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Lappeenranta **University of Technology**

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**SUPPORTING IT TRANSFORMATION PROJECTS WITH BUSINESS  
PROCESS MANAGEMENT IN BANKING - METHODOLOGY  
EVALUATION THROUGH CONSULTING CASES**

Master's Thesis

Helsinki, April 22, 2018

Supervisor: Professor Petri Niemi

## ABSTRACT

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Finance sector and banking are under large transformation, as new technologies are emerging to replace initial solutions and services, and new regulations are expanding the requirements towards regulating authorities. Large banks are driving extensive IT transformation programs to replace legacy IT solutions, that are restraining them from meeting modern customer expectations and fulfilling the new regulations.

Large IT transformation programs may have hundreds of employees, integrations to great amount of legacy solutions, and complex networks of stakeholder groups. This challenging project environment can be supported with different project management and delivery methodologies. Business process management and workflow modeling has been tools for increasing process understanding, enhance communications, and support change management in various environments. Business process management tools and techniques were used as part of transformation projects in a large European bank.

The aim of this master's thesis is to evaluate the benefits and requirements of business process management activities, within transformation projects in banking. The evaluation is done through two chosen case projects, that were done for the same target organization. The results of this study are based on feedback and observations from the case studies. The results support findings from previous studies from different industries and project environments.

## TIIVISTELMÄ

**Tekijä:** Aki Jussila

**Otsikko:** Pankkiliiketoiminnan IT muutoshankkeiden tukeminen liiketoimintaprosessien johtamisella – Metodologian arviointi konsultointitapaustutkimusilla

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**Hakusanat:** Pankkiliiketoiminta, BPM, BPMN, Vakuudenhallinta, Rahoitusala, IT muutoshanke, Maksuliiketoiminta, SEPA, Työnkulun mallinnus

Finassiala ja pankkiliiketoiminta ovat suuren muutoksen alla, uusien teknologioiden korvattessa nykyisiä sovelluksia ja palveluita sekä uusien regulaatioiden lisätessä vaatimuksia finassialan toimijoita kohtaan. Suuret pankit tekevät laajoja IT-muutoshankkeita, joilla ne pyrkivät uudistamaan vanhoja järjestelmiään. Tällä hetkellä vanhat järjestelmät rajoittavat modernien asiaksodotusten täyttämistä sekä hankaloittavat regulaatioiden vaatimuksiin vastaamista.

Suurissa IT-muutoshankkeissa voi olla satoja työntekijöitä, integraatioita suureen määrään vanhoja järjestelmiä sekä monimutkaiset sidosryhmäverkostot hallittavana. Tätä haastavaa projektiympäristöä voidaan tukea monilla projektinhallintaa ja -toteutusta tukevilla metodologioilla. Liiketoimintaprosessien johtamista sekä työnkulun mallinusta on käytetty apuna parantamaan liiketoimintaprosessien ymmärrystä, kommunikaation tukena sekä muutosjohtamisen apuna, monenlaisissa projektiympäristöissä. Liiketoimintaprosessien johtamisen työkaluja ja tekniikoita hyödynnettiin suuren Eurooppalaisen pankin muutoshankkeessa.

Tämän diplomityön tavoitteena on arvioida liiketoimintaprosessien johtamisella saavutettavia hyötyjä ja sen vaatimuksia, muutoshankkeissa pankkiliiketoiminnassa. Hyötyjen ja vaatimusten arviointi on tehty kahden, samalle organisaatiolle tehdyn, tapaustutkimuksen avulla. Tutkimuksen tulokset perustuvat palautteisiin ja havaintoihin näissä tapaustutkimuksissa. Tutkimuksen tulokset tukevat tuloksia aikaisemmista vastaavista tutkimuksista eri liiketoimintaloilta ja projektiympäristöistä.

## **FOREWORD**

It was Fall 2015 when I left Lappeenranta University of Technology, to pursue a career in consulting. It was when my professor told me that I will come back in two years to finalize my master's degree. Precisely after two years of building my professional career, I approached my professor after the foreseen hiatus and requested the support for finalizing my master's degree. I wish to express my humble gratitude towards Petri Niemi for supporting me with the journey with this thesis. His extensive knowledge and professionalism guided me through the master's thesis project.

I am grateful for all my friends who supported me during my studies and pushed me to finalize this thesis. I would like to thank my clients who trusted me with the most interesting challenges that I was also able to use for this thesis. I am grateful for the countless experiences and opportunities that LUT gave me during my studies in Lappeenranta, and what I had the privilege to experience in MTU in Michigan. Now it is time for me to head towards new challenges elsewhere. The past experiences has prepared me well.

Helsinki, April 22, 2018

Aki Jussila

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## ABBREVIATIONS

AML	<i>Anti-Money Laundering</i>
API	<i>Application Programming Interface</i>
BPM	<i>Business Process Management</i>
BPMN	<i>Business Process Model and Notation</i>
CSM	<i>Clearing and Settlement Mechanism</i>
EBA	<i>European Banking Authority</i>
EPC	<i>European Payment Council</i>
Fintech	<i>Financial Technology</i>
GDPR	<i>General Data Protection Regulation</i>
IT	<i>Information Technology</i>
KPI	<i>Key Performance Indicator</i>
OMG	<i>Object Management Group</i>
PSD2	<i>Revised Payment Service Directive</i>
SCT Inst	<i>SEPA Instant credit transfers</i>
SEPA	<i>Single Euro Payments Area</i>

## **1. INTRODUCTION**

Large information technology (IT) transformation programs can be highly complex in many aspects. Initial state can be unclear with legacy architecture without a clear picture of all system integrations, that are mandatory for creating value for customers. Collaboration is required between several stakeholder groups to achieve the common goals of the transformations. These common goals are not always self-evident as IT programs may operate under unstable environment with constantly changing business needs.

Large and complex IT transformation programs were ongoing initiatives in a large Nordic bank, when support was requested from IT consultants. These programs were aiming to replace hundreds of legacy systems with handful of modern systems, designed to achieve stable operating ground and increased capability to provide higher value for the customers. Visualization of the current situation and future operating models was carried out with utilizing business process management (BPM) tools and techniques. Purpose of BPM was to support the understanding of the solutions and to support with stakeholder management.

### **1.1. Background**

Software products and systems becomes legacies as new replacing technologies arises with such meaningful capabilities that the existing software products are no more capable of or new systems reduces required resources. Obsolete systems are replaced to reduce complexity, reduce maintenance costs and enable current and future business requirements. Many still operational core banking systems are developed during the 70's and includes overly complicated logics for nowadays standards. (Seacord, et al. 2003 p. 1-17; Matei 2012 p. 92) Many of the largest banks in the world are spending hundreds of millions of US dollars for their modern core banking transformation programs. (Franzen 2010, p. 1-2)

Finance sector is influenced by several technologies that forces banks to face changes in their IT landscapes and positions in banking industry. Instant payments, open application programming interfaces (API), blockchain technologies, mobile banking, and big data are identified as the most significant advancing technologies for banks in payments industry. Blockchain technologies, open banking technologies and APIs are identified as enabler for innovation, to enhance customer engagement and creating new revenue sources for retail banking businesses. Regulations as Revised Payment Service Directive (PSD2) and General Data Protection Regulation (GDPR) are also challenging existing core banking IT systems, payments systems, and banking business processes, increasing the need to revise existing legacy systems and related business processes. (Capgemini & BNP Paribas 2017, p. 34-38; Lloyds Bank 2016; European Union 2016)

Legacy IT systems is one of the challenges, restricting banks to truly enable benefits and functionalities from the newest financial IT technologies. (Mullan et al. 2016, p. 325-330) This creates new challenges with competitiveness for large banks, as new financial technology companies (fintech) are challenging the banking and payments industry, without the restrains of the legacy systems. Fintechs are fulfilling more comprehensively expectations for the gen y and other tech savvy customers. Many banks does not see fintechs as straight competitors but as opportunities for collaboration. One channel for the collaboration between banks and fintechs is bank's application programming interfaces (API) that enables fintechs to access relevant banking data and systems. In this collaboration banks provides the customer base and their data, while fintechs provides the modern customer experience. This requires modern IT architecture for the banks that are willing to open their data for the collaboration. (Capgemini 2018, p. 13-49; Carol 2017)

Another layer of complexity, for the legacy banking IT systems, have been generated through mergers and acquisitions in European banking industry. In 1999 European Union had 10 909 registered operating banks in Europe, compared to 7 274 registered operating banks in November 2017, meaning consolidation of 33 %.

(Varmaz & Laibner 2016 p. 511; European Central Bank 2017) Complexity in banking systems increases the risks in core banking processes, related to transactions and accounting. (Ivan et al. 2012, p. 136-139)

Process modeling and visualizing information system concepts are methods to build understanding around complex information system. Modeling can be used to support several stakeholder groups with providing consistent communication in IT programs. (Recker 2011, p. 11-15; Siau 2004, p. 73-80; Sharp & McDermott 2009, p. 39-48) Cost of fixing systems errors are recognized to grow exponentially as a function of elapsed time of founding the errors, so to minimize additional cost it is relevant to minimize the time taken for error identification. Well executed concept and process modeling can support error detection and fixing the errors. (Moody & Shanks 2003, p. 619–646)

A global delphi study have identified benefits that can be expected to be achieved through comprehensive business process modeling. Benefits were split into three different groups of stakeholders. These were practitioners, vendors, and academics. Three most significant benefits were identified as process improvement, increased understanding, and communication. Perceived benefits were varying between the different stakeholder groups, but ten most significant benefits are summarized in the table 1. (Indulska et al. 2009)

**Table 1.** Top ten business process modeling benefits (adapting Indulska et al. 2009)

<b>Issue</b>	<b>Description</b>
Process improvement	Greater ability to improve business processes
Understanding	Improved and consistent understanding of business processes
Communication	Improved communication of business processes across different stakeholder groups
Model-driven process execution	Ability to facilitate or support process automation, execution enactment on the basis of the models
Process performance measurement	Issues related to the definitions, identification or modeling of adequate levels of process abstraction
Process analysis	Greater ability to model processes to analyze them for possible problems, and/or time/cost reductions
Knowledge management	Support for identification, capture and management of organizational knowledge
Re-use	Greater ability to re-use previously designed validated processes
Process simulation	Greater ability to see how a current or re-designed process might operate, and its implications
Change management	Support for business change management practices, results or impacts

## 1.2. Research objectives and questions

There are several books and studies related to evaluation of business process modeling techniques and grammars (Teplykh 2010; Recker 2011; Sharp & McDermott 2009; Indulska et al. 2009) This master's thesis will evaluate how process modelling concepts supports change needs in finance sector and especially in large scale IT transformation programs. Focus of the evaluation will be based on consulting cases from the scope of this master's thesis.

The purpose of the thesis is to evaluate what benefits could be expected when applying business process management (BPM) methodologies into IT transformation programs in banking. This enables BPM practitioners, bank IT transformation program decision makers, and banking IS vendors evaluate whether BPM servers their specific needs in the given context. It is expected that applying BPM comes with requirements for the project and project environment. Identifying

these requirements supports comprehensive evaluation, is adapting BPM worth the benefits.

To attain the goals of the research, research questions are formulated:

1. *What are the benefits of Business Process Management in IT transformation programs in banking?*
2. *What are the requirements for successfully applying Business Process Management in IT transformation programs in banking?*

### **1.3. Scope and Limitations**

This master's thesis focuses on evaluating two case studies within one bank. Several projects were carried out at the target organization, utilizing BPM methodologies, but only two cases are evaluated. These two cases were chosen, as they both adapted large set of BPM practices, utilized BPM tools for several months, contributed to changes into the receiving organization's ways of working and therefore being transformational, and both projects were successful with the BPM adaptation. In contrast, the focus areas are different between the case studies, as first one includes an introduction of a new payment scheme functionality for the bank and the second case is a project where legacy collateral management systems were replaced with one new system. Both projects were also delivered with using different methodologies. First project was managed with waterfall approach and the second project applied agile development principles. This master's thesis will not evaluate the performance of the delivery methodologies, but it will evaluate what kind of benefits BPM provided within these two different contexts. Studying two cases from the same organization, reduces the variance in the case environment as the company had established its own BPM methodology.

Both case projects used other methodologies and practices in parallel with BPM, such as business architecture, capability mapping, information architecture, and

requirements engineering. This master's thesis will focus on evaluating BPM and related activities and does not assess the other methodologies used in the case projects. The final evaluation is focused on the observations and feedbacks from the case studies.

#### **1.4. Structure of the thesis**

This master's thesis has been divided into five main chapters. The structure of this master's thesis has been illustrated in Figure 1. The first chapter describes the background and purpose of this study. It provides the research objectives and question, including the scope and limitations of the study.

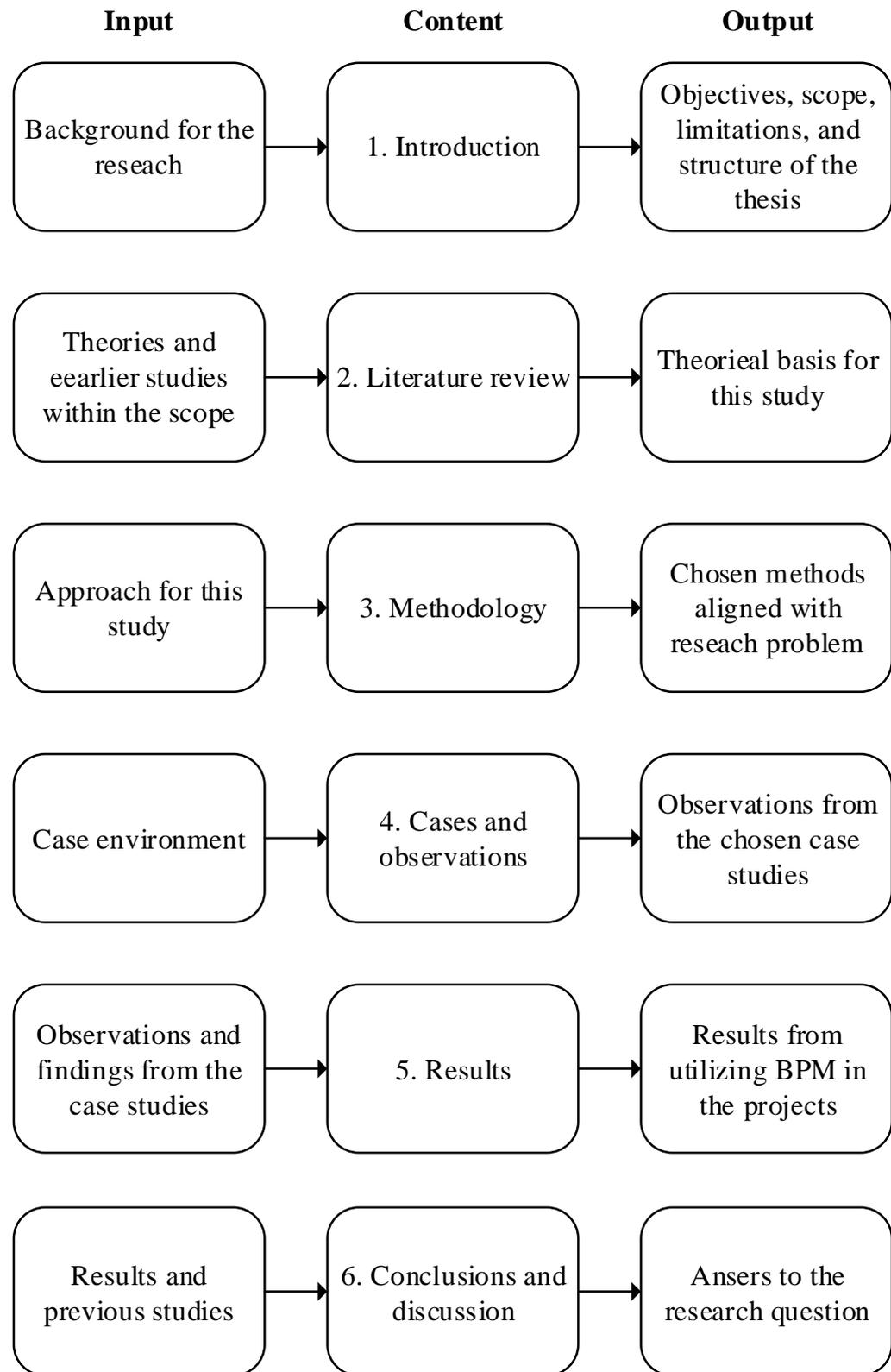
The second chapter provides a literature review within the context of BPM. This provides the theoretical basis for the study and case evaluation. It describes the theoretical approach for business process modeling and supporting methodologies, including a review on the recent studies within the scope of this master's thesis.

The third chapter describes the empirical methodologies and approach for this master's thesis. It provides the reason why the methods were chosen and how they are relevant contribution for answering the research question.

The fourth chapter provides a comprehensive description of the case environment and case studies. This chapter includes description on how BPM was utilized in each of the case projects. Observations and feedbacks from utilizing BPM activities are described in forms of benefits and requirements, after introducing each of the cases.

The fifth chapter consolidates the results from the case studies. It includes a comparison between the case environments and summarizes the results. The results will be compared to the literature review.

The final chapter provides conclusions and discussion around the study. Conclusions are answering for the research question. End of sixth chapter includes contribution for the previous studies and potential topics for future research.



**Figure 1.** Structure of this master's thesis

## **2. LITERATURE REVIEW**

Business process modeling techniques, principles, and management have gone through several great changes, aiming to serve the needs of the era. All in common for these different approaches for modeling, is the need to describe “how” organizations execute specific work, whether we study 90’s business process re-engineering, Business Process Model and Notation (BPMN) or basic flowcharts. (Dumas et al. 2013, p. 1-3; Sharp & McDermott 2009, p. 13-28) This master’s thesis elaborates on the basic process modeling techniques and theories that are acknowledged by the target organization of the consulting cases. This includes workflow modeling, BPMN and supporting BPM frameworks, including process governance structures and process lifecycle management.

There are several definitions for process. Many descriptions notes that process models are graphical presentations of certain pieces of work, started by specific start event or trigger, involves activities, and deliver discrete results or outputs. (Sharp & McDermott 2009, p. 39-48; Recker 2011, p. 2) These models are created by using chosen process modeling grammars. These grammars includes BPMN, Control Flow Diagrams, Data Flow Diagrams, Flow Charts, Functional Flow Block Diagrams, Gantt/PERT Diagrams, IDEF, and UML. (Dufresne & Martin 2003, p. 5-10). There’s also several other grammars, some more theoretical, some more practical (Recker 2011, p. 4-10). Evaluation of these grammars is not within the scope of this master’s thesis.

### **2.1. Workflow modeling**

Workflow modeling is visualizing organization’s specific work into graphical format. It aims to create simple and self-explanatory diagrams that are easy to read for all stakeholders. They show all actors in the workflow, what specific steps they are responsible and how they interact with each other. (Sharp & McDermott 2009, p. 39-48)

Visually workflow diagrams are constructed with actors, swimlanes, steps, flows and handoffs. Actors represents who is carrying out, and responsible of, a specific tasks in the workflow. Actors can be specific roles, systems or other entities carrying out the work and are show at the beginning of swimlanes. In this way swimlanes represents the actor in workflow and covers the entire length of the workflow. They organize steps under the actors and emphasize responsibilities. Steps represents activities, task, or the actual pieces of work and services that are carried out by the actors. Steps are visualized with rounded rectangles. Flows are showing the sequence dependency of tasks. Handoffs represents the flows between two actors. (Sharp & McDermott 2009, p. 77-82)

Workflow-driven methodology is built on three main phases: establishing process context, scope, and goals, understand as-is process-workflow and other enablers, and define to-be process characteristics and requirements. (Sharp & McDermott 2009, p. 83-85)

Purpose of the first phase is to define clear scope for the modeling project and the overall goal for the processes in the scope. Scope is defined by developing a process map or process landscape. This should include the processes within the scope and also process triggering events, outcomes, related organizations, and systems and mechanisms supporting current scope. (Sharp & McDermott 2009, p. 84)

Second phase covers modeling current state, or in other words as-is workflows. As-is models are created to understand, why process goals are not met in the current state and what are the factors contributing for it. As-is models are basis for analyzing the changes required. (Sharp & McDermott 2009, p. 85)

Third and final phase is designing to-be process. To-be process are visualization of desired ways of processing and drawn to represent the target state of the process. This phase should be based on thorough assessment and analysis of the as-is processes to understand what should be changed and how to meet organizational goals for the future state process. (Sharp & McDermott 2009, p. 85)

Workflow models can be used to assess the statuses of business operations, understand improvement opportunities and current strengths. It is a viable tool to support system development or for programs acquiring new information system from external vendor. This can clarify whether the new system will support the business goals, affected by the new system. (Sharp & McDermott 2009, p. 88)

## **2.2. BPMN**

BPMN is acknowledged framework and grammar by the target organization of the consulting cases. It is developed by Object Management Group (OMG) with goal to provide a standard notation that is understandable and consistent for BPM practitioners, business units, IT developers and other stakeholder groups, and to create portable process definitions between different modeling tools. BPMN enables different stakeholders to visually see subjects of discussion in a standardized modeling grammar while utilizing other standards to define data types, expressions and service operations. These are XML Schema, XPath, and WSDL. BPMN was originally released in May 2004 and the current version of BPMN is known as 2.0. (Geiger et al. 2017 p. 250-252; Corradini et al. 2018, p 1-3; OMG 2011 p. 1, 49)

BPMN is structured around graphical elements. These standard elements create the basis for easily understandable and high-quality business process models. BPMN uses the most familiar modeling elements for modelers and practitioners. These elements are simple, to ensure consistency and ease of use, without compromising the ability to visualize complex business processes. BPMN categorizes these elements into five main categories:

1. Flow objects
2. Data
3. Connecting objects
4. Swimlanes
5. Artifacts

BPMN flow objects are events, activities, and gateways. Events are the process triggers or start events, results of process or end events and intermediate events. Extended BPMN modeling elements includes visual event symbols for messages, timers, errors, compensations, conditionals, links, multiples, terminates, signals, cancellations, escalations, and parallel multiples. Visual representation for events are circles. (OMG 2011, p. 27)

Activities presents the work performed by the organization. Activities also includes choreography tasks and sub-processes. Tasks and are represented with rounded rectangles. (OMG 2011, p. 29)

Gateways are presenting divergence in the process flow. It determines branching, forking, merging, and joining of process paths. Gateways are visualized with diamond shape. The decision types for which BPMN have specific visualization symbol are exclusive, complex, event-Based, inclusive, parallel event-Based, and parallel. (OMG 2011, p. 34)

BPMN is built with these main flow objects but framework also acknowledges other variations of these objects. It encourages to use simple visualizations, if applicable in the visualization context. (OMG 2011, p. 27)

Data is represented with four elements. These elements are data objects, data inputs, data outputs, and data stores. These elements provide information on what activities are required to perform or what do they produce. (OMG 2011, p. 28-36)

There are four main connecting objects. These are sequence flows, message flows, associations, and data associations. Sequence flows visualizes the order that activities are performed. Sequence flows are presented as solid arrows. Message flows shows the flows of messages between two separate participants in the process. Message flows are visualized as arrows with dashed line. Associations are used to link information objects and artifacts with graphical elements. Associations are

visualized with dotted line and may have arrow head if direction of flow is relevant in the context. (OMG 2011, p. 28-29)

Swimlanes describes categorization and responsibilities in the process. Swimlanes includes two graphical elements, pools and lanes. Pools represents participants in the process and also acts as a swimlane. Lanes are used to organize and categorize the activities in the process and they extends the entire length of the process. (OMG 2011, p. 30)

Artifacts are used to provide additional information that is not visualized with other elements and not directly linked to message flows or sequence flows. Groups and text annotations are standard artifacts in BPMN, but it is not limited to use only of these two. Associations are used to link information and artifacts with Flow Objects. Associations are visualized with dotted lines. (OMG 2011, p. 28-40)

Group objects provides a visualization of grouping for elements. Groupings are not flow objects so they are not connected to sequence flows. Groups can be used to highlight certain areas within a process. Groupings are visualized with rounded rectangle with solid dashed lines. (OMG 2011, p. 30)

Text annotations are used to provide additional information of a process diagram that is not otherwise visible from the other elements. Text annotations can be linked with flow objects but does not affect the process flow. Text annotations are visualized with open rectangle that with a solid single line. (OMG 2011, p. 30)

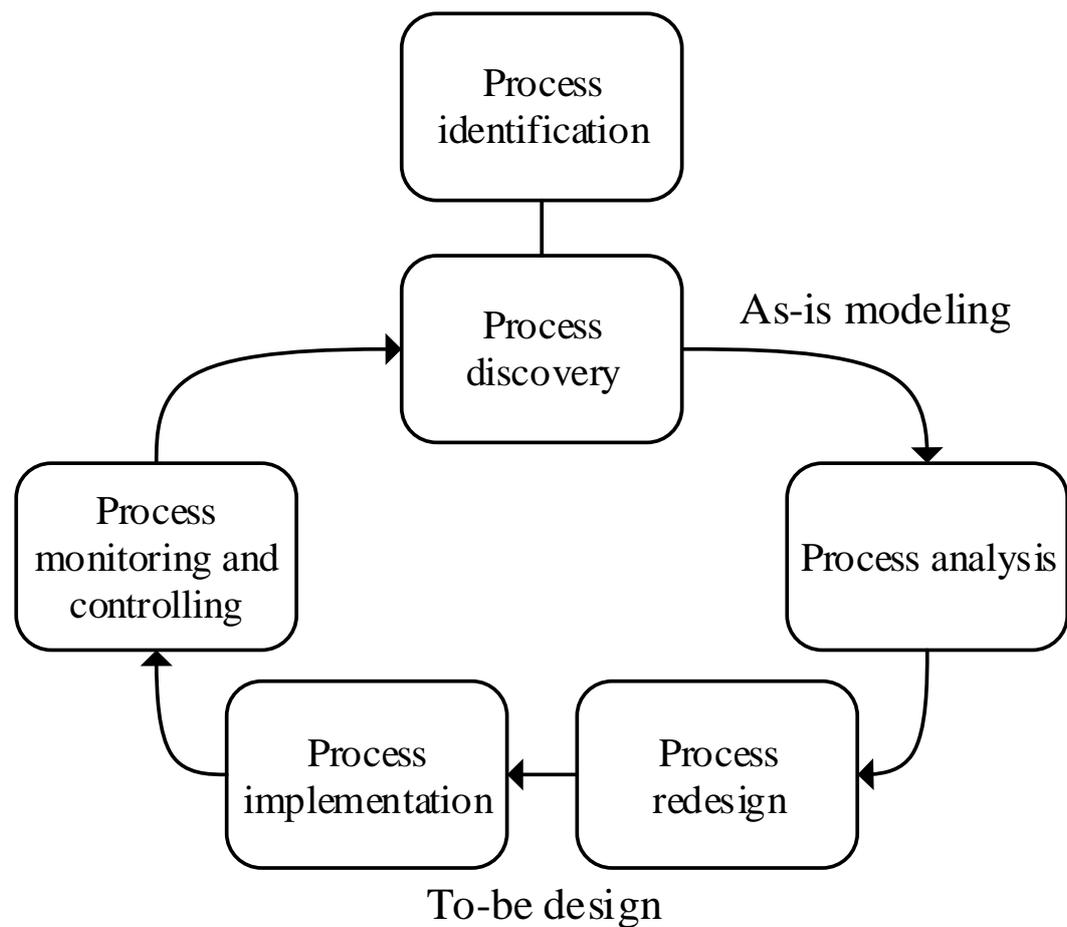
Process is defined in BPMN as follows: *"A Process describes a sequence or flow of Activities in an organization with the objective of carrying out work. In BPMN a Process is depicted as a graph of Flow Elements, which are a set of Activities, Events, Gateways, and Sequence Flows that define finite execution semantics"* (OMG 2011, p. 145) BPMN is designed to cover three models of processes: private processes, public processes, and choreographies. Private processes is internal for the organization and refers what BPM describes as workflow. Public processes

represents interactions between private processes, another processes, or another participants. Public processes does not show the details of private processes but the messages that creates the interaction between these two or more participants. Choreography describes how participants coordinate their interactions. This is different from other process types as it does not show the way how work is performed but focuses on the exchange of information between relevant participants. (OMG 2011, p. 23-25)

BPMN provides examples of business processes that can be modeled using BPMN. As example it is applicable for high-level non-executable process activities, detailed executable business process, as-is business process, and to-be business process. (OMG 2011)

### **2.3. Business process lifecycle**

Business process lifecycle describes the phases of process development. Purpose of process lifecycle models is to describe the sequence of typical process development related activities, from identifying the process under improvement to monitoring the performance of improved process. Typical phases of these lifecycle models are such as process identification, process discovery, process analysis, process redesign, process implementation, and process monitoring and controlling. (Dumas et al. 2013, p. 15-23) Process lifecycle model is visualized in figure 2. There are specific business process lifecycle models for specific business cases and organizational needs. (Papazoglou & Van Den Heuvel 2007, p. 79-85; Markus M. & Jacobson D. 2015, p. 311-315) In this master's thesis, a generic process lifecycle model is introduced.



**Figure 2.** Example business process lifecycle (Adapting Dumas et al. 2013)

First phase is process identification. This is the phase where organization identifies improvement opportunity, change or problem in business. Specific processes are not modified in this phase but the overview of the processes under change is identified. This should represent the processes in scope or in other words, process architecture. (Dumas et al. 2013, p. 21-22)

Process discovery is phase for current state analysis for processes in scope. Main delivery of process discovery is as-is documentation of the processes and workflows in scope. (Dumas et al. 2013, p. 21-22) Principles of as-is modeling is introduced in chapter 2.1.

Process analysis includes analyzing the current state as-is diagrams. Output from the analysis is documentation of the issues related to the processes. These issues are

also quantified, prioritized, and estimated by the estimated by required resolution effort. Existing key performance indicators (KPI) could be used to support analysis if such exists. Output of this phase is insight on weaknesses and estimation of their impacts. (Dumas et al. 2013, p. 21-22)

Process redesign is based on previous as-is models and analysis of the models. This is phase for developing changes to meet desired performance improvement for the processes. Redesign is based on all relevant change factors of which will be combined to achieve desired outcome. Delivery of this phase is to-be processes. (Dumas et al. 2013, p. 21-22) To-be design is introduced in chapter 2.1

Process implementation phase includes identification and execution of required changes of organization and processing to move from as-is processes to to-be processes. This includes changes that can be identified as differences in as-is and to-be process models. Differences can include changes in process actors or participants, different activities in the process, different or automated IT systems, and changes in supporting processes. (Dumas et al. 2013, p. 21-22)

Final phase is process monitoring and controlling. This phase is performed when new to-be processes are active. Performance of the change is monitored, analyzed, and evaluated to determine the performance of new processes. Evaluation is based on identified unintended changes, processing errors or challenges with performance. This evaluation is used to enable next improvement in next cycle of process improvement. (Dumas et al. 2013, p. 21-22)

#### **2.4. Business process governance structures**

There are different stakeholders involved in process lifecycle during different phases. Governance structure for these stakeholders, around business processes, is important to ensure successful business. This governance structure means direction, coordination, responsibilities, mandates, and control for the involved stakeholders. These governance structures may be aligned with organizational structures but are

not necessary to be so. (Markus M. & Jacobson D. 2015, p. 311-315; Dumas et al. 2013, p. 23-25)

Management team can be identified as one key stakeholder group for business processes. Chief Executive Officer is responsible for the company's success. Chief Operations Officer is responsible for the performance of company's operations units and operational processes if there is no appointed Chief Processing Officer. The Chief Information Officer is responsible for the performance of IT system's and IT architecture's performance. The Chief Financial officer is responsible for company's financial performance and financial activities. Human Resource director is responsible for organizations workforce resources. Management team's responsibilities varies based on how the organization is structured and also other top managerial positions can also be relevant for business process governance. Management team is responsible for organization's strategic goals and steering process lifecycle to fulfill those goals. (Dumas et al. 2013, p. 23-24)

Process owner is a role appointed to be responsible for the specific process. Process owner is responsible for the process through the lifecycle if the owner role is not changed between as-is and to-be transition. They are responsible for setting the goals and KPIs, ensuring efficient execution, measuring the performance, and initiating improvement activities of the process. One process owner can own several business processes within the same organization. (Dumas et al. 2013, p. 24)

Participants are the people performing the process activities. They are subject matter experts for the process, coordinated by process owner. Process participants are involved in process lifecycle by supporting process analysis, development, and improvement implementation. (Dumas et al. 2013, p. 24)

Process analyst are the experts of BPM techniques and process modeling. They coordinate several activities in process lifecycle depending on their specific skills. Business oriented process analyst works around organizational requirements, process performance, and change management. IT oriented process analysts works

with process automation. They conduct process identification, analysis, and to-be design activities. (Dumas et al. 2013, p. 24-25)

Systems engineers captures system requirements during to-be design and are responsible for system testing and implementation. They cooperate with process owners and process participants to secure that system designs are serves business needs. (Dumas et al. 2013, p. 25)

BPM group is group of experienced process experts. They are responsible for maintaining organization's BPM methodology, BPM systems, and overall BPM culture. They support organization's process lifecycles with their knowledge and also maintain process architecture. These groups are more common in large companies. (Dumas et al. 2013, p. 25)

There are three main reasons identified for organizations to understand governance of their processes. First is to identify inefficiencies and errors in business processes and how governance contributes for them. Second reason is to understand how processes are governed before implementing any changes for processes and therefore understand what parts of organizations are touched upon through the changes in different phases of business process lifecycle. Third reason is to enable good maintenance and business process success after the implemented changes. (Markus M. & Jacobson D. 2015, p. 311-315)

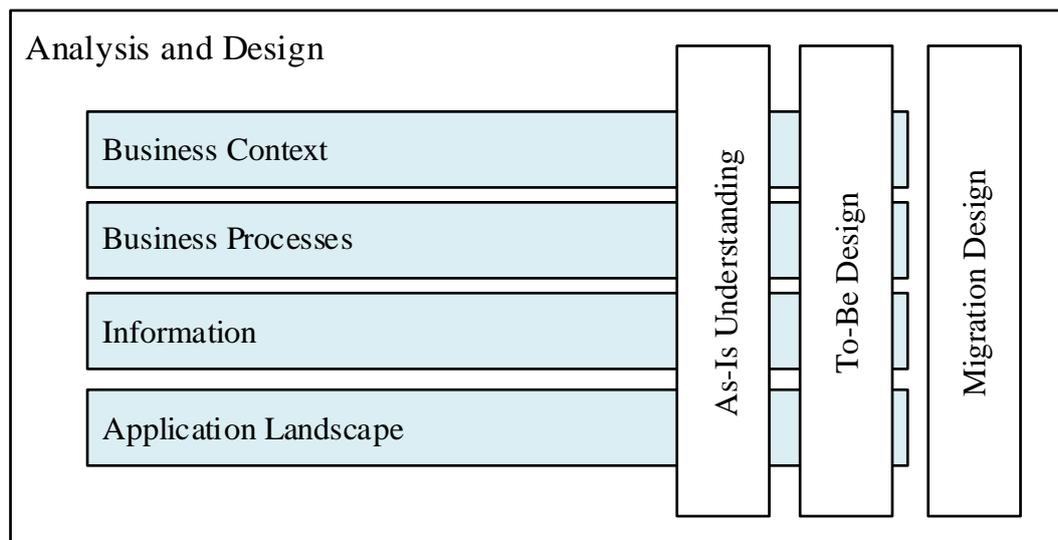
## **2.5. BPM in a consulting company**

BPM activities in the organization was partially done by external consultants. Consulting company, that provided external BPM capabilities, had its own approach for BPM. Purpose of this chapter is to introduce the characteristics of the approach by the consulting company.

BPM is seen as a part of business analysis in projects and programs. Business analysis is seen as a practice to identify the needs of a business and structuring a

solution for catering the identified business needs. Solution is commonly structured around IT systems. According to the consulting company, business analysis is built with three key areas. These areas are subject matter expertise, business process management and information analysis.

The highest level of business analysis comes from the business context. Business context defines the business needs and requires subject matter expertise. Business needs determines the features that are required to fulfill the needs. Business processes are describing how these needs are fulfilled. Information and data are what the processes requires to be executed. In case of IT solution, applications are used to cater the processing of the information.



**Figure 3.** Business processes as part of business analysis

Figure 3 visualizes the project approach for business analysis. Business context, business processes, information, and application landscape are different streams that are approached within three phases in sequence and should be worked in that order in each of the phases. As-is understanding involves the current state analysis for each of the streams. The purpose of this phase is to create a common understanding of how the business works today, as base for future improvements. The Business Context, business processes, information and applications of the current situation are described coherently. The level of detail should be described

as far as needed to design the future situation and how to migrate from the current to that future situation, but not excessively. The objective of the to-be design is to create a design of the desired situation, which meets the objectives and the business requirements of the business. The design should be created after the business drivers for the business initiative have been articulated and validated against the findings in the as-is analysis. Migrations design I conducted to enable transformation from the as-is situation into the designed to-be state.

BPM as such is seen as a management discipline. It requires and enables organizations to manage business processes within business process lifecycles. Lifecycles consists process design, process monitoring and measuring, and continuous optimization and improvement. The goal for business process lifecycles is to improve products or services. Improvement should be tangible in forms of cost efficiency, agility, process transparency, process standardization and improved ability to manage business processes in structured manner. BPM should aim to create a business setup, where processes are an asset to be valued, designed and utilized to create customer value. IT is seen as an essential enabler for BPM. BPMN 2.0 is acknowledged as the preferred modeling language.

### 3. METHODOLOGY

The research methods for this master's thesis are constructed around literature review, case studies, and participatory action research. Literature review is descriptive part of the thesis, case studies were used to gather empirical observations, also including characteristics of participatory action research.

Case studies were used as the primary research method in this master's thesis. Case study is defined as an empirical research method that studies phenomenon in their real context. Case studies are common in business context when evaluating specific phenomenon in contrast to the target organization. (Yin 2002, p. 13-14)

Case studies are preferred research method when comprehensive understanding of complex phenomenon is sought after and to when questions what, how, and why are to be answered. (Ghauri & Gronhaug 2010, p. 109-110) Case study, as a research method, is based on understanding contexts and presented processes. Usually data is collected by utilizing several different methods. (Saunders et al. 2009, s. 146) Case studies were chosen as the primary research method as the method is good fit to study and challenge the research question. Data collection methods for the case studies in this master's thesis includes, observations, and interviews.

The cases for this master's thesis were chosen from several consulting cases that were conducted for the same target organization. Target organization is in a large role of case studies as the boundaries of the context and researched phenomenon can be hard to identify. (Yin 2002, p. 13-14) Therefore cases were chosen from the projects conducted for the same target organization.

From several cases a total of two cases were chosen to be studied to support the research for this master's thesis. These two cases were chosen as they were identified as the most relevant to study the topic of research question of this master's thesis. These two cases were the most comprehensive cases utilizing BPM, and they

were successful cases for the business of the target organization. These two cases were also studied in different phases regarding BPM lifecycle so that the methodology could be evaluated in more comprehensive manner. The first case was utilizing BPM as part of new payment scheme in new payment engine and the second case was utilizing BPM for collateral management transformation project. Both cases are described in more details in chapter 5.

The research method of case studies also have characteristics of participatory action research as the case studies were executed as participant of the projects studied. The participant role was external business analyst as part of the projects, supporting the needs of target organization. From the chosen case studies an identified key features of participatory action research methodology includes, collaboration between researcher and the target of the research, and incorporating local knowledge. (Greenwood et al. 1993, p. 175-192)

### **3.1. Research problem setting and objectives**

In the projects of the cases, there are several business activities affected and stakeholder groups to be communicated with. Inconsistent or faulty communication and non-comprehensive change analysis can lead to unexpected challenges during and after the projects. Therefore, consistent communication tools are needed and clear structures are required, around the changes created by the projects. As it was found in the literature review, BPM tools and techniques can support understanding how organizations execute specific work and constructing management and governance structures around it. It was shown in chapter 1.1. that successful BPM adaptation enables benefits for process improvement, process understanding, process communication, process analysis, and other process management benefits.

Answers to the research question will be based on the literature review and the nature of chosen case studies. Objective is to study whether BPM is able to support communication, change management, and business analysis in the large scale IT transformation projects. This will be evaluated through the data collected by the

research in the case studies. Requirements for the BPM adaptation will be evaluated, to support the decision making, whether adapting BPM and its benefits are worth the requirements.

Experiences from stakeholders were collected to study the research objectives and to construct the answers for the research question. Experiences were collected in forms of observations and feedback, during both of the case studies. Observations were gathered constantly during projects and feedback was gathered during and after the projects. The observations were done, and feedback was collected while working as a business process expert in the projects. It was a part of the business process expert role and expected from the project organizations, to enhance the ability to steer the business process work to provide the highest value for the projects.

Observations and feedback are structured and summarized in chapter 6. The detailed documentation is not part of this thesis to ensure anonymity of the target organization, which was in a client relationship with the consulting company that delivered parts of the case projects. Conclusions and discussions in the chapter 6. are based on the feedback and observations, gathered as presented in this chapter. Feedback and observations are also compared to the methodologies of the consulting company in the chapter 6.2., linked with managerial implications.

## **4. CASES AND OBSERVATIONS**

Purpose of this chapter is to describe, what the content and context were of the case studies, how BPM was utilized in the case projects, and to summarize the results of utilizing BPM. Chapter have been divided into three different subsections. The first subsection describes characteristics of the target organization of the case studies. This includes a description of the organization's key characteristics and a description of the organization's BPM framework. The second subsection describes the first case study, the implementation of SEPA instant payment scheme, and BPM as part of the implementation project for the target organization. The third subsection describes the second case study, how BPM was used to support collateral management system transformation project for the same target organization.

### **4.1. Target organization**

The target organization was a large European bank. The bank operated in corporate banking, investment banking, personal banking, private banking, and transaction banking areas. During years 2016 - 2017, the target organization's total operating income was approximately 10 000 million Euros for both years and it had over 30 000 employees.

The target organization had a history of several acquisition of banks operating in the same region. These acquisitions had created a complex and scattered IT landscape that included several hundreds of necessary systems for payments' execution, investment activities, and core banking operations. The organization had identified the significant effort required for maintenance and update of these systems and challenge to fulfill modern business requirements with them. This situation had led the organization to initiate IT transformation programs to simplify the IT landscape, aiming to lower IT maintenance costs, standardize system landscape on a group level, and to enable faster response time for market needs. The case studies in this master's thesis are part of these transformation programs and described in more details in chapters 5.2 and 5.3.

#### **4.1.1. Target organization's BPM framework**

The target organization had its own implementation of BPM framework. The organization acknowledges BPMN as the process modeling grammar, had developed its own business process lifecycle framework, and developed process governance roles to support BPM. This framework was developed, maintained and implemented into the organization by central business process management team. This team was a collection of experienced BPM practitioners that worked as business process experts (BPE) in the organization's projects and programs.

BPMN was not utilized with the full extent but the organization had taken most of it into use. Flow objects were implemented with limited scope. Events and activities were implemented as they are in BPMN but from gateways, only exclusive, inclusive, and parallel were implemented. Data objects were implemented as they are defined in BPMN. Sequence flows and message flows were used from connecting objects category. Swimlanes were used as BPMN defines them. Visualization of swimlanes were done both horizontally and vertically, depending on the visualization tool used. Both of the two standard artifacts, text annotations and groups, were used as defined in BPMN.

#### **4.1.2. Target organization's business process lifecycle**

The organization had developed its own version of business process lifecycle. It was developed to work as a common way of working with process development, ensure quality of process documentation, and to ensure the continuous improvement of business processes. The model was constructed around six phases of which were scoping, modeling, implementing, monitoring, analyzing, and optimizing.

The first phase in the model was scoping. Purpose of this phase was to describe background and reasoning for the business process initiative. This includes evaluation of the project scope, timeline and magnitude of the impact, appoint target

and project organizations, identify key stakeholders and appoint process governance roles.

Modeling was the second phase of the lifecycle model. It includes the analysis of existing process descriptions, conduct as-is process modeling workshops, defining customer journeys, identification of process improvement areas, conduct to-be process design workshops, develop to-be processes, define performance indicators for the target processes, and perform testing towards to-be processes.

The third phase was the implementation. This included the handover of the process documentation and responsibility from the project organization to the business line organization. Quality check was conducted for the processes and related documentation. Support with the process documentation was provided for the program communication and teams conducting training.

The fourth phase was monitoring. Process monitoring was executed through the process performance indicators that were defined in the modeling phase.

Analyzing phase was the fifth phase in the process lifecycle model. It included analysis of the performance indicator metrics, generating solutions for the identified improvement opportunities, and communicating the findings and solutions with relevant stakeholders.

The final phase of the process lifecycle model was optimizing. This was the implementation of improvements from the previous phase and initiation of another process development projects through revisions of current as-is documentation.

There were also standard artifacts and templates designed for each of the phases, when relevant. SIPOC –tool and template was created for the scoping phase. SIPOC stands for supplier, input, process, output, and customer. As the abbreviation states, these the aspects that were to be identified in the scoping phase for each of the processes. Standard MS Visio –template was provided for modeling as-is business

processes and to-be business processes. Quality checklist was provided towards business process drawings to ensure consistent look and feel for all of the process drawings. For KPIs, a standard MS Excel template was provided.

#### 4.1.3. Business process governance

Business process governance roles were defined to support organization's PLC model and BPM in the process development and improvement projects. Target organization's business process governance model was structured around four roles. These roles were process owner, process manager, process specialist, and BPE.

Process owner was defined as being accountable on the strategic level. It was the role accountable for the strategic steering of the processes and responsible for setting process goals and targets to serve the strategic goals. It was set to be accountable for the process performance, SLA establishment, process lifecycle management, prioritization of improvement activities, providing resources for process improvement, harmonization and standardization of processes on group level, process risk management, and process compliance.

Process manager was defined as being responsible on tactical level. It was the role to ensure that the processes meets the strategic goals by being responsible for setting up tactical goals and ambitions for the processes. Process manager was responsible for following up process performance indicators, following up SLAs, driving process improvement initiatives, aligning process improvements on operational level, identifying operational risks, implementing compliance initiatives, ensuring up to date process documentation, and communication of the process initiatives for the relevant stakeholders.

Process specialist was defined as performing on the operational level. It was the role that performs the process activities and monitors the process performance. Process specialist is responsible for executing the processes on the agreed

performance level, providing input for both strategic and tactical goals, identifying process improvement opportunities, identifying process risks, performing risk mitigating activities, and creating working instructions.

Business process expert was not defined as process responsible role in process performance perspective but being the strategic and daily sparring partner for the other process roles in the framework. BPE was the facilitator of the process lifecycle activities such as process scoping, process modeling, performance indicator definition, process performance analysis, and continuous improvement model definition.

#### **4.2. BPM as part of SEPA instant credit transfer implementation project**

The organization launched a project to implement SCT Ints. payment scheme capability into its payment engine in June 2016. This project is used as a first case example in this master's thesis, as BPM was used extensively to support the system implementation. This sub-chapter describes the purpose of the project, project organization, SCT Inst. payment scheme main functionalities, how BPM was used as part of the project, how business processes were designed in the project, and what were the results utilizing BPM. The results part of this sub-chapter contributes for structuring the answer for the research question of this master's thesis.

##### **4.2.1. Purpose and approach of the project**

Objectives for the project were to transform the organization's payment systems to process SCT Ints. payments, enable line organization for processing of SCT Inst. payments, and prepare the receiving organization to take ownership of the new capability. Payment systems' transformation was planned to be delivered by defining the required target payment architecture for SCT Inst., utilizing bank's current payment engine and other payment systems that were suitable for the new scheme, and implementing the mandatory new functionalities. The existing payment systems in scope were payment accounting system, payment screening

system, fraud monitoring system, payment customer channels, payment order management system, and the payment engine that communicates towards European Banking Authority (EBA). Line organization's units that were planned to be included with the changes were the business unit responsible for the bank's SEPA payment capability, the unit responsible for the payments screening and anti-money laundering (AML) and fraud management, the payment application management unit, the customer support unit, and the unit responsible for payment channels.

Payment accounting systems was the system performing payment bookings into banks internal books including loro, voro, and nostro accounts, and customer accounts. Payment screening system was preventing money transfer against global and local payment blacklists and preventing crime and terrorism related financial activities. Fraud monitoring system was the system collecting customer behavior data and performing customer profiling based on the data. Purpose of this profiling was to recognize suspicious customer behaviors to prevent fraudulent money transfers. Both the payment screening system and the fraud monitoring system were in place to fulfill compliance legislations and to ensure the legality of the money transfers. Customer channels were the applications where the bank communicated with its customers and where customers performed payment activities. Payment order management and payment engine were the systems executing payment messages and integrated all the other systems to enable the payment functionality.

Objectives were planned to build a solution to ensure that the organization can execute and manage SCT Inst. payments, every day with no downtimes. Objectives were planned to be fulfilled with scoping in the SCT Inst. core functionality, compliance towards European Payment Council's (EPC) SCT Inst. rulebook, enable one customer channel to be used for the scheme, include accounts from bank's one operating country, and create ability to expand the solution to other countries and other customer channels. Objective was to participate EPC's pilot in November 2017.

Project was planned to be delivered through two main phases. First was the maturing phase, to build the knowledge and capabilities for the project organization and draft high-level requirements of the solution. Second phase was to prepare deliverables, where detailed requirements were to be built for delivery for the selected vendor and initiate dry run of the solution.

#### 4.2.2. Project organization

Project organization was structured with customer organization's participants, consultants, and a vendor. Participants from customer organization were project management, business representatives and IT representatives.

Project management carried managerial tasks such as strategic steering of the project, staffing, budgeting, and stakeholder management. Program management reported for the company's program portfolio steering group that controlled several IT and business change projects simultaneously. The program sponsor was accountable for the delivery and part of the program portfolio steering group.

Business representatives consisted of process owners, product owners, business driver and other supporting business roles. Product and process owners were responsible to ensure that the project fulfills business needs, provide subject matter expertise, and to represent business in requirements engineering team. Process and product owners were expected to continue as such roles also after the project was finalized. Business driver managed the decision making on business perspective and reported the progress and results for the steering group. Other business roles performed business change management, supported with business analysis and conducted user acceptance testing.

IT representatives were IT architects and organization group's IT representatives. IT architects delivered architectural design for the new system to ensure a good fit into company's existing IT landscape. Group IT representatives were part of

requirements engineering team to ensure solutions fit for existing IT capabilities, such as sanction screening, AML, and reporting.

Consultants fulfilled gaps in customer organizations capabilities by providing external expertise, in subject matter and methodology aspects. Requirement engineering team was led by senior consultant and supported by another senior consultant. Business process management activities were facilitated and documented by consultant. IT testing was carried out by external consulting company.

Vendor provided the solution based on the requirements by the requirements engineering team. Vendor's solution was based on EPC's standards for SEPA Instant credit transfers (SCT Inst) but aligned to fit customer company's IT landscape and business needs.

#### 4.2.3. SEPA Instant credit transfer

SCT Inst is a payment scheme designed and managed by EPC. Purpose of the scheme is to provide a standard pan-European instant payment scheme, designed to serve current needs of European banks and available for all organizations and individuals in SEPA coverage area. (EPC 2017, p. 9-14)

The key benefits features of SCT Inst are maximum payment processing time of 10 seconds, initial maximum payment amount of 15 000 euros, availability of 24 hours a day and on all calendar days of the year, and flexibility to serve specific needs in the changing industry. (EPC 2017, p. 9-14)

Maximum payment processing time is set for 10 seconds. It covers the processing time between payment originator and payment beneficiary. In this time all the necessary processing steps must be executed, beneficiary must be credited, and payment originator debited. Rulebook sets hard time-out deadline of 20 seconds if either of the service providers or clearing and settling mechanism (CSM) cannot

execute the payment. Shorter payment execution times are acceptable and scheme participant banks can mutually agree shorter time-out requirements. (EPC 2017, p. 9-14)

The maximum amount of payment is 15 000 euros. Higher payment amounts are rejected by service providers, if higher payment limits are not agreed between participant service providers. All transactions are executed as euros. Payments can be initiated with other currencies but must be converted to euros before initiating message flows between participants. (EPC 2017, p. 9-14)

SCT Inst scheme always available. Participants must offer the payment service every day of the year with no breaks for availability. It is also optional for service providers to participate the scheme only as at beneficiary bank. (EPC 2017, p. 9-14)

The main scheme consists of seven processing steps. Step 1. is initiation of a payment instruction Step 2. is an originator bank sending the payment instruction to CSM. Step 3 is CSM sending the transaction message to a beneficiary bank. Step 4. is the beneficiary bank sending a confirmation message to CSM. Step 5. Is the beneficiary bank making funds available for the beneficiary. Step 6 is CSM informing the originator bank regarding the transaction's outcome. Step 7. is in case of unsuccessful transaction, the beneficiary bank informs the originator bank about failed transaction. Step 7. is not mandatory, in case of a successful payment processing. Processing steps are visualized in figure 4. All participants are also responsible for providing a negative confirmation in case of maximum processing time is exceeded, or if for any reason, the transaction would fail during the payment processing. Participant banks can also initiate payment recalls, in case of participant bank initiates erroneous payment instructions. If the beneficiary bank receives a payment recall, it may return the funds for the originator bank, but it is not forced to do so. Payment returns can be executed through the same scheme as the SCT Inst. payments but with different payment message type. All payment and

information messages in the scheme supports ISO 20022 standard, which is Universal Financial Industry message scheme (EPC 2017, p. 8-14)



**Figure 4.** SCT Inst. scheme functionality

The originator is an individual, an organization or a customer of a bank x, that initiates a payment instruction. The originator bank is a bank, acting on behalf of the originator towards the CSM, informing the originator regarding the success of the payment execution and debiting originator's account. EBA provides CSM for the scheme. The beneficiary is an individual, an organization or a customer of bank y. The beneficiary bank is a bank acting on behalf of the originator towards the CSM, informing the beneficiary regarding the success of a payment execution and crediting beneficiary's account. Additionally, there could be indirect participant banks, in case of subsidiary banks. In these cases the direct participant bank acts on behalf of the subsidiary bank. SCT Inst scheme doesn't define information flows between subsidiaries. (EPC 2017, p. 9-14) Business processes for the customer organization were developed around the scheme, are described in chapter 5.2.5.

#### 4.2.4. BPM as part of the project

The customer organization had history of utilizing BPM as part of its payment development projects. At the time of the SCT Inst. implementation project, the organization was defining other payment processing processes within the same IT landscape than where the new scheme would be implemented. The IT landscape was under a full transformation as the organization was currently replacing legacy payment systems with centralized payment engine. This created a demand to utilize BPM from the beginning of the project from the payment engine transformation program, of which SCT Inst. project was established as well. Project sponsors and

program steering group were the same in all payment transformation projects within the same transformation program.

Projects BPM activities were started with organization's BPM PLC scoping phase. The first BPM activities in the project were workshops for creating SIPOCs for the processes in scope. Before the workshops, these processes were identified by business analysts and SEPA payment scheme subject matter experts, internally from the organization. These workshops included business representatives who would become the process experts after the project, IT architects, internal and external business analysts, business driver, product owner, and the program sponsor.

In the beginning of the BPM work in the project, the identified processes were incoming payments, outgoing payments, incoming returns, outgoing returns, incoming recalls and outgoing recalls. The process workshops generated the understanding of supplying systems and supplying participants, inputs, outputs, and customer systems and customer participants for the identified processes.

The payment scheme was completely new for the organization so as-is analysis by modeling current processes was not relevant activity for the program, as there was now existing solution. However other SEPA payment schemes were used in the bank and process documentation from those schemes were utilized as a basis for SCT Inst. process work. These processes used the same payment system architecture, so the existing processes were relevant a basis for SCT Inst. processes, even though changes were expected from the unique characteristics of the payment scheme. SIPOC workshops generated understanding of current IT systems that were to be used with SCT Inst., and therefore provided some of the information that would have been expected as outputs of extensive as-is process modeling.

The to-be process modeling was done in five months' time. Process modeling was started with high level to-be process drafting, based on the SIPOC, existing payments scheme material and EPC's SCT Inst. rule book. These processes

structured the mandatory payment processing activities in sequence and linked the activities with systems executing the activities. These processes were drafted in workshops with the same setup than what the SIPOC scoping workshops were conducted.

Process modeling was used as a visualization tool while solutioning the different processing phases of the payment scheme. High level processes were detailed as the understanding of the scheme developed during the project. Details of the processes were adjusted several times, while processes were fitted into company's existing IT landscape.

Additional detailing led to structuring the original process flows into several more specific ones, as the amount of activities for the process flows increased. Outgoing payment processing was split into separate process flows for receiving and validating customers' payment instructions and executing and booking of the outgoing payments. Incoming payment processing was split into separate flows for validating and confirming incoming payments and booking incoming payments. The processes for outgoing payments and incoming payments fulfilled the basic scheme functionality that was described in Figure 4. Payment recall flows were defined as receiving recalls, sending recalls and receiving reply for a recall. Other processes, that were required to meet the complete payment scheme entirely were return of payments, receiving revoke requests from customers, receiving payment investigation messages, receiving payment rejections as originator bank, receiving payment rejections as beneficiary bank, and account reconciliation. Sanction screening and AML activities were included into the processes when necessary.

All business processes were defined by business process experts in collaboration with business and IT responsible business analysts, IT architects, and payment subject matter experts. The process flows included required activities, required systems, units responsible of the systems, units performing manual activities, process inputs and outputs, and linkage to company's high-level process map. Possible failure scenarios were visualized into the payment processes as well as

sufficient timers to ensure meeting the time critical processing that the scheme requires. Timers were visualized in the processes when payment related messages were sent outside of the bank and it was mandatory for the message to receive a reply within a time limit. Company's own modeling template was used for visualization.

The main BPM deliveries of the project were defining processes for all payment processing steps within SCT Inst. scheme and securing process governance around them. Process governance roles were agreed within the payment capability unit and the head of the bank's payments unit was nominated as the process owner for all SCT Inst. processes. Process manager role was appointed for a manager of regional payments capability, of which was the first implementation country for the new payment scheme. Process specialists were nominated from the pool of SEPA payment subject matter experts in the same regional payments capability team.

Modeling of the processes were used during the scoping and modeling phases of the program. Implementation phase included the handover of the process models from the program organization for the company's line organization, meaning the business unit under the appointed process manager. Monitoring, analyzing, and optimizing of the processes were left to be carried out by the line business organization and BPE's were not planned to facilitate that work.

#### 4.2.5. Observations from utilizing BPM

BPM and especially process modeling played a large role in the project. Utilizing process modeling had several identifiable benefits for many stakeholders, but it also required a significant effort. This sub-section summarizes the achieved benefits and required efforts. The benefits and requirements are based on feedback and observations that were made as a business process expert, working within the project.

Process modeling was used to describe all payment processes in company's implementation of the SCT Inst. payment scheme. This visualization approach was utilized from the very beginning of the project when project participants and stakeholders didn't have extensive understanding of the payment scheme, or the IT landscape that was used as a basis for the implementation. The first project scoping workshops built the basic understanding of the scheme for the participants. The basic understanding was enhanced with more detailed understanding of the scheme as the same participants were the contributors of the following process workshops, where the processes were visualized and linked to the company's IT landscape.

The early adoption of process modeling contributed for finding challenges from the SCT Inst. payment scheme itself. The first process modeling workshop had project participants from business and IT side of the organization. These participants were professionals of SEPA payments and payment IT architecture. Introducing the scheme for payment professionals, by visualizing it into company's IT landscape, revealed challenges of the original SCT Inst. message flows. There were concerns that the original setup for message flows would be more complicated than what the functionality would require and that customers of the participant banks would not be properly informed regarding the outcome of payment initiation. These concerns were raised towards EPC. EPC took in the improvement suggestions and updated the scheme rulebook as the organization proposed.

EPC's changes towards the scheme were made after few months of introducing the scheme into public audience. The scheme improvements were made before the solution was entirely designed, so the organization and vendor didn't have to do significant changes into their project plans. Later introduction of these improvements could have led for change requests towards the vendor and therefore increased costs for the program.

Common understanding of the implementation was built between business participants, IT participants, and program management through the process modeling workshops. This was beneficial for the project's internal communication

and communication towards program management and steering group. It was simple for business and IT to visualize the solutioning through the process drawings as both parties understood the visual representation in the same manner. Solution design and project reporting towards steering group had less changes for misunderstanding as they could use the same process drawings to support the communication. High level processes with less details were used to communicate with people outside of the project and more detailed processes were used for the solution design. The organization was operating within several countries and the project had members with many different nationalities and native languages. Process drawings were visual representations of the implementation and therefore reduced the risk of erroneous communication because of language barriers.

Project's business analysts utilized the process drawings for requirement engineering. Functional and non-functional requirements were created by the business analyst for the vendor to enable it to create a sufficient product for the company's needs. Significant amount of the requirements was identified during the process workshops and the requirements was also mapped into the processes, when possible. This approach supported business analysts to ensure that all parts of processing were thoroughly covered with requirements and it helped to structure the requirements by different processing steps.

Business analysts also used the failure scenarios and timers, that were modeled in the payment processes, to generate requirements. Identifying the failure scenarios was also a part of the solution design. The scheme rulebook didn't dictate the way of bank's internal processing and therefore the actions taken after payment failures was mandatory to be designed in the project. The design was approached by visualizing the solution proposals. This enabled easy iterations for different approaches for the failure scenarios' solutions.

Change management and communication team utilized process drawings with company's internal communication. The processes included all relevant organizational units and therefore provided a comprehensive view on what units

would be needed to execute the payments, what systems would be managed by which units, and how the units would be linked with each other. This enabled different units to have comprehensive understanding of the implementation and how they were expected to work within the new solution. Process drawings were also used for the projects internal training needs. The project had new people joining when necessary and process drawings were used for introducing the scheme and the implementation for the new project members.

Processes were created to ensure compliance and to ensure that the solution fulfills all the requirements from financial regulatory authorities. The regulators and authorities require banks to provide information regarding payment solutions to ensure that banks operate within lawful basis. The processes created for solution were also planned to be supporting document while collaborating with regulators and authorities. Bank's internal lawyers and compliance officers were also informed about the solution and their approval was acquired for all the new payment processes in scope.

Facilitating workshops and defining processes required resources from the program. There were two business process experts working full time in the program during the scoping and modeling phases. These phases took approximately 12 months and one business process expert continued to support the project these phases. Scoping and process modeling workshops also required active participation from business and IT representatives. Total of eight large workshops were kept that included participants between 10 to 15 employees and lasted one to two working days. Several smaller workshops were also kept but with smaller pool of participants.

Project members required to understand business processes as a basis to work with project related processes. Business process expert carried out the facilitation and modeling in scheduled timeframe, so it was necessary to have experienced professionals in place. Workshop participants were required to understand basic process elements, sequence flows and gateways to be able to properly read the

visualizations. Line organization was expected to take over the process development, after the project delivered the solution, so it was mandatory for process owner and process specialists to participate company's business process management training. Training provided the understanding of the company's process lifecycle model, process governance model, and basic tools for process modeling.

Business process approach required approval from the program management, before any BPM activities. Process work was structured around chosen professionals, so it required program management's approval for these special resources. It also required approval from program management to allocate project members time to process specific activities. Strong support from management enabled comprehensive business process approach as there were no constraints regarding resourcing or allocating time for the process work and the suggested approach by business process experts was taken into the project's planning.

#### **4.3. BPM as part of collateral management system transformation project**

The organization launched a project to implement a new collateral management system. The program was launched during 2016 but BPM became a part of the project during June 2017. This project is used as a second case example on how BPM was used to support the implementation of a new system. This sub-chapter describes the purpose of the project, project organization, collateral management system's purpose for the business, how BPM was used as part of the project, how business processes were designed in the project, and what were the results utilizing BPM. The results part of this sub-chapter contributes for structuring the answer for the research question of this master's thesis.

##### **4.3.1. Purpose, approach, and organizational structure of the project**

The organization had identified several reasons to replace its legacy collateral management systems, with a single consolidated and more modern alternative. The

main reasoning for the project was new and stricter regulatory requirements related to capital and capital reporting for banks. The organization had existing IT applications for handling collaterals that did not have the required functionalities and quality to support an efficient use of capital. The data quality was not optimal on the legacy systems and its management was experienced as extensive effort. Additionally, the legacy setup had different systems for each operating country, and many of these legacies were not seen as suitable for further development to fulfill business needs.

The project was established with goals to improve the quality of collateral data, increase processing efficiency within collateral management, simplify IT infrastructure of collateral systems, and ensure compliant collateral processing and collateral management. These goals were planned to be achieved with implementing a common collateral solution to replace existing IT applications for managing collateral in corporate banking and personal banking, in all operating countries. The project was also set to prepare receiving business units to operate with the new system and take ownership of the new system after the implementation.

The project was planned to be delivered with agile development methodology. Project organization was structured around agile teams that were fulfilling different project needs. These teams were business architecture, IT architecture, IT development, IT environments, project management, testing, and training teams. All teams were primarily structured with organization's internal resources but complemented with consultants for specific needs. Vendor had its own team that was a part of agile planning events. These events were held in every ten weeks. The ten-week periods were split into five development sprints that were aligned within the agile teams in the planning event. The project management team controlled the development backlog that consisted the development feature items for the development sprints. These features were prioritized in the planning event.

#### 4.3.2. Collateral management

Collateral management was a key part of secured lending processes for the organization. Collaterals were pledges of assets that were acting as a security towards loans. Collateral assets were working to protect the bank in case of the borrower would have been unable to pay back the loan. Assets and collaterals were also a great part of banks valuation and therefore an extensive reporting of the valuations was mandatory, towards regulatory authorities. Typical collateral assets for personal banking were savings, checking accounts, residential and business properties, stocks, and other bonds holding monetary value. Typical collateral assets for corporate banking were real estate and other buildings, machinery, vehicles, ships and vessels, and other tangible assets. The bank managed assets that were valued from thousands of euros, up to hundreds of millions of euros.

Collaterals were managed by the back-office units. These units were working to serve secured lending process and their tasks were fulfilling requirements of loans agreements and other legal agreements towards the collaterals. These units handled the recording of the assets and collaterals into related IT systems and performed releasing the assets and collaterals from the IT systems, when the agreements expired, or the loans were paid down. Asset and collateral information were available in credit memos for the back-office units. Customer relationship managers were responsible for negotiating the loans agreements and recording the asset and collateral information into credit memos, in corporate banking operating model. The same activities were performed by customer facing units, in the personal banking side.

#### 4.3.3. BPM as part of the project

The project had existed over two years before introducing BPM activities. Project had delivered data cleansing for the collateral data that existed in several legacy systems, developed features for the new systems to enable it to fulfill the goals for

the project, planned integrations towards the existing master data systems and loan origination systems, and planned end-user trainings.

The first drafts of collateral processes were drafted by a business architect in June 2017. These processes were describing the sequence of activities that were to be performed in the new systems by the end users. These processes were recording collateral, recording collateral asset, recording asset valuation, updating asset valuation, recording third party registry information, activating collateral, releasing asset, and releasing collateral. These processes were used for building the understanding around the new solution but not used project wide.

The first implementation of the new system was planned for corporate collateral management teams in one country for November 2017. Business process expert took over the process work during August 2017 with purpose to clarify the implementation towards the business units in the line organization. The existing processes, made by business architect, were used as a basis for creating more comprehensive process documentation. These processes were modelled into BPMN format by the business process expert. The modelling was done in collaboration with other project resources. These were business architects, an IT architects, subject matter experts from collateral management, and a business analyst from the system vendor. These processes were specific for the systems and mostly independent from each other, meaning that they could have been performed in different sequences.

The implementation required training of the solution for the receiving business units. Operating model workshop was facilitated for the receiving business units, with purpose to define how they will operate the new collateral management system. There were four different collateral management teams involved, as the bank had specific units for specific collateral asset types. All these units were managing collateral data recording in different ways as the surrounding teams were not providing them collateral data in same ways. Two more workshops were held to visualize the entire secured lending process and how new collateral management

processes were part of it and to achieve an agreement on the operating model. These workshops included also teams' managers and customer relationship managers. Involving these participants, enabled sufficient understanding of the entire secured lending scheme and gave the decision-making power for the workshop. The visualization was done by business process expert by utilizing BPMN.

Process governance was built around the subject matter experts in the receiving business units. These units were performing the same collateral management processes but for different asset types. Therefore, these units didn't have a common management, and the process owner role was set temporarily into the project organization. Business development team was built up from the collateral management subject matter expert with goal to enable coherent process development after the system implementation.

The process modeling and operating model was completed before the target implementation date. The implementation got postponed to beginning of February 2018 and this allowed the project to build more BPM competence into the receiving line units. BPM training was delivered for the line business units before the new implementation date. The training included basics of the company's BPM modeling methodology, common BPM governance structure and common PLC methodology. Process models were handed over from the program organization to the receiving units, after the training was conducted and the system was implemented.

#### 4.3.4. Observations from utilizing BPM

Process modeling was utilized in the project after it was active for two years. BPM was not utilized as company's framework suggests because of the late utilization but it had several benefits for the implementation, but it also required resources. This sub-section summarizes the achieved benefits and required efforts. The benefits and requirements are based on feedback and observations that were made as a business process expert, working within the project, as part of business architecture team.

Process modeling was used to visualize collateral management processes, that were to be performed in the new system. These processes contributed to business analysis and IT architecture analysis, as they showed integrations to old legacy databases in simple manner. These integrations were not understood well in the program before. Visualizing business processes and operating model, on how new collateral management processes are part of secured lending, increased the understanding of generated business value of the project. The project was driven as a IT project, as new system was replacing a legacy system, with a goal to increase data quality. Visualizing business processes increased the discussion on business benefits, that could be achieved through the project, in contrast to develop system for solely as IT project.

Collateral management processes were used for programs internal and external communication purposes. Internally, processes were used in between different scrum teams to align the scope and content of the sprint features. Processes were used mainly by business architect team, communications and training team, solution testing team, and project management team. Internal communication between scrum teams was most active during PI planning events and process modeling was used as one of the communication tools during the events. Program had members with several nationalities and native languages, so the visual communication tool decreased the risk of misunderstandings.

Business architects used collateral management processes and operating model, that was agreed with line business units, to build understanding, how the entire solution will work for the business needs. Architects used these processes to understand, how the solution will be aligned with company's other solutions, such as lending systems. This was done for several operating countries, of which all had different legacy collateral management systems and lending systems. Business architects used processes as communication tool between line business units, to understand their needs. Processes provided a way to discuss about concepts that could be understood differently by employees with different backgrounds.

Communications and training team used processes in their end-user trainings. Processes provided visualization of the concept that was understandable for the end-users, before starting detailed training on specific system functionalities. This helped the end-users to understand their role within the entire secured lending process and how their tasks are connected to their co-worker's tasks. Processes were used in on the spot trainings, and in follow up feedback discussions that were kept as online meetings. The operating model visualization was used to communicate with several stakeholders, outside of the program. It was used to present the changes in secured lending for a group of relationship managers, lending back-office employees, lending subject matter experts, and related management. This created common understanding of the scope of the changes and adjustments for each of the roles.

Project's testing team utilized both collateral system processes and operating model visualization, to perform end-to-end solution testing. Operating model was agreed with the receiving line business units, so the testing team ensured that the system specific processes caters the operating model as intended. Both visualizations supported the testing team to understand the scope of the testing, what are the inputs for the solution, and what are the expected outputs. Testing team's activities were focused on testing the functionalities of the new system, before introducing the business processes.

Project management team used business processes for their communication needs, internally and towards program sponsor. Process documentation provided a visual communication tool that was suitable to help with the communication towards management team's stakeholders, such as program steering committee.

The workshops to achieve and agreement on the operating model with the new system, helped receiving business units to understand the scope of the change. They gained an understanding on, what is their part within the changing secured lending solution, and how it will be different from the previous ways of working. Operating

model workshops revealed several differences within the ways of working, between different collateral management back-office teams. These differences were not identified before the workshops, but after the workshops these differences were identified and documented. Through the different ways of working, a common new operating model was agreed, with the new collateral management system. Visualizing the operating model, aided these units to agree the optimal and unified operating model. Visualization provided the understanding on, why activities were performed in the planned sequence and who were the needed actors.

Line business units gained increased interest to develop their business and ways of working, after facilitating operating model workshops. They understood how they operated in different manner, even though they were performing almost identical activities, as their operating models were not challenged before by each other. This led the teams to establish a shared business development team, including members from all collateral management teams in the country. The goal for this team was to harmonize their ways of working even further than the scope of the agreed operating model and to generate common development initiatives towards other business units. The development team generated a development backlog that was generated based on the agreed operating model and identified improvement opportunities regarding it.

The operating model for secured lending and collateral management as part of it, was used as a basis to plan the implementation for the company's other operating countries. It was identified that the program activities were easier to comprehend, when visualized in structured manner. This approach was acknowledged to be utilized for the remaining implementations and taken in from the beginning, rather than near the go-live date.

Project's system vendor was taken into the workshops, where new operating model was agreed. New operating model process documentation was given for the vendor. By having this documentation and being present in the workshops, vendor was able to align their system's standard documentation to reflect the receiving organizations

operating model. The systems also included built-in workflows, that were adjusted based on the operating model. The vendor was able to initiate discussions with other system vendors, that were providing lending specific systems for the same organization. They were able to increase collaboration to provide extended value for the receiving organization, after understanding the organizations operating model around secured lending.

Utilizing BPM in the program was not the intended way of working for the project in the beginning. Introducing BPM activities faced resistance in the project, as it was seen merely generating additional work and achieved benefits were not identified. Process modeling, operating model agreement, and process governance agreement gained positive reflections after the project members understood the value of visual representations as part of the communication.

It took around six weeks for BPM to be a part of program's regular communication and several months after the BPM started to gain positive feedback inside the project. Receiving business units expressed lack of transparency, insufficient communication, and being unheard in the project, before they were taken in with BPM activities. Receiving business units expressed appreciation towards the visualization activities, as they gained comprehensive understanding of the changes in their business and felt that they were able to contribute to the solution.

BPM capability and experience is required for a project, to successfully apply BPM and achieve the available benefits. Performing BPM activities required a BPM professional in the project. BPM training was held for several collateral management subject matter experts, so that the operating model visualization workshops were easier to facilitate as the tools were commonly understood. The trainings also provided knowledge of the organization's process governance roles and therefore made it easier to agree the roles within the line business units.

Visualizing systems related processes required time from projects IT resources as the integration towards other systems were also visualized, as part of the processes.

Vendor's time was required to approve the process documentation as the processes were heavily related to the system's functionalities. Resources were required from line business organization to be able to visualize and agree upon the operating model.

## **5. RESULTS**

This chapter will conclude the findings from the case studies, presented in chapter 4. The results are based on the participatory action research, carried out in the case projects. The results chapter has been divided into three subchapters. The first subchapter describes the differences and similarities between the case projects. The second subchapter describes the benefits of applying BPM into the projects. Third and final subchapter describes the requirements for applying BPM.

### **5.1. Characteristics of the case studies**

The case studies and the related projects had similarities and differences, that are relevant for the results of this study. Both cases were chosen from projects that were done for the same organization. This eliminated the differences that could have been occurred from different organizational cultures.

Goals of the projects were different, as the SCT Inst. payment scheme implementation introduced a new payment functionality into existing solution architecture, but the collateral management system transformation aimed to replace legacy IT systems. Goals of the projects were different, but it didn't have significant impact on process design. Both projects were able to utilize existing processes for the basis of the design and had external vendors and regulations, dictating process components. Both projects also had linkage to other solutions and therefore were not able to freely design processes without limitations in wider process architecture. SCT Inst. payment scheme implementation was linked to bank's internal settlement processes and collateral management processes were linked to secured lending processes.

Both projects had several internal and external stakeholder groups. The first project had project members approximately in between 25 to 50 people, and the second project had approximately in between 50 to 100 people. Both projects were affected

by cost saving exercises and that caused the head counts to vary. First project had more BPM experts involved, but it was also mainly driven by a single BPM expert.

The projects had lifespans of many years but had different adaptations of BPM during these times. The First project was started with BPM initiatives but the second took in BPM work after being operational for two years. Early adaptation made it easier for the first project to adapt BPM as part of the project initiatives as in the second project BPM was not acknowledged way of working, and its value had to be proven by delivering value for the project to achieve acceptance in the project.

Different project delivery methodologies created different attitudes towards BPM initiatives. The first project utilized waterfall approach as the second project applied agile methodologies. Organization's BPM methodology was designed to be delivered alongside waterfall structured project and therefore all BPM initiatives were good fit into the project. Organization's interpretation of agile ways of working didn't support BPM and the BPM methodology wasn't fully aligned with the agile development either. This challenge led to more flexible adaptation of BPM in the second project. BPM activities were held, when a clear need of process visualization or design was identified. The first project had more structured approach as BPM activities were held in the sequence, that was designed in the organization's BPM methodology.

Both projects had participants from several countries and system vendor that was outside of the organization's primary operating countries. This created a setup where first process workshops were facilitated as on location workshops, where all key stakeholders were present, but the process work was continued as online meetings.

There was no big difference in the amount of designed processes in the projects. Processes in the first project was mostly performed automatically by payment systems and only included manual intervention in exception cases or erroneous payment processing. These processes catered for the bank's all operating countries,

for which the payment scheme was relevant for. Most of the processes were manually performed in the second project and only included a few automated activities. The second project included also an operating model design that involved participants outside of the project's initial scope. The operating model was unique design for the implementation country but also intended to be utilized for the system implementation in the other operating countries.

Case project characteristics, presented in this subchapter, are summarized in table 2. Characteristics are listed and specified under both case projects.

**Table 2.** Case project characteristics

<b>Characteristic</b>	<b>BPM as part of SEPA instant credit transfer implementation project</b>	<b>BPM as part of collateral management system transformation project</b>
Purpose of the project	Implement new payment scheme functionality	Replace legacy collateral management systems
Employee count	Varying between 25 - 50	Varying between 50 - 100
Number of BPM experts	Varying between 1 - 3	1
lifespan	2 years	3 years (on-going)
delivery model	Waterfall	Agile (modified SAFe)
Solution provider	external vendor	external vendor
Employee locations	Multiple countries	Multiple countries
Delivery location	Implementation into IT solution that caters for several countries	First implementation in one country and following three more countries
Number of processes	14	9
Nature of the processes	Automated. Manual intervention in case of failure	Mostly manual. Included operating model workflow

## 5.2. Benefits of applying BPM

Applying BPM in the case projects had several notable benefits for the projects and other stakeholder groups. The process work in the projects was focused on the analysis and design part of the processes. These projects were not part of process

lifecycle's monitoring or optimizing activities and therefore the benefits are results of activities in the earlier steps in the lifecycle model. These benefits are described in this subchapter and summarized in table 3.

BPM increased process understanding of business processes in the scope. Both programs had subject matter experts that were familiar with activities within the business context, but process modeling created comprehensive visualization of the processes. This enabled common understanding of the business processes. Increased understanding of the business processes enabled project participants to produce improvement ideas towards the processes and activities that were either inputs or outputs for the processes. Similarly, the increased understanding enabled continuous improvement business process development, but performing continuous improvement activities were not in the scope of the projects. The projects handed over sufficient knowledge and documentation to work as continuous improvement enabler.

Creating the visual representations of the business processes, supported the understanding of the projects' scopes. Process documentation presented what was expected outputs from the processes and the new activities that were to be performed in the to-be state. This supported the participants to understand the goals of the projects, meaning what were to be created to reach the desired to-be status. This was more notable in the agile setup, as the final goal of the project was not commonly understood, and the agile way of working was not routine for most of the project members.

Business units from the line organizations were engaged in the programs, through BPM initiatives. The first project involved receiving business units from the very beginning of the project. Contribution from line organization's subject matter experts was mainly taken in through business process workshops. The second project adapted BPM activities later in the project but also involved line organization's professionals through business process workshops. Subject matter

experts from the second project reported being more involved and understanding better the incoming changes, after participating the business process workshops.

Business processes created a common visual language for the projects. Business processes visualized the concepts in standard BPMN format for all project members. In the first project, this improved the collaboration between business and IT units, as they were working together with the same documentation. Business and IT units were able to present their ideas and challenge others' ideas in the same format, that was understandable for both parties. Business units created more detailed working instructions and system requirements, while IT units created IT architecture documentation and system requirements for their needs, but both sides were able to utilize the common business processes as a basis. In the second project, both business and IT units were also able to utilize business process documentation, but the level of utilization was not as extensive.

Business process documentation was used to communicate towards stakeholder groups outside of the projects. These groups were steering groups of larger programs, that the projects were part of and other stakeholder groups that were not part of the projects but were influenced by the changes. The documentation was used for communication by projects management teams and change management teams. Change management teams were also using business process documentation as basis for creating their own communication material for their specific needs.

The second project used process documentation for training purposes. The project was based on replacing IT systems, but processing in the legacy systems and in the new system included manual activities. This meant changing ways of working for the receiving organizations. Training team adapted business process documentation into their training material, as it was providing visual representation of the to-be situation and who will be executing necessary activities. Training team also used more detailed documentation that included system field data attributes and input formatting information, but the business process documentation was used first to provide a higher-level introduction regarding the entire solution.

Business analysts were part of BPM workshops in the first project. They used the business processes for the solution design and requirements engineering. Risks of payment processing failures and not meeting the scheme requirements were identified by the business analysts during business process design. Business analysts were not part of BPM workshops in the second project, but process modeling revealed issues that were raised for business analysts to be solved.

Vendors adapted the business process documentation in both projects. Vendors were able to understand how the client organization was using their solution and how it was deviating from the standard offering. This supported the collaboration between the vendors and the projects. Vendor was able to modify the solution in early phase of the project, as they were part of the process workshops in the early phases of the first project. These changes would have been addressed in later phases if they wouldn't have been identified at that point of time.

**Table 3. Benefits of applying BPM**

<b>Benefit</b>	<b>BPM as part of SEPA instant credit transfer implementation project</b>	<b>BPM as part of collateral management system transformation</b>
Enabling continuous business process development	By creating the business processes	By creating the business processes
Enhance business engagement	By involving business units in solution scoping and process design	By involving business units in operating model design
Enhanced communication from the project to other stakeholder groups	By providing practical solution documentation	By providing practical solution documentation. By involving other stakeholder groups in operating model design
Enhanced communication inside the project	By involving majority of project stakeholder groups in design. By providing consistent solution documentation	By providing practical documentation. By involving project participants in operating model design
Improved common understanding of project's purpose and goals	By creating transparency of the solution and goals	By creating transparency of the solution and goals
Improve collaboration between business and IT	By involving business and IT into solution scoping and design. By providing coherent documentation	By providing coherent documentation for business and IT
Improved understanding of business processes	By involving majority of project stakeholder groups in design.	By providing practical documentation. By involving line organization in operating model design
Support business analysis	By involving business analysts in scoping and design workshops. By providing practical documentation	By finding gaps in the solution through visualization
Support change management	By involving receiving organization in the solution design. By providing practical documentation	By providing practical documentation
Support risk identification	By identifying risks in the solution through visualization	No clear connection
Support system vendor	By involving vendor in solution design. By providing visualization of customer's solution.	By providing visualization of customer's solution
Support training activities	No end-user training in the project	By providing high-level documentation of the solution

### **5.3. Requirements for applying BPM**

Applying BPM into the projects had requirements for the project and the people involved in BPM activities. Requirements from the case projects are described in this subchapter and summarized at the end of this subchapter in table 4.

Business process experts were driving all BPM activities in both projects. They were facilitators for all business process related workshops, planned BPM activities, documented final versions of business processes, introduced organization's BPM methodology into the projects, ensured quality of the documentation, ensured BPM competence in the projects, and facilitated BPM trainings.

Business process workshops requires resources. Business process experts were facilitators for business process initiatives but subject matter experts, business analysts, and IT professionals were the main contributors for the design and content of the documentation. These resources were participating for the workshops and contributed for further detailing of the business processes as the projects developed.

Time was required in a sense of working hours, but also for the receiving organization and project organization to adapt the way of working, required by BPM methodology. Both projects had participants that were not familiar with BPM before and had skepticism towards the need of business processes. After working few weeks with BPM, the skepticism was reduced as the value was realized. This was larger challenge in the second project, as BPM was introduced in the middle of the project.

BPM methodology could not have been introduced into the projects without a clear goal and purpose. Acceptances were granted for utilizing BPM, when introducing the goal and purpose for the projects managements and for the managements of the projects' receiving organizations. Managements' approvals enabled resource allocations for BPM initiatives and supported achieving agreements on business

process governance structures. Having a complete BPM methodology was a pre-requisite to be able to introduce the goal and purpose of BPM.

Training off organization's BPM methodology was given for the subject matter experts in the second program, as there was no existing BPM experience. Most subject matter experts were familiar with BPM methodology in the first project, so no trainings were facilitated. Training and previous BPM experience supported the business process workshops. Workshops were able to focus on the goals because participants were familiar with the organization's BPM methodology and there was no need to use time for building the competence for the methodology.

**Table 4.** Requirements for applying BPM

<b>Requirement</b>	<b>BPM as part of SEPA instant credit transfer implementation project</b>	<b>BPM as part of collateral management system transformation project</b>
BPM expert	Provided BPM competence. Facilitated all BPM activities	Provided BPM competence. Facilitated most BPM activities
Resources from the project organization	Provided content for solution design	Provided content for solution design
Resources from the line organizations	Provided business needs and understanding of business context for solution design	Provided business needs and understanding of business context
Time	Resource time allocations for BPM activities	Resource time allocations for BPM activities. Time for stakeholders to take in BPM methodology
Methodology with goal and purpose	Enabled management's approval for utilizing BPM	Enabled management's approval for utilizing BPM. Enhanced resources' involvement
Management approval	Enabled resource allocation for BPM	Enabled resource allocation for BPM
Understanding of BPM methodology for the participants	Enabled solution design with BPM and process governance structure setting	Enabled operating model design with BPM and governance structure setting
BPM training	Not needed, as the competence was built earlier	Mandatory for understanding the methodology

## 6. CONCLUSIONS AND DISCUSSION

The purpose of this master's thesis was to evaluate the potential benefits and requirements for utilizing BPM in IT transformation programs in banking sector. The goal was to approach the research question with participatory action research method, through case studies. Two case studies were chosen, thoroughly studied, and evaluated to generate answers for the research questions. This chapter provides conclusions of the study and discussion about the contributions to previous studies.

The case studies showed similar benefits and requirements, even though the purpose of each case project and delivery methodologies were different. The most notable benefits were delivered through common understanding and visual representation that was provided by BPM. Project participants, from business units and IT units, were able to design solutions in collaboration, utilizing same documentation. Other stakeholder groups were able to use the same documentation for different communication purposes. Adapting business process lifecycle model and establishing business process governance structure were enablers for continuous process improvement activities. The benefits and requirements are recapitulated in the chapter 6.1., under summarizing the answers for both research questions.

### 6.1. Answers for the research questions

This chapter answers the research questions, that were defined at the beginning of this master's thesis. The answers are structured from the results and conclusions.

1. *What are the benefits of Business Process Management in IT transformation programs in banking?*

Benefits from BPM were generated by several factors. Process modeling generated a common understanding, coherent documentation, and transparency of the solution

for different stakeholders. These supported communications within the projects and stakeholder groups outside of the projects.

Business process design workshops were beneficial for solution design and business analysis. Solution design and business analysis were able to utilize the visual presentation of the business processes that were constructed in collaboration between several business and IT representatives. Both initiatives were partly done in parallel with business process workshops. Business units addressed increased ability to influence on the solution design and better possibility to provide their expertise on the design, than what they had experienced without BPM activities.

Change management was supported with business process workshops. Business representatives from line organizations were part of process design, so at the time of new solutions implementation business units were already knowledgeable for the change. Additionally, change management and training teams were able to adapt process documentation as a basis for their specific needs.

*2. What are the requirements for successfully applying Business Process Management in IT transformation programs in banking?*

Requirement for successfully applying BPM had several key areas. These were sufficient BPM expertise and competence, resources from the project and line organizations, time for adapting the way of working, having a defined methodology with goal and purpose, and management's approval for the adaptation.

Management's approval was the first enabler for all BPM initiatives in both projects. Having the approval enabled sufficient resourcing for BPM workshops, securing governance structure into line organizations, and other BPM activities. Approval didn't grant a buy-in of the approach from project participants, but the comprehensive approvals were achieved through the created value. It took time from the employees to gain comprehensive understanding of the methodology, but it was required to enable efficient BPM activities. Having a clear goal and purpose

for the BPM approach was required to achieve the managements approval, it supported the BPM work, and supported achieving the employees buy-in of the methodology.

All BPM workshops, process visualizations, governance structure setting in line organizations, and BPM trainings, required extensive facilitation. It was mandatory to have facilitators with understanding of BPM methodology and the purpose of all delivered BPM activities. Facilitators were leading the discussion in workshops and creating the visualizations of the processes, and therefore related competence was required. Facilitators provided the methodology and approach, but subject matter experts, business analysts, product owners, IT specialists, business and IT architects, and other project participants provided the content of the processes. These contributors made the solution and operating model decisions, but facilitators were quidding the decision-making process, to achieve coherent business processes.

## **6.2. Managerial implications**

Subchapter 6.1. and tables 3 and 4 provided summaries of the benefits and requirements of utilizing BPM in two large IT projects in banking. These summaries can be used to support the decison making, if BPM should be adapted into comparable projects or program environments. Neither the benefits nor the requirements showed clear linkage to the banking sector as such. All found benefits could be achieveable in similar large scale IT projects and programs within other industries, if the nature of the projects and programs are corresponding the case studies in this master's thesis.

There were no clear connection towards the projects' chosen delivery methods, but depending on the other project practices, such as change management and communications, the magnitude of BPM benefits may vary. If these other practices are executed in inadequate manner, the benefits of BPM may be more evident. In case of competent execution of change management and communications, these specific benefits of BPM may be supporting the other practices.

Adoption of BPM was easier in case of earlier utilization within the project's lifespan. The resistance towards the methodology was lower and the benefits for solution design and analysis were greater. Business' involvement in solution design was greater when subject matter experts were involved from the beginning of the project, through BPM initiatives. If BPM is utilized, it seems to be beneficial for all stakeholders, to aim towards early adaptation.

Consulting company's approach was suitable for the first project but not completely utilized as presented in chapter 2.5. The project built the business processes, based on the needs from the business context, but the existing IT landscape had dominating role defining the process activities. The existing IT landscape was not to be drastically changed, but to be improved by a new functionality. This limited the freedom of the design as the existing applications were crucial for the new payment solution. This led to challenges with fulfilling the payment scheme requirements, such as not having down times of the systems for service breaks, to meet the always available -requirement. The existing systems had scheduled service breaks that had to be considered while designing the new solution. Another deviation from the consulting company's approach was that the design didn't utilize as-is analysis extensively. As-is documentation was brought in from similar SEPA payment scheme, but the current situation was not analyzed otherwise, as the payment scheme was new and the actual current situation was nonexistent.

Performing BPM activities in the manner that the consulting company recommends was not completely possible in the first project, due to the limitations in surrounding IT architecture. It also showed that the process work had challenges meeting the business context's requirements as the limitations were coming from the stream that was recommended to be designed after the process design. Implementation was not performed as migration design, as the consulting company's model states, because there was not comparable as-is situation.

The second project was not fully comparable to the consulting company's method. Complete as-is analysis was not applied as the program requested the process work to support the implementation with short time frame. This led to a situation of designing operating model on top of an existing operating model and adjusting it with the functionalities of a new system that replaced a legacy system. The new system's functionalities were already agreed when the new operating model design was initiated and therefore a detailed business process design was not done based on the business context.

Applying the consulting company's methodology, as presented in chapter 2.5., structures the design based on business context without limiting it by existing applications. This gives freedom for designing processes to fulfill business needs, but it was not applicable in the contexts of the case projects.

### **6.3. Reliability assessment**

The findings are based on observations and feedbacks within the case projects. Observations were made in the case projects under extensive period. Feedback was gathered from several stakeholder groups in both projects. Feedback was consistent and gathered separately from different groups. This supports the validity of the findings, as the feedback was subjective from each individual, but coherent between stakeholder groups. Feedback and observations were found to support each other.

Both case studies were conducted in the same organization. This may limit the reusability of the results, outside of the organization. Further studies from other organizations, within the same industry, would be sufficient to eliminate the possible bias, related to the organization.

### **6.4. Contribution to previous studies**

Similarities with previous studies, supports validity of the findings in this master's thesis. Results described in chapter 5, supports findings from previous studies, such

as presented in table 1. by Indulska et al. (2009). Benefits for process improvement, improved process understanding, improved communication around processes, support for change management, and better re-usability of business processes are comparable findings in the earlier study and in this master's thesis. Performed BPM modeling exercise in the case projects, supports efficiency of practical approach for modeling, presented in workflow modeling literature (Sharp & McDermott 2009) and supports the value creation by alignment between business and IT.

There are several studies of the benefits of BPM and process modeling as visualization tool (Indulska et al. 2009; Moody & Shanks 2003; Recker 2011; Sharp & McDermott 2009; Siau 2004), but limited studies regarding BPM in large IT transformation programs in finance sector. This master's thesis emphasizes the findings of the previous studies around BPM but within specific context.

## **6.5. Future research**

Related future research topics were identified through the case projects and results of this master's thesis. Second project was using agile development as a delivery methodology. BPM as such was not a defined building block in the chosen way of applying agile development and therefore created uncertainty on how to fit BPM into the project. BPM was seen as waterfall approach related element and therefore questioned whether it fits into the delivery methodology, but the visualization provided through BPM was highly valued. Results of this study shows benefits for applying BPM in agile development but extensive study on combining agile and BPM could be in high demand.

The case projects were using several methodologies to support the projects' and programs' deliveries but lacking with aligning these methodologies. There would be interesting research topic to study the alignment between BPM, business architecture and service design. BPM and business architecture were utilized in the projects but there was uncertainty on how these two practices should be linked and how the practitioners of each methodology could benefit from each other. Service

design was a topic that raised in the discussions in the projects but there was no sufficient knowledge on how service design should be linked with BPM or with business architecture.

The results of this study are based on BPM activities in process lifecycle's steps before the implementation. Research on BPM's value for continuous improvement and monitoring the performance of business processes in finance sector would be interesting. Study of that nature would fulfill the entire process lifecycle model's benefits and requirement in the finance sector, when combined with this master's thesis.

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