

Post-Evaluation of IT Project Outcomes

Defining and measuring project success in the case company

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Abstract

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Abstract <p>Post-evaluation of IT project outcomes requires both an understanding of the success criteria and the ways to measure the success. Even though the success is case-sensitive, the criteria need to be defined in cooperation with all the stakeholders, including possible customers.</p> <p>The objective of this thesis is to define project success, outline the purpose and benefit of the post-project evaluation processes, and point out possible development needs of the IT project reporting of the case company. A new reporting tool and suitable success measures for the case company are implemented based on the research results. The tool is used for post-project evaluation purposes, to summarize and report the success of the completed IT projects.</p> <p>This qualitative research is done with inductive and deductive methods. It aims to create a theory about the project success criteria and the needed measures with the help of research conclusions and it examines whether the existing theory of the project management triangle is a sufficient model for evaluating project success.</p> <p>The result of the research is that the reporting practices of the case company need improvement to successfully measure and evaluate the IT project performance and outcome. Another important observation concerns the timing of the post-evaluation; the evaluation of the outcome is only possible in a longer time frame. The study also highlights different approaches to the project management triangle which is a well-known model used by the case company as well.</p>		
Keywords Project management, IT project model, project management triangle, IT project outcome, success criteria		

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1 Introduction

1.1 Background

Project management monitors the project work and all the phases that projects go through to deliver a desired outcome (Cockrell 2012, 4). It is part of the project management responsibilities to communicate with the stakeholders and to define all the project requirements and best practices (Project Management Institute 2021, 100). Continuous improvement of processes and project performance require fluent communication and consistent documentation (Schneider 2023). The project documentation forms the base for reliable reporting, which makes it possible to gather and visualize project-related data and make conclusions about the deliverables.

A project is considered completed when all the project tasks are done, and all the deliverables are accepted by all the stakeholders (Maslam 2022). Post-evaluation of the project outcomes takes place in the project closure phase, and it aims for facilitating meaningful insights that can be used for supporting the decision-making both on organizational level and on future projects to come.

This thesis is done in a work life cooperation and the idea of the research paper topic, “Post-Evaluation of IT Project Outcomes”, was a proposition given by the Portfolio Management team of the case company. Post-project evaluation in the case company currently consists of a Lessons Learned meeting, but systematic collecting, summarizing, and evaluating the success of outcomes is not yet validated part of the IT project model. The importance of post-evaluation practices has already been recognized but due to amount of other, more urgent development processes, resources for this project have so far been unavailable. It has been recorded on the IT Portfolio Management Roadmap that developing post-project practices is on the list of things to do in the year 2025, but along this thesis, the related research can be preponed.

1.2 Objectives

The given assignment, and the main goal of the study is to gain insight into evaluating success of IT project outcomes from the perspective of the case company. Post-project evaluation can be carried out by understanding what factors can, and should be measured, and how it is done. To be able to make conclusions whether a project succeeded or not, success criteria need to be defined in advance. To evaluate the project performance, the existing, well-known metrics like “Actual costs compared to original budget”, “Used time compared to planned schedule” and “Realized deliverables compared to initial scope and

objectives” can be utilized but instead of focusing only on project process, evaluating outcome requires studying other ways of measuring success as well. The difference between the project output and the outcome success needs to be outlined, as the project process itself can partly fail, yet the outcome can be successful and vice versa.

Another essential research objective in addition to well-founded conclusions about what are the relevant and measurable or comparative success factors, is the competence to identify possible needs for improvement of the current reporting requirements of the case company. This concerns requirements that are proven to be meaningful prerequisites for post-project reporting and evaluation.

The functional objective of the thesis is to design and implement a template, which is used for reporting and analyzing pre-defined expectations and actualized project outcomes. Recording the instructions for efficient usage of the template can be done by utilizing the Measuring success of the IT projects chapter of the thesis report. Demonstrating business value opportunities that can be achieved through post-project evaluation is of great importance for effortless introduction to the new post-project template and engaging project stakeholders to possible changes. It is to be mentioned how post-evaluation could benefit the follow-up of project success within a longer time frame, in an Effectiveness Review meeting of the case company.

A couple of important matters are not within the scope of the study because the focus is on the post-project evaluation in the project closure phase. Studying user satisfaction more in-depth has been excluded from this study because it does not fit into the chosen time frame, even though it is something that is taken into consideration when evaluating project success in the long run. The same applies to thorough introduction of the different phases and stages of the project process which all undeniably affect the project success but is deliberately not part of this research hence the chosen focus of this thesis is on the project outcome.

1.3 Case company

The case company in this study is a Finnish manufacturing company that develops and supplies industrial products and services. It operates globally in more than 40 countries and has a solid market position with stable growth expectations.

Information technology is a fundamental function in any modern company and a key success factor of the business and operations of the case company as well. The company has divided IT functions into different service areas, which enable agile IT operations for effective results from both business value and customer satisfaction perspectives.

As previously mentioned, this thesis is an assignment done in collaboration with the IT Portfolio Management team whose main function is IT Project Portfolio Management. The Portfolio Management team of the case company develops demand and project management processes, IT project models and templates, and is responsible for ensuring that IT projects meet the strategic goals of the IT services. The lead of the Portfolio Management team has mentored this thesis work and offered guidance for finding internal materials relevant to this research.

2 Research description

2.1 Research questions and research method

Defining favorable outcomes of IT projects is always case-sensitive, thus creating an unambiguous model of success factors or pointing out attainable benefits is challenging. The nature of IT projects narrows down the definition of project outcome and offers guidelines for developing success measures for the case company. Regardless of, gathering a robust theory base requires delving into the topic; there is plenty of research on the success of the project process but when it comes to the success of the project outcomes, the information is scattered. This indicates that the results of the research need to be compiled into beneficial form in close cooperation with the case company.

Based on the identified problems, the main research question is:

- How to define, measure, and evaluate the success of IT project outcomes in the case company?

The sub questions of the main research question are:

- What are the needed measures; can they be formed and summarized by using current reporting requirements or is there an information gap?
- What kind of business value or other benefits can be achieved by post-project evaluation?

The starting point of this qualitative research is the business need of the case company from which the research questions and the research objectives arise from. The research is done by using an inductive and a deductive method. Inductive research develops generalizations or theories based on the research data and the whole research process starts by collecting data and identifying possible patterns that could be helpful for forming new hypotheses, while deductive method starts from existing theory that is being tested with research conclusions (Streefkerk 2023).

The research and the data collection process aim to find answers for all the research questions and to form a conception of the success criteria and measures that are suitable for the needs of the case company. The research conclusions help to examine whether the existing theory of the project management triangle is a sufficient model for evaluating project success.

Interviews with employees of the case company form the collection process of empirical data. The questions for the interviews are planned beforehand and the candidates are designated according to their roles and competence. The answers are used for concluding what are the expectations and possible demands of the project stakeholders, and in the end, what is the essential information needed for defining IT project success and how to collect and measure it. That data together with the internal materials of the case company, form the primary literature sources of the research. Secondary literature sources are collected mainly by choosing the most essential academic publications and other reliable articles related to the research questions and the key concepts of the research. Selected information supports the research process by being based on the research problem and fitting into the defined framework. The theoretical literature and the interview data are summarized and analyzed to create an adequate base for reliable assumptions and generalizations, and the results are compared to test the initial hypothesis.

The development part of the process aims for well-justified output, as the objective of this thesis is to develop a post-evaluation template. The template is planned to be used for reporting the project performance and transforming that information into understanding about success factors of IT projects and conception of how they can affect the project outcome.

2.2 Overview of the theoretical framework

The theoretical framework of this study is based on a theory of the classical project management triangle, also known as a triple constraint or iron triangle. The project management triangle is a widely used project management model for controlling time, cost, and budget of a project to produce high quality deliverables. (Rudder & Main 2023.) This model is introduced more in-depth in the following chapter. The hypothesis is that it alone does not provide enough information for evaluating the success of IT project outcomes and demonstrating business value realization.

The key concepts of the research are the following: IT project management and IT project model, success criteria, and IT project outcomes and post-project evaluation. Determining success criteria and defining the outcome of an IT project is part of the project management process. The chosen IT project model enables planning and describing all the project phases, activities, and requirements; it aims to ensure that the desired outcome is reached. Post-project evaluation of the outcomes analyzes how well the predefined success criteria were met. Figure 1 presents how these concepts are connected in practice.

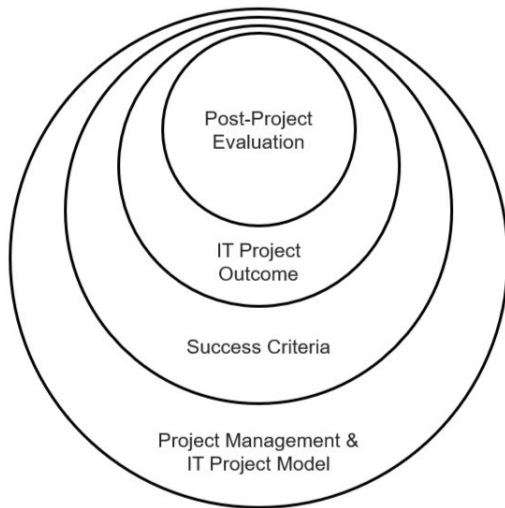


Figure 1. Key concepts.

3 Key concepts of the research

3.1 IT project management and IT project model

A project means activity that consists of different tasks, it has beginning and ending, and it aims for creating a unique product, service, or result (Cockrell 2012, 2; Project Management Institute 2021, 31). The term IT project refers to a project with an IT element which means that certain IT skills are needed to complete the project work (Pratt 2012, 24). The concept of project management means guiding the project work in such a manner that the project activities meet the requirements and can deliver the planned outcomes (Project Management Institute 2021, 31). Simply put, IT project management is about choosing a project that is creating something completely new or improving an existing system (Pratt 2012, 20).

Many projects are derived from a need identified by a business case, whether it is a delivering a new product or service or improving an existing one (Project Management Institute 2021, 61). The same applies to the case company as most of its IT projects are business projects with an IT function. In other words, the demand for enhancement or developing something completely new comes generally from the business and IT is needed for executing certain required capabilities.

All projects together form a collection called project portfolio, which is managed by Portfolio Management Office (PMO). Keeping in mind, besides portfolio, PMO can be used for referring to Program or Project Management Office (Project Management Institute 2021, 306). This way of managing projects is common for all organizations whose aim is to deliver outcomes and benefits of high quality for customers and end-users (Hanley 2014). The Project Portfolio Management (PPM) of the case company uses Scaled Agile Framework (SAFe) principles as a part of their incremental development practises. This popular framework is a body of knowledge, and it offers guidance on how to manage work, implement agile practices, and how to share roles or responsibilities (Piikkilä 2023). The framework itself helps realising the agile benefits and the Measure and Grow approach of SAFe emphasises the importance of understanding what to measure and how to do it as a means of continuous improvement of business performance (Scaled Agile Inc. 2023).

Project management can follow different kind of methodologies like waterfall or agile. Waterfall project has predefined phases that linearly follow each other. Each phase depends on the completion of the previous phase. (Palmquist 2023.) Waterfall approach to project management might be consider somewhat inflexible in some cases, and the answer to this problem is agile methodology (Cockrell 2012,164). Instead of being just one methodology, agile in fact covers different methods and frameworks. An agile project follows incremental

and iterative development life cycle which means that new features are being added and released throughout the whole project process (Kerzner 2024, 156).

Projects can be managed with different kind of project management models. The model in this context refers to a strategy that describes for example project process or framework (Project Management Institute 2021, 248). A model called project management triangle, also known as iron triangle or triple constraint, is one of the most popular project management models and it concentrates on managing three key project variables, cost, scope, and time (Figure 2). The project management triangle model aims for delivering high-quality result by balancing those three constraints if changes occur during the development process. Cost includes all the resources needed in the project, scope defines the deliverables and basically all the boundaries of the project, and time indicates the whole timeline of the project. (Rudder & Main 2023.) Time, cost, and scope all together represent the project expectations, and the quality aspect of the model means fulfilling those expectations by delivering the quality outcome within time and cost restrictions. Quality also reflects the compliance of the project management best practices and in fact measures the implementation of the project. (Pratt 2012, 183-184.)



Figure 2. Project management triangle (Business Technology Forum A)

IT project management of the case company has deployed the project management triangle as a part of their project model. The main emphasis of that model is on promoting business value-driven approach which aims for ensuring that the project is proven to be necessary and it is delivered within the budget and schedule. The focus of project outcome and decision-making is on delivering business value and high-quality deliverables. (Case company 2020.)

The Project Portfolio Management of the case company uses its IT project model for defining a common structure for all projects and clarifying the roles and responsibilities of each project stage. The model helps managing and steering the projects successfully through all the phases and stages (Case Company 2020). The present IT project model used by the case company is an adaptation of the Business Technology Standard (BTS) project portfolio steering model. BTS is an open-source technology management framework, and it is developed by Business Technology Forum. This gate-based model concentrates on efficient managing of development throughout the whole project life cycle, controlled by the Portfolio Steering as the Figure 3 presents (Business Technology Forum B). It can be used for steering for example agile or waterfall projects and it consists of multiple project elements, starting from Opportunity Identification stage in the Pre phase and ending to Benefit Realisation stage in the Post phase. The Post phase of this project model marks the point where the evaluation of the project performance and success takes place, and the purpose of the Benefit Realisation stage is to ensure that business benefits are achieved, and the deployment of the newly created changes is performed as expected. (Business Technology Forum 2022.)

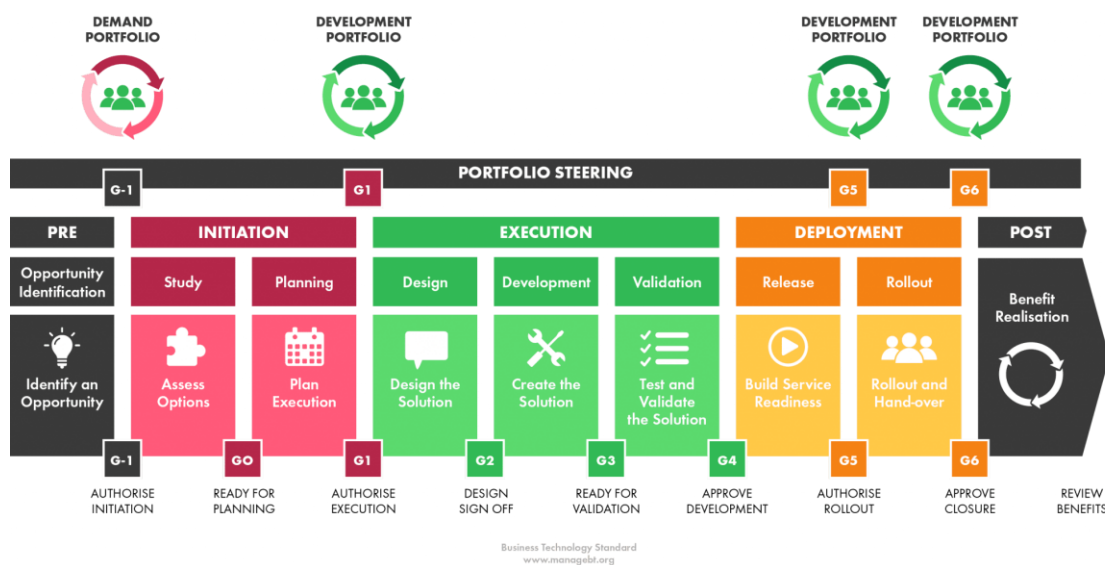


Figure 3. Project portfolio steering (Business Technology Forum B).

3.2 Project success criteria

The project should start with clear definition of success and a good way to approach this are the project objectives. Effective objectives help to define success and they depend on

two aspects: questioning the clarity of purpose and perspective of measurement. (Duggal 2018, 163.) Each project must have business purpose and their own contribution to business value and the project success must then have some kind of business component (Kerzner 2024, 40). The traditional project management triangle has been used for defining project success but besides time, cost, and scope, organization can have other project success criteria like stakeholder or customer experience and satisfaction or realization of business benefits (Duggal 2018, 174).

One of the project success indicators is value. It means subjective worth or usefulness of something and depending on the stakeholders of a project, the value should be defined case-by-case from the perspective of the customer and be balanced with the organizational values. Value should be the driver of projects and it should focus on the outcome of the deliverables. (Project Management Institute 2021, 61-62.) The projects can create value in a form of new product or service, but things like sustaining benefits of previous projects and improving existing solutions, effectiveness, or productivity, are alike means of value creation (Project Management Institute 2021, 35-36).

It is important to recognize what kind of business value and other benefits the project is planned to generate. Demonstrating value must always start from the end-user or client satisfaction because the project benefits are significant to them, not to the project team, PMO, or any other providers (Duggal 2018, 164-165). Value-driven projects need to focus on how value is quantified and reported instead of budgets or schedules. Measuring needs to prove the contribution of the project to the objectives of the company (Kerzner 2024, 579).

Well-coordinated project is the very basis of the project success and despite the chosen method of coordinating work, it is the supportive leadership and the engagement of the project teams and other stakeholders that are responsible for the successful outcome (Project Management Institute 2021, 39). While traditional project management measures projects in terms of time or money, in benefits management the focus is on measuring the success and value from the end-user point of view. As the value as a concept can be sometimes hard to define precisely, becomes the importance of measurable benefits increasingly relevant. (Kerzner 2024, 2.)

3.3 IT project outcomes and post-project evaluation

Outcome represents a result of a project, and it focuses on the project benefits and value (Project Management Institute 2022, 31). IT Project outcomes are results that represent the measurable success of the project activities and outputs. According to Barr (2017, 37) the

results are durable states or qualities that are executed with single tasks or projects. Even though project deliverables can support the outcome, the purpose of the project becomes more understandable when the focus is on the outcome of the project instead of the outputs (Project Management Institute 2021, 63). With the help of outcomes, organizations can recognize if their solutions are creating intended benefits and business or customer needs (Scaled Agile Inc. 2023).

The transformation of the project output into a project outcome is crucial part of the project process. This can be realized by considering what are the real end-user needs and what needs to change that this happens. (Kerzner 2024, 3.) Clearly defined outcomes should be also up to date during the whole project life cycle, despite the changes that can be made, and the project progress needs to be constantly evaluated to ensure that the intended outcomes are being met (Project Management Institute 2021, 62).

The project closeout phase marks the end of the project process but it is not the end of all activities. To assess whether the defined success criteria live up to the expectations, the process of post-evaluation needs to begin, and it must be both logical and well-organized. Because of that process, the valuable learning points and all the gained experience can be used for making reliable analysis of the project performance and running more successful projects in the future. (Cockrell 2012, 156.) Post-evaluation also ensures the successful deployment of the project (Kerzner 2024, 3). For some projects it can be difficult to or even impossible to identify the value and realize the success at project closure. This means that the time frame for waiting and measuring the results needs to be established. (Kerzner 2024, 583.)

According to the IT project model of the case company, benefits and outcomes are being reviewed in the last project stage called Realize Benefits. In that stage, the focus is on ensuring that the desired benefits of the project are achieved and that the business changes are operating as intended. Additionally, the further development needs of the solution and the potential utilization possibilities outside its initial purposes are being investigated. (Case Company 2020.) The case company implements the post-project evaluation of the IT projects in a Lessons Learned meeting. The purpose of this meeting is to focus on improvement of team performance and to collect information about the parts of the project that were successful and those that could have been done better. (Project Management Institute 2021, 275.)

4 Measuring success of IT projects

4.1 Approach to measuring project success

Measuring success is crucial way of managing the upcoming projects and identifying needs of improvements or problems that can occur in the future. With the help of meaningful measures, it can be verified that the project goals are met and as Barr (2017, 7) notes, those measures not only track the progress but offer real and objective evidence of it. If the relevant things are being measured and tracked objectively and reliably, the decisions can be made with confidence, and eventually the goals turn out to be more reachable (Barr 2017, 52).

To be able to create convincing facts that are not just some insignificant counts, Barr (2017, 61-62) suggests that defining the result should be the very first thing to do. After that comes the clear evidence of the result, and lastly the measures that quantify that evidence. Sparks (2023) also highlights the importance of identifying the objectives that are specific enough and relevant to the context. He notes that objectives should easily engage the project team to common goals. When the project teams are aware of the things that they are trying to achieve, how they are going to do it, and furthermore why it needs to be done, the teams are proven to be more productive and engaged (Sparks 2023).

For this purpose, there is a widely accepted and recognized management strategy called Objectives and Key Results (OKRs) which aims to defining objectives and tracking the results, as the name implies. It alone does not guarantee success or growth; it requires strong leadership, effective decision-making, and a culture of creativity. (Sparks 2023.) According to Sparks the objectives not only steer the work but inspire and engage all employees and the whole organization to shared strategies. The key results are more concrete measures that help reach the objectives that have been set (Duggal 2018, 178). To ensure that the OKRs support teams in achieving measurable outcomes, the key results need to have certain qualities. The desired outcomes should be defined as proof of value-driven results and to be able to compare the planned outcome to the actual outcome, both the key results and the target must be measurable and gradable. If the focus is only on outputs instead of outcomes and the key results are merely a list of project tasks or deliverables, the impact of the OKRs can be even negative. (Scaled Agile Inc. 2023.)

The objectives of IT projects are usually explained by the business value that they provide to the organization, and they can be defined with SMART (specific, measurable, assignable, realistic, and time-related) criteria: Specific objective focuses on a single business value

and that value should be measurable. If the objective cannot be assigned to any stakeholders, it is not in the scope and thus not a valid objective. From the perspective of the triple constraint, the objective must be realistic, and the business value needs to be reasonably time-bound. (Pratt 2012, 24.) With SMART objectives the benefits realization and the decision-making become easier (Kidston 2016, 45). Based on the strategic objectives of the organization and the input of stakeholders, defining SMART goals can be stated as an undisputed part of IT project planning, regardless of the complexity of the project and this approach should be benefitted in developing the measures for any other projects as well.

Measuring customer satisfaction is an important indicator of project success because customers are the ones that are the reason behind developing a service or a product (Duggal 2018, 164). Customer satisfaction tells of the ability to meet the customer expectations by focusing on long-term benefits of the project (Miels 2023). Some companies even refer the post-evaluation phase as the customer satisfaction management phase which offers information about the improvement possibilities of the future projects (Kerzner 2024, 233).

4.2 Measuring success with the project management triangle

The project management triangle is commonly used for measuring project results and defining project success, but it is questionable if it provides genuine evidence of the success of the outcome. It has been known for decades that things like value, risk, and customer satisfaction define success but because time, cost and scope have been the easiest ones to measure and report, the value has been same as quality or cost. (Kerzner 2024, 662.) Duggal (2018, 161) reminds us how measuring what is easy to measure and trusting hard measures can mislead organizations or project stakeholders to think that scope, cost, and time promote desired behaviour and provide expected results. Instead, Duggal demonstrates in Figure 4 that the three constraints of the PM triangle should be reflected by the corresponding outcome: cost and time corresponds to business benefits and benefits of time-to-market, the scope mirrors how well it has been adapted by the end-users, and the quality is proven with customer or stakeholder satisfaction. (Duggal 2018, 174.)

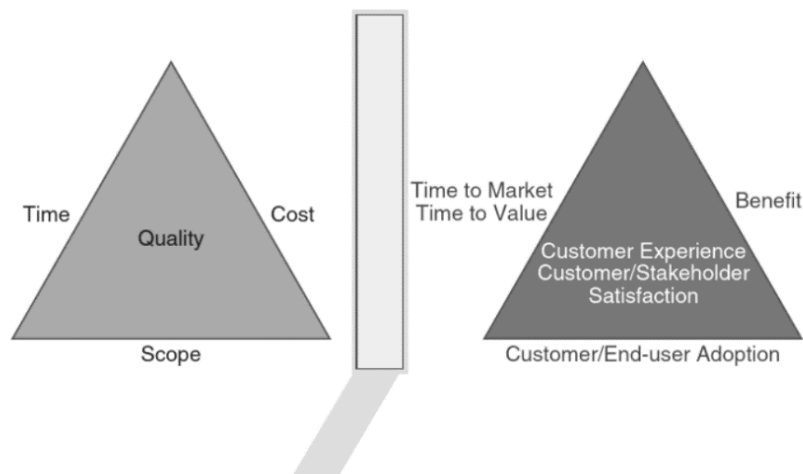


Figure 4. Mirroring Project Outputs and Outcomes (Duggal 2018, 175).

Barr (2017, 49) also discusses the difficulty of defining, implementing, reporting, and interpreting the right measures and mentions that the theory of three constraints, among other frameworks, is merely a result framework, that does not describe how to create practical performance measures. According to Baratta (2007) it can lead to poor decisions because the relationship between the constraints is not predictable:

The Triple Constraint says that if we want to shorten the schedule (time) we must increase cost. It says that if we want to increase scope we must increase cost or schedule. However, the data says otherwise. Why is it that the majority of projects that are over budget are also late? This runs contrary to the constraint. Why is it that projects that are both late and over budget also have a tendency to under deliver (scope)?

Kidston (2015, 48) shares this idea and states that project can be successfully delivered while it fails in delivering the benefits, or project is able to deliver considerable benefits despite the project failed. Kerzner (2024, 504) states that those projects that follow waterfall methodology and are implemented with well-defined requirements, focus usually on measuring time, cost, and scope. But the projects that involve innovation and have a higher risk of failure, may require measures that reveal the variables affecting the possible changes or in some cases, a failure. Kerzner suggests that some of these measures could be a number of approved and denied scope changes or a number of altering the baseline of time, cost, and scope.

Baratta (2007) cites Francis T. Hartman with the idea about long-term return being the best reference for project success, and based on this, he proposes a variation of the classical

triple constraint called Value Triple Constraint (VTC), a model that focuses on success and net value of the projects (Figure 5). This VTC model consists of value that can be delivered with the scope and all the capabilities of the project process. Value represents the outcome, and it is a formula, a sum of project benefits and all the costs extracted from it.



$$\text{Value} = f(\text{scope, capability})$$

Figure 5. Value triple constraint (Baratta 2007).

The model aims to attach quantified project benefits to scope or functionality and with the ability to measure the timebound value creation of each project, it enables comparing the delivered value with the estimated budget value. When truly recognizing how significant the business value is, the focus moves from project deliverables to outcomes with the means of value-driven project management activities. This undeniably sets a requirement that the business case and all the preferable benefits are clear. (Kerzner 2024, 664.)

4.3 Other ways of measuring success

Project success is measured by comparing the achievements to the acceptance criteria that has been agreed in the business case and like Kidston (2015, 48) points out:

Achievement of project requirements and end-user benefits needs to be considered together because it is the creation and use of deliverables that produces benefits. For this reason, benefit realisation measures should be identified, and baseline data should be collected before implementation begins. This should be presented alongside the project outcomes. Business case benefits are very theoretical, which is why 'easy to measure' statistics should be collected for benefit realisation purposes that indicate whether the theoretical benefits have been delivered.

When measuring only outputs, the focus is on the process and project activities but if the intention is to also examine outcomes, it is the results that need to be measured. This means measuring the difference that is created with the outputs of the project (Sparks 2023). Duggal (2018, 167) demonstrates the emphasis on output and outcome benefits with understandable comparison: time, cost, scope, or quality confined measures focus on output benefits, while return on investment (ROI), net promoter score (NPS) or customer satisfaction are measuring the eventual outcome.

Despite some of the benefits can be intangible, a monetary value should be assigned to these benefits. Return on Investment (ROI) is used for comparing the benefits to the costs of the project. The formula for calculating ROI is based on calculating the net benefits minus the costs, dividing it with costs and finally multiplying it with 100. (Kerzner 2024, 406-407.) Outcomes can be measured by using Key Performance Indicators (KPIs) that represent measures of business results. Even though outcome metrics like KPIs are usually context-specific and depend on the many factors like the chosen business model or the nature of the project, there are indicators that can be applied in various contexts. One of these is Net Promoter Score (NPS). (Scaled Agile Inc. 2023.) NPS measures the customer satisfaction and willingness to recommend the services or products of the organization to others (Project Management Institute 2021, 276). It can be calculated with the following formula: $(\text{number of promoters} - \text{number of detractors}) / (\text{number of responses}) \times 100$ (Gillis & Ehrens 2023). Customer or end-user satisfaction can also be evaluated with different kind of surveys, open-ended questions, and rating scales (Miels 2023).

Selecting the few essential KPIs is better than measuring too many things. KPIs can be informative performance measures about the actions that are expected to lead to the results but in addition the Key Result Indicators (KRIs) can be used along with the KPIs to offer better understanding about how teams or the whole organization are performing. (Kerzner 2024, 53.) KRIs can be either financial or non-financial measures, like net profit of a project or a number of customer inquiries (Bernstein). The key results connected to the project objectives can be tracked with OKR measure called key result progress. The progress in percentage is calculated with formula $(\text{current value} - \text{start value}) / (\text{target value} - \text{start value})$ (Zdravkovski). Soft and tangible project values can be measured by using for example Net Present Value (NPV), payback period, and Internal Rate on Return (IRR) (Kerzner 2024, 581). NPV tells the worth of the project investment and the profitability in the long run (Project Management Institute 2021, 270). The formula for calculating a short-term project with single cash flow is $[\text{cash flow} / (1 + \text{discount rate})^{\text{number of time periods}}] - \text{initial investment}$. For longer-term project investments with multiple cash flows each cash flow is discounted individually and then they are added together. (Kenrick 2023.)

The duration of a project can be measured simply by calculating the number of days between the starting and ending dates of the project. The same applies to comparing the planned payback time with the actual payback time. An additional and interesting time measure is flow time which measures the efficiency of the workflow usually starting from the idea phase and ending in production. It shows the total duration of the whole workflow and the length of each step. Flow time is usually measured by average length of the work item like a specific capability or feature, and it aims for decreasing the total flow time and thereby delivering value in a lower time frame. (Scaled Agile Inc. 2023.)

5 Interviews

5.1 Interview process

As a part of qualitative data collection, a series of individual interviews was conducted with ten employees of the case company during October 2023. The interview candidates were chosen according to their different backgrounds and titles to ensure that the questions were directed to the personnel who have the best knowledge about the topic or are in such a position that they make decisions concerning the IT projects and thus understand the project prerequisites. The interviews took place online through Teams, and the duration of each meeting was 30 minutes. A beforehand prepared PowerPoint-presentation that was used as a supporting material in every interview, consisted of introduction of the thesis author, thesis topic, and all the questions in a short, bulleted list. All the meetings were recorded with the consent of participants and the answers were anonymously transcribed afterwards.

The set of five interview questions were designed by using structured interview method. This means that the same questions were represented to all the interviewees. The open-ended questions concerned success, quality, and value creation of IT projects. They aimed to strengthen the understanding of the post-evaluation criteria and measuring success from the employees' point of view. The interview data was also used for outlining the current reporting practices of the case company and highlighting development possibilities of the IT project reporting. On this basis, the questions were following:

1. What are the characteristics of a successful IT project outcome (from end-user point of view)?
2. What kind of business value should IT project outcome deliver?
3. How could value creation be measured and evaluated?
4. The quality of IT project outputs and outcomes is promoted as a part of the current "Schedule-Scope-Resources" model (IT Project Model Handbook) - Should quality be part of the post-evaluation of outcomes (and taken into consideration already in planning phase)?
5. If yes, how could quality be evaluated?

An inductive approach was used for analyzing the interview answers that were written in bullet points. The similar answers were combined and those answers that appeared in every interview, were highlighted as the most common ones. The answers were categorized into three different themes, successful outcome, project quality, and business value, according

to the content of the questions. A summary of each theme was formed to introduce the results of the interviews and some of the most compelling and unique comments were used as citations.

5.2 Interview theme: Successful outcome

The definition of success depends on the perspective. Success can mean different things for example from the end users' or customer's point of view. From an end-user perspective, the outcome is successful if the workload decreases, work becomes easier, or the implementation of a new product or service is effortless. The project process itself can be considered successful if it stays within scope, budget, and time limitations and it delivers what it was planned, whether it is business value, business case, or deliverables.

Successful projects are characterized by clear definitions. The business problem that needs to be solved creates the starting point for the whole project process and all the necessary information is available before project officially starts. This is possible only if the project is well-planned and a common understanding about all the requirements and capabilities, definition of done, and maturity of the project plan exists between all IT and business stakeholders. In other words, to achieve the goals and thus for a project to be successful, the goals and the required capabilities behind the goals need to be defined in the planning phase. Clarifying the purpose and benefits of the changes is another essential part of successful project implementation. Same applies to a decision about the process model, whether it is waterfall, agile, or some other project management method; a common understanding about the chosen approach should be clear to both Business and IT.

Planning the introduction to new features and user instructions beforehand ensures that for example the service is used as planned. In addition, it should be monitored if the user training and support are sufficient, and if not, there should be a plan for that occasion, too. Making a proper communication plan is regarded useful when conducting a survey of collecting feedback from end-users or customers. Possible user testing should be conducted with internal resources and end-users because if testing is done with resources outside the organization, it might not provide valid results. It is to be remembered that some projects lack straightforward end-users; The nature of some projects is to create changes that are not visible to end-users and measuring that experience is thus excluded.

The realization of business goals or reaching the expected end-users can be done right after the project ends but the success of the outcome can only be measured or evaluated within a longer time frame. Sometimes the changes can even create end-user resistance or dissatisfaction and it can take longer to realize the actual benefits. Therefore, the timing

of evaluating the results is crucial and the needed answers are not probably available right after the project has ended. Although over time it can be hard or sometimes even impossible to prove that some certain project is to be held accountable for positive changes, like increased sales, it is considered as *interesting and beneficial to know the long-term variance and trends of how projects overall meet the expectations*.

Measuring success can be based on objectives and key results (OKR) and quantitative measures like budget KPIs (project payback, cost base, running costs, speculative profit, cash flow, budget accuracy percentage, etc.), ROI, time performance, go-live-accuracy, amount of end users, and effectiveness. In addition, leading metrics like flow through time of leads, can provide useful information about the success of a project.

5.3 Interview theme: Project quality

It is recognized that the quality aspect of IT projects should be in a bigger role than it is now, even though is not documented or measured at all. Reason for this is, that in most of the cases business has not made any quality related definitions and as one of the interviewees emphasized, *definitions should meet the expectations of the customer, not the ones that are defined by IT*. This same criteria in IT are needed for internal processes like project management but also for possible external suppliers and supplier agreements.

The quality of IT solutions could be designated to an IT quality manager and like mentioned in an interview, *there should at least be someone who is responsible for follow-up of the results*. It was suggested that the general quality function of the case company could be used for defining IT quality categories and criteria. Using service design could also help to ensure that the evaluation and improvement of IT project quality or eventually the project outcome would not be so easily forgotten.

Quality of the output affects greatly on the quality of outcome and the output quality could be validated for example with user testing. Once more, by defining precise goals and the quality expectations of the output and the outcome in the beginning, the project is more likely to achieve higher quality. This leads to an idea that quality could be implemented into scope as a quality of objectives, and it could be evaluated together with the value outcome by asking *what was the original value goal? or if there were changes in scope, how did it affect quality?*. As measuring quality depends on the nature of the project and what it is planned to deliver, each project should have quality measures that are case-specific in addition to generic ones. One way of measuring quality could be qualitative comparison between quality goals and achieved quality or comparing the outcome to the strategic goals.

Quality is a relevant part of IT projects and outcome evaluation especially in a longer time frame and follow-up because defects in quality reflect to value realization. Defects and readiness of the solution and time spent for fixing the errors or maintenance costs could be measured and compared to planned running costs as a part of the quality evaluation. An IT project outcome is generally considered of high quality if the result is usable or stable but, in some cases, high quality means that no one notices the changes and there is no end-user experience to evaluate. It is worth noticing that quality cannot come with the cost of budget or time, nor should it be more or less than was planned. The phrase “fit for purpose” applies especially well to defining quality and it means that what is done, is not too little or too much, but enough for that specific purpose.

5.4 Interview theme: Business value

The goal and measures of value creation should be defined in planning phase as a part of the Business Case or Project Plan and the definitions should be in line with business value realization. Most of the value definitions come from business because IT defines only technology-related matters like technical requirements and IT is merely a supportive function of business projects. In practice, stated by an interviewee, *IT only makes it technically possible to achieve what the business wants* and, in the end, *the value of the business is the value that it is delivering to the customers*. It is seen that the definitions in the case company are not made as well as they should be, and the actual value creation is not currently measured or reported. Just like with the quality, follow-up best practices are needed and someone responsible for these actions should be designated.

The value created with IT projects can mean things like enhancing strategy or capabilities, creating innovations or competitive advantage, improving work efficiency or compliance, or simply learning new things. The value of IT projects should be divided at least into upper-level categories according to the goal: Is the project aiming for improving something, which can be measured with proven decrease of costs, payback, user satisfaction, etc., or is it a necessity required by law, directive, etc., which can be measured with time and budget criteria, but not with user satisfaction. The value measures should be case-specific, depending on the nature and objectives of the project. Measuring could concentrate on business or production growth, reducing costs, process efficiency, increasing leads, strengthening the business of the customers, building brand image, end-user engagement, increasing performance of business processes, etc.

Qualitative value measures should be user experience-based surveys or interviews for validating soft values like user and customer satisfaction, user adaptation, and usability. This means that the target user groups or users are defined before the project starts and there

is a follow-up plan for the user experience results. User experience measures should be able to describe the reasons behind the results; what succeeded or didn't, and why?

6 Results of the research

6.1 Key findings of the theoretical research

The process of creating meaningful and relevant measures and metrics appears to be a challenge that many companies and organizations have been grappling with for a long time and will continue to do so from now on. It is not effortless to decide what to measure and how to do it, and there is no complete certainty of how the results will be interpreted or will those metrics even be used as intended. Despite the approach, an effective measurement framework should focus on the purpose of the measurement, being clear about the objectives and goals, and identifying how all the stakeholders, including possible customers, define success (Duggal 2018, 177-178).

A successful project outcome, accomplished with successful project activities, can be measured, and evaluated with value-based key results. The key results must be quantitative and measurable, and they must demonstrate how ambitious the goals are. Measuring is implemented by comparing the starting point to the desired goal and the results are used for describing what value the project is delivering for the organization or the customers. (Scaled Agile Inc. 2023.) However, it is not possible to know what should be measured or how it is done, without setting clear goals. They should always be the starting point for defining the key results that most accurately demonstrate success. Piikkilä (2023) also reminds us about one of SAFe values; how the definition of “done” should be clear in every project and in each project task. As OKRs are a well-recognized way of measuring project performance outside IT functions in the case company, using this framework could provide a practical method for implementing some of the measures for IT projects as well. But since there are no consistent reporting requirements that would support measuring IT project performance with key results, this approach can only be brought up as a recommendation at this point.

SAFe emphasizes that quality must always come before agility and the quality itself can be divided into five dimensions; flow, architecture and design quality, code quality, system quality, and release quality (Piikkilä 2023). Project Management Institute (2021, 76) defines project management quality with probability of reaching the pre-defined objectives in the given time frame and budget. Quality management and quality-driven project means delivering the desired level of excellence and fit-for-purpose with the help of effective project work and processes.

As stated in the Project Model Handbook of the case company (2020), the review must be repeated at regular intervals during the whole lifetime of a service. In addition to the Lessons Learned meeting in the project closure, a retrospective, which means a workshop where

the project process and results are being explored and improved, is suggested to be held regularly (Project Management Institute 2021, 275). Duggal (2018, 94) has a similar opinion: the benefits realization must be tracked throughout the whole project life cycle and the PMO is responsible for promoting a culture of focusing on outputs and the outcomes. In some cases, there can be too much focus on the measures instead of the outcome and this can lead to wrong behaviour if people are trying to alter the figures to make it look like the targets have been met (Barr 2017, 54). This indicates a short-sighted and misleading approach to measurement and obviously does not improve performance (Duggal 2018, 162). Measuring can be efficient addition to set of tools that describes the reality only when the carefully chosen measures are provably creating information that supports decision-making and describe the changes and the reasons behind it reliably.

6.2 Key takeaways from the interviews

The topic and the research overall are found beneficial and important because the post-evaluation and follow-up of IT projects are considered insufficient in the case of the company. As Pratt (2012, 24) states, a successful IT project must deliver business value and pure IT projects do not therefore exist – same applies to the interviews, proving that IT is a supportive function of business, and it mainly aims for delivering capabilities driven by the business needs. It is a common conception that success is built on clear project definitions prior to the execution phase. Consequently, a successful project delivers what was initially planned and a well-planned project is more likely to be of high quality. Speaking about quality, quality management of IT projects should be in bigger role, and this sets a demand for quality definitions.

Even though scope, schedule and cost can provide basic performance measures for IT projects, it is the end-user and customer satisfaction that are the most important parts of post-project evaluation. This sets a demand for a making a thorough plan for instructions, training, and support, and all this needs to be done in the project planning phase. Moreover, it is necessary to understand that evaluating the results takes time because the full outcome is not likely to be measurable at the project closure phase.

6.3 Overall conclusions

Based on the conclusions drawn from the research, any organization, including the case company, can make evidence-based decisions with accurate reporting and well-conducted post-project evaluation. The decision-making can be put into practice by focusing on results and it is the results that need to be measured and under comparison. In other words, the starting point for measuring anything should be the clear goals that the project is trying to

achieve. To ensure that the goals are in line with the expectations on all levels, and the project becomes successful, effective communication between all stakeholders and the organization is a necessity. However, the project expectations may not be met if the decisions are made based on the best interest of the project but not based on what is best for the whole organization. It is notable that the definition of success is always case-sensitive, and the measures should be adjusted accordingly. And when the IT projects demonstrably emerge from business needs, it is the business that also defines what is considered as a successful outcome.

Collaboration between different stakeholders is the key to creating a common understanding of success, defining the objectives and key results, and ultimately selecting the most important metrics. This supports the visibility of the project process both on team and on organizational level. After this, it is essential to make all the stakeholders engage in common goals and in possible new reporting requirements by emphasising the business value and other benefits that the project is planned to deliver. Once the measures have been developed and proven as the most beneficial ones with practical experience, the results need to be tracked, reported, and analyzed by the party who is responsible for those actions.

By interpreting the results and evaluating the outcome, it is possible to create impactful insights and have a deeper understanding of project processes. This means that measuring is not just a usage of some set of tools, a model, or a formula for tracking trends or performance; it is about creating completely new information and increasing knowledge that benefits not only a singular project team or a specific project but the whole organization. This as such can be considered as value creation, and it can be realized if the fresh insights are provenly used for supporting decision-making. Even though value realization usually takes time, achievements, and the desired outcome, like better customer service, can be demonstrated in the early stages with efficient implementation and with the support of capable leaders. Along with the quest for desired outcomes or fresh insights, measurement should primarily increase customer satisfaction and demonstrate the benefit realization. Measuring project success should help set project priorities, and in addition, it should promote transparent communication inside the organization and between all the project stakeholders.

The different ways of interpreting the project management triangle supports the original hypothesis that the success of IT project outcomes cannot be measured, and therefore business value cannot be demonstrated unambiguously with time, cost, and scope. Those three constraints form a good basis for measuring success but to be able to evaluate the project quality and the desired outcome, the focus needs to be also on the business value,

on the benefit that the project is engaged to deliver, and on the customer or end-user satisfaction.

Post-evaluation of IT projects should not be limited only to the project closure stage but to be complemented with follow-up activities. As both interviews and the theoretical material have shown, the best way to evaluate the success of outcomes is by end-user or customer satisfaction and that is possible only in a longer time frame. This is the reason why organizing a benefit realization review is crucial. Conducting a post-implementation survey is also a useful way of proving that the planned benefits have been realized and in the case that something did not go as planned, it offers a chance to analyse the reasons behind the results.

7 Implementation of the post-evaluation template

7.1 Template development

The post-evaluation template is planned to be used for summarizing relevant information and for evaluating the success of the project outputs and project outcome from IT projects with general and case-sensitive measures. In the case company, the evaluation activities take place in the Realize Benefits -stage when a project has in previous Rollout stage reached 'closed' status, from the project steering group. As the interviews and the research has shown, the full outcome can be realized and evaluated in a longer time frame and for this reason, the template is suggested to be divided into two parts. Due to the scope of this study, the second part is not concretely implemented but a proposal of the recommended content is given.

The first part consists of things that can be measured right after each project has ended. It is an Excel-file that presents the results in quantitative form. This format enables interpreting and analysing of the results in a visual form with a business intelligence tool like Power BI. The second part is used for follow-up purposes in an Effectiveness Review meeting after six months; for comparing long-term realization to rollout results and to the planned results. This part could be designed in a PowerPoint format because it would offer a convenient way of presenting the results in different kinds of meetings and it is also a commonly used format in other IT project templates of the case company.

The measures for the first part are developed based on summarizing the key findings of the theoretical and interview data. In the case of the case company, the success of the IT project outcome is recommended to be evaluated with measures that focus on time, cost, and scope, but also on benefit realization and quality. The duration of the project and the pay-back time are time-related measures. The project costs are evaluated by comparing the planned and realized costs and running costs. Net Present Value (NPV) measure offers an understanding of how much is the project worth now and what are the future expectations. Return on Investment (ROI) gives information about the success of a project by telling the efficiency of the investment. Measuring key result progress identifies how successfully the project objectives have been reached. The number of scope changes reflect the quality of the project, as it is one of the few ways to evaluate quality before end-user or customer satisfaction evaluation is possible.

The required information for the measures used in the template is recommended to be summarized from the Business Case and Project Plan reports that are already part of the

reporting practices of the case company. However, the reality is that those mentioned reports do not provide all the needed information after the planning phase of the projects: all the required definitions, targets, and a plan about how to measure those are not necessarily available for each project. The suggested way of measuring achieved benefits by using an OKR measure called Key result progress, cannot be implemented without defining the objectives and key results separately while planning the project. Another measure that sets new reporting requirements is the number of scope changes. For that purpose, creating a change backlog would be a minimum improvement. All this demonstrates that the reporting practices of the case company need to be improved and the Benefits Realization stage needs its own prerequisites and standards concerning the project closing activities. Also, the Lessons Learned meeting needs to be consistently conducted if the willingness is to implement post-evaluation of IT projects as a part of the best practices of the case company.

7.2 The final template with the measures and other requirements

The Excel file has two sheets. The layout and appearance are designed to be like the other existing Excel files to maintain consistency between different IT project reports of the case company. On the first sheet, there is a possibility to record planned, actual, and revised figures for each measure. Difference-column calculates the difference between records in percentage. On the second instruction sheet are the formulas for using the measures and the suggested source reports. As another requirement, in addition to the measures, the information that should also be recorded in the first part of the post-evaluation template, is the persons who are responsible for the whole follow-up process and reporting, and the actions that are taken if the goals are not reached.

The template and its content, the sources of the measures, and the user instructions have been approved by the case company before publishing this thesis report.

The measures for the first part are:

- Total planned costs vs. total actual costs
- Total planned running costs vs. actual running costs
- NPV (Net Present Value)
- ROI (Return on Investment)
- Planned project duration vs. actual project duration
- Planned payback time vs. actual payback time

- Key result progress
- Number of scope changes

The measures for the second part are:

- End-user / customer satisfaction (biannual survey or other kind of ratings, usability measures like Customer Effort Score (CES), Net Promoter Score (NPS))
- Improvement backlog (feedback from end-users / customers)
- User engagement measure (planned users vs. actual users, cost per user)
- Planned running costs vs. actual running costs
- Planned payback time vs. actual payback time

8 Summary and development possibilities

8.1 Summary

The purpose of the research is to create a perception of how to measure and evaluate success of IT project outcomes from the perspective of the case company. With the help of the research conclusions, it was possible to develop a post-evaluation template that the case company can use when evaluating the success of IT project outcomes.

The beginning of the report introduces the key concepts that are essential for achieving basic understanding about the topic. The key concepts are followed by the theoretical data that creates the foundation for understanding how to measure project success and why measuring or post-evaluation are important for the IT project management of the case company. The interviews offer irreplaceable organizational information and opinions from the professionals with long working history on the industry. Based on all this information it was possible to decide what kind of post-evaluation measures would be the most reasonable ones for the case company.

Key findings of the study are that the current reporting practises of the IT projects in the case company need improvements and the project management triangle can be used for evaluating project success but other approaches to creating post-evaluation measures are needed as well. And as the interviews proved, the quality aspect of the case company requires more in-depth studies. Especially the quality of IT projects should be approached and researched as its own topic, which could be developed together with the general quality function of the case company.

Instead, the initial objective to focus on evaluating the outcome success partly failed. Even though the success of the project process and its outputs are forming a topic that is broad enough to be evaluated on its own, it is not rational or even possible to separate the output and outcome. As the study shows, if the aim is to evaluate the success of the outcome and take those learning points to future projects, there needs to be an understanding about all the factors that have led to that result, whether it is successful or not.

8.2 Reliability of the research and validity of the conclusions

The study is a good combination of sufficient amount of existing research materials and knowledge from the case company related to the topic. The number of sources increased expectedly during the research process because the initial sources defined in the thesis report plan were insufficient and mainly formed a basis for understanding what the key concepts could be. The chosen literary resources consist of reliable publications that have

mostly been published approximately within ten years. The interviews succeeded in delivering valuable information about the topic and the state of IT project management in the case company and those insights can be considered useful outside this thesis as well. The interview meetings were well conducted, considering it was the first time for the author to conduct any interviews. The feedback given by the interviewees was positive; fluency of the appointments and the well-planned presentation were highly appreciated. Even though the time frame of each meeting was tight, it came out to be enough to pose all the questions. The possibility to record the meetings and transcribe them afterward was an advantage that ensured that none of the important information was excluded.

The theoretical research and the interview results are similar, and the measures of the post-evaluation template are approved by the case company. Both of these facts indicate that the results of the research are indeed valid.

8.3 Further development possibilities of the template

More precise and hands-on information about the usability of the post-evaluation template can only be obtained over a longer time span, which is out of the scope of this study and thus impossible to be inspected. Using the second part of the post-evaluation template in the latter Effectiveness Review is an idea that can be introduced in practice after the minimum requirements of the first part have been successfully reached and the development of reporting practices have been realized. At this point it is also good to remind that the purpose of measurement is not only to gain insights or drive benefit realization but to improve the measures themselves when needed. This is another of those things that comes out when enough information has been gathered through practical experience. To be able to use the learnings of this research and transform the theory to practice, the results and the template needs to be tested with a few projects first. From there on it is possible to deploy the new post-evaluation practices as a continual part of IT project model.

Sustainability and circularity related key figures are already well-recognized part of case company operations and sustainability benefits of IT projects are already being recorded in the Business Case. Some kind of sustainability measure of IT projects could, and in the future most probably will be part of the reporting requirements. Utilizing Artificial Intelligence and Machine Learning can easily be seen as a part of the post-evaluation process and the related tools can be used for example for interpreting the results and making better predictions about the projects to come.

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