UNIVERSITY OF LJUBLJANA
SCHOOL OF ECONOMICS AND BUSINESS

MASTER THESIS

OPPORTUNITIES FOR IMPROVING BUSINESS ANALYSIS PROCESS IN THE IT SECTOR BY APPLYING PROCESS AUTOMATION

Ljubljana, September 2025 MLADEN ALADŽIĆ

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ABSTRACT

This master's thesis examines how modern process automation technologies can transform and enhance the business analysis process in the IT sector. In the context of growing digitalization, particularly in traditionally conservative industries like finance and insurance, business analysts face increasing pressure to deliver faster, more accurate, and cost-efficient results, often within fixed-price project constraints. Traditional methods such as repetitive workshops and interviews are becoming less viable. This thesis argues that automation tools can significantly reduce effort and improve the quality of outcomes in key phases of business analysis.

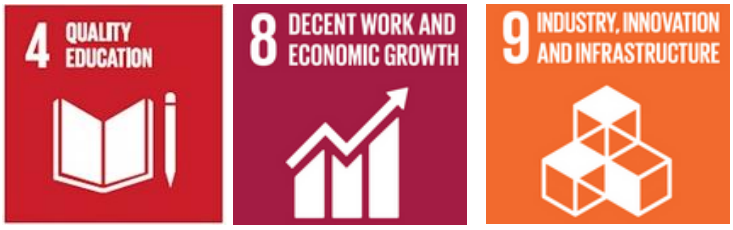
The thesis combines a literature review, expert interviews, and a survey of professionals including business analysts, consultants, and product managers. Using frameworks like BABOK and the Business Process Management Lifecycle, it identifies common challenges such as fragmented stakeholder knowledge, poor documentation, and inefficient manual discovery methods. Automation technologies such as automated process discovery (APD), process mining, and AI tools are proposed solutions to support discovery, modelling, and validation.

A conceptual model of the current general business analysis process was developed to highlight problems and inefficiencies. Based on this, an improved model incorporating process automation was designed to accelerate data collection, reduce errors, and enhance consistency in four phases of complex IT projects: team formation, planning, analysis execution, and result validation. Generative AI tools (e.g., ChatGPT, Perplexity) supported the research through literature research and review, summarization and brainstorming, with careful attention to checking the academic integrity of results.

While focused on IT, the findings suggest broader applications for process-heavy industries. The thesis concludes that automation can serve as a strategic enabler for more agile, adaptive, and value-driven business analysis, contributing to both academic research and practical frameworks.

KEY WORDS: business analysis, business process management, process automation, process improvement, IT industry, process mining, artificial intelligence

SUSTAINABLE DEVELOPMENT GOALS



POVZETEK

Magistrsko delo raziskuje, kako lahko sodobne tehnologije avtomatizacije procesov preoblikujejo in izboljšajo proces poslovne analize v sektorju IT. V kontekstu naraščajoče digitalizacije, zlasti v tradicionalno konzervativnih panogah, kot sta finance in zavarovalništvo, se poslovni analitiki soočajo z vse večjim pritiskom, da zagotovijo hitrejše, natančnejše in stroškovno učinkovitejše rezultate, pogosto znotraj omejitev projektov s fiksno ceno. Tradicionalne metode, kot so ponavljajoče delavnice in intervjuji, postajajo manj izvedljive. Trdim, da lahko orodja za avtomatizacijo znatno zmanjšajo trud in izboljšajo kakovost rezultatov v ključnih fazah poslovne analize.

Raziskava združuje pregled literature, strokovni intervju in ciljno usmerjeno anketo med strokovnjaki, vključno s poslovnimi analitiki, svetovalci in produktnimi vodji. Z uporabo okvirjev, kot sta BABOK in življenjski cikel managementa poslovnih procesov, sem identificiral pogoste izzive, kot so razdrobljeno znanje deležnikov, slaba dokumentacija in neučinkovite metode ročnega odkrivanja. Tehnologije avtomatizacije, kot so avtomatizirano odkrivanje procesov (APD), rudarjenje procesov in umetna inteligenca, so predlagane rešitve za podporo odkrivanju, modeliranju in validaciji procesov.

Razvil sem in analiziral konceptualni generalizirani model trenutnega procesa poslovne analize, da bi izpostavil težave in neučinkovitosti. Na podlagi tega sem zasnoval izboljšan model, ki vključuje avtomatizacijo procesov, da bi pospešil zbiranje podatkov, zmanjšal število napak in izboljšal doslednost v štirih fazah kompleksnih IT projektov: oblikovanje ekipe, načrtovanje, izvedba analize in potrjevanje rezultatov.

Čeprav se ugotovitve osredotočajo na IT, kažejo na širšo uporabo za panoge, ki so močno povezane s procesi. Magistrsko delo ugotavlja, da lahko avtomatizacija deluje kot strateški dejavnik za bolj agilne, prilagodljive in vrednostno usmerjene poslovne analize, kar prispeva tako k akademskim raziskavam kot k praktičnim okvirom.

KLJUČNE BESEDE: poslovna analiza, management poslovnih procesov, avtomatizacija procesov, izboljšanje procesov, IT industrija, rudarjenje procesov, umetna inteligenca

CILJI TRAJNOSTNEGA RAZVOJA

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LIST OF ABBREVIATIONS

AI – Artificial Intelligence – sl. Umetna inteligenca

APD - Automated Process Discovery – sl. Samodejno odkrivanje procesov

BA – Business Analysis – sl. Poslovna analiza

BABOK – Business Analysis Book of Knowledge

BPM – Business Process Management – sl. Upravljanje poslovnih procesov

BPMN - Business Process Modelling Notation – sl. Notacija modeliranja poslovnih procesov

CASE - Computer Aided Software Engineering – sl. Računalniški podprto programsko inženirstvo

CSF - Critical Success Factor – sl. Ključni dejavnik uspeha

ERP - Enterprise Resource Planning

EU – European Union – sl. Evropska unija

FSD - Functional Specification Document – sl. Funkcionalni specifikacijski dokument

GAI – Generative Artificial Intelligence – sl. Generativna umetna inteligenca

GDPR - General Data Protection Regulation – sl. Splošna uredba o varstvu podatkov

IIBA – International Institute for Business Analysis – sl. Mednarodni inštitut za poslovno analizo

IoT – Internet of Things – sl. Internet stvari

IPA – Intelligent Process Automation – sl. Inteligentna avtomatizacija procesov

IT – Information Technology – sl. Informacijska tehnologija

LLM - Large Language Models – sl. Veliki jezikovni modeli

ML - Machine Learning – sl. Strojno učenje

MM - Meeting Minutes – sl. Zapisnik sestanka

NLP - Natural Language Processing – sl. Obdelava naravnega jezika

RCA - Root Cause Analysis – sl. Analiza temeljnih vzrokov

RPA – Robotic Process Automation – sl. Robotska avtomatizacija procesov

sl. - Slovenian

SME - Subject Matter Expert – sl. Strokovnjak za področje

UML - Universal Modelling Language – sl. Univerzalni jezik za modeliranje

VAA - Value-Added analysis - sl. Analiza dodane vrednosti

1 INTRODUCTION

Rapid changes in the Information technology (IT) industry have had significant impact on the companies in all domains, especially when legacy software needs to be replaced by a new one or an upgrade of existing solution is needed. Business analysis (BA) has quickly become a crucial element in those processes. It involves a series of steps, combined with close client interaction, with the aim of understanding the client's needs and from there defining a clear and precise set of requirements that later serve as reference points for design, development and implementation of a software solution. Considering the modern interaction between business and IT, the importance of quality BA is growing exponentially. However, this growing importance coincides with significant challenges, particularly when performing BA for clients in industries that are notoriously slow in adopting new technologies (like finance, insurance, banking, brokerage, etc.). This resistance creates complexity for analysts because clients are overly reliant on their current applications, practices, and modus operandi. Therefore those clients usually have undocumented (or poorly documented) legacy processes and resistance to changes, which requires additional effort from the analysts to understand them before even proposing a change.

Companies from IT sector that are applying to tenders of such clients, for replacing legacy systems or digitalization of current business processes, have 2 options on their hands when it comes to business analysis: to outsource this activity (e.g., to a partner that has developed BA competences) or to develop internal BA departments for this purpose. The option to outsource this part comes with additional risks, such as communication gaps for requirement quality (Standish Group, 2023) and hidden project costs when outsourcing (McKinsey & Company, 2021) and this will not be a subject of this thesis. Internally developed BA capabilities can facilitate the implementation, enhance the effectiveness and quality of company's services, and eventually lead to new revenue streams from this activity. Therefore, in order not to lose track of the competitors and track and deliver projects successfully, IT companies need to develop versatile and competent BA teams.

This thesis examines the main issues that an IT company, with internally developed BA competencies, encounters while performing business analysis for their clients from complex industries. Additionally, the thesis proposes process improvements by taking advantage of current options for process automation. This chapter provides an introduction to the research by first discussing the background and context, followed by the research question, research purpose and goals, significance, methodology, and finally the limitations of the thesis.

Market developments in the last 5 years, including the prioritization of digital transformation during the Covid-19 pandemic, created a lot of opportunities for IT companies on the market and in different industries (including the traditionally IT conservative finance industry). General BA approach and tools are synthesized within International Institute for Business

Analysis' (IIBA) general guideline document Business Analysis Book of Knowledge (BABOK), an industry standard when it comes to business analysis process. BABOK contains a detailed list of approaches and techniques for business analysts to use when performing business analysis. Most important step being the requirements elicitation. Elicitation is the drawing forth or receiving of information from stakeholders or other sources. It is the main path to discovering requirements and design information, and might involve talking with stakeholders directly, researching topics, experimenting, or simply being handed information (IIBA, 2015, p. 53). Listed techniques include document analysis, process modelling, data modelling, focus groups, interviews, workshops, and other (IIBA, 2015, p. 63-64). It also describes the most common stakeholders that are included in the elicitation process.

But all those approaches and techniques are mostly described in a way that projects are done on time-and-materials basis, meaning that total costs of business analysis are a direct consequence of analysis time and resources spent on the BA project. Current trend in IT industry is leaning to fixed price analysis projects (Financial Express, 2025), followed by implementation projects where only some project components, such as data migration, may be executed on a time-and-materials basis and everything else needs to fit within the fixed budget. This only increased the importance of high quality BA practices, to conduct the analysis more effectively and efficiently in order to stay within the project budget but also deliver high-quality analysis outputs.

In addition, conducting business analysis process in highly complex organizations (e.g. insurance companies, banks, brokerage, etc.) comes with certain specifics which reduce the effectiveness of traditional tools. Acquiring domain knowledge is generally straightforward compared to understanding complex internal business processes of the client. On the other hand, the development of modern IT, with new ways for gathering and processing data, provides many opportunities for innovation and automation in certain parts of the common business analysis process – not just for clients from finance industry but in general. And IT companies with developed BA competencies could exploit those opportunities and gain a competitive edge on the market.

As a result, current body of knowledge doesn't provide enough instructions or guidelines for business analysts in IT companies that work in modern circumstances and fixed price projects, where's very little room for long meetings, repeating workshops, and individual interviews in order to get all the necessary information. With that in mind, there's a critical need for process innovations in the domain of process automation. This would enable the BAs to compress timelines and reduce costs while maintaining analysis quality. And modern IT development provides many options for implementing process automation in current business analysis process in IT industry, to directly address these challenges by accelerating data gathering and analysis, reducing reliance on lengthy manual elicitation sessions, and providing quicker insights into complex client processes – thereby enhancing both efficiency and effectiveness under tight project constraints.

Given the lack of concrete guidelines in terms of process automation, the purpose of this master thesis is to contribute to both theoretical and practical bodies of knowledge about business analysis process automation through identification and evaluation of process automation opportunities from the viewpoint of an IT company with internally developed BA competences. The result will be the proposition of a new ways of using some already known tools (e.g. artificial intelligence, business process mining, etc.), as new business analysis techniques (Grant, 2015) in order to improve the current business analysis process in IT sector, and to partially expand the mentioned body of knowledge. In short, this thesis aims to improve the business analysis process in IT companies that have their own BA departments. Therefore, the research question of my thesis will be:

- How to redesign and improve the process of business analysis in IT sector by using modern process automation options?

The actual goals are derived directly from the research question and problem definition. Those goals are:

- To analyse and model the current business analysis process in IT sector, based on gathered primary and secondary data;
- To analyse the process model and propose improvements of this process by using process automation, that will reduce the analysis time and enable greater precision when identifying processes and requirements;
- To model a future business analysis process in IT sector, based on analysis findings and proposed improvements.

A mixed-methods approach is used combining interview survey and literature review. Qualitative interview with Head of BA department of one IT company in Ljubljana is performed to explore individual experiences and approaches to BA. A survey targeted to a specific population (business analysts, process analysts, business consultants, product owners, etc.) is conducted to assess the general work experiences in business analysis, attitudes toward using IT tools for business and process analysis, and satisfaction with current ways of how business analysis is performed. Literature review is performed for the most important theoretical parts of the thesis such as business analysis, process management, and process automation. Content and thematic analysis are used for interview and literature review, while basic descriptive statistics is used for data gathered from the survey.

Generative artificial intelligence (GAI) tools are used as helpers in this master thesis. From a methodological perspective, GAI tools offer significant advantages in terms of speed and access to large volumes of data. However, these tools are not replacements for critical academic judgment. Content generated or summarized by AI may lack proper context, may omit citation details, or may include inaccuracies, biased perspectives or hallucinations. Therefore, all outputs from GAI tools used in this thesis were verified against original sources and directly referenced material was independently reviewed and manually cited to

preserve academic integrity. Ethically, the use of GAI introduces potential concerns related to originality and transparency. This thesis follows the principle of transparency by clearly disclosing the use of GAI in the methodology, as follows:

- GAI tools (ChatGPT and Perplexity) are used for literature analysis for the purpose of searching for relevant materials (articles, journals, books, blogs, etc.), summarizing the content and determining its relevance for the thesis topic, and comparative analysis between several articles,
- GAI is also used for brainstorming about potential usage of recognized improvement options, searching for real-life examples, and minor rephrasing of long and wordy sections.

Tools were used for idea exploration and text structuring, to avoid misrepresenting AI-generated content as original work. These tools were used in a supportive role, and their content was critically evaluated and never taken as standalone evidence. Moreover, the analytical reasoning, synthesis of findings, and final arguments are my own work.

This thesis has a limited scope and while the findings may offer insights for other complex domains, the primary focus and applicability of this research are on business analysis processes within IT companies. Having that in mind, the resources and sources of knowledge are closely tied with this specific domain, and the findings can't be easily and uniformly generalized across other business domains. And while some examples may come from finance, the thesis applies to BA in the broader IT sector.

Structural outline of the thesis:

- Current state and trends in the IT sector (main indicators, current position of BA in IT),
- Business analysis fundamentals, covering main concepts and theoretical frameworks important for the thesis, and outline of the BA process steps,
- As-Is IT business analysis process model, representing the common Business analysis process in IT with the description of process steps,
- To-Be IT business analysis process model, which includes the analysis of As-Is process model, stating the main issues, presenting the improvement options, and creating a new To-Be process model,
- Discussion, where the main findings are highlighted,
- Conclusion, where the results and findings are analysed and commented.

2 CURRENT STATE AND TRENDS IN THE IT SECTOR

The IT industry is undergoing rapid evolution, driven by advancements in digital technology, shifts in consumer demands, and the acceleration of digital transformation across industries. As businesses increasingly prioritize technology to enhance operations, improve customer

experience, and streamline processes, IT continues to be a critical driver of global economic growth.

The IT industry's current landscape is one of rapid transformation, defined by powerful technologies that enable businesses to operate more efficiently, make smarter decisions, and engage customers in new ways. As trends like artificial intelligence (AI), cloud computing, data analytics, and Internet of Things (IoT) mature, the industry will continue evolving, likely bringing further innovation, disruption, and opportunities. Staying informed about these developments will be key for organizations and professionals alike to remain competitive in a tech-driven world.

In this chapter, main financial indicators and trends for the IT industry in European Union (EU) will be reviewed to gain insight about the state of this business sector. The data was gathered from publicly available sources and reports, published by respectable consulting companies and EU reports. Financial indicators are selected so that they depict a wholesome picture of current state of IT industry in EU in terms of market evaluations, generated revenue and its structure, and impact of emerging technologies (e.g., AI) on the valuation and value creation. Also the main trends and growth predictions are cited from the same sources.

Then the most popular technology trends relevant for the topic of this thesis will be inspected with the aim to recognize the opportunities on the market for process improvement, automation, and work optimization. And in the end, position of Business analysis in the modern IT landscape will be inspected.

2.1 Financial indicators and trends in EU

The European IT industry represents a cornerstone of the continent's economic output, generating €1.5 trillion in sales and contributing more than 8% to the overall European economy (Deloitte, 2022). Despite disruptions from the COVID-19 pandemic, the sector has demonstrated remarkable resilience, with consistent growth throughout this challenging period. A shift in the revenue structure is evident, where the software services accrue for approximately two-thirds of industry revenue according to the data in Deloitte Insight article from 2022 (Deloitte, 2022). Recent period was not without significant falls from grace either, as French multinational IT service and consulting company Atos faced a plunge of its stock prices for more than 90% in just two years period (Tech Monitor, 2024). Once bosting a valuation around € 10 billion and spearheading the development in various IT domains, it still suffered a severe losses and other organizational issues. But despite this example and after experiencing a significant contraction with approximately $400 billion in value erased during market downturns, European tech industry has demonstrated good recovery, with the ecosystem value rebounding to $3 trillion and experienced a period of steady growth in the last 5 years.

Within specific segments, the European IT Services market achieved a valuation of USD 412.28 billion in 2023 and is projected to expand to USD 658.66 billion by 2029, reflecting a compound annual growth rate (CAGR) of 7.96% during the 2024 - 2029 forecast period (TechSci Research, 2024). On a broader scale, the overall IT industry in Europe is expected to grow on a steady 5% through the remainder of the decade (Deloitte, 2022). The greatest driver of the current trend, and also the main driver of development in the future, is the artificial intelligence sector. The European AI market reached an estimated USD 66.4 billion in 2024, accounting for 23.2% of global AI market revenue. This segment is experiencing explosive growth, with projections indicating a CAGR of 33.2% from 2025 to 2030 (Grand View Research, 2024). Similarly, GAI technologies are expected to achieve market value of €18.89 billion in 2025, with an annual growth rate of 41.53% potentially driving the segment to €107.3 billion by 2030 (Contextual Solutions, 2025).

Entrepreneurial vitality represents another significant indicator of IT ecosystem health, with EU demonstrating robust performance in new company formation despite elevated barriers to market entry. The annual volume of founders establishing new IT start-ups in Europe has consistently exceeded comparable metrics in the United States for each of the past five years. The developing bench of active EU investors represents another encouraging indicator, with the number of unique investors deploying capital into EU technology companies rising consistently throughout the past decade (State of European Tech, 2024).

In short, both hard financial data and other 'soft' facts portray EU as a solid IT market, with stable and constant growth, with prospect to grow even more in the future. The emerging trends in the IT industry will also provide additional opportunities for growth and expansion, nut should be reinforced with proactive measures and attitude that will enable IT companies in Europe to make the most out of those opportunities.

2.2 IT trends in EU

Global IT industry, not just in Europe, is experiencing significant transformations, driven by advancements in AI, machine learning (ML), cloud computing, cyber security, and digital transformation. There are also many emerging trends that are driving the growth and investments in the IT industry (e.g., quantum computing, neuromorphic computing, digital twins). But while other regions have mostly wholeheartedly supported these new trends, trying to catch the early wave and gain some competitive advantage, Europe has also invested significant effort in regulatory framework (e.g., AI Act, Digital Services Act, Digital Markets Act) in order to set legal norms for behaviour and development for some of those technologies. This also led to certain constraints, which hider the development of start-up culture as in North America. But, even so the main trends in IT have found their place on Europe’s market.

AI has become a central focus for European IT companies, influencing various sectors from finance to manufacturing. The AI landscape in Europe has been shaped by significant

technological advances alongside important regulatory frameworks. The European Union's introduction of the AI Act represents a landmark development, establishing the first comprehensive legal framework globally for artificial intelligence development and deployment. Multiple factors are driving AI market growth across Europe. Healthcare applications for disease diagnosis and drug development represent a major growth area. Additionally, the convergence of AI with other emerging technologies, including blockchain and IoT capabilities, is creating new innovation opportunities. As per available data (Contextual Solutions, 2025) the AI adoption landscape varies considerably by country. Eurostat statistics indicate that approximately 13% of German enterprises with 10 or more employees had implemented AI technology by 2023, while adoption rates reached 14% in Denmark, Luxembourg, and Finland. Across the entire EU, approximately 8% of enterprises had deployed AI technologies by 2023. But even with these numbers, AI remains one of the main driving forces of EU's IT industry.

Cloud computing is becoming a very important factor in today's business in Europe, even with heavy legislation on data security and sustainability. Europe's cloud market is compliance-first, prioritizing security and sustainability over cost or global scalability. While it trails North America in innovation and Asia in growth velocity, its regulatory influence (e.g., General Data Protection Regulation - GDPR) continues to shape global cloud practices. For enterprises, Europe offers a stable, ethical environment but at a premium - ideal for industries like finance and healthcare, where compliance is non-negotiable.

As with other IT trends, EU has developed extensive regulations that enabled the development of a very robust cybersecurity framework. Regulations such as NIS2 Directive, GDPR, and Cyber Resilience Act helped with strengthening of defensive capabilities for EU businesses. But, even with the regulation in place the adoption rates still vary across regions due to multitude of reasons (e.g., financial and administrative constraints). But the increased awareness of cyber threats is pushing the companies to invest more in the matter. Another important initiative is SPARTA (Sparta, n.d.), an EU-funded AI threat detection platform aimed to counter advanced threats, which would improve the overall defensive capabilities of EU business entities while also fuelling the investments in AI.

Last but not least, digital transformation. During the recent COVID-19 crisis many EU business entities have jumped head-first in to the murky waters of digital transformation. While the final results are still not that clear, it is evident that the paradigm has shifted and sole fact that full remote or hybrid working options are still available is a strong evidence for that. Businesses had to adapt to the new circumstances which inevitably lead to digitalization of their business processes. Currently, EU enterprises are intensifying digital transformation efforts mostly by focusing on AI-driven solutions to enhance operational efficiency. For the purpose of further development and digitization in the EU, a number of strategies, programs, and legislations were formulated and formally introduced (e.g., Europe's Digital Decade, Digital Services Act, Digital Europe Programme, Horizon Europe).

However, a recent State of the Digital Decade report indicates that member states are collectively falling behind these targets (European Commission, 2024).

Above stated trends in the IT industry have also made significant turmoil for various occupations within the industry, both by providing numerous improvement possibilities but also demanding a perspective shift about the work itself - how it's done currently and how can it be done in the future. And that is in the direct focus of modern Business analysis – using modern solutions to resolve business issues and improve business operations.

2.3 Current position of business analysis within the IT sector

Business analysis occupies a unique and increasingly pivotal position within today's IT landscape, serving as the essential bridge between business objectives and technological implementation. The discipline functions as a crucial translation layer between business stakeholders who understand organizational needs and requirements, and technical teams who develop and implement solutions to fulfil those needs and requirements. Business analysts are ensuring that IT initiatives remain aligned with strategic business goals and deliver measurable value to other stakeholders (TechTarget, 2024). The relationship between business analysis and IT has evolved considerably from earlier models where requirements were simply "thrown over the wall" to development teams. Modern business analysis in the IT context involves continuous engagement throughout the solution lifecycle, from initial concept exploration through implementation and post-deployment evaluation.

The evolution of Business Analysis reflects a broader organizational transformation toward data-driven decision making, with the discipline expanding beyond traditional requirements gathering to encompass strategic analysis, predictive capabilities, and change management. They are required to understand the wealth of data stored in the client's Enterprise Resource Planning (ERP) software and put that data in to good use. Analysts are also included in several agile ceremonies such as sprint planning, backlog and tasks refinement, and retrospectives. This gives them a better overview and control of the work and eventual outcomes, but also increases the responsibilities and required skillset for a business analysts. The technical dimensions of business analysis have also expanded dramatically within the IT landscape, with analysts increasingly expected to demonstrate proficiency with data analysis tools, understanding of database concepts, familiarity with API integrations, and knowledge of enterprise architecture principles (RIB Software, 2024).

But even with all these increased demands, the position of business analyst is still expected to be a crucial actor in many new developments in the IT industry, by recognizing the potential of the new technologies and trends, using them to create solutions to real-world problems, and in that way create additional value for different stakeholders. IT companies can greatly benefit from developing this kind of expertise internally. In the next chapter, Business analysis fundamentals will be explored and analysed, together with Business process management as a common complimentary practice to Business analysis.

3 FUNDAMENTAL ELEMENTS OF MODERN BUSINESS ANALYSIS

In the current period of economic development, characterized by market volatility fuelled by almost constant influx of technological innovations, maintaining a tight balance between business agility and effective usage of available IT tools becomes ever-more important objective for businesses. Companies need to thoroughly analyse their needs if they want to make any kind of major technological switch, especially if it involves changes in the IT domain (new ERP, supporting apps, platform changes, etc.). The journey may be long and hard, but the benefits it can provide usually greatly outshine the negative consequences. But only in the case when everything is done correctly, of course.

And one specific discipline has become a very important part of this journey, and that is business analysis. Business analysis is critical to the success of any project (IT included), enabling organizations to translate business needs into technical requirements. It is a practice that involves identifying business needs, analysing problems, and proposing solutions to improve business performance. Business analysis is a continuous process that involves various activities, including gathering and analysing data, process modelling, identifying and defining business requirements, and developing strategies for implementing solutions (IIBA, 2015, p. 2). The official definition of business analysis, provided by IIBA states the following: Business Analysis is the practice of enabling change in an organizational context, by defining needs and recommending solutions that deliver value to stakeholders (IIBA, 2015). As such, business analysis is a vital part of many change management initiatives in different business domains. In recent times, business analysis is a crucial activity in the modern IT industry because it enables organizations to identify their business needs and align them with new IT solutions and strategic goals. As the pace of technological innovation accelerates, businesses must be able to adapt quickly to remain competitive.

Development of business analysis caused the emergence and development of a new profession – business analyst. By identifying potential risks, costs, and benefits of proposed solutions, business analysts help organizations make informed decisions and optimize their investments in technology and IT solutions. But it doesn't stop there, as the competence of business analysts grew, they started to deal more with the analysis and modelling of processes related to problematic areas or applications. This helped to bridge the gap between process analysis and modern business analysis, and brought those two closer together.

This chapter will present the fundamental concepts and definitions important for understanding both business analysis and business process analysis, the tools and techniques at their disposal, and how they complement each other through a prism of a business improvement initiative. Also, process automation as a concept will be explored, with some major theoretical foundations. All this to lay the foundation for modelling the currently prevalent BA process in IT industry in a process diagram.

3.1 History and goals

When talking about business analysis and its origin, one could wander all the way back to the dawn of humanity. Problem identification, understanding the underlying factors of the problem, awareness of the available resources, and putting them into proper use to solve the problem is an integral part of human life. Some problems are simple and can be resolved on our own, and some are complex and require dedicated interdisciplinary teams to find the solution. All this leads to a simple conclusion that business analysis was present for a long time but was practiced intuitively and somewhat unknowingly.

Ever since our ancestors faced the challenge of adapting to the ever-changing world around them and started developing different adaptation techniques - they started practicing a form of business analysis. Upon understanding the problem they were facing, they had to use all their wits to overcome the challenges and capitalize on the opportunities presented to them. This usually led to a certain innovation (big or small), created a level of resilience, and resulted in knowledge sharing which set the foundation for further development.

In the following parts, a short history of the Business analysis practice will be described along with the main goals of Business analysis.

3.1.1 History

The history of business analysis as a formal discipline dates from the mid-20th century, although its roots can be traced to earlier management practices. In the 1950s and 1960s, as businesses increasingly relied on technology to support operations, the need to translate business requirements into technical specifications grew. But in those times, this technology was only available to the government, universities, and the companies that made computers. The costs were too high for all others, in terms of operating and educational costs. At that point system analysts acted as an intermediary between business users and programmers. Their main focus was designing and documenting technical systems while the planning was linear with upfront requirements documentation (waterfall planning). This led to rigid solutions that were often disconnected from evolving business needs.

However, in the 1980's – early 1990's, things started to change. Data storage became less expensive, relational databases were introduced, new object-oriented programs such as Java were invented and the first graphical user interfaces came into being (BA Times, 2014). Although the technology became much more accessible and more people were involved in the actual development, the costs were even higher due to many failed attempts to include IT in business. But still, the prevailing stance was that this has to be done, the issue was how to do it properly. It soon became clear that efficient and effective communication between business and IT was the key for success, and this marked the beginning of traditional business analysis discipline and consequentially business analysts as a role. With the rise of information age and growing importance of data, "an important role for the business analyst

was to understand how and what data could be used to improve processes and ensure delivery of better returns from IT investments" (Milani, 2019. p 2). But the main focus was still on understanding the business needs and communicating them in a way understandable for software developers.

Further development and inclusion of IT into business domain expanded the scope for business analysis. And things got even more dynamic when agile practices were established as a way to promptly respond to fast-paced changes in the business world. This lead to business analyst being included in the overall (re)design of a process, not just formulating requirements. The role became an agent of change and the new situation was that "business analysts are involved not just in analysing and specifying software requirements, but also with understanding current state business processes, helping plan business process improvements and changes, and driving the implementation inside the business user community" (Bridging the Gap, 2015).

Perhaps it can be said that the role of the business analyst has grown from a mere formulation of requirements to the work performed prior to the requirements, stretching into analysis aiming at unravelling the real needs, root causes, and assessment of alternative solutions (Milani, 2019. p 2). And modern achievements and breakthroughs in AI and ML will once again push the boundaries for the discipline and remodel the business analyst role as we know it by enabling automation of repetitive tasks and standardized analysis procedures.

3.1.2 Goals

The field of business analysis uses various frameworks for defining its goals and objectives. Therefore, the goals need to outline the most important outcomes for any business analysis. Based on publicly available sources common BA goals that can represent the foundation of effective business analysis practice are deduced and displayed in Table 1 below.

Table 1: Business analysis goals

Goal	**Description**	**Reference**
Delivering Business Value and Successful Outcomes	The main goal of business analysis is to ensure project outcomes deliver real business value. It's not just about thorough analysis or perfect requirements, but about aligning outcomes with business goals and launching successful solutions. Business analysis should always focus on value, not just the analysis process itself.	IIBA, 2022
Identifying Needs and Recommending Solutions	Business analysis focuses on identifying business needs (problems or opportunities) and recommending effective solutions. It involves managing requirements to ensure solutions meet stakeholder expectations and deliver expected benefits. Strong requirements and stakeholder engagement are key to project and organizational success.	Project Management Institute (PMI) White Paper, 2017

To be continued

Table 2: Business analysis goals (cont.)

Aligning Projects with Organizational Strategy	Business analysis helps align projects and programs with the organization's strategy and goals. This alignment ensures that investments support long-term priorities, boosting the chances of successful execution and creating competitive advantage.	PMI White Paper, 2017; Harvard Business Review, 2024
Ensuring Alignment Between Analytics and Business Objectives	In business analytics, the goal is to align analytics efforts with business objectives. Strong alignment enables organizations to capitalize on data-driven insights for profitability, growth, and improved customer outcomes, while misalignment wastes resources. Achieving this requires a data-driven culture, leadership support, and building the necessary skills and competencies.	Harvard Business Review, 2024; Harvard Business School Online, 2019
Developing Robust Business Cases	A key goal is to create strong business cases that justify project funding, present viable options, and highlight expected value. They support decision-making by ensuring stakeholders understand the need and benefits of the proposed solution.	PMI White Paper, 2017

Source: Own work.

To fulfil these goals IIBA recommends usage of several tools, for different situations and purposes. In the next section those tools will be described in more detail.

3.2 Business analysis tools, technologies and techniques

Although the main "tools" that a good business analyst should have are in the domain of individual traits and soft skills, such as negotiation, active listening, teamwork, analytical thinking, abstraction and similar, there are some formal tools that complement these intrinsic ones. They help the business analyst communicate, guide and manage the work needed to fulfil the analysis goals.

IIBA in its 3rd edition of BABOK divides these tools into 3 major segments:

- Office productivity tools and technology

Office productivity tools and technology provide business analysts with the ability to organize, dissect, manipulate, understand, and communicate information clearly (BABOK, 2015, p 212). These tools are mainly used to document and track information and analysis artefacts. Since it covers a wide variety of tools and technologies, most notable being: word processing and presentation programs (e.g., MS Word, MS PowerPoint, Prezzi, etc.), spreadsheets (e.g., MS Excel, Google Sheets), communication tools (e.g., MS Outlook, Gmail, Yahoo mail, MS Teams, Slack) and collaboration and knowledge management tools (e.g., MS SharePoint, Atlassian Confluence, Trello). Every tool from every group caters for different needs and scenarios, it's up to analysts to use the most appropriate ones in order to achieve the organization and analysis goals.

- Business analysis tools and technology

Business analysts use a variety of tools and technology to model, document, and manage outputs of business analysis activities and deliverables to stakeholders (BABOK, 2015, p 213). The tools and technology from this segment enable analysts to comprehensively encapsulate all relevant aspects of analysis, transform them into a meaningful visual artefacts, allow collaboration and knowledge transfer, and ultimately create the common ground for all participants which in turn makes the model and requirements confirmation a much easier task. These tools may have functionalities such as modelling, requirements management, issue tracking, prototyping and simulation, computer aided software engineering (CASE), and survey engines. Although no single tool covers all of those areas, solutions like Bizzagi Modeler, iGrafix, Blueworks Studio, Figma, Axure, Atlassian + MS PowerApps are worthy mentions but of course analysts can use different combination of these and other available tools to cover all mentioned aspects and functionalities.

- Communication tools and technology

Communication tools are used to plan and complete tasks related to conversational interactions and collaborative interactions. Communication tools allow business analysts to work with virtual and co-located teams (BABOK, 2015, p 215). These tools are used mainly for modern business analysis activities, when traditional on-premise analysis is not so common anymore. They can also be used for team management and collaboration with stakeholders. Again, solutions like MS Teams, Slack, Google Meets, Zoom and similar are first that come to mind in this aspect. The possibility to communicate within the analysis team and with other stakeholders is crucial for the success of any business analysis project and these tools and technologies make it possible.

As for available techniques for business analysis, there are 50 techniques mentioned only in BABOK as a source. Most commonly used ones are interviews, workshops, business cases, data mining and modelling, process analysis and modelling, SWOT analysis, Root Cause analysis, etc. Every technique has its own strengths and weaknesses, as well as business domains and cases where it’s most suitable. Business analyst must have a good understanding of the situation and circumstances in order to select the most appropriate techniques to be used for analysis. And given that modern business analysis is currently very much focused on business processes, and how their improvement can solve bigger business issues, some of those techniques will be inspected in greater detail in the chapter about Business Process Management (BPM).

3.3 Modern Business analysis process steps

Business analysis has come a long way since its early days. In the modern era, where almost everything is governed by computers and IT solutions are one of the main drivers of the economy, business analysis as a practice has emerged as a vital part of the development

success. By following the whole project end-to-end, if done effectively and efficiently, business analysis enables the development of software solutions that fit the client's needs with the best possible combination of resources. In order to achieve this, business analysis process goes through couple phases. The following description of the process is based on personal experience and information gathered from the interview in the Appendix 1.

First, the analysis team needs to be formed. On larger analysis projects, this usually means to divide analysts in teams (often called streams), and assign every team to a specific area of the analysis. In the early stages, business analysts need to map the current situation properly and with precision (detect affected processes, create process diagrams, define actors in those processes, map the data flow, identify key tasks and responsibilities, etc.). This will serve as a starting point for the analysis project. This part requires tight cooperation with the relevant stakeholders from the client's side, since they are the main sources of knowledge for this phase.

Then, performing activities to identify the main pain points of the targeted process, understand the underlying factors and causes for those issues, and then propose solutions for identified issues. The structure of the prepared solutions differs according to the end goal of the project, since "socio-technical systems with which business analysis deals are subject to a characteristic known as equifinality. This means that any such system can achieve its goals or purpose in a number of different ways" (Beynon-Davies, 2021, p 77). For those projects whose end goal is the creation of a new custom software solution, the proposed solution comes in the form of a detailed description of necessary features and functionalities required and confirmed by the client. In case that the goal is to implement already existing off-the-shelf software, proposed solution comes in a form of a detailed description of the major and minor gaps between features and functionalities required by the client, and features and functionalities offered and supported by that software solution. In any case, direct contact with stakeholders is still very much necessary and a greater deal of interaction and exchange of ideas between analysts and stakeholders must happen.

After one solution is confirmed and accepted by the client, comes the implementation phase. Now the new solution must be developed (or existing one adapted) according to the agreed client requests. In this phase, business analysts usually support the development team by providing additional explanations or act as "client eyes" during the development by making sure all main client requirements are met. In case that some parts need further clarification or some change requests are submitted by the client, business analysts act as intermediaries to efficiently resolve the new challenges.

Having everything abovementioned in mind, it's clear why is business analysis so important in modern IT world. Whether it is practiced knowingly or unknowingly, it is a crucial part of modern problem-solving process. Although this thesis will target the business analysis in IT industry, the same described principles and steps apply on other industries as well since (as stated before) IT solutions are so omnipresent in the modern business world.

Although there are some standard steps in business analysis, defined and prescribed as examples of best practice by relevant bodies of knowledge (e.g. IIBA's BABOK), it is not a strange thing that IT companies add some specific steps or procedures relevant for their own modus operandi. Many of those specifics remain within the company, but from time to time they can emerge as innovations accepted by other business analysis practitioners.

One important aspect of modern business analysis is the increased focus on processes, now that IT systems and application perform majority of tasks previously done manually by employees. This blurs the line between business and process analysis, and requires from modern business analysts to be very much up-to-date with both newest trends in process analysis and BPM as a discipline. Next subchapter will cover the development, basic theoretical concepts, and main elements of BPM in order to provide better understanding of the new challenges for modern business analysts.

3.4 Business process management

This chapter covers the basic theoretical framework related to BPM, relevant for this thesis. At the beginning, there is a brief conceptual introduction of a "process", together with some historical background about BPM. After that follows the part about BPM Lifecycle, how it unfolds, what are the main parts, and what are the results. Next business process improvement as a concept will be covered, what it means, how it's performed and what are the results. In the end, main success factors for BPM initiatives will be explored from a project standpoint.

3.4.1 About processes

Ever since the early ages, when first companies were founded, people started noticing how small changes in the organization of work can have significant positive impact on the end result, regardless is it a product or a service. Small blacksmith shop reduced its time to build shields and knives when expert blacksmith decided to rearrange the tools, positions of anvils and furnaces in order to get more streamlined production steps. By focusing on the big picture, not just on the task at hand, people started thinking about the way the work is interconnected and how all those small individual tasks and activities are a part of one big whole – a process.

Process was a bit vague concept in the beginning, but as time passed and body of knowledge grew it became something much more understandable, and more importantly - verifiable. In his famous example of a pin factory (Smith, 1776), Adam Smith describes the benefits of viewing how things are made by dividing the whole work (i.e., process) into parts (i.e., activities) performed by different people (i.e., actors), and this sparked the further development of the theory about processes. A business process can be defined in many ways, and with the development of BPM as a discipline many authors provided their own takes on

the subject. Every definition reflects the view of its authors, and is usually closely tied with the author's immediate field of study. Therefore, initially, there was no universal process definition to be widely accepted and applicable.

But, processes got their own field of study that today crosses classical borders between several study fields, since it incorporates basic principles of economics, statistical and mathematical models and logic, modern day informatics and even some sociology concepts (e.g., organizational culture). But in essence, main elements of a process stayed the same and are displayed in Table 2:

Table 3: Process elements

Process element	Description	Example
Event	Events are things that happen atomically and have no duration.	Ordered merchandise arrived in the warehouse.
Activity	Triggered by events, require some work to and usually take some time to be finished. Can be simple (i.e., tasks) or complex.	Reviewing the received merchandise.
Actor	Participant in the process, makes decisions and influences the process. Actors can be humans or IT systems, both internal and external.	Warehouse manager, ERP system.
Decision point	Represent points in the process where some decision is been made that affects the rest of the process.	Is delivered merchandise accepted by the warehouse manager?
Outcome	Result of the process, based on the performed activities and decisions. A process can have several outcomes, positive and negative ones.	Merchandise is received and stored in the warehouse.
Customer	A special actor that consumes the output of the process. This actor will be satisfied with positive or dissatisfied with the negative outcome of a process.	Sales department that uses the received merchandise in its sales process.

Source: Own work

By combining abovementioned elements, we can define a process as "a collection of inter-related events, activities, and decision points that involve a number of actors and objects, which collectively lead to an outcome that is of value to at least one customer" (Dumas et al., 2018, p 8). Now when there's a concrete definition of a process, a short review of BPM history follows.

3.4.2 Business process management history

As a discipline, BPM had a very rocky path to be fully acknowledged as a standalone discipline, constantly joined under other emerging trends like scientific management, total quality management, etc. In Table 3, there's a chronological overview of important milestones which led to establishment of BPM as a discipline.

Table 4: Chronology of important BPM development milestones

Period	Milestone	Contribution to BPM	Reference
1750s – 1800s	Adam Smith's initial work on processes.	Formalized view on work through a series of steps in order to achieve a goal.	Smith, 1776
1870s – 1920s	Frederick Winslow Taylor & Scientific Management	Early foundations for the discipline through his influential work "The Principles of Scientific Management"	Wikipedia, 2023
1950s – 80s	Total Quality Management, Lean management	Emphasized the importance of continuous improvement and waste reduction, paving the way for a more holistic approach to managing business processes	Dahlgaard et al., 1997
1980s – 90s	Business Process Reengineering	Work of Shewhart and Deming on statistical process control, which introduced the usage of statistical methods to analyse processes. Michael Hammer's work that redefined the view on process and shifted the focus from process execution to process design.	Vom Brocke, Roseman, 2010

Source: Own work

From its early beginnings and simple work atomization, to introducing statistical methods to identify and eliminate variation in process outcomes with relying on performance metrics and data over opinions BPM has come a long way in its development. Shifting the focus from execution to process design enabled the development of BPM as a discipline as it is today, acknowledged as "an integrated system for managing business performance by managing end-to-end business processes" (Vom Brocke, Roseman, 2010). One of the well-known definitions, by authors John Jeston and Johan Nelis, is that BPM is the discipline in which people use various methods to discover, model, analyse, measure, improve, optimize, and automate business processes (Wikipedia, 2025). Michael Hammer refers to it as "arguably the first set of new ideas about organizational performance since the Industrial revolution" (Vom Brocke, Roseman, 2010).

Next chapter is about the formal flow of BPM Lifecycle and describes how the established BPM activities (result of BPM development and enhancements) are performed in more detail.

3.4.3 Business Process Management Lifecycle

The BPM Lifecycle serves as the guiding framework for organizations seeking to systematically analyse, optimize, and manage their business processes to achieve strategic objectives and drive sustainable growth. At its core, it consists of a series of interconnected phases, each contributing to the overall improvement and refinement of organizational workflows. Through continuous iteration and refinement, organizations strive to enhance

efficiency, reduce costs, mitigate risks, and enhance customer satisfaction. The BPM Lifecycle embodies a holistic approach to process management, emphasizing the importance of aligning business processes with organizational goals and adapting to changing market dynamics.

Below is a listed view of all BPM Lifecycle phases, while more in-depth descriptions for each phase can be found in Appendix 4.

- Process identification,

In this phase business problem is posed, relevant problematic processes are identified, their interconnections defined and mapped. The underlying reason for subpar performance is not explored in this phase. Output of this phase is process architecture "which provides an overall picture of the processes in an organization and their relationships. This architecture is then used to select which process or set thereof to manage through the remaining phases of the lifecycle" (Dumas et al., 2018, p 22).

- Process discovery

In this phase relevant knowledge about previously identified and selected process is gathered to model it properly. The knowledge necessary for effective process modelling can come from different sources (e.g., internal or external stakeholders, business documentation, clients ERP data). BPM professionals communicate with relevant actors and subject matter experts (SMEs) to gain a better understanding of the process (Dumas et al., 2018, p 160). Once that is done, the existing process model is created. From flowcharts to using Universal Modelling Language (UML) and Business Process Modelling Notation (BPMN) version 2.0, the use of diagrams in the process discovery phase not only enhances transparency and comprehension but also lays the foundation for successful process management and continuous improvement initiatives. Existing As-Is process model is the output of this phase.

- Process analysis

When the process is modelled and understood by the BPM professionals, the process analysis phase can begin. Process analysis involves a systematic examination of process inputs, outputs, activities, dependencies, bottlenecks, and performance metrics. Through techniques such as process mapping, data collection, and performance analysis, analysts aim to uncover inefficiencies, redundancies, and areas of waste within their workflows. Output of this phase is a structured collection of recognized issues, usually ordered by priority and impact they have on process performance.

- Process redesign

Next phase is the process redesign (also known as process improvement phase). Based on the output of previous phase, BPM professionals can come up with different solutions for

identified issues, conduct an analysis of their effects, and sort the identified solutions based on the performance improvement. As stated in (Dumas et al., 2018, p 23) “process redesign and process analysis go hand-in-hand: As new change options are proposed, they are analysed using process analysis techniques”. The best solutions are then incorporated, and the future To-Be process model is created – which is the output of this phase.

- Process implementation

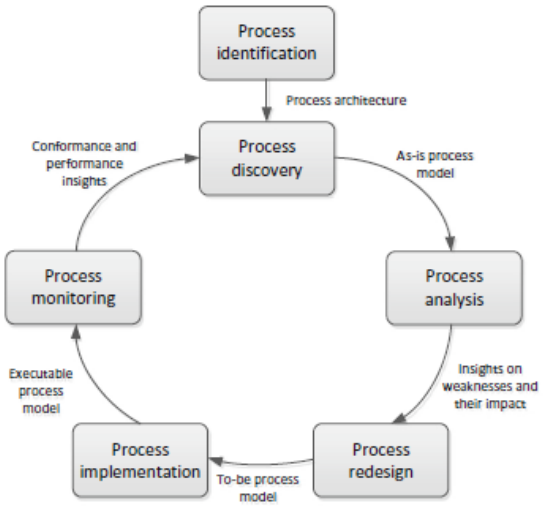
After identifying the best process improvements, and defining the future process flow, it is time to implement it. In process implementation phase all previously identified process changes are performed to turn the As-Is into a To-Be process model. So the output is fully functional new process, implemented at the client.

- Process monitoring

Process monitoring deals with constant collection and analysis of improved process’ data in order to gain insight about the performance. The performance is being monitored to determine if the planned performance metrics (defined during the process redesign) are achieved, and if the BPM initiative in the company provided desired results. Except from this, this phase can also spark another BPM cycle based on the collected data.

And this is the main point of the BPM lifecycle flow presented in Figure 1 below, the BPM lifecycle should not be a one-time event but a continuous activity aimed at learning from past mistakes, making informed improvement decisions, and staying vigilant in ever-changing business environment.

Figure 1: Business Process Management Cycle



Source: Dumas et al. (2018).

Process-oriented companies are aware that BPM initiatives need to be iterative. The iterative nature of BPM initiatives ensures continuous improvement and adaptation to evolving business needs and market dynamics. By frequently redoing the BPM cycle, organizations can incorporate feedback, refine processes, and address emerging challenges in real-time, leading to greater agility and responsiveness to changes. This iterative approach fosters a culture of continuous learning and innovation, enabling organizations to stay ahead of the curve and drive sustainable long-term success.

To enable this iterations, it's required to be as effective in all of the phases of the BPM Lifecycle and process automation can help in that area. Modern software solutions and IT development provide opportunities that companies should capitalize on in order to maintain the desired culture of continuous process improvements.

And since every business process improvement project includes many, if not all of the previously described BPM lifecycle phases, it is important to understand how a common business process improvement project unfolds. And this is the topic of the next chapter.

3.4.4 Business process improvement

In today's dynamic and competitive business environment, organizations are constantly challenged to enhance operational efficiency, reduce costs, and deliver superior value to customers. To adequately answer those challenges, companies need to have a proper understanding of their processes combined with an adequate strategy on how to properly monitor and improve them when needed. And when that situation arises, companies require an end-to-end inspection, review, and redesign of their under-performing processes, or in other words they need a business process improvement project.

Process discovery, analysis, and redesign of the previously mentioned BPM lifecycle play a vital role in any business process improvement initiative. Starting point is to understand how the process currently unfolds (discovery), then to proceed with analysis of its major bottlenecks and inefficiencies (analysis), and eventually to come up with the best solutions for recognized issues and how to integrate them in the current process (redesign).

Every of the mentioned BPM lifecycle phases has its own distinctions, challenges, and set of tools to support any business process improvement initiative. In the following subchapters they are described in more detail.

3.4.4.1 Process discovery

Process discovery is the first step in any process improvement project, where organizations work to fully understand how their current processes operate before making changes. It is "defined as the act of gathering information about an existing process and organizing it in terms of an As-Is process model" (Dumas et al., 2018, p 159). And because the formalized

output of this phase is a process model, sometimes process modelling and process discovery can be used as synonyms. But in its essence process discovery is a broader term, encompassing a broader scope of activities.

Process modelling is done based on already gathered data, using already acquired knowledge and understanding of the process flow and its participants. Process discovery on the other hand deals with the actual gathering of the necessary information, acquiring the necessary knowledge, and documenting it in the form of a process diagram. So, in essence, process discovery as a BPM lifecycle phase also includes process modelling. Additional distinction is that process modelling can also be a part of other BPM Lifecycle phases, where process materialization in form of a diagram is needed.

The process discovery plays a crucial role in business process improvement initiative and as such requires collaboration among several key roles. Process analysts play a central role in identifying and documenting processes using analytical techniques. Their expertise in gathering process information process and modelling languages (e.g., BPMN, UML, flowcharts) is essential. Prior domain experience and knowledge is beneficial but not mandatory. Domain experts provide process insights, as they possess in-depth knowledge of the processes and usually participate in some key process steps and activities. They may be employees as well as external stakeholders such as suppliers and customers, offering diverse perspectives on process execution. Process owners in charge of the targeted process not only provide crucial process details and outcomes, they also need to ensure alignment of the analysis outcomes with organizational goals, driving the initiative forward and fostering collaboration among different cross-functional analysis team members. Their role is vital in securing stakeholder engagement and ensuring a comprehensive analysis of processes (Dumas et al., 2018, p 161). Together, these roles facilitate a thorough process discovery phase, laying the groundwork for subsequent analysis and improvement efforts.

Next parts address the process discovery methods and most common challenges that analysts face during this phase.

Process discovery lays the foundation for subsequent analysis and redesign efforts, providing a clear blueprint of organizational workflows and potentially highlighting areas for improvement. But it is a daunting task to overcome all obstacles and to gather all relevant information necessary to end process discovery phase successfully. To do it effectively, process analysts can use different methods that are at their disposal. Those methods are usually divided into 3 groups (Dumas et al., 2018. p. 165):

- Evidence-Based Discovery

Evidence-based process discovery in BPM involves leveraging empirical data and evidence to understand and analyse the current state of business processes. This approach focuses on collecting and analysing real-world data from various sources, such as documentation, observation, transaction logs, system records, and performance metrics, to uncover insights

into how processes are actually being executed. As the name implies it relies on hard evidences about the process behaviour, and it can have a traditional or modern manifestation.

Traditional evidence-based discovery methods are documentation analysis and observation, while a modern manifestation is represented through automated process discovery.

Documentation analysis refers to the examination of existing materials (e.g., procedures, user manuals, organizational charts, and policy documents) to gain insight into the original design of the business processes. While valuable for establishing an initial understanding, this method is usually not sufficient on its own due to limitations such as outdated process descriptions, inappropriate granularity level, and a lack of process-oriented structure. Despite not reflecting actual process execution, it can reveal the formal sequence, structure, actors, and governing rules of a process. Therefore, it can be used for fundamental understanding of the process.

Observation involves the process analyst directly monitoring participants as they carry out their work. This method provides valuable, first-hand insights into the actual execution of processes, revealing the sequence of activities, stakeholder interactions, and deviations from formal procedures. It captures real-world behaviours, informal practices, and subtleties often missed in documentation or interviews. Observation can be conducted in two main forms: active and passive. With active form, observer actively engages with the process (e.g., as a process customer) or participants during the observation. And with passive form observer does not interact with participants but watches the process as it naturally occurs, often referred to as "shadowing" in BPM. Disadvantage of observation is subjective process interpretation of the observer and participant’s behaviour may change when they are aware of monitoring.

Automated Process Discovery (APD) revolutionizes business process analysis by leveraging event logs from operational systems alongside machine learning and data mining to automatically reconstruct process models. Unlike traditional methods reliant on subjective human input (e.g., interviews, workshops) or manual observation, APD generates objective models based on empirical execution data. Tools such as process mining software, task mining platforms, or BI-based analytics enable organizations to systematically identify bottlenecks, inefficiencies, and compliance gaps while supporting data-driven optimization. Main advantages and disadvantages of APD will be described later in the chapter dealing with process automation.

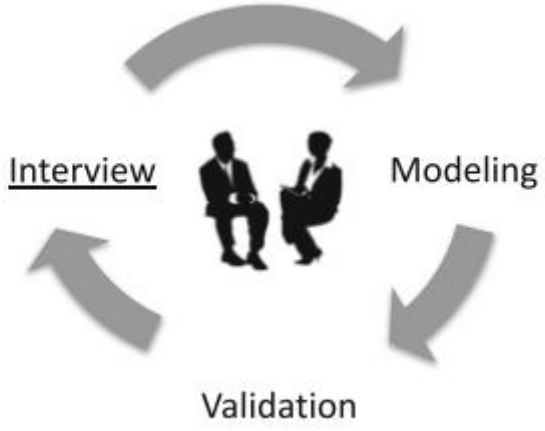
- Interview-Based Discovery

As the name implies, interview-based discovery involves process analysts conducting interviews to collect detailed information about a specific process. While widely used, this method requires consulting multiple subject matter experts to address fragmented knowledge across different roles which can be very resource-intensive for complex processes. Effective interviews must strike a balance between exploring standard workflows and exception cases,

all while considering the limited process modelling literacy of some stakeholders. Achieving an accurate As-Is model often requires multiple validation cycles and repeated interview rounds.

There are 3 main phases when performing interviews are displayed on Figure 2 below.

Figure 2: Interview Phases



Source: Dumas et al. (2018).

During the interview phase, analyst questions selected stakeholders using combination of direct and open-ended questions to gain insights about the process. There are different approaches to interviewing and analysts need to select the most appropriate one for every interview. Following initial interviews, analysts synthesize gathered inputs into draft As-Is models. These models are then validated by the same stakeholders with the goal of reaching a consensus. This consensus usually requires several iterations when analysing complex processes.

While interviews enable direct stakeholder engagement and contextual insight capture, their efficiency depends on balancing the interview methodology and resource constraints as multi-round sessions incur significant temporal and financial costs to the project.

- Workshop-Based Discovery

Workshops serve as a collaborative method for eliciting process knowledge, enabling the simultaneous involvement of multiple domain experts. Compared to interviews, they can save time but require more effort to organize. Workshops benefit from a mix of perspectives and bringing together participants with different viewpoints helps identify inconsistencies in daily operations and supports building a clear picture of how the process actually works. They are usually supported by specific roles, such as an analyst who leads the discussion, a modeller who maps the process, and a scribe who records key points and decisions. Although

these roles can be combined if resources are limited, it is recommended to divide them among different people when possible. For workshops to be effective, it is important to align expectations early, such as setting clear goals, scope, and basic modelling rules. Another important aspect is to encourage open environment for active participation of all involved parties, that's why it's important for analysts to understand the overarching company culture. But regardless of the setting, the facilitator's main task is to create a comfortable environment and guide constructive dialogue.

One of the main advantages of workshops is the ability to bring several domain experts together, which allows for faster data collection compared to individual interviews. They also create opportunities to compare different views of the process, which can help uncover inefficiencies. However, workshops do require careful preparation to make sure all domain experts can participate effectively. Another drawback is the potential increase in project costs, since additional roles (e.g., a facilitator, process modeller, and scribe) may be needed to run the session successfully.

Like other phases of BPM Lifecycle, process discovery has several challenges, including fragmented process knowledge, case-specific thinking, and limited familiarity with process modelling languages (Dumas et al., 2018, p 162). Some other sources (EdgeVerve, 2022) list additional challenges, such as lack of process documentation and knowledge, lack of knowledge on variations and exceptions in the real-life processes, understanding exceptions happens at a later stage, etc. One important challenge can emerge from current company culture – resistance to change. If not handled properly, it can deter and undermine process discovery efforts made by other stakeholders.

By addressing these challenges, organizations can enhance the accuracy and efficiency of process discovery, ensuring a well-founded basis for process improvement initiative.

3.4.4.2 Process modelling

As previously described, process discovery involves systematically gathering information about process flows, including tasks, roles, and constraints. Documenting the findings in plain text, while simple, is time-consuming and can cause ambiguity for different readers, making stakeholder alignment more difficult and potentially prolonging the analysis.

By presenting the findings visually, analysts can transforms complex text into clear diagrams that help align different stakeholders and reduce misunderstandings among them by achieving a unified view of the process (Reijers, H., 2021). These models help teams identify gaps, validate workflows, and serve as a shared foundation for process improvement.

Selecting the right process modelling technique is key. The choice depends on factors like process complexity, stakeholder familiarity with modelling techniques, technical detail, and

project scope, as each technique offers different strengths for visualizing business workflows. Most popular techniques are BPMN and UML, flowcharts, and others.

But, as every step and part before, process modelling is not without its challenges. What to model, how detailed should the model be, how to introduce process participants and their actions, all those are relevant questions that need to be answered in order to deliver a high quality process model. If those questions are addressed properly, process analysts are able to assemble the initial model of the analysed process. This represents a starting point for all following activities and BPM lifecycle phases. But before moving on to the next phase, it is essential to assess the quality of the designed process model.

Although the quality of a process model is a very project-specific thing, this doesn't mean that there are no formal guidelines on the subject. There are theoretical frameworks and guidelines for model quality evaluation, like the SEQUAL framework (Krogstie et al., 2015) or concepts of syntactic, semantic and pragmatic quality of a process model (Dumas et al., 2018, p 183). Also, practical tools and techniques to evaluate and verify a process model are available, such as end-to-end test case generation from BPMN models (de Moura et al., 2017) or bPERFECT framework (Lopes and Guerreiro, 2023). Regardless of the selected approach, it is very important that produced process models have some sort of verification before they are presented to the stakeholders to avoid confusion and misunderstandings.

3.4.4.3 Process analysis

Building upon the insights gained during the discovery phase, the process analysis phase delves deeper into the performance and efficiency of the targeted process. Organizations leverage various analytical tools and methodologies to collect and analyse process data, identifying bottlenecks, inefficiencies, and opportunities for optimization.

And as with everything, there is a plethora of recommended approaches, methodologies, tools, guidelines and other helpful assets when it comes to process analysis. The analysis can go in the direction of examining already known issues highlighted during process discovery, doing a qualitative analysis of the whole process, or relying on hard data and quantitative analysis to pinpoint the problematic activities. The selection is not exclusive and for bigger process improvement initiatives a viable combination of different approaches is usually the best option.

The most basic categorization of process analysis methods is on qualitative and quantitative analysis methods. Former address the soft dimensions and elements of a process, while the latter is more data-oriented and focuses on hard facts to assess the process performance.

Qualitative process analysis

Analysing business processes is both an art and a science. In this respect, qualitative analysis is the artistic side of process analysis (Dumas et al., 2018, p 213). As a method, it examines business processes using non-numeric, descriptive data to gain insights into the process's performance, issues, and improvement areas. Those insights are inherently subjective, since they are usually gained by observation and stakeholder feedback. Three important parts of it are: identification of process parts that are not related with desirable outcomes, identification of issues that affect the process and identification of root causes for those issues (Dumas et al., 2018, p 213).

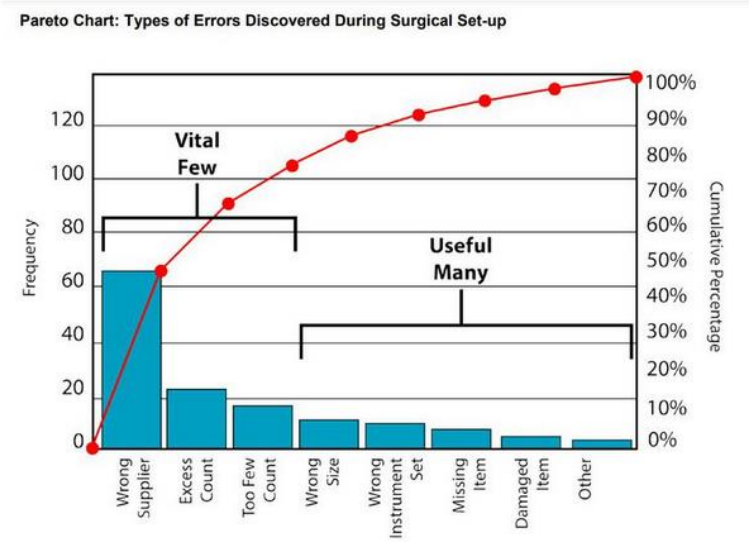
For identification of process parts that are not related with desirable outcomes, analysts can choose between:

- Value-Added analysis (VAA), where the process (or a task, or an activity within the process) is broken down into steps, then those steps are categorized in to value adding and non-value adding based on customer feedback, and lastly non-value adding steps are appropriately eliminated (Dumas et al., 2018, p 214).
- Waste analysis, where all waste in the process (i.e., in the steps, between the steps or throughout the process), is detected, classified, and purposefully eliminated (Dumas et al., 2018, p 218).

For the second part, that requires identification of issues that affect the process, analysts commonly use:

- Stakeholder analysis, which usually includes several rounds of interviews and workshops but now with the aim of identifying issues in the process (Dumas et al., 2018, p 225).
- Pareto analysis, a decision-making tool premised on the idea that 80% of problems can be traced to 20% of the causes. In other words, it posits that not all inputs have the same or even proportional impact on a given output (Investopedia, 2024). The result is the so-called Pareto chart (Figure 3) that displays the relative importance of different factors contributing to an overall effect.

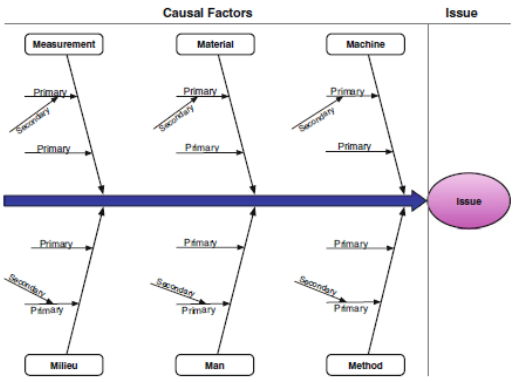
Figure 3: Pareto chart



Source: Investopedia (2024).

And for the last part analysts frequently use Root Cause Analysis (RCA), a method of problem solving used for identifying the root causes of faults or problems (Wikipedia, 2024). RCA is also used as pre-emptive measure rather than just putting out fires. Commonly used RCA technique is Ishikawa diagram (also known as fishbone diagram). Created by Kaoru Ishikawa, it shows the potential causes of a specific event. Each cause or reason for imperfection is a source of variation. Causes are usually grouped into major categories to identify and classify these sources of variation (Wikipedia, 2024). The problem to be solved is shown as the fish's head, facing to the right, with the causes extending to the left as fish bones; the ribs branch off the backbone for major causes, with sub-branches for root-causes, to as many levels as required (Ishikawa, 1976), as displayed on the example in Figure 4.

Figure 4: Ishikawa (fishbone) diagram



Source: Dumas et al. (2018).

To conclude, qualitative process analysis allows for more systematic insights into a process and a more humane understanding of process dynamics and human factors that are involved,

making it invaluable for identifying issues and their causes that quantitative metrics can't evaluate, such as employee morale, user satisfaction, and cultural barriers.

Quantitative process analysis

While qualitative analysis is valuable for understanding process dynamics, it often lacks measurable evidence to support decision-making. In contrast, quantitative process analysis applies data-driven methods to evaluate and improve business processes. The most popular technique nowadays, given the breakthrough in the IT sector in general, is the use of a simulation.

As per (Dumas et al., 2018, p 279), "the essential idea underpinning process simulation is to use the process simulator for generating a large number of hypothetical instances of a process, executing these instances step-by-step, and recording each step in this execution. The output of a simulator then includes the logs of the simulation as well as statistics of cycle times, average waiting times, and average resource utilization". In short, simulation software generates virtual process executions, collects performance data, and compiles a comprehensive report. This allows the BPM analysts to assess current process performance but also predict how potential changes may influence outcomes, without incurring the risks or costs of live implementation.

Quantitative process analysis provides a clear, objective view of how a process performs against targets and industry standards, enabling organizations to make informed, data-driven decisions. It is particularly valuable for continuous improvement initiatives, allowing teams to track performance changes over time and ensure that improvements have a measurable impact.

3.4.4.4 Process redesign

Armed with insights from the discovery and analysis phases, organizations move to process redesign stage to transform their vision for improvement into actionable strategies. This phase involves reimagining and restructuring business processes to enhance efficiency, effectiveness, and customer satisfaction.

But even the most complete insight doesn't guarantee a high quality improvement of the process. And these improvement come in various shapes and sizes, from calculated tweaks and low cost – high impact changes to overall restructuring of a process and organization around it, the size and scale of the changes that come with implementation of improvements differ significantly from case to case. There are cases where the processes are built on solid foundations and just need a bit of polishing in order to be back in the top performing tier. A good example would be Toyota's Just-In-Time production that is refined over time to stay competitive but the core process approach stays the same. On the other hand, there are cases where it's decided to follow Michael Hammer's advice "Don't automate, obliterate!"

(Hammer, 1990) to the letter and do a complete redesign of their processes. One good example is the IGN Netherlands big-bang switch from traditional to more fintech way of work in 2015 (Barton et al., 2018).

Regardless of the approach and scale, all process redesign and/or reengineering initiatives have one thing in common – they seek to improve the current process quality and performance. In ideal case there is an improvement solution that provides many benefits without any drawbacks, but in reality that is not so often the case. In every redesign project analysts must be aware of the Devil's Quadrangle, a common framework in Project management also applicable in BPM. The Devil's Quadrangle framework is based on 4 performance dimensions: cost, time, quality, and flexibility. It is used to analyse the trade-offs between different process performance metrics. For example, optimizing a process to reduce time and cost might also reduce flexibility or quality. In other words, "improving a process along one dimension may very well weaken its performance along another" (Dumas et al., 2018, p 303). Therefore, analysts must be careful and take many information into consideration when deciding on the redesign approach since there are many of them (e.g., Business Process Reengineering, Product Based Design, Six Sigma, etc.).

Process redesign as a phase serves for summing up of all insights, gathered knowledge, guidelines and tips from the stakeholders, requirements, and understanding of the clients strategic goals, all in the service of extrapolating a list of improvement propositions that not only resolve the acute process performance issues but also contribute to the company's strategic goals and vision. It's the make-or-break moment in the analysis, since it really tests the competence of the analysis team but also paves the road for the future implementation and in that way steers it towards success or failure.

3.4.5 Success of a BPM initiative

All previously mentioned aspects of BPM are providing a part of a greater puzzle that is a successful BPM project. All previous BPM phases play their role in it. But, just following the theoretical fundamentals and going "by the book" does not guarantee a successful BPM improvement project. Although serious effort and resources are invested in numerous BPM initiatives across various domains, it is estimated that (Trkman, 2010. p 126) as many as 60-80% of BPM initiatives having been unsuccessful.

In an article from 2010, Trkman suggests that one of the major contributors to that is the lack of concise critical success factor (CSF) for BPM initiatives, where the participants don't have the appropriate tools to assess and measure the effects of those initiatives. While BPM theory has some CSFs defined, they are very general and not precise enough (e.g., top management support, project management, project champions, communication and inter-departmental cooperation, etc.). The article proposes 3 concrete CSFs to be followed and addressed: fit between the business environment and business process, continuous improvement efforts, and fit between business processes and technology.

The fit between the business environment and business process basically means that there is no one-size-fits-all type of process and every organization must build their processes according to the specific environment and conditions under which it does its business. Only customized processes can be effective and therefore bring additional value. Continuous improvement is important because of the ever-changing business environment and even the perfect initial processes will become outdated and suboptimal after some time. Only by keeping them "fresh" can the organization preserve the competitive advantage that a high quality process brings. And the fit between the business processes and technology is important because of the heavy reliance on IT in modern days, and processes are not exempt from that. In other words, IT must complement the processes it supports but also processes must use all the benefits that a good IT fit brings.

Besides CSFs one additional thing can largely determine the success of a BPM project and that is business process orientation (BPO) maturity of the organization. This actually determines how focused is the organization on its processes in comparison to hierarchical structures, outcomes, and customer satisfaction. Also, CSFs and BPO are inherently connected and go hand in hand because both are both dependant from and can be used to evaluate implemented business processes. Proper implementation of BPM practices directly affects BPO which can thus be used to measure the success of BPM (Škrinjar, Trkman, 2013).

By combining these concepts organizations can strengthen their processes, increase their process orientation maturity, and with that increase the chances for a successful BPM improvement projects.

Next part is about one of the main building blocks for the topic of this thesis, process automation, its significance, and how it can help improve business process improvement initiatives and consequentially improve business analysis process.

3.5 Process automation

Process automation involves using technology to automate repetitive, rule-based tasks or workflows, reducing human intervention, minimizing errors, improving efficiency, and lowering operational costs. It combines software, hardware, and methodologies to streamline business processes.

Process automation as such can be applied in different ways and varieties, starting from adopting industry-level best practices thorough the implementation of a reputable solution provider all the way to developing unique solutions that threaten to disrupt the status quo. In this light, we can distinguish between the traditional and next generation of process automation.

- Traditional process automation

In the last ten to fifteen years, a number of software packages have emerged as industry standard solutions that guarantee the implementation of best business practices and standardized processes upon adopting them. Typical examples of the use of such best practices are processes that are highly influenced by legal regulations, e.g. in the field of finance, accounting or human resources administration (Scheer et al., 2004, p 4). In case of finance, when going for a new ERP solution SAP and Microsoft Dynamics 365 are the industry go-to providers, for customer relationship management solutions that is Salesforce, for human resources the solution of the biggest companies is Workday HCM. And when deciding for the best industry practises, there is very little place for customizations that suit the client's specific needs which is the biggest drawback of these solutions aside from high implementation costs. So they are a good choice when the company must stay on the same level as the competition.

- Next-generation process automation

The basis for next-generation business process automation is the separation of the application software itself, the integration technologies and the business process design (Scheer et al., 2004, p 8). This means that instead of having an integrated solution, important elements (i.e., components) are developed to suit the needs of the business or support the desired processes and then connected by a modular architecture which makes sure that every component functions and the data flow is on point. This means that the end product can be customized to serve special client needs and wants without going for the full package and enforcing other things as well. In a sense, these solutions deliver the appropriate functionality needed in various processes.

The application functionality combined with the data involved and the logical procedure of applying the functionality to the data is often called a "component". Such a component delivers a "service" that can then be used by another component according to the defined business process logic. This allows integration of applications without using difficult means to maintain interfaces. If such a service is offered through the Internet using specific standardized protocols, it is called a "web service" (Scheer et al., 2004, p 10). Of course, next-gen process automation is very susceptible to changes as it closely follows the latest trends and tries to implement them in the best way possible. And while these solutions are easily accessible and can answer the specific process needs, their major drawback is the need for correct customization and the operational risk that comes with trying to "reinvent the wheel".

Process automation tools nowadays range from usage of artificial intelligence (AI) for different tasks that require any kind of processing of large quantity of data, using existing tools powered with AI, automated process discovery and many more.

Usage of AI can take many shapes and forms, from using natural language processing (NLP) for summarizing and extracting the most important data from large documentation, using AI

as a verification tool (e.g., fraud detection), using AI as a communication facilitator, and many more. Concrete examples are described in the practical part of the thesis. AI-powered tools can automatize repetitive tasks and also can be configured by non-technical users using structured prompts.

APD also has the potential to significantly reduce the analysis time, for example when creating a process diagram from scratch. APD takes event logs as input and produces a process model that captures the behaviour of the log in a representative way as output (Dumas et al., 2018, p 427). And process mining is a modern manifestation of APD that takes full advantage of modern IT architecture and application design for process exploration and discovery (Yano et al., 2013). More detailed description of process mining process and available tools is in the process improvement chapter.

Every potential automation comes with a variety of options and can massively boost the process improvement and therefore success probability of a BPM initiative. Consequentially, process automation becomes the crucial factor in knowledge-based domains like business analysis where most of the work was done manually or with just a little modernization and automation, but it's important to process vast quantities of data, extract conclusions, and propose solutions. In that sense process automation, with all stated potential use cases and benefits, can improve existing process and analysis deliverables.

Downside is that APD is very reliant on hard data, meaning if the data from even logs is weak then the results of analysis using APD will be weak as well. So before blindly applying APD as analysis technique (Dymora et al., 2019), analysts must ensure that data quality standards are fulfilled and potential data quality issues are resolved.

Now when all relevant theoretical parts are covered and explained, it's time to prepare As-Is process model of a common business analysis project in IT.

4 AS-IS IT BUSINESS ANALYSIS PROCESS MODEL

In order to create a strong foundation for process model creation and analysis, relevant data was gathered. This thesis employed a mixed-methods approach, combining quantitative and qualitative data collection. An online questionnaire was administered to 35 targeted individuals with background in business and process analysis in order to identify the most common obstacles, tools, and technologies used in the domain (Appendix 1). This was followed with an interview with an experienced business analyst, former Head of BA in one IT company in Ljubljana, to get the basic outline of the business analysis process in one IT company (Appendix 1). All this was complemented with an extensive literature review in business analysis, process analysis, process automation, and other related fields.

On the basis of all previously explored theory and examples, master thesis survey, answers from the interview, and my own personal experience in the domain of IT business analysis,

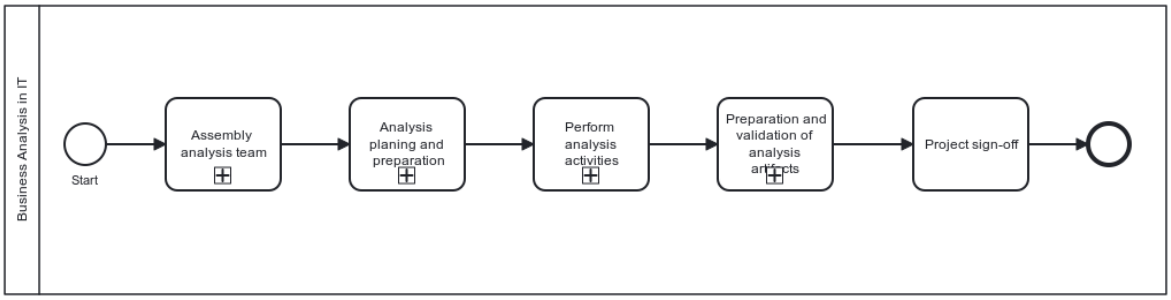
in this chapter the As-Is process model of business analysis in IT will be created and most important sub-processes will be discussed in more detail. The model represents the most common approach to business analysis in IT sector, performed by majority of IT companies.

4.1.1 High-level As-Is process model

This process model displays the most important activities that are usually performed in one business analysis project in an IT company, regardless if it's product or service oriented. Almost all activities are organized as sub-processes to de-clutter the diagram and highlight the main steps in a common business analysis project in IT sector.

As displayed in Figure 5, there are four important activities in one business analysis project in IT industry. As stated in the interview, it all starts with creating an analysis team that needs to perform the analysis. Then comes the analysis planning and preparation where dedicated team, through a series of steps, prepares the scene for analysis activities. After that the actual analysis work begins, where analysts perform planned inspections, interact with different stakeholders, draw conclusions and perform other analysis work. And last important activity is to prepare and validate analysis artefacts, to confirm that during analysis enough insight and understanding is gathered and correct conclusions or action points are determined. In the end, all that is left is the project sign off where all steps are formally finalized, documentation is handed over to the client (or to the next team in the pipeline), and project is closed.

Figure 5: High-level process model



Source: Own work.

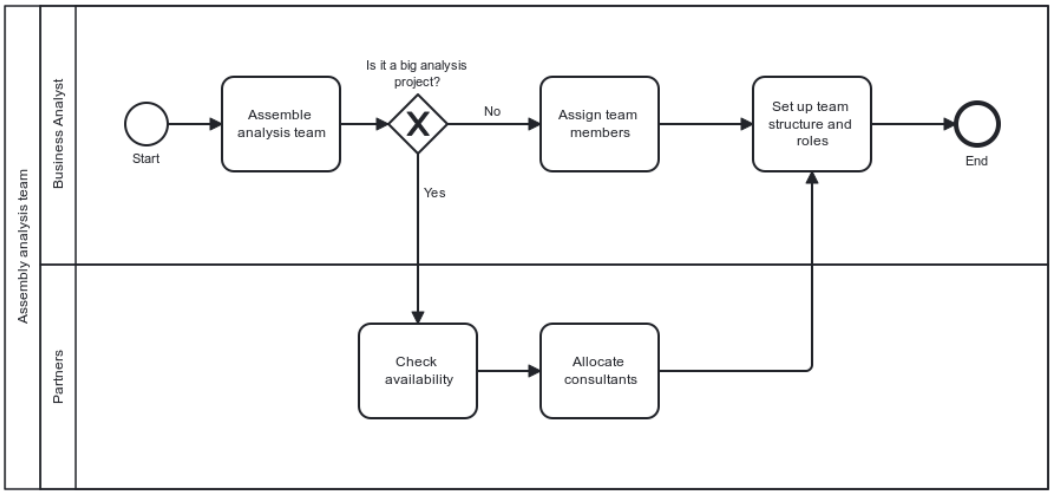
In the following subchapters, every important sub-process will be explained in more detail together with concise description of steps that are a part of that specific sub-process. This will be the starting ground for the As-Is model analysis and preparation of improvement suggestions in the following chapters.

4.1.2 As-Is sub-process models

The initial high-level model consists of four major sub-processes that depict the majority of work done in a common business analysis project, and in the next paragraphs every single one of them will be explained in more detail based on available resources and personal working experiences.

First thing that happens in a common business analysis project is the assembly of the analysis team in charge of the actual work. Depending on the project size and business complexity, as mentioned in the interview in the Appendix 2, sometimes there is a need to onboard additional help. Reasons for including partners in the analysis project may vary, from simple convenience and overcoming the language barrier in case of multinational consultancy, to hiring specialized consultants to cover important business areas where the company is weak and has no internal expertise. Figure 6 depicts general steps in this sub-process, internal alignment to check the general availability of the people for the project at hand, estimation of the project size and/or complexity to assess the need for eternal help, and in the end organization of project roles and assignment of analysis tasks. This sub-process contains the steps for initial organization of the analysis team, different ways of how it can be assembled, and assignment of analysis tasks. The output is structure of analysis team adapted to the needs and circumstances of the analysis. A team that will be involved in the analysis planning, organization, execution, preparation of necessary analysis artefacts and their validation with the client, divided by streams.

Figure 6: Assemble analysis team sub-process model

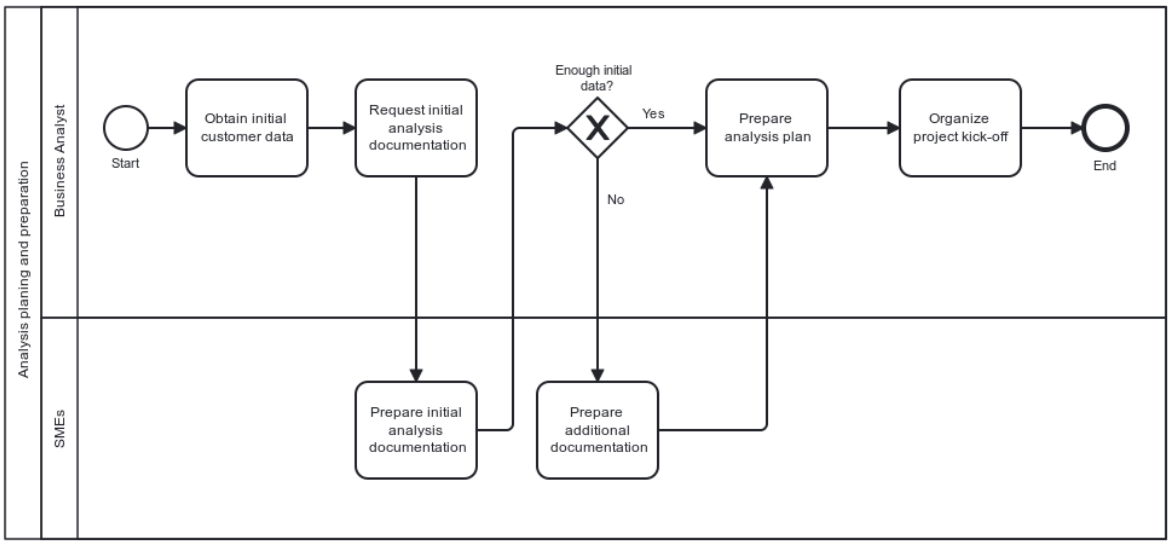


Source: Own work.

Next sub-process, depicted in Figure 7, covers the initial planning and necessary preparations before the actual analysis work. To prepare for the analysis accordingly, analysts must acquire the necessary data regarding the client in order to do an initial screening. This includes gathering both formal and informal data to form a clear picture and

understanding of the client and the position they're in. This initial screening helps the team to prepare for the direct interaction with the client and also to frame the analysis in the right way to be both effective and efficient. After initial screening analysis team requests some formal documentation necessary for analysis planning such as business procedures, policies, organizational diagrams, process models, etc. This helps every analysis stream to get some initial understanding how the client functions and where are the major points of interest for every analysis stream. In this step, streams contact their SME counterparts on the client side and obtain the necessary documentation from them. For example, in the case of business analysis of an insurance company in search for a new core system, the product stream would ask for insurance tariffs and general sales procedures, claims stream would ask for claim handling rulebook, etc. There can be the case that initially obtained documentation is not sufficient to create analysis plan, in that case this documentation gathering cycle can repeat several times. After enough information is gathered, analysis team proceeds to analysis planning step. Here, analysis team uses the gathered materials to build a high-level analysis plan. This means setting the main discussion topics for every stream, setting the analysis goals, and estimating required effort to achieve those goals. It's important to keep those plans agile so that eventual changes don't break the whole analysis flow. In other words, it's necessary to avoid classic waterfall planning. After planning is done, project kick-off can be organized. That represents the formal start of the project, where the main analysis goals and means to achieve those goals are presented to the client. Also, it is an opportunity for analysis team to formally introduce themselves to the client.

Figure 7: Analysis planning and preparation sub-process model

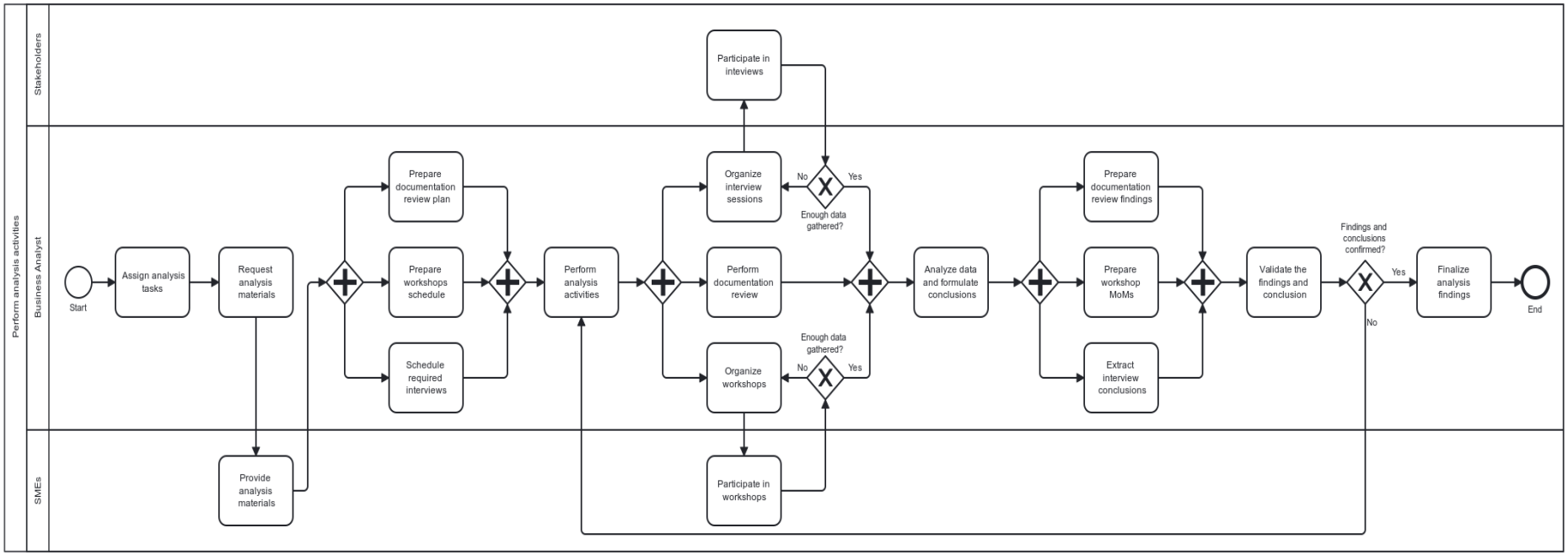


Source: Own work.

After the initial preparations and planning, it's time for the "real" analysis work. Figure 8 models the common steps for performing analysis activities. In the very beginning, from the generated plan, stream leads create tasks that are assigned to team members. Those tasks usually put them in charge of a certain analysis activity that will occur later in the analysis

pipeline. After that, every analyst can begin their assigned work. This usually starts with preparation of assigned analysis activity on the project. As stated in the interview, here analysts can do further inspections and that sometimes requires gathering additional analysis materials. This can take many forms, from requesting specific business documents to sending out a customized questionnaire to the SMEs on the client side, and the ultimate goal is to prepare for the execution of analysis activities. Once prepared, analysts proceed to the execution. There are many ways and techniques used to gather insight in a specific domain of client's business but three of them are most commonly used even today – documentation review, workshops, and interviews. Analysts prepare for them based on the all available data and information gathered before and also build their analysis approach around them. Of course, activities that require direct interaction like workshops and interviews need to be planned, aligned with other participants, and scheduled ahead while documentation analysis can be planned independently. Then analysts approach to the actual execution according to the plans. Workshops are usually done with the client's SMEs while interviews can go even further and include a wider stakeholder population. After performing those activities there's usually a follow-up on them. Workshops have different deliverables for participants on both sides (e.g. process diagrams, initial designs of features and functionalities, UI designs, etc.) and it's very important to create Meeting Minutes (MM) that contain the main talking points, agreements, open questions and other action items. Interviews must be reviewed and main conclusions must be extracted. And also the main findings from documentation analysis must be systematized and organized. After all that is done, all these things must be validated with the client so they can be used later on as building blocks for analysis artefacts. And this is usually repeated for every analysis activity and every iteration until the findings are validated. After validation and confirmation from the client, final analysis findings are composed.

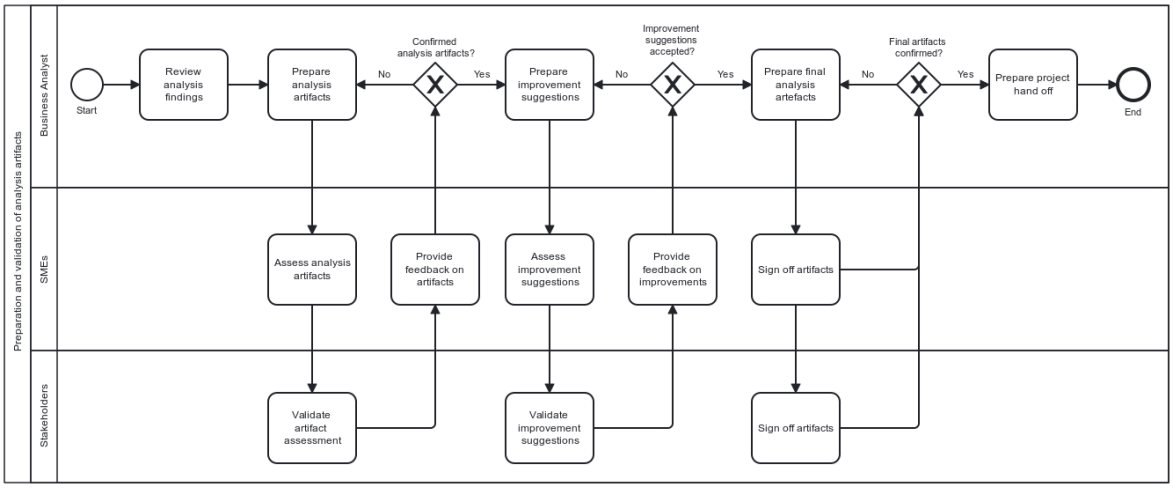
Figure 8: Perform analysis activities sub-process model



Source: Own work.

And in the last sub-process model, in Figure 9, are displayed the steps for preparation and validation of analysis artefacts. Analysis artefact is, as per BABOK glossary, any solution-relevant object that is created as part of business analysis efforts (BABOK, 2015, p 441). As the definition implies, they can be in various forms and variants but they must stem from the business analysis efforts (i.e., business analysis activities). Analysts start from confirmed analysis findings and start building the artefacts (e.g., requirement lists, future process diagrams, prototypes, user stories, etc.). Once created, they need to be verified by the relevant stakeholders (i.e., that are affected by them). As before, this verification can have several iterations. Once verified, artefacts are used to generate and support improvement suggestions. Those suggestions are also verified by the customer, very often this also requires several iterations. Once verified, stakeholders are also giving the sign-off for those suggestions. Improvement suggestions are sometimes generated individually but they can also be a part of a bigger analysis deliverable – functional specification document (FSD). FSD is a detailed blueprint that defines what a system, software, or product must do from the user's perspective. It outlines the functional requirements, features, process models and their descriptions, behaviours, and interactions with the system, serving as a critical reference for many stakeholders in different phases of the overall project.

Figure 9: Preparation and validation of analysis artefacts sub-process model



Source: Own work.

And lastly, after all these sub-processes end successfully the project is signed off and analysis deliverables are handed to the next phase where the actual implementation of proposed solutions is done.

Now, when the As-Is model is prepared, it’s possible to analyse it and formulate some improvement suggestions.

5 TO-BE IT BUSINESS ANALYSIS PROCESS MODEL

In this chapter, based on the previously generated process model, it is possible to perform a deeper analysis of the mentioned process, find process bottlenecks, identify improvement solutions, and propose how to incorporate them in the existing process. All these steps will the lead to the creation of a future To-Be business analysis process model.

The content of this chapter and the performed analysis is based on personal working experience in business analysis, data from the conducted interview in Appendix 2, master thesis survey answers from other business analysts, and other data from publicly available sources.

With As-Is model in place we can proceed to the analysis phase, pinpoint the most problematic process flow areas and track the least effective activities in it. Analysis findings will be then be used as basis for finding the best improvements solutions. After the identification those improvements, new To-Be process model will be created together with the implementation of those solutions.

5.1 As-Is process model analysis

As previously mentioned, process analysis can be done on qualitative and quantitative grounds. Both ways bring a unique perspective about the process and can set the stage for high quality insights that eventually lead to effective improvement solution.

In this case qualitative analysis methods are not possible due to the lack of hard data about the process execution, since the process itself is not tied to any specific business entity but it represents a common business analysis process in IT based on data from various sources. Qualitative analysis will be performed based on personal experience (issues, situations, bottlenecks, and process inefficiencies I've faced), feedback from other analysts gathered via survey, and insights from the performed interview. It will cover all four major sub-processes with highlighting the inefficiencies during the analysis.

5.1.1 Assembly analysis team

This sub-process is the one with the least issues, since it's mostly a matter of organizational efficiency. The decision about analyst allocation to the project is strictly managerial and not directly based on any client-provided data or documentation. The company can have issues with the lack of knowledge diversification within the team but that is not something that can be resolved on the process level. Also, if the company needs partner support there is not much that can be done in terms of process automatization since that's in other company's domain. There is an option to improve the assignment part by introducing a scheduler app or HRM tool that enables tracking of the employee's availability and then recommend the team members based on that (and maybe combined by the education background and work

experience). But even for that scenario it's clear that the potential cost of such solution would greatly outweigh the benefits, especially for mid and small IT companies that have their designated analysis teams. So this sub-process can stay as it is.

5.1.2 Analysis planning and preparation

This sub-process covers the initial steps of the analysis team to adequately prepare for the upcoming analysis activities. It includes limited interaction with the client and some general client investigation. The purpose of client investigation is to familiarize with the client, its background and history, market position and other aspects that can help to better plan and prepare for the actual analysis. Initial documentation provided by the client serves the same purpose, just with a bit more focus on the actual analysis areas and topics.

From the initial process step where analysts gather general data and information about the client, to the analysis of the documentation and materials provided by the client and preparing the analysis plan, it's evident that there is a lot of analysis time spent on this, and that I can confirm also from personal experience. And every activity that includes any kind of analysis and review of materials is nowadays very much a potential bottleneck. There many opportunities that modern tools at our disposal offer to reduce the time spend on these activities.

Today we have several ways how to efficiently gather data from public sources, there are tools that enable summarization and extraction of main points from the uploaded materials, and tools that support planning and organization activities. All those are ways to cut down the analysis time spent on these activities and redirecting the attention of analysts to more value-adding tasks, such as preparing themselves for the actual analysis work. So the first bottleneck that needs to be tackled here is the analysis time spent on gathering and initial review of gathered data in all forms and from all sources.

5.1.3 Perform analysis activities

In this sub-process real analysis work is being performed, via different techniques and methods business analysts are gaining necessary knowledge about every major part of client's business (products, services, processes, interactions, culture and environment, etc.) in order to understand it, make correct assumptions, discover potential pain points, and verify those with the client in order to proceed to creation of main analysis artefacts.

Again, similar as in the previous sub-process, there are many steps that require data gathering, analysis, some manipulation, and there is a lot of interaction with different stakeholders. The issues are the same as before, much time can be spent for data gathering and review, also in this part of the analysis there is contact with the client during different analysis activities (i.e., workshops and interviews) that also require verification of the

conclusions, agreements with SMEs, and other analysis deliverables in this phase. In short, there are two potential bottlenecks in this part of the process. First, same as before the analysis time for gathered materials and data. And second, the time spent on direct interaction with the stakeholders through meetings and interviews. These interactions require follow-up items, such as MMs, process diagrams, UI designs and similar to be delivered and verified with the client. This opens the door to smart applications that support these kind of interactions and empower business users to focus on the essential matters while the tools take care of the related "bureaucracy".

5.1.4 Preparation and validation of analysis artefacts

This sub-process shares the same pattern as the previous ones, albeit on a bit more structured level. Analysis team needs to create agreed analysis artefacts and verify them with the stakeholders before the final deliverables are generated and project hand off is organized. Again, time necessary for generating the artefacts as well as getting the feedback from stakeholders represents a threat to process efficiency and agreed timeline. Analysts could use some help in summarising the analysis findings and generating quality improvement suggestions, while the exchange of generated artefacts and the feedback from the stakeholders should be as seamless as possible to reduce the risk of data loss or even worse misunderstandings that would prolong the verification steps and therefore the analysis itself. So those are the two major potential bottlenecks in this part of the process that need to be tackled.

Following subchapter deals with the bottlenecks recognized in the analysis and propose improvement solutions that would automatize the process and make it more efficient.

5.2 Identification of improvement possibilities

Previous analysis detected several bottlenecks in the As-Is process model that could unnecessarily prolong the process and therefore negatively affect the analysis project in terms of costs and planned timeline. The recognized bottlenecks could be categorized in three groups:

- Time spent on data gathering,
- Time spent on the review of gathered data and knowledge extraction,
- Time spent on generation and verification of analysis deliverables.

For every group, given that the majority of work in them is done manually or without any significant technological support, the most logical improvement suggestions are from the domain of process automation. This in the broadest sense means that the work, previously done manually by analyst, is replaced by some automation tool or procedure that can shorten the expected analysis time and provide faster insight or results, or to rely on modern

technological solutions to take over one part of the communication management during the analysis.

5.2.1 Process automation possibilities

In case of the current As-Is process model, traditional process automation is not an option given that business analysis process is not standardized at any level or in any industry. There are common activities being executed but they need to be adapted to every client. So the go-to method for process automation in this case are the next-gen tools. The following sections will present the most appropriate automation solutions, how they solve the main process inefficiencies and bottlenecks, and propose actual tools that can be utilized for the purpose of process automation.

5.2.1.1 Usage of AI for process automation

The possible usage of AI in process automation was recognized very early. Not only the potential to greatly improve existing processes (Jämsä-Jounela, 2007) but to disrupt the common way of doing work. The possibility to process vast quantities of data and information, categorize and organize it, extract the main ideas, and generate solution proposals all in the matter of minutes would sound like a fairy tale to business analysts from the past. From the perspective of the analysed As-Is process model there are couple of situations where AI and GAI can be used as process automation tools.

As previously observed, there are many points in the process where analyst must review vast quantity of data, extract the most important parts and plan the further steps according to it. In this light AI can be of great help, since NLP can help in many ways:

- Documentation analysis

NLP models (e.g., AWS Comprehend, IBM Watson) scan process manuals, meeting notes and other documentation to extract key steps, roles, and dependencies, flag inconsistencies (e.g., missing steps, outdated procedures). Large language models (LLM) like GPT-4 or Claude can generate a concise executive summary of the document, highlighting core steps and objectives that analyst can use in analysis preparation and execution.

- Auto-Diagramming

AI services can convert textual requirements into BPMN/UML diagrams. Good examples for this are Lucidchart AI or Celonis. Some tools, like Flowable AI Studio, allow users to describe processes in natural language and have the AI generate a corresponding model. Models generated in this way are often flawed but greatly reduce the analysis time. But even flawed, since they can’t cover the non-described process behaviour, they can serve as conversation starters to avoid analyst starting from scratch.

- Facilitating communication

AI features and functionalities can help with meeting capture and summarization. Tools like Otter.ai or Microsoft Teams offer real-time transcription with abstractive summarization of workshops and interviews into clean notes. Avaamo uses conversational AI to automate stakeholder interviews, extracting key objectives for inclusion in the BA plan. One big drawback of this is that capture and summarization currently work best in English but given the rapid development in this area in the last few years, even more languages will be fully supported in the near future. One more application is the sentiment analysis, where AI can discern the attitude of stakeholders towards analysis deliverables, artefacts, and improvement solutions based on provided notes, mails, transcripts and other written communication. This can provide pointers for analysts about topic importance, adjusting the approach, and taking pre-emptive actions to keep the analysis on track.

- Preparing analysis deliverables and artefacts

AI can be used for automated user story generation, where AI templates with custom LLM prompts for user story formatting can convert transcripts and notes into user stories with acceptance criteria. Requirement categorization is also one example where AI can classify functional vs. non-functional requirements (e.g., AWS Comprehend).

All previously mentioned solutions are relevant for the issues discovered in the analysis and will be incorporated in the To-Be process model. The main drawback of this solution is the data quality, if tools are fed bad data they will only produce more bad insights more quickly. So that's one major thing analysts must have in mind when using AI for these purposes.

5.2.1.2 Intelligent Process Automation

Intelligent Process Automation (IPA) is the product of combining advancements in the field of AI and existing practices in Robotic Process Automation (RPA). RPA is the use of bots (autonomous computer programs) to automate repetitive, routine business processes (Eulerich et al., 2022). From the perspective of the analysed process, even the general RPA could help with the analysis, in the domain of searching the internet and publicly available sources for initial client screening. But, it would still require a bit of a technical background to set up the bot that will do the manual tasks for the analyst. In case with IPA, instructions for data gathering can be provided in natural language via prompt, then AI would take over and convert the instructions to concrete commands and rules or the RPA bot. But it doesn't stop there, additional instructions can be provided by the analyst on how to structure and organize gathered data, even data transformation is possible. In that case, after a well-structured set of instructions, analyst can get a fully customized report on the requested client, organized to highlight the most important information, and help the analyst to plan and prepare for the analysis in only a fraction of time that was previously required to compose similar report manually. Additionally, such bots could also take over mundane

tasks like mail review, where a bot could go through the received mails, summarize the content from previous communication, and prepare answers for the analyst. In projects where analysis artefacts include prototypes and test cases, bots can execute test cases, validate workflows, and ensure solutions meet requirements pre-deployment. Popular RPA tools with AI features include UiPath, Celonis, Microsof Power Automate, Appian, etc. Another good example is Perplexity, AI-powered search engine capable of producing extensive reports based on prompts.

For the analysed general process, the first described example for client screening is the most appropriate one to apply, while other can be relevant depending on the analysis project. Major drawback for this method is the actual usage, users must be well up-to-date with the topics in order to steer the bot appropriately, to get the best data.

5.2.1.3 Automatic process discovery

With many businesses growing at a supersonic speed, management requires the ability to obtain insights into business processes at lightning speed, and the agility to implement adjustments instantly. Automated process discovery, also known as process mining, is a way to achieve this. Process mining is a kind of business process analysis that is fully automated and is designed on the basis of algorithmic and computational logic. Data is collected from audits, event logs and so on, cleansed and analysed to identify the process models (IntelligentHQ, 2019). In the time when every serious business has an ERP or a similar software keeping track of all transactions happening every day, it's a dream come true for process mining enthusiasts. Event logs, i.e., data mapping traces of process execution in modern information systems, can be used to derive new process models and derive optimisation possibilities (Puchovsky et al., 2016).

Process mining has 3 basic types (Turner et al., 2012) process discovery, conformance checking, and extension. Process discovery is already described, it happens when there is no a priori model and analyst needs to generate one. Conformance checking is the confirmation that existing a priori process model is performed as described in real life. Extension includes addition of extra parameters to the existing a priori model so that new aspects could be tested. As a well-established method for overseeing processes with well-known applications in healthcare, financial audits, and public sector (Grisold et al., 2020), process mining can certainly find a purpose in business analysis field as well.

Given the increased focus of modern business analysis on business processes, based on the interview and the answers in the survey in Appendix 3 – Figure 3, for an analyst to gain a good understanding of the actual process at a client (in case the client's processes are not modelled and there is no model catalogue), analyst must go through a series of interviews, workshops and documentation reviews. And this is only to model the initial process model, which then needs to be verified, analysed and eventually improved. The potential time spent on these activities can be very long, unnecessarily prolonging the analysis and also

increasing its cost. By relying on process mining, analysts can quickly get to a working process model that is based on hard facts, meaning that subjective bias is partly eliminated due to the precise data from the event logs about a real-time process execution being used as basis for modelling. But this is not the only use case, process models created by process mining tools also enable extensive testing and simulations of the process behaviour providing analysts a personal sand box environment for testing improvement solutions.

Popular process mining solutions include Celonis, Apromore, SAP Signavio, UiPath Process Mining (Celik, U., Akçetin, E., 2018).

For the analysed process, the first described example is the most appropriate one, while the second can be relevant depending on the actual analysis project. Major drawback for this method is again the data quality, if the event logs are faulty or inconsistent than APD and process mining will only create additional confusion and produce models that are totally of the mark. This could have a detrimental effect on project both in terms of time and costs.

This concludes the analysis and selection of best improvements from the domain of process automation, and with selected solutions we proceed with the implementation and process redesign to get to a future To-Be process model.

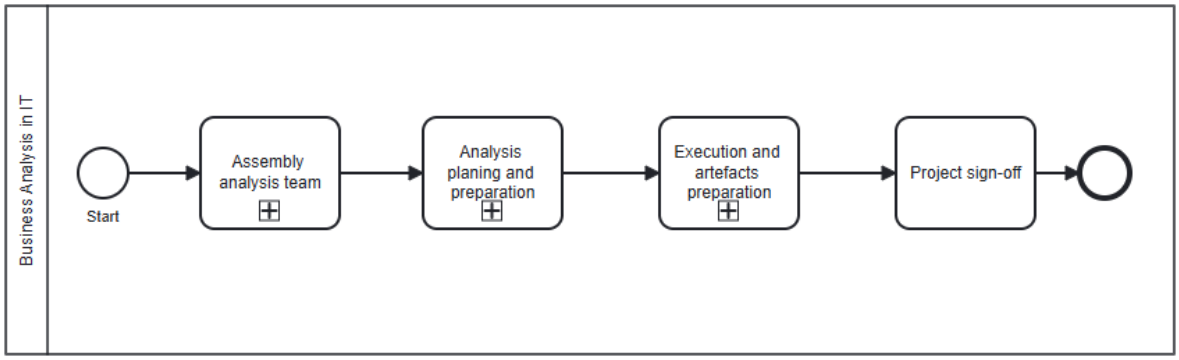
5.3 To-Be IT Business analysis process model

All previously written leads to this moment, the creation of a To-Be IT business analysis process model. This new process model incorporates previously selected improvement suggestions, proposes a new process approach, and consequentially a slightly different organization of process activities and their steps. This is all accompanied with explanations how the proposed improvements make a difference compared to the As-Is process model from before.

5.3.1 High-level To-Be process model

On the top level, process model is slightly different because now it contains only three sub-processes and one closing activity. As displayed in Figure 10, it all starts with the analysis team assembly sub-process that stays the same as before. But the major changes are in the next two sub-process that now join the activities from the previous As-Is process model. The analysis planning and preparation is the same only in the naming but the structure of the sub-process is significantly changed. And next is the most important sub-process that joins the analysis execution and verification of analysis deliverables sup-processes from before. In the next sub-chapter new sub-processes will be described in more detail together with the implementation of the proposed process improvements via process automation.

Figure 10: High-level process model



Source: Own work.

5.3.2 To-Be sub-process models

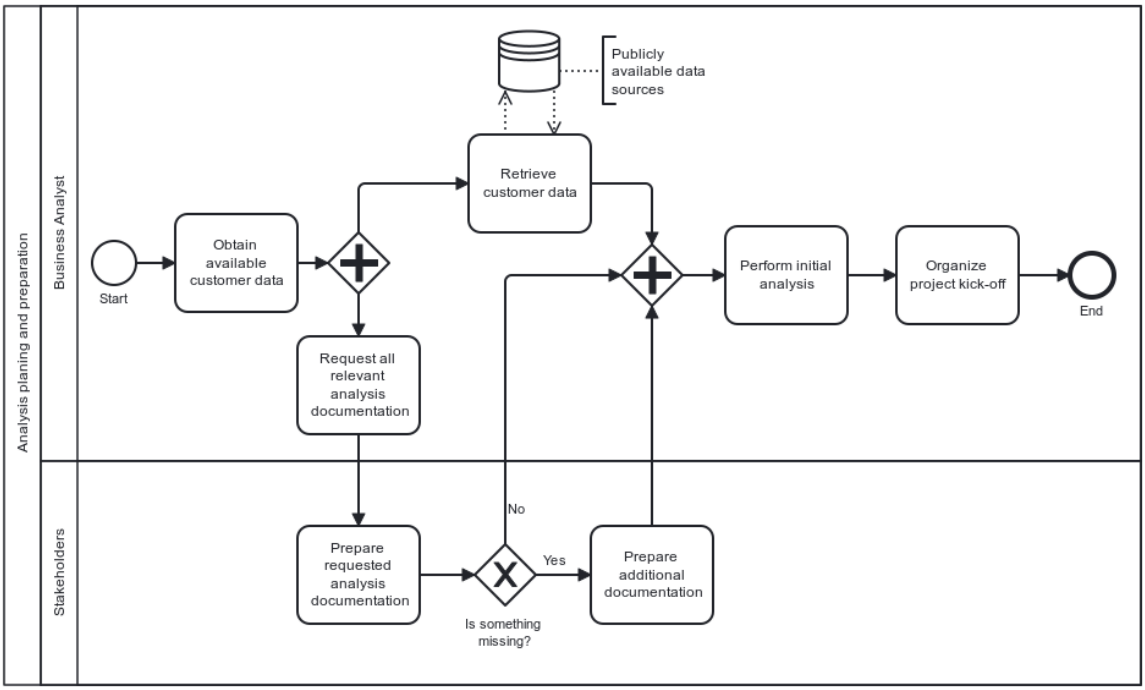
As mentioned, Assembly analysis team sub-process was not a subject of process improvement measures since it mostly deals with decisions regarding allocation of business analysts and eventual involvement of partners on the project. These types of activities are difficult to automate effectively and usually the costs of automation greatly outweighs the benefits – so this stays the same as in the As-Is process model.

5.3.2.1 Analysis planning and preparation

Figure 11 displays the new organization of activities within Analysis planning and preparation sub-process. This new process model includes improvements from the domain of usage of AI, IPA, and potentially process mining techniques. Now the analysis team doesn't have to be limited to just some initial data about the client like before, since time constraint to gather the data and information can be significantly lowered with the help of IPA and AI powered search engines. Once programmed to scrape the data, IPA bots can both tirelessly extract and transform the extracted data so that analyst only needs to deal with end results and focus their attention there. Also, AI can be used for summarizing large documents, quickly highlighting the most important conclusions that can help with the analysis preparation. If the analysis demands it, analysis teams can use process mining for generation of initial process models to be used as starting point for discussion with SMEs and other stakeholders. In short, the previous limitation to using only some general materials and data has been lifted, analysts can better prepare for upcoming analysis activities, and acquire more knowledge about all aspects of the analysis project in far less time than before. Now, retrieving the publicly available data and requesting the analysis documentation activities can be done in parallel since the analysis team has more processing capacity and time to focus on project-critical activities and preparations. Initial analysis is also modernized with the help of AI and can prepare the initial analysis materials faster and more thoroughly than before. And all this can be done with a smaller team of analysts, as long as

they are up-to-date with the mentioned tools and technologies, which can further reduce the cost of the analysis project while preserving the quality of analysis outputs

Figure 11: Analysis planning and preparation sub-process model



Source: Own work.

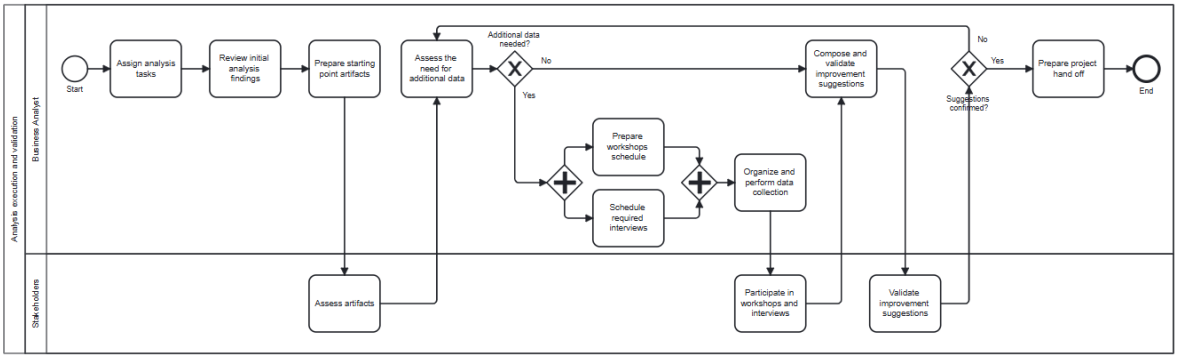
5.3.2.2 Execution and artefacts preparation sub-process model

Figure 12 now displays a totally redesigned sub-process, analysis execution and artefacts preparation, that is a fusion of the two sub-processes from before - Perform analysis activities and Preparation and validation of analysis artefacts. By introducing process improvements in form of AI usage, process mining tools, AI-enhanced communication applications and IPA the previously separated sub-processes can now be done as one.

After assigning analysis tasks, every analyst can use the findings from the previous part and already prepare initial analysis artefacts. After sending them for verification and getting the feedback from the stakeholders, analysts need to assess the need for additional data. If it's not needed, analysts can proceed to creation of improvement solutions. If it's needed, analysts can use IPA to organize additional meetings (workshops and interviews) and rely on AI capabilities for facilitating communication to take care of MMs, interview feedback, and summarize additionally provided documentation. In some advanced cases, AI agents could perform standardized interviews and do the stakeholders' sentiment analysis. After getting the additional data, analysts create improvement suggestions and all process automation tools can help with that: AI with the summarization of stakeholder's feedback, IPA with reviewing the test cases and checking the product prototype, and process mining with extension testing of created future process model. After that, final verification is needed

and if everything is on the satisfactory level analysts can finalize the analysis project. If not the process repeats again, but now with the help of process automation tools and provided feedback data the process time should be significantly lower than the first time.

Figure 12: Execution and artefacts preparation sub-process model



Source: Own work.

And with all previously mentioned process improvements, estimated process duration is expected to be significantly lower due to the fact that manual labour will be significantly reduced, more data and materials can be processed in shorter timeframe, and process artefacts can be delivered more quickly for verification. Even the verification and feedback loops can benefit from proposed improvements.

6 DISCUSSION

The business analysis process in IT has come through significant changes from the business analysis' inception until today. From early days of System analysts to modern Business analysts, the role also evolved along with the discipline. In the beginning the main focus was the technology, then how to "fit" the technology in business, then how to adapt the technology to "fit" the business, then the mindset changed to thinking in process terms and how the technology affects the business processes. This switch enabled the development of modern business analysis as a link between business and technology domains, but not only a link but also an important enabler of integrating technology into business operations.

In modern IT landscape business analysis has special place and a growing importance, especially with the speed of the changes we're experiencing lately. That growing importance can be observed in articles from 2021 (Coursera, 2021) and 2022 (Dataquest, 2022), backed by data from U.S. Bureau of labour statistics, where business analyst role are on track to grow up to 25% by 2030. This speed puts a lot of pressure on analysts to stay up-to-date with the many changes technology brings but also offers a lot of possibilities to improve current business practices and deliver value-increasing solutions more quickly.

The main premise of this thesis is that much time in modern business analysis process is spent on analysing (e.g., documentation, analysis materials, communication, process models, etc.) in order to formulate some insights and findings, and verifying those insights and findings with the client. The basis for this claim are the feedback provided in the interview in Appendix 2 and survey answers in Appendix 3. The interview was done with an experienced business analyst, former Head of Business Analysis department in one IT company in Ljubljana, Slovenia. The survey was performed on a targeted population, people with actual background in business and process analysis with experience ranging from 1 to 20 years in BA, as it's displayed in Appendix 3, Figure 1 and 8.

Data from the survey, displayed in the Appendix 3, Figure 2 and 3, and also answers from the interview lead to a conclusion that most common techniques for gathering data are documentation review, workshops, and interviews. All those techniques are very time consuming, since they require preparation, execution, and follow-up activities like summarizing the findings, preparing MMs, extracting the conclusions from the documentation, preparing process models, etc. Then it's required to verify all that with the stakeholders, which usually leads to another round of those activities. Plus, different stakeholder structure can lead to various challenges for the analysis team as displayed on Appendix 3, Figure 4. Also, alignment of the analysis deliverables (requirements, process models, etc.) usually require direct communication and review of the analysis documentation and other deliverables, as seen in the survey results in Appendix 3, Figure 5.

On the other hand, second major point in this thesis is the over-reliance on manual work instead of using modern technologies to speed up the mundane tasks and allowing analysts to focus on project-critical activities. Maintenance of documents shared with the client, meeting minutes, day to day communication, preparing JIRA tickets, etc., all this takes time and steers analyst's attention from the main analysis activities. Current sentiment toward technology support in the survey is slightly negative although many have faced technology limitations in their work, as displayed on Appendix 3, Figures 6 and 7. For that reason, the main proposition of this thesis is to introduce several process improvement from the domain of process automation.

Theoretical fundamentals of business and process analysis from both formal and publicly available sources, combined with the currently prevalent trends in IT and modern BA, provide the necessary basis for understanding the role, activities, and flow of modern business analysis process. It also emphasizes its growing importance in the modern business world, especially in IT sector.

Combining those theoretical concepts, personal experience in the field, and data from both interview and survey resulted in the general As-Is Business Analysis process model. The model is presented graphically and explained in great detail, with main points highlighted in the text. After the analysis, detected issues and inefficiencies are described, and

improvement propositions were listed. Those propositions come from the domain of process automation, and include next-generation process automation solutions like:

- Usage of AI tools,
- Usage of IPA tools and technologies,
- Usage of process mining tools.

Every solution was described, appropriate use cases and benefits in the target process were disclosed and potential drawbacks were stated. Then, based on the improvement propositions, new To-Be process model was created with redesigned activities that reflect the benefits of proposed improvements. It is expected that proposed improvement solutions resolve two major issues, reduce the process time by taking over the data gathering and processing activities thus freeing the analyst for more important work, and also facilitate the communication and reduce redundancy in interactions with the stakeholders by better preparing the analyst for verification of analysis findings.

The thesis has limited contribution to the expansion of theoretical business analysis body of knowledge due to heavy focus on one specific industry but can have practical implications under right circumstances for business analysis in general. This is especially valid for companies that seek ways on how to empower their analysis teams and reduce the analysis costs in one go. Thesis introduces several ideas on how business analysis process in IT can be automatized and business analysts freed from extensive and repetitive manual labour to focus their attention on the actual analysis work and problem solving.

For future reference, a solid case study on a real-life example should be performed to test the actual effect of such and similar process improvements to process time, analyst effectiveness and overall efficiency of the project.

7 CONCLUSION

In an era marked by rapid digital transformation, the role of business analysis within the IT sector has evolved into a strategic function that bridges organizational goals with technological execution. This master thesis set out to explore how business analysis processes can be redesigned and enhanced through the integration of modern process automation tools and techniques, particularly in complex industries where traditional analysis methods often fall short. The central research question was: How to redesign and improve the process of business analysis in IT sector by using modern process automation options? And the thesis had few main goals:

- To analyse and model the current business analysis process in IT sector, based on relevant literature review;

- To propose improvements of this process by using process automation, that will reduce the analysis time and enable greater precision when identifying processes and requirements;
- To model a future business analysis process in IT sector, based on findings and proposed improvements.

Through an extensive literature review, the thesis provided a foundational understanding of business analysis, business process management, and process automation. And by looking at the current situation and trend in IT sector, such as leaning to the fixed-price contracts, shorter timelines, complex industries with rigid cultures opting for digital transformation, and development of AI, analysis suggests that traditional BA methods (e.g., manual elicitation, workshops, interviews, documentation review) are simply not good enough anymore. They are burdened by the gathering-generation-validation cycle that takes time and resources, hence are in direct collision with current trends. It became clear that the traditional toolkit of business analysts must evolve. In particular, the BPM lifecycle was analysed not as a purely theoretical construct, but as a practical framework that, when augmented with automation technologies such as process mining, GAI, and low-code platforms, can significantly improve both the speed and quality of business analysis deliverables.

The empirical component of this research, which included interviews and surveys with IT professionals engaged in business analysis, additionally proved that most bottlenecks are tied to data gathering, preparing analysis deliverables (e.g., requirements, process models, etc.), and validating those deliverables with stakeholders. Process automation tools address these issues by providing options on how to process large amounts of data, detect bottlenecks and issues, extract conclusions, prepare draft process models without interaction with stakeholders, in significantly less time and with relatively increased accuracy. The findings underscored a growing acceptance on digital tools to support process discovery, stakeholder engagement, and requirement validation. And this shift does not diminish the human role in analysis but repositions it: analysts are no longer mere gatherers of information, but orchestrators of insight, leveraging automation to focus more on high-level analysis, strategy alignment, and change management.

Based on the insights gathered, a redesigned business analysis process model was proposed, reflecting how automation can be effectively embedded across the process lifecycle, from initial discovery and modelling to implementation and preparing analysis artefacts. The proposed model does not replace existing best practices, but enhances them by introducing tools and workflows that compress effort without sacrificing quality. The approach is scalable, relatively domain-agnostic in structure, and adaptable to both product and service-based IT companies.

While the research was constrained by its primary focus on the IT sector and a limited sample size, the implications are broader. As industries across the board become increasingly

digitized, the case for automated, data-driven, and process-oriented business analysis becomes universally relevant. This thesis contributes to both academic understanding and practical implementation by offering a framework that IT companies can adopt to improve analysis efficiency, reduce costs, and better align their services with client expectations. One of the key contributions is the proposed enhanced BA process model that integrates process mining and AI-based requirement elicitation tools to reduce analysis time while increasing accuracy in complex business domains.

The limitations of this thesis are mainly caused by the qualitative nature of the As-Is model analysis, meaning that there is no hard data to be cross checked between the two models to support the claim that the proposed improvements made a significant difference. Also, the costs of implementation, education and procurement for proposed improvement solutions weren't assessed due to a highly hypothetical nature of the thesis. Another limitation is the heavy reliance on personal experience and feedback from a population that has very similar background and experience, as displayed on Appendix 3, Figure 8. Final limitation is that these kinds of experiments with process automation tools were not done and described in any publicly available professional article, so there's no additional evidence that the proposed improvements can deliver those results.

Looking ahead, further research could explore:

- Actual impact of proposed improvements on process efficiency (as in real life example or a complex simulation),
- The long-term impact of automation on analyst roles, stakeholder satisfaction, and project success metrics,
- And continuous evaluation of emerging tools and regulatory frameworks (such as the EU AI Act) will be essential in shaping responsible and effective deployment of automation in business analysis.

In conclusion, process automation is not just a technological upgrade it is a strategic imperative that enables business analysts to adapt, excel, and drive value in an increasingly complex digital economy.

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APPENDICES

Appendix 1: Interview with Head of Business analysis department in IT company.

The following transcript is from an interview with Head of Business Analysis department in one IT company from Ljubljana, Slovenia.

Hello, and thank You for finding the time for this interview. Let's start with the questions.

1. Can you introduce yourself to us briefly?

Okay. Let me first introduce myself. My name is Ivan Vidmar, I've been at Adacta for a very long time I would say, but basically almost 20 years, a bit less, since summer of 2001. And at the moment I'm the head of a Business analysis is department, the department in Adacta responsible for product development, business analysis and for customer management.

2. Can You briefly introduce Adacta d.o.o. Ljubljana?

Of course, I'll make an introduction of who Adacta is, what it is, how it came to be and what it was earlier and what it is present. Okay, basically long story short, Adacta is formed in 1989, as an IT company composed of few teenagers eager to develop software.

This was some new trend or new industry at the time, at least in Slovenia. So basically in the beginning in 1989, there were just a few IT companies. And Adacta was also the author or the first Slovenians Windows application. Basically, if you don't know, when those desktop applications started to appear, in the beginning of nineties, most of the applications were still in text mode. And later on, these business applications came to be in the form of windows platform like you know them today. So, then, Adacta wa involved in many projects and with many tailor made solutions. It was involved in the banking sector a lot, definitely there, we had some products developed and this is still in sort of support mode.

3. Can You tell us about digital transformation in Adacta? When did it begin and how was it planned?

I'm not really sure where to start. We can talk about 2 specific things. In 2007 we decided to move from banking to insurance, to support insurance industry, to become a vendor on that market. At this point we knew that in order to achieve something on a global market, or in order to achieve sustainable development, you have to have a product not just support or not just to offer simple service to your customers. I mean, tailor made solutions are good, but in order to make some change, long-term change on the market, you need to have your own product. So at that point we started with developing AdInsure, updated it from version 1.0, quickly followed by 2.0 and in this second generation AdInsure existed for quite a while, it was upgraded and upgraded, but it had its own problems. Basically old AdInsure was desktop application, basically meaning that it had on front end desktop fat client. It had server side and then the third tier was a database system. So these technology, if it was okay for the 2007 became quite obsolete in a later part of 20 times It had its own, sort of, technological

solutions that became “old fashioned” in the middle of second decade of 2000 basically. And at the time, let's say around 2015, second big shift was made. We started redesigning core solution, to think about a new platform because the old platform became absolutely obsolete. And simply, it didn't stand the test of time anymore. So at the time Adacta started thinking about new generation and new platform. What else did we learn in this process, is that product driven approach is basically still the only way to go. You have to have a product and release that product on the market. Only with this you can penetrate the market and you can do some changes. And again, the companies who do one-off solutions or tailored solutions are just a hired help for their customers. They’re actually not IT companies, they are just hired or sub-contractors of the insurance companies in this case. So this is definitely established at our board. So basically when then we started to think about AdInsure third generation.

4. What did Adacta do differently in third generation of AdInsure, in terms of technology and product development?

We definitely knew that this new generation of applications and services have to meet some standards, for example they should be portable. They should be portable from platform to platform, meaning they should be web-based in order to facilitate different types of devices and gadgets like mobile phones, like tablets, like all kinds of different specialized hardware, adapted to normal browsers that we are using on our desktop computers. So definitely this new system should be portable in our case. Uh, the second thing we had in mind was openness and connectivity. More and more systems interconnect and interconnectivity is very important because Adacta, as a vendor, cannot do all of the solutions, all of the required services and make them perfect. There are existing solutions on the market that have niche problem to solve. Our idea is that those solutions become part of the application landscape or system landscape, together with the AdInsure insurance platform, allowing us to target insurance companies. So basically if you look at the systems like a customer management or retail system, the CRM systems are getting more and more powerful. And basically they manage everything from sales leads or sales campaigns to, I don't know, customer loyalty programs, et cetera. This is not a function of system like AdInsure, meaning this being a core insurance solution. This is a CRM system. So basically you would like to integrate those systems, not implement those functionalities in AdInsure system. Then again specialized software, normally each insurance company has DBM, Datawarehouse, et cetera. They also have user or employee management systems. This is something that's already existing in every insurance company. So basically it's straightforward integration point. And then specialized or some systems which would give quite a lot of added value to the way the insurance company is processing its data and doing its processes. I would like to mention here, for example, fraud detection of fraud operations on the claims side, then various different systems for monitoring and for interacting with customer like monitoring of driving for example, this is quite popular solution a couple of years ago and there are new solutions coming out. So all of these systems comprise the application landscape for the insurance company. And basically based on this, we decided that our new platform has to be quite open

for integration. And this was one thing. This is what got us thinking when we were designing, starting to design the new system. Then we looked at other trends, other related industries, mostly IT not just insurance industry. So we realized soon that, in order to broaden our customer base, we would have be offering our system as Saas services, software as a service. Basically that AdInsure and Adacta will not provide just system, would also provide the service. If you see the market, if you have looked at the market today, there is a growing number of insurance companies that are basically looking for solutions like this, startups or companies that are sort of spin-offs from the existing traditional insurance companies, that are looking for this kind of service. They don't want to get involved into laying cables, buying servers, having ID department, et cetera. They would just like to define the requirements. And they would like to penetrate the market as fast and as efficiently as possible. In order to do this, you should not be bothering yourself with those technical stuff, but more with the business stuff, what products to offer, how to offer it, to whom to offer it and how to do this, I would call this more marketing stuff or more market-related stuff and leave the technicalities to guys who are experts on this field. So, Adacta in this case with this new platform, third generation of AdInsure started to move towards this kind of solution, to offer a service. Okay. And what else did we learn during our time in developing software for finance industry and basically more or less for the insurance industry? Well, customers want modularity. It is also quite important because, as I said, different business models are appearing on the insurance companies market. And basically not all of the customers require all of the solutions or want to have same vendor for every solution. End result is going to be that, in some cases, some insurance company are completely outsourcing their claims processing part. Basically they have service providers who do not just this traditional stuff, like manage individual claims, but manage whole portfolio of claims. So in this case, modularity helps us and AdInsure to cut out one modul and replace it with integrations of other kind, from another source. Or another use case would be that some parts of their system, or some processes are already covered sufficiently in an insurance company, for example, reinsurance could be the case for that. Insurance company can have different core solutions for life and non-life or in different parts of portfolio. In this case, modularity is needed in a way that AdInsure processes data from both, for both types of portfolio. On the other hand, it does not cover for example, life part of portfolio. So in this case modularity helps us to sort of isolate the reinsurance module and to work with data that comes from external sources and not internally from AdInsure. So basically, these were the requirements. These was what got us thinking, what made us want to achieve the third generation of our system. There's many other, there were many other reasonings behind this. There are many other decisions to be made, but basically we somehow focused on open platform, focused on this portability or between devices, meaning that we need to make devices to meet or we need to support those thin clients as they are called, whether a web browser on your desktop, whether some dedicated window, or dedicated mobile app. What else did came into account when we were designing the latest generation of AdInsure? Configurability again, to reduce the time to market, to reduce the effort needed from Adacta as a vendor, as a service provider, to enable our clients to do as much as possible modifications to the products and the

processes on their own. So basically this configurability became a buzzword in Adacta and "Everything is configurable", and in the end everything really is configurable. Basically we talked about APIs and open platform, and we took extra care that each configurational change of the system, of the process, of the data schemas et cetera, also that these open platform changes are basically handled in a way that APIs automatically do follow the configuration of the system or the processes in the system.

5. Did Adacta change anything else, besides the technology and product development approach?

Of course, we had some major changes on the organizational side, we did change our company considerably. Earlier we had some division between departments who are developing the core product and departments who are developing the implementations or who are supporting our customers. With new product development this divide got a bit stronger. Basically, we have now dedicated core or R&D or product development department with several other teams, each handling different modules of AdInsure. On the other hand, we have structured Services department who is dealing with integrations, but most importantly, we also introduced dedicated Business analysis department. The service of ours, which used to be integrated within Services department, or the guys who did the analysis, who collected the requirements, who did this are usually embedded within the project team, those people and those services I would say, are now gathered within stand-alone department and importance of this is new department is basically, we are now able to offer expertise. And if you're talking about expertise in business expertise, in how to design the processes, expertise in various not technical, but business related fields. So basically if Adacta is about to offer software as a service, and we are offering these, we should be offering also business consultants who are able to guide our customers through this process, which is a mixture of IT requirements, or IT stuff, how the process is done, of what computers can do, what AdInsire as a platform can do and on the other hand business requirements, which is what they want to do, which insurance products they want to market, how do you want to market them? What is the optimal solution, etc. So basically we are, Business analysis department, sort of a link between those two departments I mentioned earlier - product development and services implementations, and the customer at the end. So this is the big sort of change in thinking, not just embed business consultants with to developers and send them off to a project, to the customer. But do develop the expertise to develop solutions, and offer as a service also consulting and offer as a service also standardized solutions that are of course, based on AdInsure platform.

6. Can you describe the business analysis process in Adacta in few sentences?

Yes, of course. Obviously, it all starts with signing the contract for business analysis project. This lays the foundation for the next project in the whole pipeline and that is the implantation of our solution in manner and form determined by the analysis and confirmed by our client. After that, we need to estimate the scope and size of the project, since that can significantly

influence the resources that we allocate to it given that we don't have a large team of consultants and analyst. If the situation demands it we also include partners in the analysis, but that is usually only if some areas of the analysis require some specific knowledge and skills that we don't have in our team. After that we divide the analysis into streams and dedicate one or more people to a stream. Every stream has its own lead that is in charge of general stream organization and eventually analysis artifacts. Next, we gather some initial data and information from the client, for the purpose of setting up the analysis plan and inter-stream organization. After everything is set we start the analysis, we organize and lead workshops, request and review business documentation, do additional inspections and other stuff that helps us understand how the client operates, what are the processes, how the data flows are setup, etc. All this helps us to understand where the client is and where they want to be in a sense. From there we create different artifacts and deliverables that we must align with the client and other involved parties. When we get the confirmation that they are OK then we create the final artefacts, get the final sign off and this then becomes the foundation for analysis. In short, this is how we do it. Of course, there can be several iterations of workshops or other confirmation meeting because complex topics must be discussed more thoroughly to get to the same level as the relevant people on the client side. But in general that's how one analysis project looks like.

7. What are those deliverables, which you provide to your clients during analysis?

There are many of them, some less and some more important. For starters, we have a policy of delivering meeting minutes (MoM) within 48h and you can imagine that can become very tricky to do on a tight schedule. The MoMs need to be aligned with the client as well and this can sometimes complicate things in the later stages since MoMs are building blocks for other artifacts. Based on aligned MoMs and other conclusions from the meetings and workshops, we start building the requirements list and then this also needs to be aligned and confirmed by the client. A requirement needs to be categorized in the light of the implementation, in other words is it something we support without any additional development, do we need to only do some configuration of our solution to support it, or is it something that needs to be custom developed for the client. In the light of the consultancy we provide, we also model and analyze business processes of the client. All these things, plus the documentation we got from them, is then used to create Functional Specification Document (FSD). This document contains all relevant descriptions of confirmed requirements, future processes, UI designs, etc. In short, it represents the desired application features and functionalities that the client wants and needs. This is then taken over in the implementation project as a blueprint of what needs to be done there. It's also used to assess the implementation costs since previously gathered requirements need to be estimated by the development team.

8. What are the plans for future development in Adacta?

What else did we do in this or where we are now is basically, we are now developing and releasing version number six of AdInsure third generation. Most of the base processes, our requirements from current insurance companies are now achieved. So with the additional new releases with releases from now on, we will be looking more into these features that make a difference. As I said, uh, there is a lot of things that a market now demands and more and more of these features will be added through subsequent releases. So basically we got a lot of feedback what the insurance company needs in the corona crisis, and this corona crisis just accelerated this process of going online, selling online in this digital transformation process. So at the end of the day, we are able to do everything from our home. And insurance is also one of the things we will be able to do from home. And of course, industry has been prepared to some extent, but it has not been prepared in this extent to they are really able to do everything by the moment. So this is what's following now here. Another thing in this digital transformation area or this phase we are in, as I said, we are developing product. And having a good, solid product is a must to be considerable actor on the market. And to be persistent actor on the market, then how to expand. We'll at some point reach this. We did not reach it yet, but at some point we will reach the growth limit and at some point in the future it's no longer feasible that we expand our company, expand the size of our company in order to serve all of our customers.

Additionally, we aim to improve the business analysis practices in the company, to expand the areas of expertise on our analysts. Also, we're looking at new emerging technologies that can help them to be more efficient and save their time for activities that add value to the project not just do the clerical tasks. The market has several interesting opportunities and we'll evaluate and maybe implement some of them when time comes.

That would be all, thank You again for finding the time for this interview and answers You provided.

Appendix 2: Survey answers

Figure 1. Survey participants

Figure 2. Requrements elicitation techniques

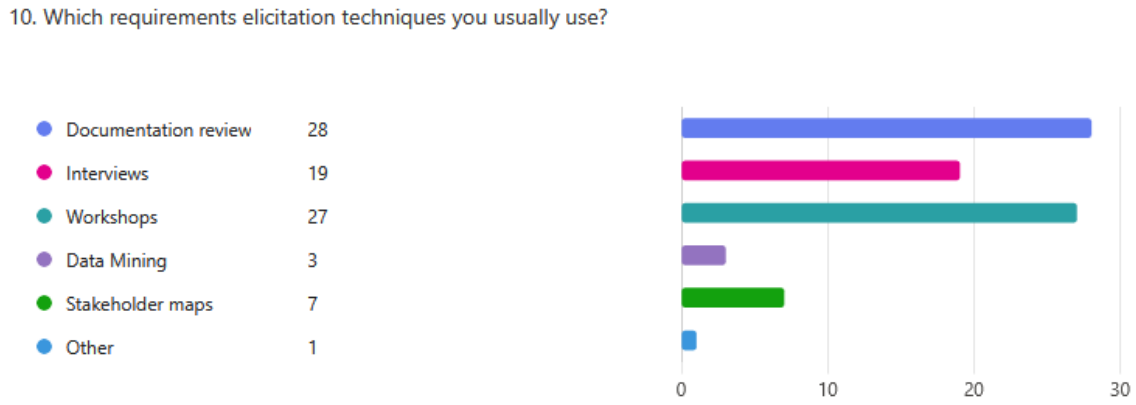


Figure 3 Process discovery techniques

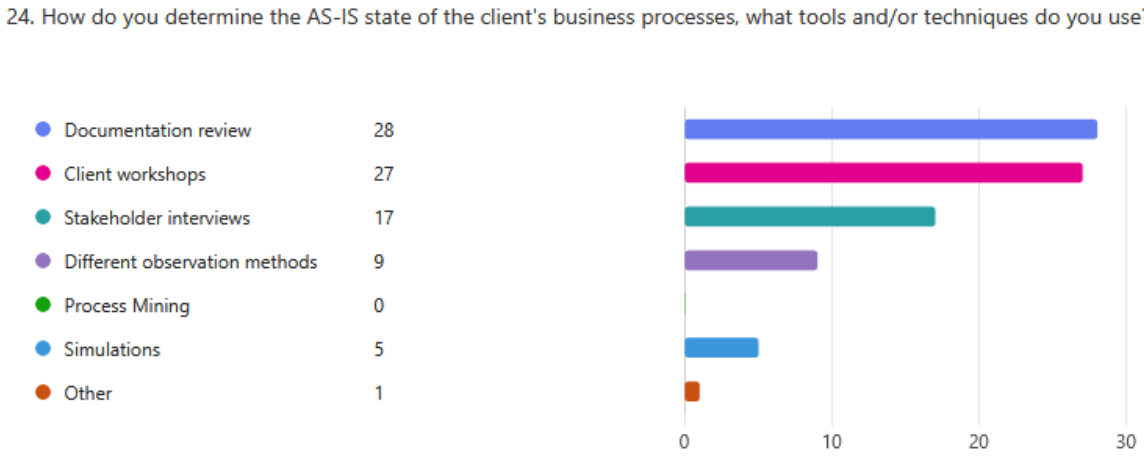


Figure 4 Requirements elicitation challenges

11. What is the biggest challenge you face when trying to elicit requirements from stakeholders?

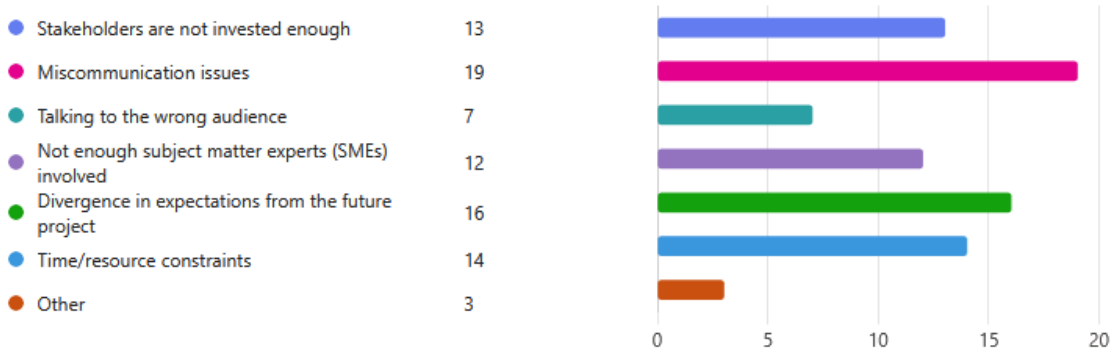


Figure 5 Common procedur for requirements elicitation

18. What does the common procedure for requirements aligning and confirmation in Your company include?

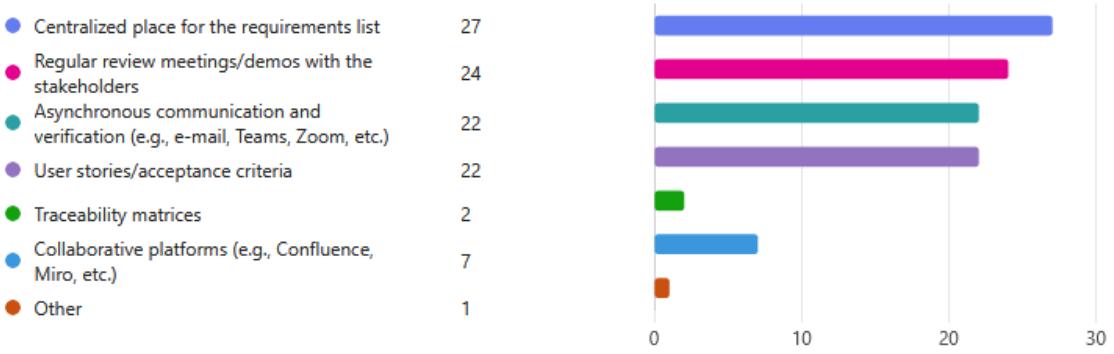


Figure 6 Current technology support satisfaction

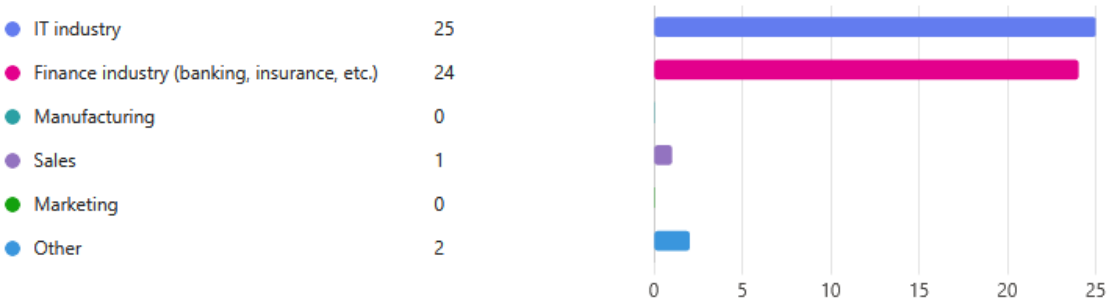
9. How satisfied are you with the current technology support for Your regular field of work?

Figure 7 Technology limitations

15. Have you ever encountered technology limitations that prevented you from meeting certain requirements?

Figure 8 Working experience

6. In which domains did you acquire that experience?



Appendix 3: BPM Lifecycle description

The BPM Lifecycle is a series of activities performed in any BPM project or initiative, and below is a detailed description of all of them.

In the beginning, the essential step is for the company to understand and accept that current overall performance is not on the desired level due to the subpar quality of its processes. The reasons can range from outdated process definition to inadequate performance metrics, but at the end the result is the same – subpar performance. So, when this step is done all others come more naturally. Now the company can detect subpar processes within areas that have performance issues and set the stage for BPM professionals to take over. This is actually the *process identification* phase, where the business problem is posed, relevant processes are identified, their interconnections defined and mapped. The outcome of this phase is process architecture "which provides an overall picture of the processes in an organization and their relationships. This architecture is then used to select which process or set thereof to manage through the remaining phases of the lifecycle" (Dumas et al., 2018, p 22). In parallel, the company should also determine the adequate metrics that will be used to evaluate the process outputs, quality, and state.

When the problematic process is identified, and proper performance metrics are defined, the next step is to describe it in an understandable way. And in order to describe a process, BPM professionals need to understand it first. *Process discovery* phase is the part where this is done - relevant knowledge about the process is gathered and used to model it properly. The knowledge necessary for effective process modelling can come from different sources. Companies can have some general procedures that describe the actors and their roles or even the process itself, depending on the company's process orientation even some high-level process diagrams could exist. BPM professionals can also communicate with relevant actors and subject matter experts (SMEs) to gain a better understanding of the process (Dumas et al., 2018, p 160). Once that is done, the existing process model is created.

There are many approaches to process modelling but one of the most convenient ones is to display the process in some graphical way, usually through different diagrams. The use of diagrams in the process discovery phase of BPM is crucial for several reasons. Firstly, diagrams provide a visual representation of complex workflows, making it easier for stakeholders to understand the sequence of activities, dependencies, and interactions in a process. This visual clarity fosters effective communication and collaboration among team members, allowing them to identify shortcomings and bottlenecks of the process more easily. And secondly, diagrams serve as a means of documenting process knowledge, preserving institutional memory, and facilitating knowledge transfer within the organization. From flowcharts to using Universal Modelling Language (UML) and Business Process Modelling Notation (BPMN) version 2.0, the use of diagrams in the process discovery phase not only enhances transparency and comprehension but also lays the foundation for successful process management and continuous improvement initiatives. Due to overarching influence

and clarity of these visual aids, the output of process discovery phase is one (or more) As-Is process diagrams.

Now, when the process is modelled and understood by the BPM professionals, the *process analysis* phase can begin. This phase plays a pivotal role in understanding the intricacies of existing business processes and identifying opportunities for improvement. Process analysis involves a systematic examination of process inputs, outputs, activities, dependencies, bottlenecks, and performance metrics. Through techniques such as process mapping, data collection, and performance analysis, organizations aim to uncover inefficiencies, redundancies, and areas of waste within their workflows. By conducting a thorough analysis, organizations can pinpoint root causes of process inefficiencies and identify opportunities for optimization, automation, or redesign. Output of this phase is a structured collection of recognized issues, usually ordered by priority and impact they have on process performance.

Next phase is the *process improvement* (also known as *process redesign* phase). Based on the output of previous phase, BPM professionals can come up with different solutions for identified issues, conduct an analysis of their effects, and sort the identified solutions based on the performance improvement. As stated in (Dumas et al., 2018, p 23) "process redesign and process analysis go hand-in-hand: As new change options are proposed, they are analysed using process analysis techniques". The best solutions are then incorporated, and the new To-Be process model is created – which is actually the output of this phase.

After identifying the best process improvements, and defining the future process flow, it is time to implement it. In *process implementation* phase all previously identified process changes are performed to turn the As-Is into a To-Be process model. Two aspects need to be covered in this phase: organizational change management and process automation.

Organizational change management deals with challenges arising from redefining the work of all process actors and adapting them to the new process. And process automation is related to development and deployment of different IT features, functionalities or even whole systems, required to support the new To-Be process model. The output is the new process structure and flow, now fully integrated in the regular company business.

And the last phase, *process monitoring*, deals with constant collection and analysis of process data in order to have full control and insight about its performance. The performance of the new process is being monitored to determine if the planned performance metrics (defined during the process redesign) are achieved, and if the BPM initiative in the company provided desired results. Except from this, this phase can also spark another BPM cycle based on the collected data. Because of that BPM lifecycle should not be a one-time event but a continuous activity aimed at learning from past mistakes, making informed improvement decisions, and staying vigilant in ever-changing business environment.

Process-oriented companies are aware that BPM initiatives need to be iterative. The iterative nature of BPM initiatives ensures continuous improvement and adaptation to evolving

business needs and market dynamics. By frequently redoing the BPM cycle, organizations can incorporate feedback, refine processes, and address emerging challenges in real-time, leading to greater agility and responsiveness to changes. This iterative approach fosters a culture of continuous learning and innovation, enabling organizations to stay ahead of the curve and drive sustainable long-term success.

BPM lifecycle requires a diverse team to pull off a successful BPM initiative. From management team, process owners, process participants, process analysts, system engineers and others, the stakeholder structure is very colourful, and they need to understand that the end goal for all of them is the same – a better performing process. Although this can have a different meaning for each group individually, it is crucial to have a consensus about the main process metrics and approach to avoid internal struggles that will jeopardize the success of the BPM initiative.

Every business process improvement project includes many, if not all of the previously described BPM lifecycle phases.