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Performance dashboard effectiveness improvement to support service delivery within global IT solution provider

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ABSTRACT

IT has become increasingly complex and time-critical. For the global IT solution provider, this means service delivery has to develop, and its service delivery team must be provided with effective tools. An effective performance dashboards is the way to support best-in-class service delivery by enabling the service delivery team with timely, data-driven, in-a-glance information to support their decision-making and increase efficiency.

This thesis aimed to understand how successfully the case company has increased its competitive advantage by analysing the effectiveness of recently implemented performance dashboards based on the IS model. The objective was to develop an improvement plan for the company's management to support achieving its strategic goals. The research was conducted using qualitative methods.

Semi-structured interviews of the participants and daily observations by the researcher over nine months provided documented data. After each round, data was analysed using clustering and phenomenographic qualitative methods, reviewing deviations, and compared to the best practices in the literature.

The case company started to implement recommendations after the first round. It is currently working to incorporate the proposed improvement plan into its strategy and the subsequent releases of the dashboards as was proposed in this research.

Keywords: performance dashboard, IS model, D&M model, dashboard effectiveness, key service account manager

CONTENTS

1. INTRODUCTION

“It is not a nice-to-have – it’s a must-have”: Doug Henschen from Constellation Research has said about business intelligence tools in today’s organisation. (Stedman, 2021)

Dashboards are one of the commonly used business intelligence tools. Since early 2000, business has been expanding in using dashboards as dashboards provide information that allows managers to focus on objectives and goals by providing input on important aspects and ones needing attention; as a result, supporting quality decision-making (Rikhardsson & Yigitbasioglub 2018). It is both necessity, as well as it is fashion to have them (Raynus 2011, 225). For example, organisations with a data-first approach utilising available data are twenty times more likely to be significantly ahead of the competition (Sukumar 2020, 21).

Dashboards are a graphical representation of key indicators relevant to the business process of at-a-glance. A performance dashboard is a layered information delivery system providing users with information, insights, and alerts to measure, monitor and manage business performance (Eckerson 2011, 10). With the development of IT systems and provided possibilities, the dashboards are developing to even further support business strategy and operations. With the increased amount of available data, there is an increased focus to create a competitive advantage using data-driven decision-making. In the article by Vasarhelyi and Alles (2008) notes that the new business model is built on faster business processes and a faster view of decision consequences. Actionable data is more significant compared to traditional historical data and provides the business with a minimum to stay competitive (Vasarhelyi & Alles 2008). Dashboards provide a way to bring the needed data at at-a-glance to the teams for action.

1.1 Research background

Removed text. The acceleration of IT development globally not only provides advantages but also puts constraints on companies across industries. Service is a crucial part not only of the business but also key to customer satisfaction.

The case company has been developing a customer-centric service delivery model for years. The master thesis is focused on analysing the effectiveness of performance

dashboards to key services account managers' operations, supporting delivery of the best in industry service experience. Another key aspect to be analysed is whether the performance dashboards have achieved their strategic objective of strengthening the customer-centric delivery model.

The researcher has worked in different capacities at the company for more than two decades. Most of the time, the researcher has been part of the services business team in service sales, services business development, and services delivery-related positions. As infrastructures have become more complex and require a wider range of skills, requirements towards the service delivery team have increased. Timely proactive whole team's actions in synchronicity are critical for the customers' success. Being part of the services expert team at the company gives the possibility to experience and observe the development of different dashboards that are intended to support outstanding best-in-class service. The case company's team has put a lot of time and effort into the development of the customer-centric model and tools supporting the teams for best-in-the-industry service delivery. This research is designed to strengthen the company's attempts to develop services and delivery further.

Dashboards are commonly used tools that, if properly built, enable a company's employees at all levels to do real-time data-driven decision-making. This topic is currently becoming more and more relevant to businesses. Furthermore, it is not enough for data to be available and visually presentable. It must provide actionable information and drive action (Lawton 2021). Currently, dashboards are being designed and implemented on a massive scale. They are using different platforms (PowerBI, SQL, Google, Tableau, Excel, and others). This work aims to verify whether users widely adopt performance dashboards that, as a result, drive improvements in their performance. If such an assumption is valid, it should be visible in improved satisfaction within the account team using the dashboard and within customers supported by such a team.

Countless existing studies and information are available around dashboards and studies on dashboard impact on different business processes. Still, there is a lack of research on the effectiveness of dashboard implementation and usage in the IT services delivery field impacting tactical-level service manager work. Furthermore, there is a

lack of analysis of the impact on service delivery and development, focusing on value-added services. A lack of research in this field was noticed during the initial literature review. The rise of AI, predictive analytics and forecasting automation combined with a significant amount of available data could be utilised better for further dashboard development. As a result, the question remains: how and how effectively?

The research results would give a real-life overview of how much actual advantage performance dashboards bring to the service's delivery quality and improvement of the case company's competitive advantage. The company will be given information on five dimensions of the Information Systems ("IS") model from key service account managers' perspectives and findings of newly implemented dashboard usage. The main objective is to provide an operation plan with improvement suggestions. This shall allow the case company to have data on whether the dashboards achieve set targets from key users' perspectives and first-hand input on what improvements would help them. All that is backed up by theoretical research data available.

Performance dashboards are developed to improve the effectiveness, quality, and effectiveness of business processes, improve the speed of service delivery and enhance the user experience while providing long-term cost savings (Digital services excellence… 2021, 3). The same report focused on market pressure points to create value, automate and continuously boost productivity (ibid. 15 – 22). In the data-driven world, the aim of the dashboards could be narrowed down to the purpose of providing accurate real-time information to a decision-maker (Surma 2011, 9). With IT services spending continuously growing, companies must invest in the development of the tools (Stamford 2023).

1.2 Aim, objectives, and research question

The aim of this master thesis is to further support the company's competitive advantage by increasing the efficiency of services supporting strategy to help customers transform their business. The outcome of the master thesis research will be an improvement plan containing suggested improvements in one of five dimensions from DeLone and McLean's IS model that would bring the most value at this stage of dashboard development based on the outcome of this research.

The objective of this thesis is to increase the services account team's performance dashboard effectiveness to achieve maximum benefits from available data and the latest technological advantages and theories. To support the objective, **the main research question** is focused on what is a primary dimension that must be improved for performance dashboard effectiveness increase to have the most positive impact on the key service account managers' performance.

Master thesis work is aimed at understanding available best practices of dashboard usage over the last 30 years in combination with a possible look into less researched latest technological advantages from the perspective of one of the world's leading IT manufacturer's key service account manager role developments to increase efficiency, customers' satisfaction and competitive advantage.

The hypothesis for this master thesis is that performance dashboards help account teams improve IT environment services quality, resulting in better team' and customer satisfaction, leading to increased business. Performance dashboards also keep teams aligned with the organisation's strategy. Still, with new technological advantages, further improvements could allow the team to gain further benefits from dashboards.

The master thesis focus will be IS model dimensions for selected dashboards in selected accounts in four countries from key service account managers' role perspectives. The thesis will not analyse any other dashboards, service delivery roles or processes. The final plan will focus on the improvements that will be identified during research as the quick wins from the key service account manager's perspective focused on changes that can be executed in the short term. The improvement plan will not consider long-term suggestions as part of the research. Any other suggestions discovered during the thesis research will be provided to the company representative for further research and development.

1.3 Introducing the case company

Research is conducted for the leading global information technologies (IT) company. The company is mainly focused on enterprise hardware IT technology manufacturing and service delivery. Due to the nature of the products, the company operates only in the business-to-business segment.

During the last few years, global economic, political and technological trends have driven the IT industry to focus on service improvements. A pay-per-use approach to IT consumption, whether from cloud service providers or acquiring IT infrastructure for on-premises use, has driven significant development in IT services. IT services must undergo meaningful improvements on a large scale and across the business. First-runners in this endeavour will gain competitive advantages and may win the uncovered markets (Digital services excellence… 2021, 20). The rest will have to keep up with the competition.

The case company has worked in implementing and developing a customer-centric service delivery model over the years. As part of this development, larger customers with higher level services are being assigned key services account managers responsible for vendor services' successful delivery. To support the key service account manager role, the company has developed and implemented multiple performance dashboards at the end of 2022. Dashboards are focused on different service delivery aspects. These dashboards are released on a few other platforms that fit the best to the performance dashboard nature.

Prior to the dashboard development, the company had identified pain points that must be addressed to enable industry-leading service delivery. The newly implemented dashboards strive to provide easy access to customer and service information, decrease the data sources, create a collaboration platform, and provide united, controlled and compliant documentation storage locations, drive account teams' efficiency (Jones 2023). To monitor the success of the dashboards, the company has set timelines to achieve the maturity (crawl – walk – run). Additionally, measurements, such as user adoption rate and additional business metrics, are followed (Reiter 2023). This research will review the success of the case company's dashboards based on the IS model.

1.4 Structure of the research and conceptual framework

This thesis is conducted focused on the practical research approach defined as applied research (Saunders et al. 2019, 9-10). Applied research is undertaken in the organisation with direct and immediate relevance to the company. Applied research addresses the issue(s) essential for the organisation and focuses on results that can

be acted upon. This research has tight timelines in order to deliver value to the organisation and practical applications (ibid. 10). This research was conducted within one fiscal year and aligned with the dashboard release schedule to bring timely value to the case company. Furthermore, research was done in close cooperation with the case company's management to remain focused on the practical application of the outcome of this research.

As research is conducted in the actual setting with the key service account managers to evaluate the success of the dashboards, the constructionist research design was followed (Easterby-Smith et al. 2018, 92-111). The object of this thesis is based on subjective individual views that lead to the fact there is no one truth. The research design was based on the ground theory research practice "bottom-up" (Flick 2007, 20). The research design was targeted to gain the maximum insight from the selected group within the limited time available.

The conceptual framework evaluates seven dimensions all together of dashboard use from the key service account manager perspective to gain an understanding of how successful the IT manufacturer has been with the performance dashboard implementation. There are three performance dashboards – SFDC, PowerBI, and QlickSense - evaluated in three IS dimensions – system quality, information quality and service quality. The degree of use and nature of the use of performance dashboards is evaluated as it plays a significant role in the success of the implementation. Finally, the benefits for users and their view on benefits for the organisation is evaluated.

Five of the seven dimensions directly impact the use of the performance dashboards, which in turn directly impacts the benefits. All seven dimensions are critical to evaluate the success of the dashboard. The framework of this research is presented in Figure 1.

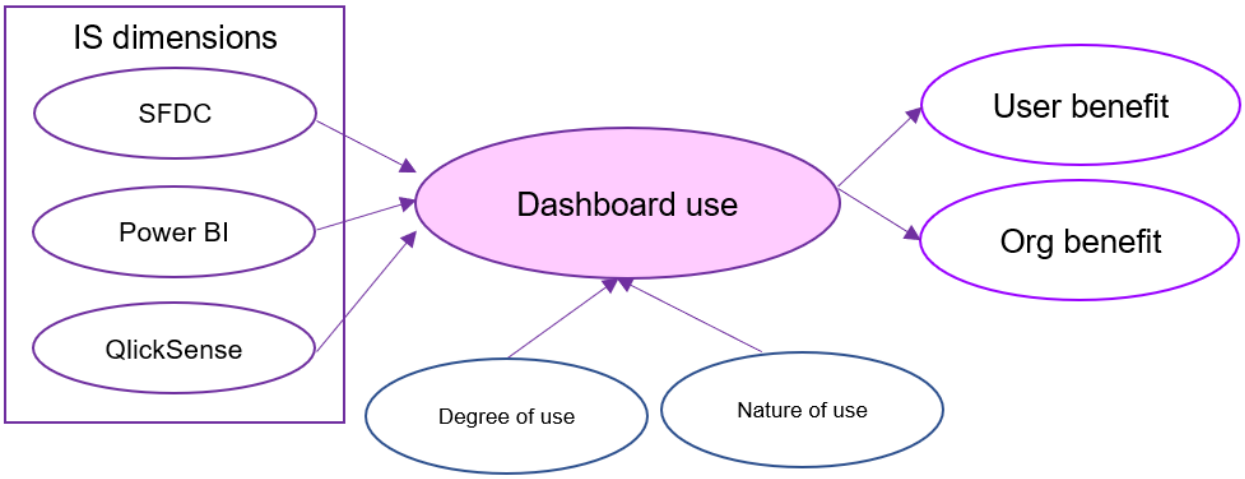

Figure 1. Conceptual framework.

IS dimensions (system quality, information quality, service quality) are independent variables. Dashboard use and benefits are dependent variables in this framework.

1.5 Research methods

This study follows a qualitative method based on a systematic literature review, thematic analysis, semi-structured interviews and observations to achieve the research objective. Semi-structured interview results were compared to observations of the researcher for data triangulation.

1.5.1 Qualitative methods

Qualitative methods allow to understand the subjective view of key service account managers and their customers on the dashboard, provide impact on the case company's services and provide information for improvement plan development.

Throughout the research, a content analysis approach is used to establish and assess the company's use of performance dashboards by the focus group against the available empirical suggestions. Analyses will also be used during the development of improvement suggestions. The content analysis is used as it is a useful approach to understanding, systemising, and deducing information relevant to a research question in a rational, transparent, and repeatable manner (Greenhalgh et al. 2004). This thesis focuses on capturing concrete, practical, and empirical recommendations for the most effective dashboard usage in the services organisation; the application of the systematic literature review method is rather appropriate and meaningful.

Thematic research focuses on analysing the commissioning company's performance dashboards implemented at the end of 2022. The final selection of dashboards in the scope of this research (Salseforce.com, Microsoft Power BI and QlickSense platform-based dashboards) were evaluated and selected together with the thesis commissionaire from the company. Thematic research will focus on understanding in more detail the performance dashboards used by key service account managers - type, focus, impact, aim, target, metrics, users, roll-out and usage schedule. This provides a basis to narrow the scope of the research and is done prior to the start of the primary data collection via semi-structured interviews.

Multiple **semi-structured interviews** will be conducted to analyse th,e performance dashboard effectiveness in-depth. Interviews will be done face-to-face, when possible, otherwise using the Microsoft Teams remote platform. All interviews will be conducted one-on-one. All results of the interviews are anonymous. The author has collected all data personally. Interview transcripts are unpublished due to data security.

Initial interviews will be conducted with the performance dashboard project team to assess the objectives and targets expected to be achieved using the dashboards. In addition, local country service management and regional stakeholders are interviewed to understand their expectations from dashboard implementation on the company's service delivery and key service account managers' performance.

The primary input will be collected via semi-structured interviews with key service account managers of the selected customer account teams. A baseline survey will be conducted as soon as possible after plan approval. Midway semi-structured interviews with the same resources will be done within three months from the baseline semi-structured interview at the beginning of June (deadline by June 15, 2023). The final semi-structured interview will be done after another three months at the beginning of September (deadline by September 15, 2023). The same questionnaire will be used to conduct all semi-structured interviews. The reason for submitting semi-structured interviews every three months since dashboards, and afterwards, usage adaption and improvement effectiveness, can be assessed after three to four months later. (Eckerson 2011) Participants' input is relevant to the research topic will be collected during

everyday daily interactions with the company's key service account managers and recorded by the researcher to support the research further.

In order to ensure the data accuracy and reliability of this research, the researcher used, in addition, the **observations**. The observation is suitable in cases when combined with other ways when the topic is related to management services and competencies. (Easterby-Smith et al. 2018, 210-219.) The researcher held a position within the organisation that provided the direct possibility to observe the key service account managers using the performance dashboards in their daily work without revealing that. This allowed the researcher to decrease the observer's effect while observing the user's behaviour.

1.5.2 Data sampling and analyses

The research will focus on the case company's IT infrastructure customers in four countries within Europe: Belgium, Denmark, Sweden and Finland. Countries were selected to represent the average company's service customers. All selected customers have the named key service account managers. Two to three accounts in each country will be selected in cooperation with the named account teams to identify the most suitable focus customers to achieve the objective of this research work. Customer selection will be based on selecting customers from different industries and with different service maturity levels. The intention is to have as wide as possible customer coverage while keeping research focused.

The key service account manager is a focus role for this research. Ten key service account managers participated in the study to ensure data reliability. That represents approximately 16% of currently available resources in this role in the Northern Europe region.

Qualitative data will be analysed in a disciplined, systematic manner to allow patterns to be understood and provide data across the customer that can be linked to theory. All collected data will be recorded in electronic format (semi-structured interviews will have notes) that will be made available to the case company project team.

1.6 Limitations

Research is done on one of the world's leading IT manufacturers. Data required for the study, especially customer and KPI-related information, is subject to confidentiality. For those reasons, not all actual collected data from the case company's systems will be possible to share directly in the thesis. The company's legal counsel will authorise the data to be shared, and data will be anonymised where possible.

The master thesis is focused on performance dashboards developed in-house without providing any background information. Furthermore, it focuses on how effective dashboards are for specific role – key service account managers. The application of the findings of this master thesis for other roles within the company and similar roles within other IT service provider companies will have to be assessed separately by interested parties. However, it must be kept in mind that this research is limited to one role within IT services. A common recommendation is focused on breaking down silos using the dashboard and use companywide. (Surma 2011, 8-11; Foley et al. 2022, 7.) Further research of the case company dashboard usage across organisation success is needed.

The IT environment is developing at a rapid speed. The business customers of the case company cover everything from small and medium business environments to major global accounts. Master thesis research was limited to fifteen selected accounts representing most customers. While the attempt is to cover the most common customer profiles in the region, the dashboard effectiveness may differ in different accounts. Further research into the specific customer segments and their unique needs might be required for a more accurate performance dashboard success evaluation.

Most risks existed within the change of personnel in the key service account manager's role. As research is expanded over a nine-month period and focuses on this particular role, it is essential to have the same resources available throughout the research period. New key service account manager onboarding in the existing account takes, on average, six to twelve months. Changes in the resource might influence the data quality. While risk is valid, rotation within the services key account manager role is limited. To further reduce possible negative impact, a minimum of ten key service account managers were selected to participate in the research.

2. VIEWPOINTS ON PERFORMANCE DASHBOARDS

Dashboards are one of the commonly used business intelligence tools. Dashboards are a graphical representation of key indicators relevant to the business process at at-a-glance. A performance dashboard is a layered information delivery system providing users with information, insights, and alerts to measure, monitor and manage business performance (Eckerson 2011, 10). While business intelligence systems have been around since the ’60s and dashboards since the ’90s, starting in early 2000, the business has been expanding in using dashboards as the information they provide allows managers and employees to focus on objectives and goals by providing input on important aspects and ones needing attention; as a result, supporting quality decision-making. (Eckerson 2011, 5; Rikhardsson & Yigitbasioglub, 2018; Stedman 2021, 3-6.) Properly designed dashboards support data-driven decision-making, both on the strategic and operational levels (Stedman 2021, 2; The key to… 2020, 30).

Dashboards can be categorised based on the organisational level they are designed for (Eckerson 2011, XIV, 101 – 121; Raynus 2011, 225, 227-239). Data is the basis for workforce decisions at all levels within the organisation (Foley et al. 2022, 6). Furthermore, it allows to break down silos within the organisation and benefits from the knowledge created by combining the data (Foley et al. 2021, 6-7; Stedman 2021). The focus on dashboard and other business intelligence tool development has been one of the top priorities for successful companies (Stedman 2021, 2; Bozic & Dimovski 2018, 191).

Technology development, artificial intelligence, machine learning and data-mining-discovery algorithm capabilities help to utilise underutilised asset – data – to improve performance and productivity (Yamin & Sweiss 2020, 397; Stedman 2021, 13-15; Digital services excellence… 2021, 8). Currently, available dataversity provides the possibility to combine meta- and actual data, allowing more users to process and analyse it (The key to… 2020, 30).

Dashboard implementation is a time and resource-consuming process. As companies have significant investments in dashboard development and implementation, there is a need to assess its effectiveness and success. Furthermore, the adoption of new artificial intelligence and machine learning tools provides benefits while demanding

skilled resources and time for adoption. (Stedman 2021, 2; Foley 2020, 8.) Ongoing research work to measure IS success and effectiveness demonstrates the importance of such performance assessments that helps business to drive improvements. It is important to note that adequately selected measurements are critical drivers for successful dashboard implementation. (Reinking et al. 2020, 2.)

2.1 Dashboard assessment models

A dashboard is a visual representation of the data. The information system is designed to support information collection, processing and distribution that facilitate decision-making. (Information systems, n.d.) As a result, the search for the most suitable assessment model was expanded to the dashboard, information system and business intelligence tool assessment. The outcome of the investigation led to a few information systems assessment models.

A model had to be selected to assess the performance dashboard system quality that best fits the task. For this purpose, there are known multiple approaches. The literature review described a few possible models that are more commonly known for assessing information systems' performance. Reviewing in detail the proposed models and considering the key service account manager dashboard of this research, the information system success model provided the most suitable model as it was the only model focused on end-user experience while considering the outcome of both individual and company benefits. Below is a short comparison of the most commonly recognised information systems success and effectiveness assessment models.

The IS-Impact measure model is one possible approach to assess the dashboard's success. The proposed model assesses the information systems in four dimensions by answering 37 questions (Gable et al. 2008). This model combines questions in four areas that are similar to the IS model used in this work:

- Individual impact
- Organizational impact
- Information quality
- System quality

The model is built in the manner of the survey with closed answers. Initial model analyses raised concerns about the depth, as well as the extent and, as a result – reliability of the research analyses.

A further possible approach is based on the theory-based success model of six IS effectiveness groups (Grover et al. 1996). The proposed model analyses and evaluates from context dimensions six units (Coughlan et al. 2013). The proposed groups are wide and require significant data collection as they cover infusion (the act of adding one thing to another to make it stronger or better (Infusion, n.d.), market, economic aspect, system usage, perceptual aspect and productivity measure analyses. Broad analyses can bring more perspective to the topic. However, the model was mainly developed and focused on IT outsourcing services (Grover et al. 1996, 90 - 93). For this reason, the model was not used for this research.

Another available model is the IS Effectiveness Measures developed by Seddon, Staples, Patnayakuni and Bowtell in 1999 (Seddon et al. 1999). This framework evaluates information systems by assessing five stakeholder groups in six dimensions. Because research in the case company is focused on one individual stakeholder group, furthermore, one role – model was too extensive to apply to this case.

Lastly, the Information System success model (IS model) considers five aspects that result in net benefit and reviews it from an end-user perspective. The model was initially proposed in 1992 by DeLone and McLean. (DeLone & McLean 1992.) The IS model defines success in six constructs (DeLone & McLean, 1992; DeLone & McLean, 2003; Gable et al., 2008). Furthermore, material research identified that DeLone's and McLean's IS model is the most used and cited (Gable et al. 2008, 379). Already by 2008, this model was cited in more than 300 scientific papers, according to research by Petter et al. (2008 cited in Pavkovic 2021, 40). Considering the case company's aim for this research, the IS model was selected as the most appropriate.

IS model is also considered to be too simple compared to other available models (Lucid 2013; Monem 2013). While there are few dimensions to assess, within each dimension, there are multiple choices left for the researcher to select from. That provides both a potential problem and a risk of researching wrong aspects. Each dimension of each dimension was evaluated prior to the research aligned with the case company's objectives. Those will be more closely described in section 2.2.2.

Based on the literature review, the IS model is commonly used in government, education and healthcare industries to assess information systems success. This research provides the possibility to evaluate the IS model used for measuring success in the IT services industry as there are currently no models specifically designed for IT serviced companies. During the research, no model was identified that would be focused on assessing IS for global corporates. Therefore, a certain level of scepticism and criticism is to be applied when analysing the data of this research.

2.2 Information systems model

As stated, one of the most common methods to evaluate the dashboard is DeLone and McLean's IS model (Gable et al 2008, 379; Bozic & Dimovski 2018). As the IS model has been researched, is commonly used and is fit for this research focus, this model was selected as a theoretical base with the case company's focus dashboard analyses framework.

According to the IS model, five dimensions are leading to success:

- System quality
- Information quality
- Service quality
- Use
- Net benefit

Note: while the initial IS model had a sixth dimension – intention to use, both authors and later researchers had proven that it is both hard to measure and has a minor impact on the success. (DeLone & McLean 2003; Maridana et al. 2015.) "Use" can be explored further, similarly to the initial model. The "nature of use" and "degree of us" can be reviewed. There is a need for further analyses on how large a role these additional dimensions of use play in assessing the success of the information systems, as there is no literature available on this topic.

2.3 Applying the IS model

The research framework was designed to apply the IS model to the research case. Framework, as such, is fully utilising the IS model with application to the case company needs and considering the newest research in the model limitation.

To measure the success of the dashboards, all the model dimensions must be successfully presented. Therefore, three focus dashboards built on three different platforms: Salesforce.com, Microsoft Power BI and QlickSense, will be evaluated in first place by analysing information's three significant dimensions – information quality, system quality and service quality. (DeLone & McLean 2003, 24.) The selection of the different platforms gives additional input to the project team to evaluate user preference for the dashboard system and understand what criteria users value in the system (Reiter 2023).

Dashboard use covers two aspects – degree of use and nature of use to gain granularity for this research work. As the degree of use (adoption rate) is a key performance indicator set by the case company, the nature of use is an essential aspect of understanding how users reach the net benefits of the dashboard. The initial IS model included an additional use aspect, while researchers later have used only one dimension. (DeLone & McLean 1993, 66; Pavlovic et al. 2021, 38-39) In some cases, use is split into the intention of use and actual use as separate aspects (Mardiana et al. 2015). However, this research will review only use due to the dashboard settings (refer to section 2.2.3.1.) Furthermore, precisely the use is the main aspect of measuring success (DeLone & McLean 2016, Sari et al. 2021, 1316).

Use has a direct impact on the net benefit delivered by the dashboard (Sari et al. 2021, 1316). IS model includes the aspect of user satisfaction, but as IS model authors state, use precedes user satisfaction, which in turn will lead to benefits (both user and organisations) (DeLone & McLean 2003, 23). Sari et al. (2021, 1316) note that user satisfaction is "a surrogate measure" of success; as a result, this research does not separately measure user satisfaction.

DeLone and McLean (2003, 23) updated the IS model, combining individual and organisational benefits under net benefits. Due to the nature of the research focusing only on a single role within the IT service organisation, it was important to separate individual user benefits from organisational benefits to better understand whether performance dashboards are fit for purpose for key service account managers from both personal and organisational perspectives.

2.4 Dashboard analyses based on the framework

Key service account manager dashboards in the scope of this research are limited to one function at the time of the study. The aim of this research is to develop fit-for-purpose performance dashboards at the initial stage of the project. Prior to any further extension to other roles and integration into the companywide system, the selected dashboard success is evaluated based on the proposed framework in this research work. However, the IS model does not provide strategic guidance on how to solve the problems identified. (Lucid, 2013.)

The research combines the recommendations in the literature and objectives set by the case company to achieve the goal of this research.

2.5 Dashboard success aspects

In the initial model, six information system success aspects were initially proposed (DeLone & McLean 1992; DeLone & McLean 2003). Over the years, the model has received a lot of attention and has been widely used for IS success assessment. Multiple researches have identified possible improvements to the model (Mardiana et al. 2015; Yamin & Sweiss 2020; Pavkovic et al. 2021; Sari et al. 2021). The initial model was improved in 2003 by the authors by adding service quality to the model. Furthermore, net benefits replaced individual benefits, impacting organisational benefits.

Due to the IS model's popularity, it has been reviewed and scrutinised repeatedly. The efficiency and reliability have been questioned. (DeLone & McLean 2003, 12-15.) Literature review includes the newest model analyses. That, in turn, combined with business reviews in the field of IT services, impacted the development of the framework of this research and laid the basis for the approach to result analyses. Below are more detailed analyses of the aspects defined in the framework, backed up by business reviews and theoretical research data.

2.5.1 IS dimensions

In 1992, DeLone and McLean brought to attention that neither financial metrics measuring success nor business scorecards provide a proper view of information systems quality (DeLone & McLean 1992, 2003; Petters et al. 2011). The model was developed

based on the assumption that the IS system is similar to communication systems (Mardiana et al. 2015).

Based on earlier studies and research, DeLone and McLean (1992, 61-79) came up with the IS model. The model was consequently updated in 2003. In the updated model, authors remind that the IS model is multidimensional and interdependent, and, therefore, all selected aspects impact each other and must be studied well. (DeLone & McLean 2003, 12.)

2.5.1.1 System quality

The first aspect of IS success is system quality. According to the model authors, it is a key variable in measurement and has a significant statistical impact (DeLone & McLean 2003, 13). DeLone and McLean (1992) stated this is mainly engineer-oriented characteristics. It is one of the most common dimensions in analysing information systems effectiveness (Gable et al. 2008; Sari et al. 2021). System quality has a substantial impact on the use and user satisfaction and, therefore, on benefits both for individuals and the company.

System quality focuses on multiple aspects of the dashboard, such as ease of use, latency, stability, reliability, flexibility, customisation possibilities, and availability of the dashboard (DeLone & McLean 1992; DeLone & McLean 2003; Pavkovic et al. 2021; Yamin & Sweiss 2020). DeLone and McLean (2016, 10) had also added such aspects as ease of learning, intuitiveness and sophistication. In the research by Pavkovic et al. (2021, 39) recommends limiting the aspects during actual evaluation that are relevant. With systems developing and users becoming more native to system use, the criticism of Pavkovic et al. becomes relevant. It requires revisiting in the future as new generations of users will emerge.

System quality is in direct relationship to creating benefits for data utilisation. The proper data visualisation allows it to be easier to read, understand, and memorise and allows users to be more effective in their work. (The key to, 2020, 29) Data within an organisation is often duplicated, conflicted, fragmented and lacks transparency (Digital services excellence 2021, 26).

In the research, Mardiana et al. (2015, 174) state that system quality has a strong impact on user satisfaction but only a partial impact on the use of the system. This research will focus on ease of use (one of the top criteria mentioned repeatedly throughout the literature), customisation possibilities, latency and intuitiveness. (DeLone & McLean 1992; DeLone & McLean 2003, Bozic & Dimovski 2018; Stedman 2021, 4; Pavkovic et al. 2021.) Stedman (2021, 4) also mentions the need for integration to ensure that users do not have to switch between the different tools, which is one of the focuses of this research as three different platforms are reviewed in the scope of this document.

Part of this research is to understand which of the used systems are preferred and why. It will also assess which of the system quality aspects listed by DeLone and McLean are valued by users. This should provide grounds for an improvement plan.

2.5.1.2 Information quality

When the IS model was developed in 1992, it was referring to the information. The information is defined as “facts or details about somebody y/something”. (Information, n.d.) Today, the industry refers to the data - facts or information, especially when examined and used to find out things or to make decisions (Data, n.d.). Data is currently a more commonly used term as information used for decision-making is at the centre. As Foley et al. (2022) states, data is the only tool to help business. As this research focuses on the dashboards for IT services, data will be used as synonyms instead of information in this document.

The initial IS model viewed information quality as a second aspect, even if DeLone and McLean (1992, 62-64) acknowledged that many researchers had put it as the primary and most evaluated dimension. The authors confirm the significance of the information quality to the benefits. (DeLone & McLean 2003, 15; DeLone & McLean 2016.) The focus on data cannot be stressed enough in the newest materials. The company should focus on data management, particularly on data quality. (Zdankus & Colli 2020, 12; Stedman 2021, 15; Digital services excellence 2021, 19.)

While there are many aspects of information quality to consider, simply put, information quality refers to the quality of the data represented in the dashboard. Information quality is assessed considering the data's "accuracy, timeliness, completeness, relevance and consistency". (DeLone & McLean 1992, 15.) In the initial model, it was referred to the quality of the system-provided reports. In addition to the measuring mentioned above information quality, there is a need to consider the dashboards' relevance, usefulness, importance, readability, clarity and decision relevance. (DeLone & McLean 1992, 64.) Zdankus and Colli (2020, 13) defined data quality as the completeness and visibility of the data. While data quality initially may seem like a simple enough dimension, understanding what aspects to focus on in success analysis can present a challenge. It can be considered that the dashboard has reached its strategic goal and business its digital milestone once data quality is there. (Foley et al. 2020, 8) The company is not expected to constantly deal with new data but utilise and build on combining new with existing data to bring value – real-time data with a view on history and input for the future (Dunning & Friedman 2020; 26).

Based on newer research, such aspects as data reliability is a key (Fowley 2022, 6; Stedman 2021, 13). At the time of the research, data is the aspect that is viewed as a primary importance and a significant challenge due to the exponential growth of the data available to the business. There are further expectations set towards data and dashboards. The need to combine and represent the data in an easy-to-use form. The dashboard is expected to display all important data on a single screen. (Reinking 2020, 5) The information must be easy to interpret. It should be real-time information with a view of the past and predictions for the future. (Stedman 2021; 4 – 17.) Artificial intelligence, machine learning and technological capabilities provide the possibility to develop more visual and interactive interfaces.

Information quality can be a significant roadblock to dashboard success. It also presents a major challenge for the company as information quality has a direct impact on the quality of decisions made. Faulty, incomplete, incorrect data will lead to inconsistent, inaccurate and even wrong decisions made. (Stedman 2021, 13; Foley et al. 2020, 8.) Foley et al. (2020, 8) state directly that "trust (in data) is a key aspect". Digital services excellence (2021, 25) article points out that today especially services are

grouped in silos and that leads to a lack of transparency and lack of integration that provides a further challenge to address for data trust.

Information quality is proven to impact the use of the system and user satisfaction directly. (DeLone & McLean 2003; Mardiana et al. 2015, 174.) This research will focus on user trust in data, data accuracy and data usability. In addition, the research will assess how the data quality dimension affects the dashboard's success from the key account service managers' perspective.

2.5.1.3 Service quality

The service quality aspect was added in 2003 by the authors after revisiting the model by acknowledging that it is one of three major dimensions of the information (DeLone & McLean 2003, 23). Service quality is referred to as support provided to the users in terms of speed of response, knowledge/training, service reliability, ease of access to the service, and level of support received (Pavkovic et al. 2021, 38).

Service quality directly impacts the use of the dashboard and user satisfaction, which in turn impacts individual and organisational benefits created by the dashboard. It cannot be stressed enough that user training strongly influences the use of the system and the benefits gained from the system. (Stedman 2021, 3 – 17.) Furthermore, Stedman proposes to have resources that primarily focus on dashboard development that are responsible for the service quality of the dashboards within the company, including, but not limited to, dashboard development, communication, training, and support. (Stedman 2021, 17; Digital service excellence... 2021, 11 – 13.)

This research will review the level of user service quality by analysing the level of training and channels of support available to the users. Additionally, an aspect that will be reviewed as part of service quality is a feedback loop and feedback channels.

2.5.2 Dashboard use

Any dashboard is designed with the intention of it being used. The abandoned system is considered to be a failure (Lyytinen & Hirchheim 1987). As such, the use is one of the aspects that is at the centre of evaluating the success of the IS. However, it is important to acknowledge that even if the dashboard is used over a more extended

period of time, it is not an indicator that the system is successful. Nor does an unused system mean failure immediately (Mardiana et al. 2015, 172). This is further supported by Mardiana et al. (2015, 175) referring that use has a weak impact on the other aspects of the model. Despite the previously stated, according to DeLone and McLean (2003, 25) and later supported by Sari et al. (2015, 1316), use is a driving aspect of dashboard success. Yamin and Sweiss's (2020, 410) research results showed that actual use has the highest importance in all aspects. After all, the use is the final step in the dashboard process when users use the information for educated, face-based, data-driven decision-making and planning (Stedman 2021; 5; Carpenter, 2011, 45-47). Data-driven decision-making helps to identify trends, opportunities and threats, uncover and understand complex and intense data into the comprehensible format, support collaboration and many more (Stedman 2021, 2; Sutner, 2020).

Dashboard use is impacted by not only three aspects included in the IS model but also by such factors as perceived usefulness, perceived ease of use, attitude towards use, required effort, performance expectancy, social influence and conditions of use that, in turn, are impacted by age, gender, experience. (Mardiana et al. 2015, 179.) This demonstrates the complexity and interconnectedness of different aspects influencing the dashboard's success.

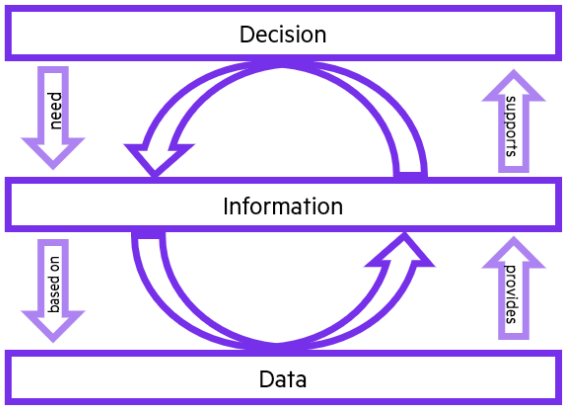

Figure 2. Relationship: data-information-decision. (Carpenter, 2011, 46 citing Reinschmidt et al. 1999)

While evaluating the use, there is a need to consider one of the IS model limitations. User experience and use is a subjective matter. IS model does not assume users' role (Monem et al., 2013). One of the aspects that the model overlooks is the user's resistance to change. In this research, the focus is on newly implemented performance

dashboards. As a result, user resistance to change must be considered by the case company's management.

Degree of use

When measuring the degree of use, there is a need to consider the context in which the dashboard is used. The factor of weather dashboard usage is voluntary or mandatory. (Sari et al. 2015, 174) Degree of use is measured by measurable metrics, such as frequency of use, schedule of use, number of accesses, and length of access and similar (Pavkovic 2021, 38).

This measure can be quantified. As a result, it is selected as a success factor due to ease of measure. Alone, this measure does not provide a valuable view of the dashboard's success. However, the user adoption rate of the new dashboard can be a major impairment of the success. (The Doppler 2020, 37; Stedman 2021, 15.) Therefore, this research will focus on the adoption rate, which aligns with the success factor set by the case company.

Nature of use

Based on earlier researches, IS model use covers aspects of the nature of the use depending on how and by whom the dashboard-provided information is consumed. There are four possible levels of use:

- Getting instructions
- Used to record data
- Use for control
- Use for planning (Vanlommet & DeBrabnder 1975 cited in DeLone & McLeon 2003, 66).

The use aspect should not only be viewed as the final step of dashboard development, but it actually should be the first one. (Farmer cited in Stedman 2021, 16) Knowing how the users will use the dashboard should be the basis of the dashboard development. Understanding the user behaviour and motivation that drives their behaviour and use shall be the basis for dashboard development. (Digital services excellence 2021, 27.) Organisations that will understand the behaviour and the mindset in their dashboard development will be the ones leading the competition (ibid, 27).

Understanding how and why users use dashboards, both from an individual motivation perspective as well as alignment with company targets, is in the scope of this research. The assumption is that understanding how, when and why users are utilising available data provided by dashboards provides insights into what can be and should be improved.

2.5.3 Dashboard net benefits

According to DeLone and McLean, the benefit is the most important measure of the information systems' success. Net benefits is a dashboard effectiveness success aspect based on the communication system. (Shannon & Weaver 1949 cited in Mariana et al. 2015.) The net benefit measures the value the dashboard delivers to its users and the organisation. The IS model viewed individual benefits as directly impacting organisational benefits. (DeLone & McLean 1992, 62.) The updated IS model combined them into one net benefit (DeLone & McLean 2003, 25).

Authors of the IS model repeatedly stress the interconnectedness of the different dimensions. The benefits of the dashboard cannot be reviewed in separation from information, system and service quality. (DeLone & McLean 2003, 25; Sari et al. 2021, 1316.) According to the IS model, use and user satisfaction have an impact on the net benefits (DeLone & McLean 2003, 24; Sari et al. 2021, 1316; Pavkovic et al. 2021, 39-40). Furthermore, the net benefit is significant as it, in turn, impacts the use and user satisfaction (DeLone & McLean 2003, 24).

It must be noted that despite IS model authors mentioned the development of the net benefits measures, there are still references in the newer research questioning the analyses of this aspect. (Pavkovic et al. 2021, 40.) The net benefits measures should be supported by performance measures of the organisation (Yuthas & Young 1998 cited in DeLone & McLean 2003, 28; cited in Pavkovic et al. 2021, 40).

For research purposes, there is a need to define the objective of the benefits and context being researched that align with the investments (DeLone & McLean 2003, 62). The case company defined the success criteria from organisational and individual perspectives to measure the internal success of the performance dashboards.

Benefit to dashboard user

According to the IS model from 1992, individual user benefit (*individual impact*) is the most difficult to define measure, as it impacts users' performance, productivity and actions. (DeLone and McLean 1993, 69.) Emery noted (1971 cited in DeLone and McLean, 1993, 69) that information has no value by itself unless it leads to the action. The same was stated in 2021 by Wand that information is only valuable if it drives actions (Wand cited in Stedman 2021, 10).

Researching the benefits to the individual, there is a need to consider perceived usefulness. This factor describes the degree of belief by individuals that using a dashboard will improve performance. (Yamin & Sweiss 2020, 400.) The perception aspect is reviewed by other researchers as well (Mardiana et al. 2015, 179). It is the company's responsibility to set processes and procedures that allow user benefits to be in line with the organisation's strategy and goals (Reinking 2020, 10).

User benefit can be measured by performance change. Here, the performance is measured in terms of the quality of work, speed of work, effectiveness increases and decrease of errors of the individual. (Yamin & Sweiss 2020, 401.) The company can assess them against the baseline (before the dashboard implementation) or against the defined company objectives.

Benefit to the organisation

Growing investments into dashboard development and implementation are driven by the business objectives. Each company defines its own strategy and goals for the dashboards. Often, these objectives are cost, revenue and profit-related measures as it is easy to quantify, forgetting the interconnectedness of different aspects. (DeLone & McLean 2003, 75.)

By evaluating the benefit to the organisation, intangible benefits should not be overlooked. Metrics to review could be an improvement in process efficiency, reduction of overhead of rework, product differentiation and product mix increase, customer luck in or customer attrition rate decrease. Furthermore, such measures as the time needed for decision-making, time to solve the problem, decision accuracy, and similar can be used to measure dashboard success (Delone & McLean 2003, 76-78).

The key to analysing the benefits to the organisation lies in ensuring that selected measurements of success are in line with organisational strategy (Reinking et al. 2020, 1). In designing the dashboard, the user benefits have to be considered, along with user motivation. The dashboard should be designed for its supporting function, not only regarding its performance measurements. Digital service excellence (2021, 61-66) article provides a good overview of what could be potential company benefits by using data automation, including dashboard usage.

3. DASHBOARD EFFECTIVENESS ANALYSES

This research focuses on analysing the performance dashboards' effectiveness designed to support key service account managers within the case company. While dashboards are used by multiple users within a company, the research was done from the perspective of the named role – key account services manager - to identify how successfully the dashboards support their work. The objective of this research is to provide an improvement plan with suggestions that would lead to increased service account team's performance and bring the maximum benefit from available data and the latest technologies based on DeLone and McLean's IS model.

As mentioned earlier in section 1.4 this thesis is conducted focused on the applied research method (Saunders et al. 2019, 9-10). Applied research is undertaken in the case company to deliver an immediate impact and benefits. Applier research was selected as it allows to focus on results that can be acted upon, which is the main objective.

The constructionist research design was followed (Easterby-Smith et al., 2018, 92-111). The object of this thesis is based on subjective individual views that lead to the fact there is no one truth. The design of the research was based on the ground theory research practice "bottom-up" (Flick, 2007, 20). The research design was targeted to gain the maximum insight from the selected group within the limited time available.

3.1 Constructionist research design

The case company had recently rolled out performance dashboards globally during the time when this research project was initiated. The company had invested significant financial and human resources in it. At the same time, the company was going through some organisational changes to meet its strategy, which directly impacted the users' maturity in the scope of this research.

Selected constructions action research design takes into account the different viewpoints of the changing reality. It is a method that allows to research the subjects that are part of the change process and being impacted directly by it. Furthermore, as part of this research design, the corporative inquiry considers the participants not only.

Explaining their experience but involving them in deciding the issues worth focusing on (Easterby-Smith et al. 2018, 111-116).

The primary method to gather the data was by conducting semi-structured interviews with the key service account managers and managers involved with the rollout of the performance dashboards. More information about the participants is explained in section 3.3. The interview process in detail is described in the appendix 2. Semi-structured interview setup.

The interview schedule was defined in the research time schedule. All interviews took place according to the schedule. Main users were interviewed three times according to the same plan. The interview schedule was agreed upon with the participants in advance. Participants were informed upfront of the time required for the interviews.

Interviews were held in one-to-one sessions between the participant and the researcher. When possible, they were conducted in person. Otherwise, Microsoft Teams using video streaming was used to follow the participants' body language and facial expressions. Answers received, and observations were documented in the MS Excel spreadsheet by the researchers. Direct quotes were used where possible.

Interviews were held in English language. The English language is the mother tongue for neither of the research participants, but everyone had fluent language skills. Still, in a few cases, the researcher was required to explain the question more. This was noted in the observations and considered during data analyses.

For each interview, a ninety-minute session was booked with the participant. This provided enough time to discuss all the listed questions and obtain comprehensive enough input from the participants without time constraints. On some occasions, when responses were vague, the available time allowed the researcher to probe for detailed and specific answers. As recommended, the semi-structured interviews should focus on the line of questioning critical to the research subject. It was crucial for the researcher to inquire about user views on the effectiveness of the dashboards, as well as user suggestions for improvement.

The researcher used her position within the company to observe the users to corroborate the input gathered during the interviews. The users and their work with performance dashboards were observed throughout the research during day-to-day interactions, regular work-related meetings, and ad-hoc interactions. The researcher recorded noted observations of user behaviour related to the performance dashboards in the same MS Excel file. The important aspect of the research was face-to-face regular interactions with the participants and the team. The researcher gained insights and inputs from the participants at all levels of the organisation by benefiting from face-to-face communication.

The observed users were unaware of the observation due to the researcher's role within the company. That has allowed to limit observers' effect and did not influence the relationships and trust between the researcher and the users.

3.2 Time schedule

A timeline was set and aligned with the best practices to meet the research objective and bring value to the case company. In order to evaluate the dashboard's effectiveness, a period of 2-3 months should pass after implementation (Eckerson 2011). Therefore, the research cycles were set around three months after each release. To further align with the case company's needs, research was conducted within one fiscal year of the case company aligned with the main focus dashboard release schedule.

To be finished by the date	Milestone
15-01-23	Plan approved
10-02-23	Questionnaire development
15-03-23	Baseline survey (release 1 December 2022)
01-04-23	Result presentation to the management team
15-05-23	Literature analyses
01-06-23	Study case dashboard usage analyses
15-06-23	Midway survey (release 2 March 2023)
23-06-23	Result presentation to the management team
15-08-23	Study case dashboard improvement development
15-09-23	Final survey (release 3 June 2023)
01-10-23	Result presentation to the management team
09-10-23	Thesis finalisation
15-10-23	Submission of the final version
31-10-23	Project End (end of fiscal year)

Table 1. Master thesis plan timeline and milestones.

3.3 Participants

The researcher conducted the research. Participants in this research can be segmented into a few groups:

- main users: the key service account managers
- managers:
  - direct managers of the main users
  - local, regional managers
  - Europe regional managers
  - Worldwide manager
- Performance dashboard program owner
- Customer-centric strategy owner (sponsor)

All participants were interviewed to gain comprehensive information on the subject. Different viewpoints provided the researcher with a wide range of input for broader analyses. Furthermore, close cooperation with the participants throughout the research project allowed the researcher to observe changes and developments first-hand.

Main users

To ensure main users were motivated to take part in this research before the research started, the researcher contacted via email the key service account managers within the focus countries (Belgium, Denmark, Finland, and Sweden) and invited them to participate in the research. All participants participated voluntarily. Participant information has been kept anonymous to promote as open and honest feedback as possible.

In order to have sufficient data samples and continuity of the research, a minimum of 10 participants were required. Ten participants account for approximately 16% of the key service account managers within the focus group. There is a need to note that in the period between the second and third interviews, 3 out of 10 key service account managers changed their roles. As a result, they could not provide valid feedback on the research subject. During the third round, the sample size represented approximately 12% of the region’s focus group. As all key service account managers were involved in the performance dashboards use, there was no possibility of having a control group. Therefore, research is based on the responses of the participants involved.

The resource changes were identified as one of the major risks during the research project planning phase. As the research project lasted over three quarters, the risks of people change increased. For this reason, enough key service account managers needed to participate in the research to keep the validity of the data throughout the project.

During the first interview, the research objective, process, schedule, IS model and data analysis principles were explained to the participants. During the research project, a few meetings were organised with the main users to present them with the gathered data results and receive any additional feedback on the matter.

	Round 1	Round 2	Round 3	Manag-ers
Belgium	3	3	3	1
Denmark	2	2	0	1
Finland	3	3	3	1
Sweden	2	2	1	1
Regional				4
TOTAL	10	10	7	8

Table 2. Count of key services account managers participating in the interviews

Managers

To define the scope of the research that would be most beneficial for the case company, the researcher closely cooperated with the sponsor and the performance dashboard program owner during the planning phase. The sponsor responsible for the customer-centric strategy development for the case company was interviewed as part of this research.

The researcher had regular weekly meetings with the performance dashboard program owner at all project stages. The program owner was interviewed as part of this research. In addition to that, the program owner was kept informed throughout the research with the received feedback to provide as early as possible input and improvement suggestions based on the data gathered and analyses. This way, as much as possible, improvement suggestions uncovered by the researcher were incorporated into upcoming performance dashboard releases.

Regional and direct managers of the main users were invited to participate in the research project on a volunteer basis. They were interviewed at the beginning of the research project. Similar to the main users, these managers were informed about the research progress and gathered data to analyse the outcome after each interview round. Information with the managers was shared over the Microsoft Teams meeting and via email. Managers were provided an opportunity to engage the researcher at any stage of the project. Many of the managers used this opportunity to both gain better insights into the input received from the main users and to discuss the proposed improvements.

Manager semi-structured interviews were conducted over Microsoft Teams based on the questionnaire documented in Appendix 6. Management interview questions. The researcher documented all responses. Responses were kept anonymous.

3.4 Result analyses

There were 27 user and eight manager interviews conducted during the research. The same questionnaire was used to obtain the responses during all three rounds to compare the changes in the respondent responses. The data collected was analysed based on the ground analysis method. Ground analysis is a systematic approach to understanding underlying themes and patterns from the data gathered (Easterby-Smith 2018, 236-265).

The input received from interviews and observations was grouped into clusters. The response clustering was done based on the maturity level according to the table in Appendix .5 Question matrix. The responses were compared, grouped and analysed using the phenomenographic qualitative research method (Kettunen & Tynjala 2018). Special attention was paid to the deviations and exceptional feedback. Furthermore, the data gathered were compared to the results of the observations and available information on the use of the system from the performance dashboards themselves. Afterwards, results were compared to the IS model framework outlined in the research plan and the insights from the literature review.

To evaluate the effectiveness of the performance dashboard, dimensions were assessed based on the questionnaire matrix after each round. This way, the researcher was able to evaluate changes that took place between the interview rounds.

		Round 1	Round 2	Round 3
Use	Familiarity with dashboard	2	2	3
	Level of use	1	1	2
	Nature of the use	1	1	1
Benefit	Personal benefits	1	1	2
	Company benefits	1	1	2
CAE	Information quality	1	1	1
	System quality	3	3	3
	Service quality	1	1	2
Account Health	Information quality	1	1	2
	System quality	1	2	2
	Service quality	1	1	1
Account SLA reporting	Information quality	2	2	2
	System quality	2	2	2
	Service quality	1	1	1
Feedback	Channels of feedback	1	1	2
Efficiency	Personal opinion of the efficiency	1	1	2

Table 3. Performance dashboard maturity matrix.

4. RESULTS AND IMPROVEMENT PLAN

This research focused on analysing the improvement areas for performance dashboards within global IT manufacturers designed for key services account managers. The reason for this research was driven by the need to understand how successfully the company is designing and implementing the dashboards. Dashboard development, implementation and maintenance is a costly endeavour. While there is a need to have dashboards to support operational, tactical and strategical decision-making, there is also a strong need to assess its success.

The improvement plan and future recommendations for the case company were developed based on the result analyses. The research process was followed to reach the objective of this project. Once the data was collected, the data were analysed and proposed improvements that were afterwards validated by the program manager. After each round, the improvement plan and strategic recommendations were shared with the management and sponsor by the researcher.

Below are findings and recommendations in the proposed implementation order derived from importance. The ease of implementation in the short term was the basis for the plan and recommendations.

4.1 Success of the performance dashboard findings

Below section will provide short analyses of each topic derived from the question matrix (appendix 5.) and respective improvement recommendations for the company's management.

Knowing the user

The first thing was to understand the user, which is the basis for the design of any dashboard (Eckerson 2011, 225). The key service account manager role was implemented during 2020 and is a relatively new role. Most of the users (8 out of 10) in the role had earlier been working within same customer account in a service manager or technical manager capacity. These users viewed their current role as an "updated" version of their previous role. People who started directly in the role had their own view of it. The outcome of analyses was that the understanding between users on the role,

its performance measures, and required tasks differed significantly between user to user and from managers' view of the role.

> "*The company should do better in understanding what we do and, what our customers expect from us, and what is the added value we bring to them" (Interview #5, 2023).*

The critical and first step to even consider the success of the performance dashboards is that the case company must define the key service account manager role. Without a clear understanding of the role and expectations, the users will not be aligned on how to use the provided dashboard efficiently.

During the research, the company underwent multiple changes in different business areas. As earlier mentioned, the key service account manager's role was new, and performance dashboards were implemented recently. It was observed by the researcher and later confirmed by the users that the company was not following change management practices. It is imperative and therefore strongly recommended that change management practices be used to ensure success in the dashboard implementation.

At the end of the research, it became obvious that a lack of proper change management caused additional challenges. There was a lost focus among users due to multiple changes going on simultaneously. Users also reported "*getting tired of this process*", which by that moment had taken more than ten months and still did not meet the expectations. The future implementations and releases must be shorter and more focused, no keep the focus on them.

Benefit

The adoption of the dashboards is linked to users' benefits. The performance dashboards should help users reduce their need for manual work, time spent in data collection and analyses, and risk of error and mistakes; at the same time, it increases the quality and speed of work and increases efficiency.

> "*I dream that it (dashboards) will make everything work smoothly, and I can eliminate all manual work" (Interview 10, 2023).*

To measure the benefit for the users, the company is suggested to access the criteria against the set baseline (Yamin & Sweiss 2020, 401). To achieve this, multiple steps were identified during the research that must be performed. First, the company must define the benefits and ways to measure them. Secondly, the management must consider the motivation of the users. The users will not change their behaviour unless they are motivated or forced to do so (Eckerson 2011, 294). Finally, the users must be educated on how to gain the benefits of using the tool via training, feedback loops and practice sharing (Eckerson 2011, 298).

Users must understand the benefits dashboards provide to them, but they also need to understand what benefits dashboard usage brings to the organisation. The research demonstrated that most of the users have been neither told nor have considered why the case company is implementing performance dashboards. The study revealed that the root cause is the failure of the company's management to set aligned measures of what and when is expected from the performance dashboard use. To meet the company's strategic goal, it is essential that the company's management sets the KPIs and communicates them on all levels of the organisation.

While analysing the benefits performance dashboards bring to the users and the organisation, the researcher noticed a common pattern which was also observed in the daily work. There is a lack of communication. The users did not ask, nor did the management. They talked about the vision, expectations, measures and targets. During interviews, it became apparent that it is assumed everyone knows while they did not. In addition, the lack of communication led to the lack of trust in the dashboards and project in general.

Communication has a significant impact on the results. Successful strategy demands leadership, which means management has interactions and relationships to communicate vision and opportunity, inspire action, and raise the "volunteer army". (Kotter, 2021, 7-16.)
The recommendation is to rethink the communication plan, communication process and channels.

Information quality

The research considered these three aspects of the data (trust, accuracy and usability).

Data must be trusted. The users were aligned with the theory (section 2.2.2.2) that information quality plays a significant role in the success of all dimensions of performance dashboards. There was some degree of deviation in whether the data must be 100% accurate or whether 80% is sufficient. But users were all agreeing on multiple aspects regarding information quality:

- Information quality is insufficient in the provided dashboards (trust in data).
- Data provided is inaccurate (data accuracy).
- Data does not support user and customer needs (data usability).

Different samples were provided on what aspects of information are lacking in quality. At the same time, it was observed that users did not participate actively in improving the data quality like it was expected from them. On multiple occasions throughout the research, it was noticed that users abandoned the use "until the information quality improves", despite it being an explicit request from management to aid in data quality improvement. It was noted that data is often treated as a liability when it should have been treated as an asset.

> "*If data would be reliable, the dashboards have all the information I would need for my customers" (Interview #23, 2023).*

The researcher could not stress enough the need to focus on data quality. As performance dashboards are there to support decision-making and strategic planning, inaccurate data inevitably leads to faulty decisions and actions (Stedman 2021, 5). The whole company's strategy should be focused on ensuring data quality as it is a cornerstone of every conclusion and decision made within the company.

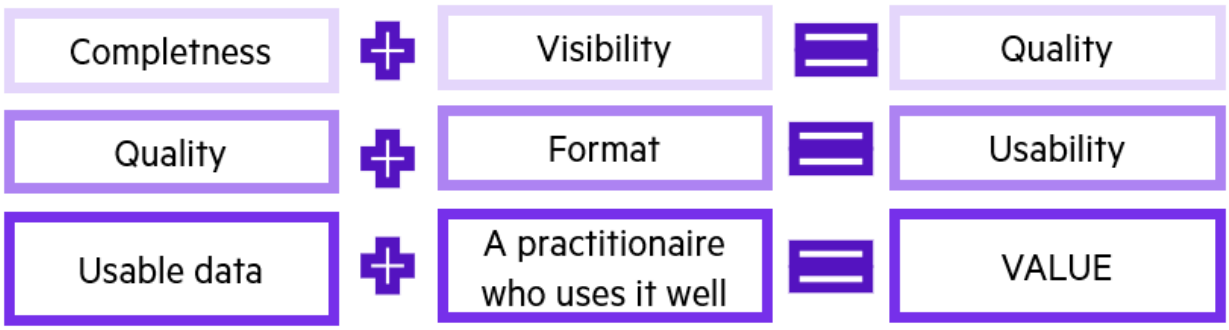

Figure 3. Data to value. (The Doppler 2022, 13.)

System quality

The two questions this research focused on in terms of system quality were which of the three systems users prefer and why. The case company use multiple commonly used systems as a platform for its performance dashboards – PowerBI, QlickSense and Salesforce.com.

The analysis of the responses indicated that the users prefer the platform that they are familiar with. All three systems received equal “support” from the users, which was, in all cases, determined by the platform they have used previously. As simple as it sounds, the recommendation for the company is to set a clear strategy for the platform the company will focus on and train users to become familiar with it.

Service quality

Service quality analyses focused on the training provided to the users and the channels of support available to them. The company provided the users with two 1-hour recorded training sessions, a job aid and a local session with the tool superuser. Further support users were to receive via Slack channel.

The analyses revealed that the training provided was insufficient and did not meet the users’ needs. Neither all users were familiar with the Slack channel. That resulted in the fact that during the first interview round, not all users were even familiar with all the performance dashboards in the scope of this research. At the beginning of the research, such a possibility was not expected.

The deep dive into the service quality aspect resulted in a few recommendations. First, the training of the resources is not an option. It is recommended that education and training be an integral part of the strategy. Second, the training plan, content, materials and delivery methods should be set right for the user group in scope. Third, the training attendance must be measured. Users who have not participated/passed training should be encouraged to do so. Fourth, the case company had previously trained local trainers and named local superusers. While it is a resource-heavy process, as the key service account manager performance dashboards are a strategic focus for the company, such investments are needed.

In addition to the above mentioned, the support after the implementation is as critical for the success as the initial training. Superusers will be natural local support for the users, driving user efficiency and dashboard utilisation. Furthermore, the company should consider other channels for support, like regular Q&A sessions and team discussions.

Feedback

While not directly part of the IS model, it was requested by the research sponsor to research the most efficient feedback channels that would fit the needs of the company and would be supported by the users. The researcher did include this question as part of the questionnaire.

The data analyses showed that the users would prefer to have a local (or regional) named person whom they can contact to discuss their feedback. As earlier, they have had a possibility to discuss with two people in the local region on all the dashboard-related matters; they stated that it is the preferred method. One of the key reasons was the possibility of getting an instant response and follow-up.

The researcher also observed that the users did not utilise the official feedback channel via Slack. Many noted that they were unaware of it, while others said it was ineffective in meeting their expectations. The researcher was even able to identify sample cases for the management to demonstrate the downsides of the Slack channel. The management was also notified that failing to collect and act upon the feedback from the users caused dissatisfaction and resistance. The communication and feedback loop are a two-way street that builds relationships between the management and people (Digital services excellence 2021, 91).

The recommendation is to name a person(s) in the region who regularly interacts with the users to collect their feedback. Moreover, to ensure a closed feedback loop to drive adoption and motivation among the users.

Additional feedback

Users had a lot of practical suggestions on what improvements in the performance dashboards would support their needs in delivering their customers' best-in-class services. All the provided feedback was shared with the case company's management. The users also requested to have more information shared among their peers, both within the dashboards themselves and during the team meeting.

4.2 The steps towards success

Once data was analysed and recommendations listed, six areas that were imperative for the success of the performance dashboards were identified. As an outcome, the researcher proposed an implementation plan for the changes to increase the effectiveness of performance dashboards. The plan is visualised in the figure 4.

The research identified the need for changes on the strategic level. Based on the best practices identified in the literature and aligning with the goals communicated by the company's management, the researcher proposed a new strategic approach. Furthermore, the same strategy was communicated to the participants to gain their buy-in and further support to support the organisation's strategy.

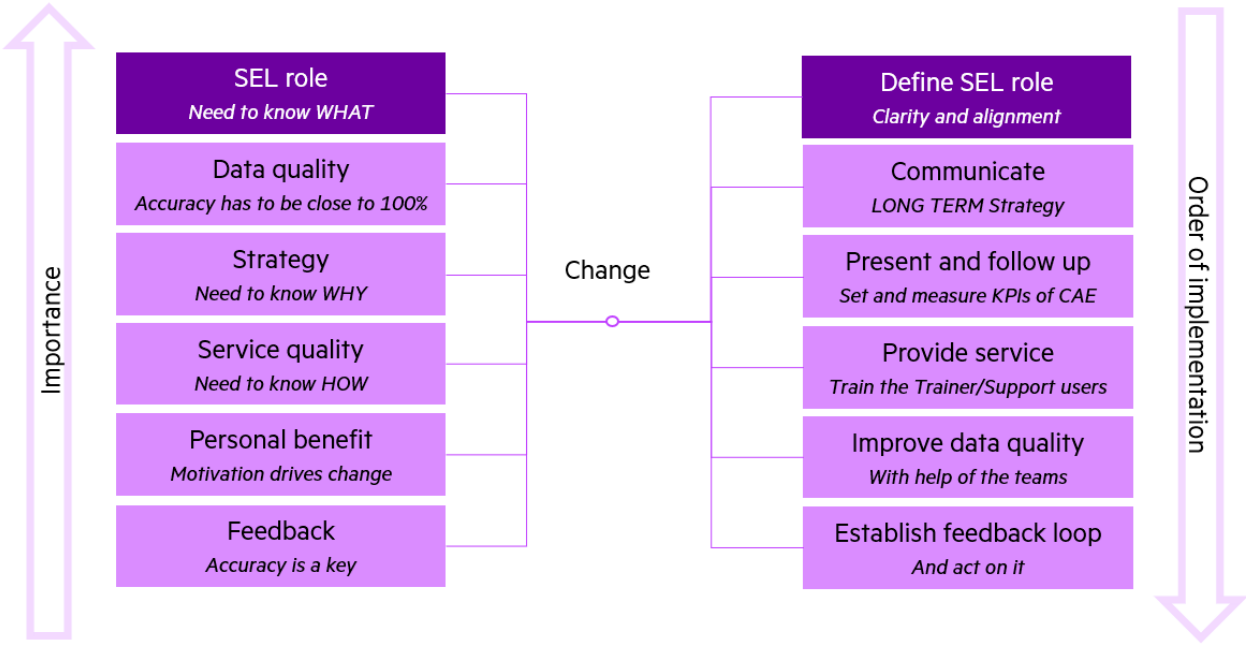

Figure 4. Improvement areas based on results.

4.3 Corrective actions made during the research period

At the beginning of the research, multiple managers involved with the performance dashboards were introduced to this research. As a result, the research gained visibility and interest within the case company's management at all levels. During the research period, regular review sessions were conducted with the case company's management to review the results. The review sessions were conducted after each interview round once data was analysed.

The review sessions with the management allowed the researcher to provide feedback as early as possible and, as a result, influence the upper management's strategic decisions and help incorporate the improvement suggestions in the upcoming dashboard releases. It is important to note here that seeing changes driven by feedback provided gave the participants motivation to support both the research and increased their positive attitude towards the dashboards.

Defining the role

After the first round, the management started working on reworking the concept of the key service account managers. Three quarters later, at the late stage of the research, it had led to complete reorganisation and re-defining the role with newly adopted KPIs. Due to the timing of the change, the impact of the change on the effectiveness of the performance dashboard could not be evaluated. Further recommendation for the case company's management is to reassess the implications approximately three months after the announcement of the change.

Communication improvement

The communication plan for the next group of users was prepared in advance. The performance dashboards for the users were rolled out in a controlled phased approach. The global team contacted the users and their managers. As proposed by Kotter (2018, 9-20), the company was starting to build a "volunteer army". The phased approach also allowed for receiving direct and timely feedback. Furthermore, the direct communication between the program team and the users have allowed to build relationship and communication channel between them.

As part of the communication plan, the education plan was changed. As indicated in the research improvement plan, the company made multiple changes. Among the improvements implemented, training content was updated to fit the needs better. The new training strategy included training the trainers. Additionally, online instructor-led Q&A sessions are being organised for the customer service managers. Improved education served the improved service quality of the performance dashboards, which is one of the success dimensions. The better-educated users adopt the tools faster and more efficiently.

Follow up

The new education strategy included follow-up in the form of measurable metrics. The program team is now measuring how many users have passed the required training covering the performance dashboard topic. Training metric has all levels of granularity, from view on the regional level (figure 5) and country level (figure 6) to the possibility drill down to the individual level. This allows management to follow up and take corrective actions in the plan.

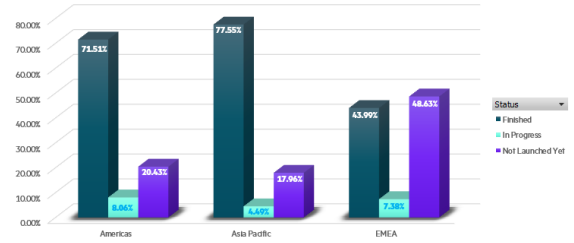

Figure 5. Training participation level by region for performance dashboard rollout to ASMs on September 1, 2023

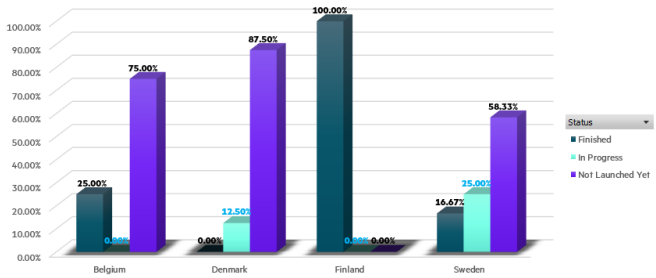

Figure 6. Training participation level by focus countries for performance dashboard rollout to ASMs on September 1, 2023.

Feedback loop

After the third round of research, the case company adopted a new strategy for establishing an efficient feedback loop with the users. As requested by most users during

the interviews, a person from the region was named as a point of contact. The responsibility is to ensure two-way communication and a closed feedback loop. In addition, during the regular online sessions, the program manager and the team listen to the feedback provided.

Once the feedback is gathered and analysed, the team ensures that there is a reverse loop to present outcomes based on the inputs. The next release cycles are currently being scheduled with a delay to allow the program team to incorporate changes based on the feedback received. The users are now an active part of the change, and the team ensures it is communicated back to the users. That is a significant improvement that will help the company to be agile and react to changes in the field.

5. CONCLUSION

This research focused on supporting the case company's competitive advantage by assessing the success of performance dashboard effectiveness. The case company had invested largely in developing multiple performance dashboards to support its strategy to help its customers in IT transformation by providing best-in-class services. The researcher was part of this internal transformation. Together with the case, the company researcher identified the need for a theory-based approach to evaluate the success of investments done. The aim was to create an improvement plan to support the strategy further.

Research took approximately ten months to reach the final stage outlined in the master thesis plan. The case company continues to work on performance dashboards effectiveness improvements for the key service account managers and other users.

5.1 Managerial implication: outcome of the research and improvement plan

This research supported the initial implementation phase of the performance dashboards and provided a theory-based approach to evaluate the success of the performance dashboards achieved. Seven dimensions according to DeLone and McLean's IS model were assessed, and as a result, improvement suggestions developed as was set forth at the beginning of the project. Furthermore, as discussed earlier, some proposed improvements have already been implemented.

This **thesis aim** was to improve the case company's competitive advantage. Effective performance dashboards are expected to improve by enabling the service delivery team to support the company's customers more efficiently and align with its strategy. **The objective** of this thesis is to increase the services account team's performance dashboard effectiveness. To support the objective, **the main research question** is focused on what must be improved for performance dashboard effectiveness increase to have the most positive impact on the key service account managers' performance. Based on the developed framework based on the I&S model, the author conducted a series of interviews and, using observations, identified short-term improvements and long-term recommendations. It can be assumed that improvements implemented so far and planned because of this research will drive the case company's competitive advantage. However, new research must be conducted to evaluate the actual results.

Improvements implemented are the first steps on the way to achieving the objective set for this research work. As a result of these improvements, the services account team's performance effectiveness should be increased to benefit the customers, users and the case company. However, as data analysis showed, the performance dashboards' success was limited during the project. Therefore, it was impossible to prove/disprove the hypothesis that performance dashboards help to improve IT environment service quality, customer and user satisfaction and result in increased business.

The improvement plan

The case company is and has been the leading company in the IT industry for almost a hundred years and remains to be the frontrunner. The company has access to talented, experienced and professional resources internally and externally to drive the change and remain the industry leader. However, this research demonstrated that the company benefits from combining the practice and expertise with the theoretical approach. The improvement plan in detail was described earlier. This section highlights three key findings.

At first, the success of the performance dashboards goes beyond the system itself. The company must be clear on the role, its metrics and tasks before the start of the performance dashboard development. Only by knowing the users can dashboards' functionality, usability, and related processes be designed effectively. This research uncovered that the case company must work on the key service account manager's role definition.

One of the main findings from the research was that dashboard rollout among experienced teams still requires the change management process to be followed. New tools drive new culture, new processes, new mindsets, and with that also opposition. Committed sponsors, clear roles and mature organisation are the baselines for the performance dashboard implementation. Furthermore, communication plays a significant role in driving the effectiveness of the performance dashboards. Whether it is explained, the users must be educated on reading data, data use intentions, and best

practices. The company should review and deploy a communication plan to drive the success of the change.

Finally, as many researchers and theories have proven before, the data quality of the performance dashboards is one of the foundations. Data must be reliable. In some cases, users expect even 100% accuracy. Otherwise, the system's success will remain limited and potentially fail completely. Furthermore, data must be clear and attractive. It was proven by the research that failing in this dimension undermines the success of all systems. On the other hand, data should not be taken for granted but become a responsibility for everyone within the organisation.

Long-term improvement recommendations

The case company has already embarked on the journey to improve the performance dashboard effectiveness. Short-term improvement plans and improvements implemented so far were described earlier in this section. This section will review in short topics recommended for the company to address in the long term further to improve the company's services delivery teams' performance.

This research work focused on the performance dashboard – a technology. Based on the commonly known triangle by Harold Leavitt (figure 7), the case company should be looking into the other two aspects of the successful model.

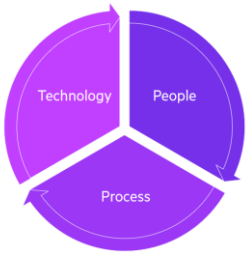

Figure 7. People Process Technology diagram.

People, in this case, the key account service managers, are the ones who define the effectiveness of the performance dashboards. They are the main users of the provided technology – performance dashboards. While the research focused on how to improve the dashboards to meet people's needs and expectations to deliver added value, inadvertently, the question arose whether, in all situations, people are suitable for the role. Many of the users in the focus of this research have long careers in technology-

focused roles that have been concerned with problem-solving for years. The company's strategy requires people to adopt and become customer-centric, driven by the business outcomes. For some users, this might be too much of a change.

Resistance to change does not make a person not fit for the role. Still, the case company has embarked on the journey to become a leading customer-centric solution provider that requires a different mindset from the key account service managers.

The third pillar is processes. Right people using the right tools will not be efficient if the processes do not support them. The processes supported by accurate time information and support timely decisions give the company a competitive advantage, which is the aim in this case (Vasherleyi & Alles 2008, 230). The service delivery processes must be designed with customer-centricity and human-centred experience in mind. The management must create an environment where the cultural shift within the company can occur. Processes should support this shift.

To be successful during the change, there must be focus and set priorities that everyone is aware of and aligned with. The researcher proposed steps to follow by management and by the users. While simple in its content, these are cornerstones for success. Failing to focus and remain aligned will lead to failure (Anand & Barsoux 2021, 25-31). Everyone needs to know the steps and stay focused until reaching the goal.

Figure 8. The steps to drive success of performance dashboards.

5.2 Research quality

The research quality is an important aspect described in the form of reliability and validity. Validity is defined as the extent of accuracy of the research finding description. (Easterby-Smith et al., 2018, 407.) Reliability is defined as the consistency of measurement of the research data (ibid 404).

The research must meet the criteria of validity and reliability as the outcome of this research will have a direct impact on the case company's strategy, actions, investments and its resources. During the research, it was critical that findings and improvements are trustworthy, accurate and ethical.

Internal validity of the research ensures the trustworthiness of the analyses and the outcome. To achieve this, the research was based on and followed the same approach throughout the project. The constructionist research approach assumes that there is no one absolute truth (Easterby-Smith et al. 2018, 111). To gain as wide as possible data input, 16% of the region's users participated in this research. Participants with different backgrounds, work experience, customer segments, contract setups and managerial levels participated in the project.

The researcher's bias is one aspect that undermines construction research as it requires complete independence of the research from the study object. To minimise the bias, researchers performed all interviews using the same questionnaire in the same setting and collected data in the same manner. Analyses were done by the researcher but verified and validated in cooperation with the participants. This way, participants were allowed to provide additional input in case they disagreed with the findings. The transparency of the research inside the case company is the key to demonstrating the process of data analyses and developing the improvement plan.

The research focused on the effectiveness of the performance dashboards following the logic and structure based on the methods and approaches tested in theory over thirty years. Combining the theory tested over time with the experience and knowledge within the company, the output of this research was ensured to be reliable, accurate and trustworthy.

5.3 Evaluation of the research

When the researcher started the work on this research project, the case company was going through changes to develop its services to a new customer-centric level that could be recognised as state of the art. With the increasing complexity of the customers' IT infrastructures and their business dependency on IT, the key service account manager efficiency must evolve to a new level. This research was conducted to support the company's strategy with theory-backed-up input to achieve its goals.

The active participation of the users and managers demonstrates that this research was needed and valuable to the company. The case company started to work on the proposed improvements as soon as the first round of data was analysed. Furthermore, the company has kept implementing short-term improvements and making the recommended strategic adjustments to succeed. The research was done at the time when it brought benefit to the company. The support and recognition received from the management of the company and research sponsors demonstrate the timeliness of this project.

The work on increasing the effectiveness of the performance dashboards for the key service account managers and, in the future, customer service managers is going on. This research provides the case company with recommendations for subsequent releases and helps to adjust its strategic direction to remain the market leader.

5.4 Potential future research and development possibilities

Whether the company should develop and implement dashboards and other business intelligence tools is no question. How to ensure that investments bring required and expected benefits and improvements remains.

DeLone's and McLean's IS model is commonly known and widely used for assessing information systems success. However, currently available research data is focused mainly on a few industries, such as healthcare, education and government. The researcher was not able to find any theoretical research done on the IT manufacturing industry. While this research provided a proven basis for IS success measurement, it would be recommended to verify how this model fits into the current day IT environment and AI/ML-empowered systems.

As a next step, the case company's strategy should be to utilise quantitative and qualitative measures to assess the effectiveness of the performance dashboards. This should be done once the dashboards and the customer services organisation reach the next level of maturity.

The case company has been the industry leader for decades. Its customers expect no less than excellent services to support their business outcomes and help them in their IT journey. Everyone within the company is required to adopt to the customer-centric model.

The performance dashboards for the key service account managers and customer service managers are being developed. While they are in crawling maturity level still, this research helped to shape the future steps to help the company achieve its goals. Furthermore, the research helped demonstrate that combining theory with experience adds value. The work must continue. The case company has all the possibilities to turn performance dashboards into success.

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List of tables

List of abbreviations

AI/ML – artificial intelligence and machine learning

ASM – Customer Service Manager

CAE – Customer Account Executive dashboard

D&M model – The IS model (see below) is often referred to as the D&M model

IS – Information Systems

IS model – DeLone and McLean Information Systems success model

KPI – key performance indicator

Q&A – question and answer session

SFDC – Salesforce.com system

SLA – Service Level Agreement

The case company Appendix 1/1

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Removed due to confidentiality.

Semi-structured interview setup Appendix 2/1

1. Key service account manager semi-structured interview

Semi-structured interview of key service account managers on selected performance dashboards. Experience shows a supporting questionnaire matrix combined with mind maps captures the relevant interview data.

2. Goal of the interview phase

Performance dashboards are developed to develop the company's services further. The output of these interviews is the fundament of capturing direct feedback from key dashboard users to identify areas for the most beneficial improvements for both key service account managers and the company. The goal of the interview is to collect direct input on aspects as per DeLone and McLean's Information Systems model to be able to assess the current situation and provide input to develop the improvement plan.

Ideation is not the goal of these interviews. The collected information during the interviews should not focus on gathering new insights. If the critical service account manager will provide such inputs, information will be gathered and provided to the company's tool research team.

Interviews will be anonymised to ensure as open input as possible.

3. Settings up and conducting interviews

During the interview phase of the selected performance dashboard, the current situation is scored in the matrix.

Below are some tips for setting the right stage for the interviews:

Interviews are to be set not more than 2 per day to ensure the interviewer has time to gather input and avoid overload.

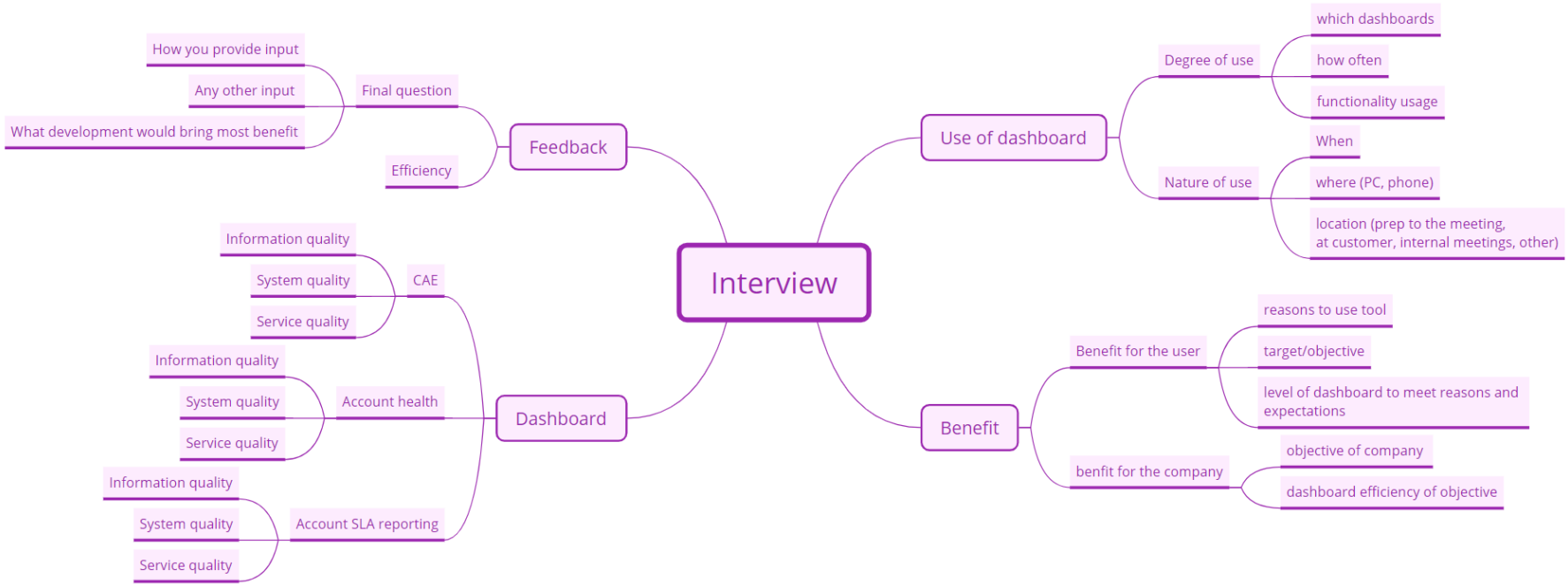
Interviews will be taken with the same resources throughout the research.

- The interviews can be conducted in random order, depending on resource availability.

- The interviews are to be conducted within two weeks to avoid tool development impact on the responses and experiences.
- IT is of the utmost importance to create during the interviews an informal atmosphere where the interviewee feels free to talk. Therefore, it is recommended not to read the questions during the interview. The mind map is sufficient to ensure all topics are touched upon during the interview.
- Taking extensive notes is not favourable as it does not create the needed informal atmosphere. If mind maps are used, you will find it easy to fill in the responses to the questions right after the interview. Do not wait until after the following interview to answer the questions, as you will become biased after the following interview.
- Do not correlate the columns in the matrix to the interviewee. Often, the misalignments of one column with the other are found in unexpected other areas of the organisation.
- Let the interviewee talk about what he/she feels. Without noticing it, he likely will start talking about what is not right in the organisation in his view. Be aware not to create a “bitching” session, so ask for facts and proof.
- Ask open questions to get as much information as possible.
- Maintain proper time management to ensure all main topics of the mind map are covered in the agreed interview time.
- Do not use a laptop during the interview. This will cause you to have to hide behind the laptop screen!

The semi-structured interview mind map Appendix 3

This appendix provides a mind map for the interviews to ensure all topics are covered during the interview.



The Key service account manager interview questions

1. What dashboards you are using to support your work?
2. Are you familiar with dashboards CAE, Account health and Account SLA reports?

Further questions are focused only on the selected dashboards.

3. How often do you use them?
4. What functionality do you use?
5. When do you use them? Where and how do you use them? For what reasons do you use these dashboards?
6. What are the benefits you see from using the dashboards? What are your personal targets/objectives for you using the dashboards?
7. What do you expect from dashboards?
8. How do you think the company has intended you to use these dashboards?
9. What do / you think are the company's objectives for creating these dashboards?
10. Do you think the objective is reached?
11. What benefits does the company achieve when you use these dashboards?

CAE:

12. What is your feedback on the information?
    Is it reliable? Is it sufficient? Does it meet your needs? Does it meet your expectations? What have you noticed about information quality? How critical is it for your work? How critical is it for you to achieve your targets?
13. What can you tell about the system quality?
    How familiar are you with SFDC Lightning? How satisfied you are with the system? What is working well in SFDC? What is not?
14. Do you receive enough support in dashboard usage?
    Have you received sufficient training? Do you know where to get support? Is it an efficient way, in your opinion?

Account Health

15. What is your feedback on the information?
    Is it reliable? Is it sufficient? Does it meet your needs? Does it meet your expectations? What have you noticed about information quality? How critical is it for your work? How critical is it for you to achieve your targets?
16. What can you tell about the system quality?
    How familiar are you with Power BI? How satisfied are you with the system? What is working well in Power BI? What is not?
17. Do you receive enough support in dashboard usage?
    Have you received sufficient training? Do you know where to get support? Is it an efficient way, in your opinion?

Account SLA report

18. What is your feedback on the information?
    Is it reliable? Is it sufficient? Does it meet your needs? Does it meet your expectations? What have you noticed about information quality? How critical is it for your work? How critical is it for you to achieve your targets?

19. What can you tell about the system's quality?
How familiar you are with QlickSense? How satisfied you are with the system? What is working well? What is not?

20. Do you receive enough support in dashboard usage?
Have you received sufficient training? Do you know where to get support? Is it an efficient way, in your opinion?

General

21. Do you know where/how to provide your feedback and input on the dashboard quality, issues, questions, and development issues?

22. Do you feel your opinion is heard and taken into account?

23. What would you like to add about the performance dashboards that you think would be useful for the research?

24. What suggestions do you have for performance dashboard improvements?

Question matrix Appendix 5/1

		LEVEL 1: IMMATURE	LEVEL 2: ADAPTING	LEVEL 3: ESTABLISHED	Questions
Use	Familiarity with CAE, Account Health, and Account SLA reporting	Not familiar/limited knowledge	Aware of the tools and their general functionality of the dashboards in scope Knowledge of other available dashboards	Extensive knowledge of the dashboards in scope, knowledge of basic and additional functionality Knowledge of additional dashboards	1,2,4
	Level of use: how often and what functions	no use / used a few times only	occasional usage, utilise only the "front screen."	regular, daily use use all available functionality and deep-dive options	3
	Nature of the use	only on managers/team's request	Use only to prepare for the review meetings, only to use to gather data	Use to support business decisions, customer experience improvement, and meetings. Use "on the go" as a tool to present	4,5,6
Benefit	Personal benefits	No clear knowledge of how to utilise the tools	Have some ideas on how dashboards could help in daily work	A clear idea of how dashboards provide support to their daily work and help to meet KPIs	7,8,9
	Company benefits	No clear understanding of the objective of the tools	Have some ideas on why dashboards are designed or intended to be used	A clear understanding of the objectives of the dashboards and how they are designed to support daily work Good understanding of how dashboards are intended to be used	11,12,13
CAE	Information quality	Information is non-reliable Information is not meeting the needs. Information is non-understandable	Information is 80-90% accurate. Sufficient information is available to replace most other reports required for daily work. Information is readable but requires "translation."	Information is more than 90% accurate Information available replaces most other data sources required for daily work. Information is easily understandable	15
	System quality	The system is not familiar. The system is having trouble hindering the usage (slow, unstable, complicated)	The system is somewhat familiar. The system could work better, but it is sufficient to support the work	The system is well-known, and the user feels comfortable using it The system is fast, stable, intuitive and easy to use	16
	Service quality	The user has not received/passed training. No user support available/ no knowledge of it	The user has received training but feels it is not sufficient. The user knows about support, but channels	The user feels that the provided training was sufficient. The user is aware of the support channel. The user is satisfied with the service tools,	17

		The service available is not satisfactory, hard to reach, and takes days to respond.	are not the most favourable/commonly used.	channels, and quality provided	
Account Health	Information quality	Information is non-reliable Information is not meeting the needs. Information is non-understandable	Information is 80-90% accurate. Sufficient information is available to replace most other reports required for daily work. Information is readable but requires "translation."	Information is more than 90% accurate The information available replaces most other data sources required for daily work. Information is easily understandable	18
	System quality	The system is not familiar. The system is having trouble hindering the usage (slow, unstable, complicated)	The system is somewhat familiar. The system could work better, but it is sufficient to support the work	The design is well-known, and the user feels comfortable using it The system is fast, stable, intuitive and easy to use	19
	Service quality	The user has not received/passed training. No user support available/ no knowledge of it The service available is not satisfactory, hard to reach, and takes days to respond.	The user has received training but feels it is not sufficient. The user knows about support, but channels are not the most favourable/commonly used.	The user feels that the provided training was sufficient. The user is aware of the support channel. The user is satisfied with the service tools, channels, and quality provided	20
Account SLA reporting	Information quality	Information is non-reliable Information is not meeting the needs. Information is non-understandable	Information is 80-90% accurate. Sufficient information is available to replace most other reports required for daily work. Information is readable but requires "translation."	Information is more than 90% accurate The information available replaces most other data sources required for daily work. Information is easily understandable	21
	System quality	The system is not familiar. The system is having trouble hindering the usage (slow, unstable, complicated)	The system is somehow familiar. The system could work better, but it is sufficient to support the work	The system is well known, and the user feels comfortable using it The system is fast, stable, intuitive and easy to use	22
	Service quality	The user has not received/passed training. No user support available/ no knowledge of it The service	The user has received training but feels it is not sufficient. The user knows about support, but channels are not the most favourable/commonly used.	The user feels that the provided training was sufficient. The user is aware of the support channel. The user is satisfied with the service tools,	23

		available is not satisfactory, hard to reach, and takes days to respond.		channels, and quality provided	
Feedback	Channels of feedback	No knowledge of the channels of feedback	Aware of the channels but does not use any	Aware of the channels and actively use them	24
Additional info	Open discussion	NA	NA	NA	10,25
Efficiency	Personal opinion of the tool's efficiency	NA	NA	NA	14

Management interview questions Appendix 6

1. How familiar are you with dashboards for key service account managers? Do you know the dashboard?
2. What are the targets/objectives for dashboards in question and SLA reporting dashboards?
3. What are critical success factors to assess the success of dashboard efficiency and achieving targets?
4. What is the schedule of company to achieve these targets?
5. How would you define key services account manager's role?

Recommendation letter Appendix 7/1

Removed due to confidentiality.

Removed due to confidentiality.