links Real-Time Data Ease of Use Security **Removed:** none	Interviewee notes that many CSFs between the demand and supply side are interrelated. The factors from demand supplement the factors from supply and result in a fit.
6: GEORGE	Quality of Information Trustworthiness of Data Quality of Data Sources Definition of KPIs → clear definitions result in context and quality. Drill-down functions References to Data Presentation of Data	Many factors match with the ones mentioned at the prior question. These can be perceived as understood. The interviewee show understanding of the remaining CSFs. Where scenario analysis and quality of automatic notifications are emphasized as very important.	Added: Visual Display → Merge the three visual factors into one new factor. Three separate factors describing the visual elements is superfluous. Quality of Data Sources Definition of KPIs References to Data **Removed:** none	The CSFs placed on the supply side clearly belong to the supply side.
7: WILLIAM	Customization Features → user can play with visual elements on a dashboard Periodically Compare Data Geographic Comparisons Customer Funnels → for e-commerce purposes very important in order to see points for improvement on the website	**Understood correctly:** Information Content Quality Access Quality Drill-Down Scenario → addresses the future potential of predictive marketing Visual Display Use of Color → simply marking targets with red and green. **Misunderstood:** Single Page → did not recognize the added value of recapitulated data.	**Added:** Customization Features Possibility to Compare Data Inclusion of Customer Funnels **Removed:** Quality of Automatic Notifications → a dashboard must outline the alarming numbers itself. Single Page → see previous explanation.	This phase is clearer than the previous phase. Demand and supply complement each other. “For example, the visual factors complement with the cognitive style of a dashboard user.”
8: MAX	Addresses factors that lead to a positive predisposition: Inclusion of Targets & Responsibilities Possibility to Compare (short and long-term) Quality of Information Trust in Information	**Understood correctly:** Content Quality Access Quality Drill-Down Automatic Notifications Scenario	**Added:** none **Removed:** All visual features → personally, the interviewee is more textual-oriented. However, he acknowledges the	This phase is clearer than the previous phase. The place of the CSFs here is correct.

Customization Features		importance of visual features for other users.	

Data Matrix 4: Implementation Context (adoption)

Analysis Questions:

- Before showing the success factor model, what CSFs are mentioned by the interviewees concerning the implementation context of marketing dashboards?
- Do the interviewees show understanding of the CSFs presented in the model?
- According to the interviewees, which CSFs could be added or removed at the implementation phase?
- Do the interviewees show understanding of the CSFs' place in the model?

	Perceived Success Factors	**Perceived Understanding of Success Factors**	**Success Factors Added/Removed**	**Perceived Understanding of Place in the Model**
1: OLIVER	User Involvement Training Motivation Consistency Feedback Use of Mockups Trust	**Understood correctly:** Communication Training IT Support Prototyping Management Support & Commitment → notes the role of management as important in achieving consistent use **Misunderstood:** none	**Added:** Motivation Consistent Use Feedback Use of Mockups → instead of prototyping Trust **Removed:** Prototyping → use of mockups instead	Some CSFs are a result of another CSF. For example, user involvement is s result of proper communication and training.
2: JACK	Accessibility Use of Mockups Quality of Information	**Understood:** Management Support & Commitment → important in steering motivation of users. Especially for the long-term. User Involvement Use of Prototypes → mockups Quality of Communication → top-down and bottom-up IT Support → when facing bugs and other issues. **Misunderstood:** Quality of Training → recognizes training as interpretation of the dashboard, but could	Added: Accessibility Use of Mockups → instead of prototypes Quality of Information → this CSF plays a role at multiple phases. **Removed:** Quality of Training → "dashboard must speak for itself"	User Involvement → Demand side to receive feedback in an early stage. Predisposition phase too as user involvement is perceived to determine a positive predisposition. Quality of Communication → goals and expectations must be communication early.

		training also implies training with the software.		
3: HARRY	Org. Culture Attitude of Management Mockups Knowledge of IT Motivation Training	**Understood correctly:** Management Support & Commitment Quality of Communication IT Support Training User Involvement → linked to role of management. Prototyping	**Added:** Org. Culture → an open culture where mistakes can be made is helpful. Use of Mockups → Prototyping Motivation → to make a dashboard successful it must be used consistently. **Removed:** none	Many CSFs are important in other phases too: User Involvement Communication Management Support & Commitment
4: CHARLES	Accessibility Real-Time Display Financial Constraints Complexity of Software Time Constraints Knowledge of Software Use of Mockups	Interviewee advises to start with a simple design and update this version based on feedback. Starting with a complicated dashboard and editing this version results in more work. Showed understanding of all factors.	**Added:** Accessibility Real-Time Display Financial Constraints Software Complexity Time Constraints Use of Mockups → instead of Prototypes **Removed:** none	The interviewee recognizes user involvement as an important determinant for a predisposition towards the dashboard. "When a user feels involved during the process he or she will be more likely to perceive a dashboard as positive."
5: THOMAS	Achieved Fit Management's expectations Mockups → important to assess the ease of use User Involvement Motivation Organization's Success → dashboard users will feel more motivated if the dashboard displays mostly positive results.	The interviewee showed understanding of all CSFs at this stage. The CSFs here clearly belong to the phase of implementation.	**Added:** Achieved Fit (demand & supply) Use of Mockups → instead of prototypes Motivation Organization's Success **Removed:** Use of Prototypes → Mockups instead	Many CSFs here are interrelated. For example, a strong level of management support & commitment result in strong communication. One could place IT support at the supply side as well. As an extra offering from the software supplier. From experience the interviewee can say that they are often the suppliers of IT knowledge. Furthermore, user involvement could play a role at demand side too. "The earlier users are involved, the more motivated they are."
6: GEORGE	User Involvement → As early as possible. "The larger the organization, the earlier decision-makers need to be involved in the process." Training IT Support	The interviewee mentioned many factors at the previous question. This implies that the interviewee understands the CSFs mentioned here.	**Added:** None → interviewee agrees with most CSFs. **Removed:** Use of Prototypes → with customization features included, testing mockups is not required anymore. "Customization	The place of the CSFs here makes sense for the interviewee.

	Top-Down Communication		features allow users to make it their own."	
7: WILLIAM	IT Knowledge Backups Documentation of your Activities Mockups Software Knowledge Training Communication of Goals and Needs	The interviewee shows understanding of all CSFs.	**Added:** Documentation of Activities Use of Mockups → instead of prototypes Software Knowledge **Removed:** Level of Management Support & Commitment → if the dashboard is properly designed, no management support is needed to steer its use.	User Involvement → must return earlier in the model → feedback at an early stage is an important factor. → demand side
8: MAX	User Involvement → early stage Communication of Goals and Wishes Management's Role Motivation Training Software Knowledge	The interviewee shows clear understanding of all CSFs. Strong Points: Quality of Communication	**Added:** Motivation Software Knowledge **Removed:** Use of Prototypes → with good customization features in place, the use of mockup is not needed anymore.	According to the interviewee, the CSFs clearly belong to the implementation phase except user involvement must be achieved in an early stage.

Data Matrix 5: Predisposition Towards the Dashboard (post-adoption)

Analysis Questions:

- Before showing the success factor model, what CSFs compose the predisposition towards marketing dashboards?
- Do the interviewees show understanding of the CSFs presented in the model?
- According to the interviewees, which CSFs could be added or removed at the predisposition phase?
- Do the interviewees show understanding of the CSFs' place in the model?

	Perceived Success Factors	**Perceived Understanding of Success Factors**	**Success Factors Added/Removed**	**Perceived Understanding of Place in the Model**
1: OLIVER	Perceived Usefulness → example with e-mail marketing & automatic notifications → department notices its usefulness which results in positivity.	Trust → perceived as very important Expectations of Management → related with clear communication. **Misunderstood:**	**Added:** Perceived Usefulness Perceived Ease of Use **Removed:** Attitude	Yes, but most CSFs are a result of course from prior CSFs.

	Trust →when people do not trust the dashboard they lose motivation	Attitude → interviewee sees attitude as too general.		
2: JACK	Achieved Fit (demand & supply) Visual Clarity Drill-Down Trust Management's Satisfaction	With the answers from the previous question the interviewee shows great understanding of the CSFs here.	**Added:** Achieved Fit Visual Clarity **Removed:** None	Yes, but most CSFs are a result of course from prior CSFs.
3: HARRY	Functionality Trust Ease of Use User Involvement Quality of Communication These CSFs are perceived to be decisive in determining a positive/negative predisposition.	Interviewee shows understanding of CSFs, but mentions that the CSFs are too general.	Added: Functionality Ease of Use User Involvement Quality of Communication Removed: None	Yes, but most CSFs are a result of course from prior CSFs.
4: CHARLES	Interviewee mentions that all previous addressed CSFs are important in determining the predisposition. Motivation Visual Aspects User-Perspective → ease of use & usefulness Access to Dashboards	The factors are good but these CSFs are according to the interviewee too general. "There are many issues determining trust and attitude."	**Added:** Motivation Ease of Use Usefulness Dashboard Access **Removed:** None	Yes, but as mentioned before they are the result of factors from prior phases.
5: THOMAS	Usefulness → "when they see that the dashboard actually has impact on the organization." User Involvement → steer motivation	Interviewee shows understanding of trust and attitude. However, he clearly disagrees with management's expectations. This CSF must return earlier in the model. "What is expected from the dashboard must be clear from the start of the dashboard project."	**Added:** Perceived Usefulness User Involvement **Removed:** Management's Expectations	Besides the management's expectations, yes.
6: GEORGE	User Involvement Trust High Quality Information Management's Support → top management makes decisive decisions	The interviewee shows understanding of all factors.	**Added:** User Involvement **Removed:** None	Yes, but many factors are a result of prior stages.
7: WILLIAM	Ease of Use Usefulness Trust User-Perspective Definition of KPIs → "a little context avoids confusion"	All factors are perceived as generalized. Nevertheless, despite the generalization these factors are determinants of a predisposition.	**Added:** User-Perspective → ease of use & usefulness Context to KPIs **Removed:** Attitude → replaced by user-perspective factors	Yes, but many factors are a result of prior stages.

8: MAX	Ease of Use → user-perspective → creates positive or negative feeling towards dashboard. Knowledge of Software Training & Support	These factors are perceived as general by the interviewee, but of importance when the bigger picture is considered.	**Added:** User-Perspective Factors → ease of use & usefulness Training & Support **Removed:** None	Yes, but many factors are a result of prior stages.

Appendix F – Misunderstood Factors

Misunderstood Factors Demand Side

Misunderstood CSFs	Explanation
Time Constraints	"I would interpret this factor more from a supply perspective. A marketing dashboard should give the user a lot of time savings. (Oliver, Interview 1)" "I would look at this success factor from the supply perspective instead of managerial pressure that is exerted from the demand side. (Jack, Interview 2)" "I suggest to interpret time constraints differently, where organizational data is time-bounded and understood from a supply perspective. (Thomas, Interview 5)" "I perceive this success factor at the supply side. As time savings is a large benefit of using marketing dashboards. (Max, Interview 8)"
Market Dynamics	"I do not see the impact of market dynamics in dashboard adoption. (Oliver, Interview 1)" "External factors do not have a role on the demand side in the adoption of marketing dashboards. (Jack, Interview 2)" "I am not able to note the importance of external factors in dashboard adoption. (Harry, Interview 3)" "I do not perceive the external factors as important in dashboard adoption. (Charles, Interview 4)" "Dashboards are built for internal purposes only. (Thomas, Interview 5)" "In online marketing, market dynamics can be seen and understood as media dynamics. (George, Interview 6)" "From a business perspective, I am not able to see the importance of market dynamics in dashboard adoption. (William, Interview 7)"
Organizational Culture	"I do not see the essence of culture in adopting marketing dashboards. (Jack, Interview 2)"

Misunderstood Factors Supply Side

Misunderstood CSFs	Explanation
Presentation Format	"The essence in presentation format depends on the goal you have with using dashboards. A general dashboard has a simpler format than a more in-depth dashboard. On the one hand, I think that it is useful to have different kinds of presentation formats available within the dashboard software. On the other hand, I think that your employees should be able to work with one standard theme." (Oliver, Interview 1) "The way people present the dashboard information to the rest of the organization" (Jack, Interview 2) "Interpreted as the way users present their dashboard information." (Harry, Interview 3)
Scenario Analysis	"I do not recognize the usefulness and applicability of scenario analysis for marketing dashboards." (Charles, Interview 4)
Single Page	"I do not recognize the added value of recapitulated data." (William, Interview 7)