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ÚSTAV MANAGEMENTU

# PROJECT PROPOSAL AND APPLICATION OF PROJECT MANAGEMENT METHODOLOGY IN THE COMPANY

NÁVRH PROJEKTU A APLIKACE METODIKY PROJEKTOVÉHO MANAGEMENTU V PODNIKU

## MASTER'S THESIS

DIPLOMOVÁ PRÁCE

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Analysis of the contemporary situation  
Proposal of solution  
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## **Abstract**

The diploma thesis is aimed at proposing a project for a change of internal process within a selected company while using project management methodologies. The goal of the project is the development and implementation of a new process and web application for the management of information about the company customers. The new process and application are supposed to eliminate the identified deficiencies of the current process.

## **Keywords**

project management, project, internal process, manufacturing company, gap analysis, web application

## **Abstrakt**

Cílem diplomové práce je navrhnout projekt změny interního procesu ve vybrané společnosti s využitím metodiky projektového řízení. Cíl projektu je vývoj a implementace nového procesu a webové aplikace pro správu informací o zákaznících společnosti. Nový proces a aplikace mají odstranit zjištěné nedostatky stávajícího procesu.

## **Klíčová slova**

řízení projektu, projekt, vnitřní proces, výrobní podnik, GAP analýza, webová aplikace

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**Affidavit**

I declare that the present master project is an original work that I have written myself. I declare that the citations of the sources used are complete, that I have not infringed upon any copyright (pursuant to Act. no 121/2000 Coll.).

Brno dated 13th May 2024

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Bc. Štěpán Stránský

author's signature

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# INTRODUCTION

De Heus has been providing high-quality animal feeds in Czech Republic since 2007. From the first factory in Marefy, Bučovice it has expanded its operations by adding another factory in Běstovice and another one in Kendice, Slovakia. Companies frequently find themselves in a constant state of transformation in today's dynamic business climate, driven by growth and adaptation. An effective internal infrastructure is becoming increasingly important as businesses grow to satisfy the demands of a constantly shifting market. Due to this continual internal process optimization is necessary for the company to remain effective.

One of the integral parts of any company is how they manage their customer's information, how they approve new customers, make sure that the information is up to date, and that it is easily accessible to all the employees that need it.

In this diploma thesis, a change to a critical internal process of De Heus is proposed, the current process is analyzed, and the reasons for why the change is necessary are established, the project management methodology is applied for the project concerning this change, and the main benefits of the change are identified.

The first main chapter of this thesis focuses on the theoretical base for the subsequent analytical and proposal chapters. Key concepts regarding project management and thesis-specific themes are explored in this chapter.

The second main chapter is concerned with analyzing the current situation within De Heus regarding Customer Cards management, a major part of this chapter are the results from the structured interviews that were conducted with the key stakeholders of the project. This chapter ends with the gap analysis where the current and the desired target states are described and the gap between the two is identified.

The third and the last main chapter of this thesis proposes a solution on how to bridge that gap. It starts with the description of the assignment, together with the proposal for the new process illustrated in the attached process flow diagram, for the chosen contracting company regarding the development of the web application for the management of Customer Cards, next is the proposed project for this purpose, represented by the project charter, RACI matrix, and other project management methodologies and tools. This chapter ends by providing an overview of the benefits that will come with the proposed change.

## **GOALS OF THESIS AND METHODS**

The main objective of this diploma thesis is to propose a project for a change of internal process within De Heus concerning the management of customers' information while using the project management methodology. To support this main objective, I have also set three subgoals:

1. Identify the reasons and arguments for why the change is necessary.
2. Apply the project management methods for this change.
3. Identify the benefits and risks of this change.

This diploma thesis is divided into three main chapters. The first chapter is dedicated to theoretical concepts coming from academic and professional literature and verified sources. These concepts are then applied in the following two chapters.

The second chapter focuses on the description and analysis of the current situation within the company. The information for this chapter comes from structured interviews with the employees and management of the company, these findings are then complemented by McKinsey's 7S analysis, and the chapter ends with the gap analysis where the current situation is summarized, the desired target state is set and the gap between the two is identified.

The third chapter proposes a solution how to bridge the gap identified in chapter two. First, the solution is described and then the project management methods are used to propose a project that will deliver the solution, the methods used are the project charter, work breakdown structure, stakeholders' identification, RACI matrix, risk analysis, and project scheduled and budget. The chapter ends by presenting the expected benefits of the solution.

# **1 A THEORETICAL REVIEW OF A PROBLEM**

The first section of this diploma thesis is focused on the theoretical base that the rest of the thesis builds upon in the analytical part and in the proposal of solution section. First the project management terminology is explained like project, project management, the constraints or lifecycle of the project, followed by the project organizational structure concerning the stakeholders and important project documents like the project charter or work breakdown structure. Project schedule and the risk management aspects are described and then the other analyses and methods used within the thesis are explored including the structured interview, McKinsey 7S, and Gap Analysis. The theoretical part of this thesis is concluded by briefly going through this project's specific areas like enterprise systems, Event-driven Process Chain, and Minimum Viable Product.

## **1.1 Project**

A project is a collection of tasks that need to be finished in a certain amount of time to achieve a set of objectives. The team responsible for completing these activities is called the project team, and it is overseen by a project manager who oversees organizing, planning, monitoring, and concluding projects successfully. (Malsam 2023)

Each project has three main characteristics with the first one being uniqueness, each project is in some part unique thus no two projects can be completely reduced to routine and there are always some exceptions to manage. The second characteristic is that each project is a one-time occurrence with well-defined results (scope) and the third characteristic is that the project has a finite duration, each project must have a starting date and an ending date and between those dates, we can also identify the lifecycle of a project. (Meredith et al., 2017)

## **1.2 Project Management**

Project management is a discipline in management that plans, organizes, and controls people, money, and cash, considers the associated risks, needs of the project investors and other stakeholders so that the project reaches its successful completion. The process of project management starts even before any resources are committed and end only after all the work is finished within the project. Well managed project should end on time, within the budget and satisfy all the stakeholders. (Lock 2019)

### 1.2.1 Agile Project Management

Companies that have reached a reasonable level of project management maturity tend to reduce the amount of documentation required (maybe even aiming for paperless project management), shift from formal to informal project management, and have faith in the project team to make the right choices. Techniques like agile project management have emerged to accommodate the more unstructured approach to project management. (Kerzner, 2017)

Delivering benefits at every stage of the process instead of just at the finish is one of the objectives of an agile or iterative approach. Agile projects should essentially exhibit the values and behaviours of empowerment, trust, flexibility, and teamwork. (What Is Agile Project Management?, c2024)

Figure 1 denotes the main differences across various factors between traditional and agile project management.

Factor	Traditional Project Management	Agile Project Management
Structured focus	Tools and processes	People
Completion focus	Paperwork and contractual documentation	Results and deliverables
Leadership style	Authoritarian	Participative
Amount of documentation	Extremely heavy	Minimal
Trust	Mistrust may prevail	Trust
Customer interfacing	Negotiation	Collaboration
Customer feedback	Minimal, perhaps only at project termination	Throughout the project
Project direction	Follow the plan exactly	Respond to changes
Project solution	Follow the contractual requirements exactly	Constantly evolving solution
Delivery	Often a late delivery	Shorter delivery time
Unused features	Too much "gold-plating"	Minimal
Number of features	Too many	What the client needs
Acceptance	Often a high rejection of deliverables	Minimal number of rejected deliverables
Best practices and lessons learned	Discovered from successes	Discovered from successes and failures

**Figure 1: Traditional and agile project management comparison**

(Source: Kerzner p.287, 2017)

### 1.2.2 International Project Management

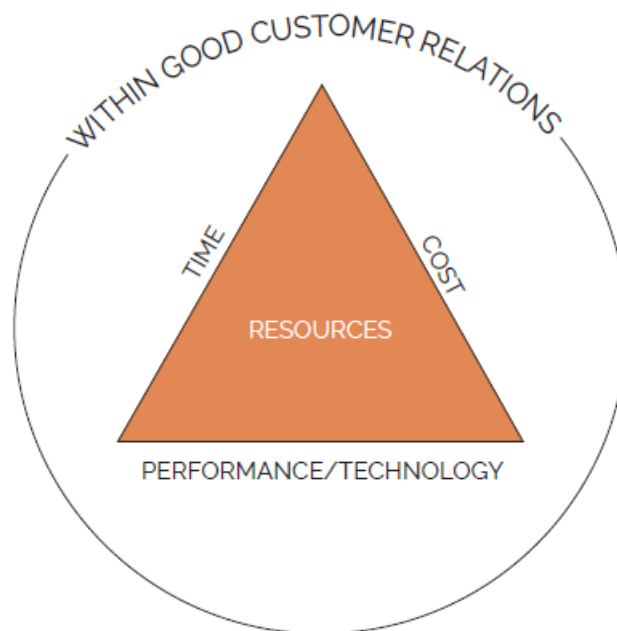
The complexity of culture, politics, law, local customs, language, time zones, holidays, methods, resources, and other factors sets international projects apart from domestic ones. Finding and using less expensive resources opens a lot of opportunities for businesses of all sizes as internet connectivity grows. Companies require human resources, which are currently accessible on a global scale. (Grisham, 2010)

In terms of the political, social, technical, cultural, economic, and ecological domains, globalization is fostering greater interconnectedness, integration, and interdependence

between people and places. This increases international project managers' access to resources at lower costs and increases the likelihood of conflict. (Grisham, 2010)

### 1.2.3 Constraints

The Figure 2's goal is to demonstrate how project management is meant to manage or control an organization's resources on a particular task while staying within timeline, cost, and performance constraints. The only limitations on the project were thought to be those related to time, cost, and performance. A fourth limitation would be present if the project was to be completed for an external client: good relationship with customers. Customers may be either internal or external to the parent company. (Kerzner, 2017)



**Figure 2: Project Management Constraints**

(Source: Kerzner p.5, 2017)

More recently, the measurement of project success has been modified to include the completion:

- Within the given time frame
- Within the allocated budget
- At the appropriate level of performance or specification
- With the approval of the client or user
- With minimal or mutually agreed-upon scope modifications

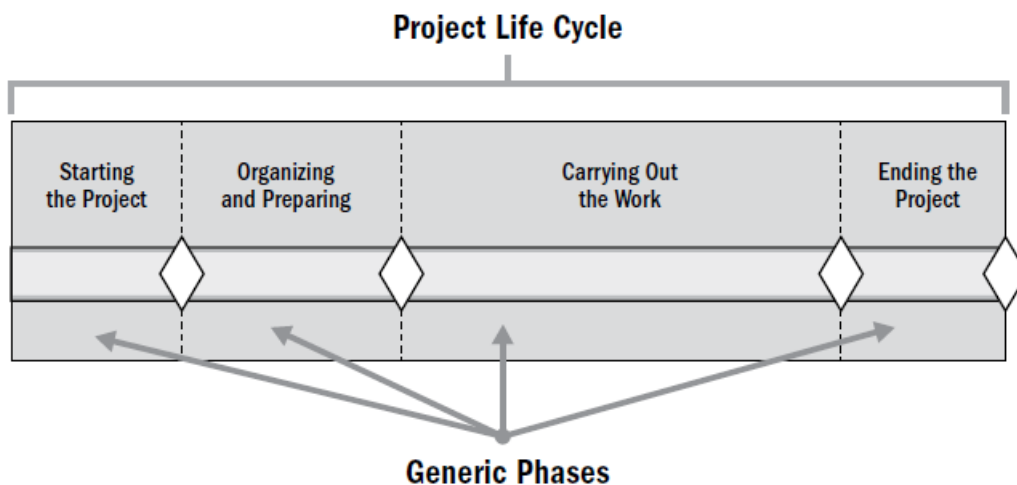
- Without conflicting with the organization's primary workflow
- Without affecting the corporate culture

(Kerzner, 2017)

In an international context the **sustainability** factor should also be considered. Building trust requires an international project manager to lead by example and prioritize sustainability. That is to aim for something greater than just meeting one's immediate needs and consider human rights, labour rights, environmental, and anti-corruption principles. (Grisham, 2010)

### 1.3 Project Lifecycle

The particulars of the company, sector, method of development, or technology used can have an impact on the project life cycle. Although all projects have a beginning and ending, the deliverables and amount of effort involved vary greatly depending on the project. The project life cycle offers the fundamental structure for project management, independent of the tasks involved. A typical project can be mapped to the following project life cycle structure in Figure 3, notwithstanding the fact that projects differ in size and complexity. (A guide to the project management body of knowledge (PMBOK guide), 2017)



**Figure 3: Project lifecycle phases**

(Source: A guide to the project management body of knowledge (PMBOK guide) p. 548, 2017)

Typically, the names given to these phases or subcomponents reflect the nature of the work completed at that phase. Phase names can include, but are not restricted to:

- Concept development,

- Feasibility study,
- Customer requirements,
- Solution development,
- Design,
- Prototype,
- Build,
- Test,
- Transition,
- Commissioning,
- Milestone review, and
- Lessons learned.

(A guide to the project management body of knowledge (PMBOK guide), 2017)

The project manager, sponsor, senior management, and possibly the customer meet at the conclusion of each phase to evaluate the results of that stage of the life cycle and obtain approval for the subsequent one. These sessions are sometimes referred to as "gates," "on-off ramps," and critical design assessments. (Kerzner, 2017)

More detailed look at the project lifecycle can also include the pre-project work phase where the business case is established and may include, but are not limited to the following:

- **Needs assessment:**
  - Identification of the cause necessitating action.
  - Situational statement outlining the opportunity or business issue that needs to be dealt with together with the value to be delivered to the organization.
  - Identification of stakeholders affected.
  - Identification of the scope.
- **Analysis of the situation:**
  - Identification of organizational strategies, goals, and objectives
  - Determining the primary cause(s) of an issue or the factors that contribute most to an opportunity.
  - Gap analysis of the organization's current capabilities in comparison to those required for the project.
  - Identifying known risks.

- Coming up with a list of potential solutions ready to utilize in order to solve the business opportunity or problem.
- **Recommendation**
  - An explanation of the suggested course of action for the project
- **Evaluation**
  - A plan how to evaluate and measure the benefits the project will delivery.

(A guide to the project management body of knowledge (PMBOK guide), 2017)

## 1.4 Project Organizational Structure

Regardless of the organizational structure, the people and leaders in charge of the key functions are what really make a project successful. A team of people committed to achieving a certain objective is needed for project management; it cannot be done by one person. (Kerzner, 2017)

Project management team main roles are:

- A project manager
- Assistant project managers if necessary
- A project team

(Kerzner, 2017)

For the purposes of the team organization there are several important definitions:

- Authority - the power given to people (sometimes due to their position) to make definitive decisions.
- Responsibility - the obligation that members of the formal organization have to carry out their duties in an efficient manner.
- Accountability - being responsible/liable/answerable for the successful accomplishment of a particular task, it can be also described as: accountability = authority + responsibility

(Kerzner, 2017)

### 1.4.1 Stakeholders

Stakeholders are people, businesses, or organizations that could be impacted by the project's outcome or management style in some capacity. Stakeholders may participate in the project directly or indirectly, or they may only be spectators. Stakeholders have an option to change from being a passive member of the team to an active participant in

important decisions. In smaller or traditional projects, the primary stakeholder with whom project managers often interact is the project sponsor, who is typically appointed by the organization that funds the project. (Kerzner, 2017)

Following are the examples of stakeholders that are either internal or external to the project:

- **Internal**
  - Sponsor
  - Team members
  - Resource manager
  - Project manager of other projects
- **External**
  - Customers
  - Shareholders
  - Regulatory bodies
  - End Users
  - Suppliers

(A guide to the project management body of knowledge (PMBOK guide), 2017)

### **1.4.2 Project Manager**

The individual designated by the implementing organization to head the group in charge of accomplishing the project's goals is the project manager. The organizational structure and project governance serve as the foundation for the project manager's reporting relationships. On top of the necessary technical skills specific to the project the project manager should also have attributes like:

- Knowledge about project management, business environment
- Abilities to develop and manage scope, schedules, budgets, plans, presentations, reports, and risks.
- Personality, ethics, communication, motivation, facilitation, negotiation, and leadership skills

(A guide to the project management body of knowledge (PMBOK guide), 2017)

### **1.4.3 Project Charter**

The project charter, provided by the initiator or sponsor, authorizes the project, and grants the project manager authority to use organizational resources for project operations. It documents the high-level information on the project and the product, service, or outcome that the project is designed to satisfy. (A guide to the project management body of knowledge (PMBOK guide), 2017)

The project charter should include the following information:

- Project name
- Project manager
- Last revision date
- Project purpose
- Project objectives
- Project scope and deliverables that are included and also those that are excluded
- Project team and resources
- Stakeholders and approvers

(Martins, 2023)

### **1.4.4 Work Breakdown Structure**

A work breakdown structure (WBS) is a product-oriented family tree that divides the hardware, services, and data needed to create the final product. The work breakdown structure (WBS) outlines how work will be completed and how project costs and data will be summarized for reporting. WBS provide a common framework for:

- Planning
- Costs and budgets
- Time and performance tracking
- Schedules and status-reporting procedures
- Responsibility assignment
- Control planning
- Risk analysis
- Objective coordination

(Kerzner, 2017)

The WBS structure should follow this pattern (denoted in Figure 4): Level 1 is the overall program and consists of a collection of projects. All project activities and costs must add up to the total program. A project (level 2) can be divided into tasks (level 3). The sum of all tasks equals the sum of all projects, resulting in the entire program. (Kerzner, 2017)

The purpose for this separation of work is merely for simplicity of control. Program management involves integrating activities, with the project manager acting as the integrator and using the work breakdown structure as a common framework. (Kerzner, 2017)

	<i>Level</i>	<i>Description</i>
Managerial levels	{ 1	Total program
	{ 2	Project
	{ 3	Task
Technical levels	{ 4	Subtask
	{ 5	Work package
	{ 6	Level of effort

**Figure 4: WBS Levels**

(Source: Kerzner p.365, 2017)

### 1.4.5 RACI Matrix

Responsible, Accountable, Consulted, Informed (RACI), also known The Responsibility Assignment Matrix (RAM), is a useful tool for outlining the work responsibility assignment matrix. The RACI Matrix is typically used to identify roles, responsibilities, and levels of authority for each project activity as well as to explain how jobs relate to one another. As the basis for the communication plan, RACI establishes who gets information, when they get it, and how detailed it is. (Suhanda, Pratami, 2021)

Benefits:

- Easier Team Communication
- Determine the number of teams / stakeholders per task
- Visualizes the workload per team / stakeholder

**Responsible** - gives information indicating that a team member is in charge of seeing a task through to completion.

**Accountable** – information that the members of this team are responsible for all given tasks and have the power to make decisions about their assignments. This function is critical since it entails complete responsibility for the decisions that were made.

**Consulted** - individuals in this role are specialists in their respective fields, as they are responsible for providing project / task-related knowledge.

**Informed** - those who are assigned to this position are constantly kept up to date on the status of a project. Any changes and the outcomes of decisions made must be communicated to someone in this function.

(Suhanda, Pratami, 2021)

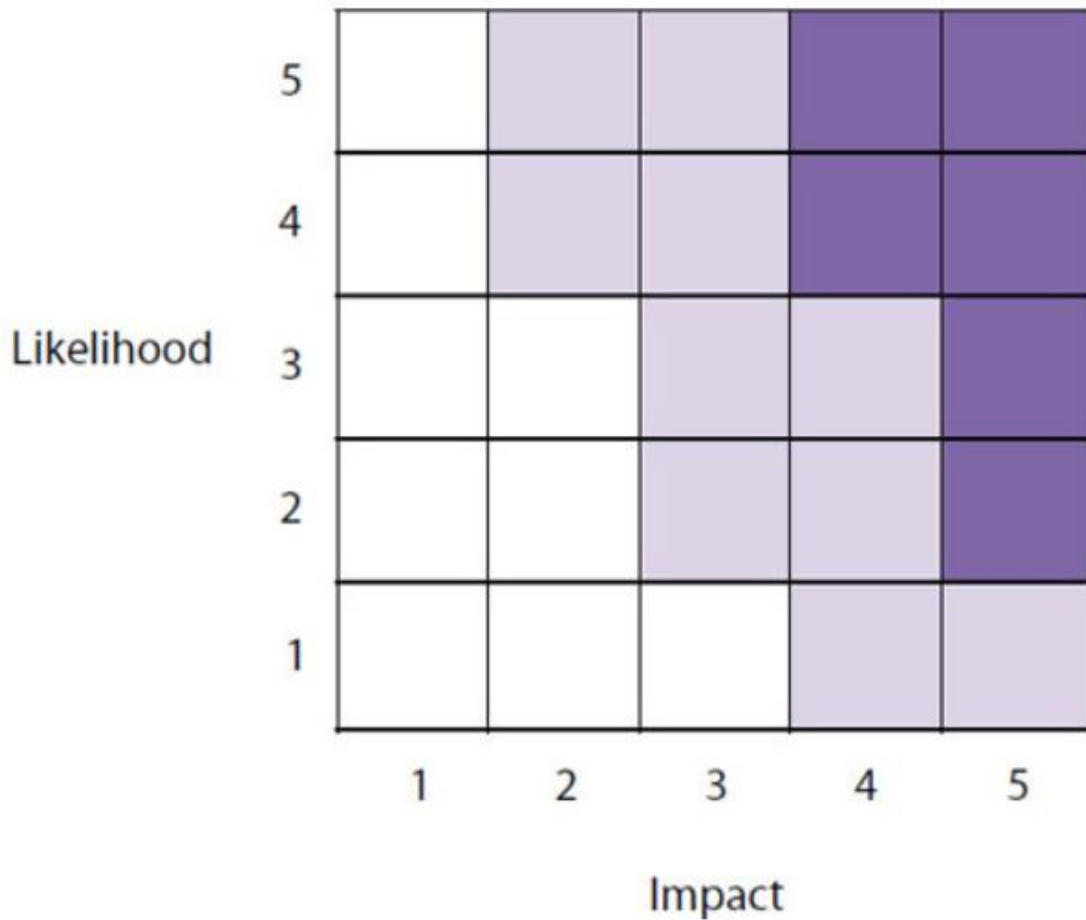
## 1.5 Risk Analysis

Risk management is the systematic process of discovering, evaluating, prioritizing, and managing potential risks to reduce their negative influence/impact on an organization's goals. It entails recognizing prospective risks assessing their likelihood and impact, and then adopting methods to avoid, mitigate, transfer, or accept these risks. Effective risk management seeks to deliver the most favourable outcome and reduce the volatility and variability of the outcome. (Hopkin, 2018)

**Impact** - the effect a risk will have on the project if it arises. (Graves, 2000)

**Likelihood** - the probability of the risk effects occurring. (Graves, 2000)

Figure 6 denotes the risk matrix, which is constructed based on two variables, the impact and the likelihood of the risk. The matrix is then divided into four zones based on how critical/severe the possible risks are, starting from the comfort zone which includes the risks that have low impact and low likelihood, and ending with the critical zone, which contains the risks with the highest impact and likelihood.



**Figure 5: Risk Matrix**

(Source: Graves, 2000)

### 1.5.1 Risk Response

The 4Ts represent the risk response options.

#### **Tolerate**

Exposure may be tolerated without additional intervention. Some risks may be difficult to address due to inadequate resources or excessive costs compared to possible benefits. (Hopkin, 2018)

#### **Treat**

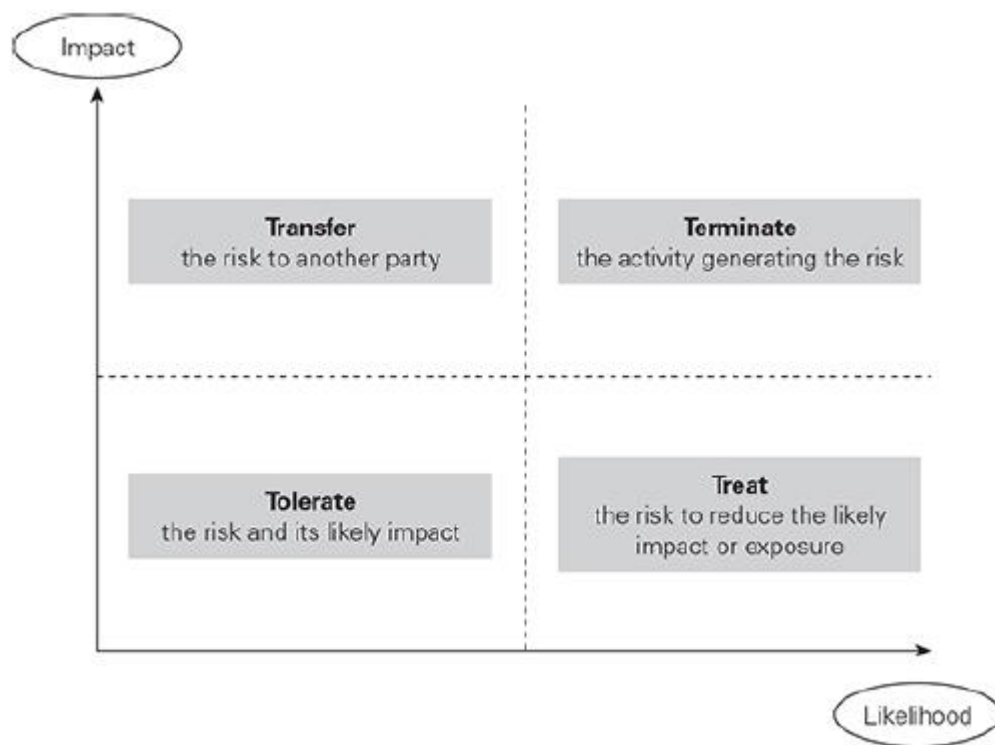
This method effectively addresses the majority of risks. Treatment involves taking action (control) to reduce the risk inside an organization while continuing with the activity that caused it. (Hopkin, 2018)

## Transfer

Transferring risks may be the most effective response. This can be accomplished through traditional insurance or by paying a third party to assume the risk in another way. This approach effectively mitigates financial and asset hazards. (Hopkin, 2018)

## Terminate

Terminating an activity is the only way to manage some risks to tolerable levels. In comparison to the private sector, government organizations may have fewer options for terminating activity. (Hopkin, 2018)



**Figure 6: Risk Responses (4Ts)**

(Source: Hopkin, 2018)

### 1.5.2 Qualitative Risk Assessment

A risk assessment provides an estimate of the severity of a risk. Without this assessment, a project manager may waste time on risks that are unimportant to the project or, worse, neglect to address major hazards. While rigorous quantitative risk analysis is generally preferable, it is not always realistic or feasible. However, qualitative risk assessment is always possible and usually takes far less time and resources than quantitative analysis. (Graves, 2000)

## **Impact**

A risk's impact (also known as its consequence) is specified on a discrete scale, with 1 = very low, 2 = low, 3 = medium, 4 = high, and 5 = very high. There is no specific relevance to using a five-level scale; other scales can be used. Most people, however, believe that five levels represent a reasonable balance between too little distinction, such as a simple three-level scale (low/medium/high), and too much, such as a ten-level scale. (Graves, 2000)

To give the impact scale meaning 4 additional variables/effects can be added to each risk and each variable can be rated on the chosen scale:

- Cost
- Schedule
- Functionality
- Quality

(Graves, 2000)

The overall impact rating of a risk is the highest of the four variables. The highest one is used since if the average was used the result could be skewed – the 100 % (impact 5) increase in cost with no additional effects on the schedule, functionality, and quality (impact 1) would equal in overall impact of 2. (Graves, 2000)

## **Likelihood**

The probability of the risk effects occurring is referred to as likelihood. As with impact, we typically define likelihood on a five-point scale, with 1=very unlikely, 2=low likelihood, 3=likely, 4=highly likely, and 5=near certain. (Graves, 2000)

First, we must decide under which conditions to estimate likelihood. Human involvement is frequently used in addition to blind statistical chance to determine the possibility of an event occurring. (Graves, 2000)

For this reason, we divide likelihood into two components: probability of occurrence (the likelihood that risk events would occur if we do nothing) and intervention difficulty (the level of difficulty that we would have in preventing the risk event from occurring). Intervention difficulty does not specify response activities; rather, it demonstrates their availability. (Graves, 2000)

Example: Standing on a railway track presents a risk of being hit by a train. The probability of this occurrence is influenced by train frequency, while the likelihood also

considers how easily one can step off the track. If the track is on open land with low intervention difficulty, the likelihood of being hit isn't tied to train frequency. However, in a tunnel where it's difficult to step off (high intervention difficulty), the likelihood depends on train frequency. (Graves, 2000)

This shows the following relationship among likelihood and the ratings: likelihood is the lower of the two ratings for probability of occurrence and intervention difficulty. (Graves, 2000)

Generic Likelihood Scales

Level	Probability of Occurrence	Intervention Difficulty
1	You would be surprised if this happened.	Your normal management processes should easily ensure an acceptable outcome.
2	Less likely to happen than not.	Careful oversight of your normal management processes will probably bring about an acceptable outcome.
3	Just as likely to happen as not.	Additional time and effort will be required to move toward an acceptable outcome.
4	More likely to happen than not.	Your resources and authority are sufficient to permit only a minor effect on the outcome.
5	You would be surprised if this did not happen.	Your ability to affect the outcome is effectively zero.

**Figure 7: Likelihood Scale**

(Source: Graves, 2000)

**Precision** is an additional variable to a risk assessment that defines the current understanding and the knowledge of the risk, it tells us how much we can trust our assessment of impact and likelihood. (Graves, 2000)

A risk matrix (Figure 6), which combines impact and likelihood, can be used to quantify the severity of the risk a simple formula is used:  $Severity = Likelihood + N \times Impact$ , where N is a numerical value expressing the constant weight added to the impact rating. (Graves, 2000)

## 1.6 Project Schedule

According to PMBOK Guide the project schedule management should include the following processes:

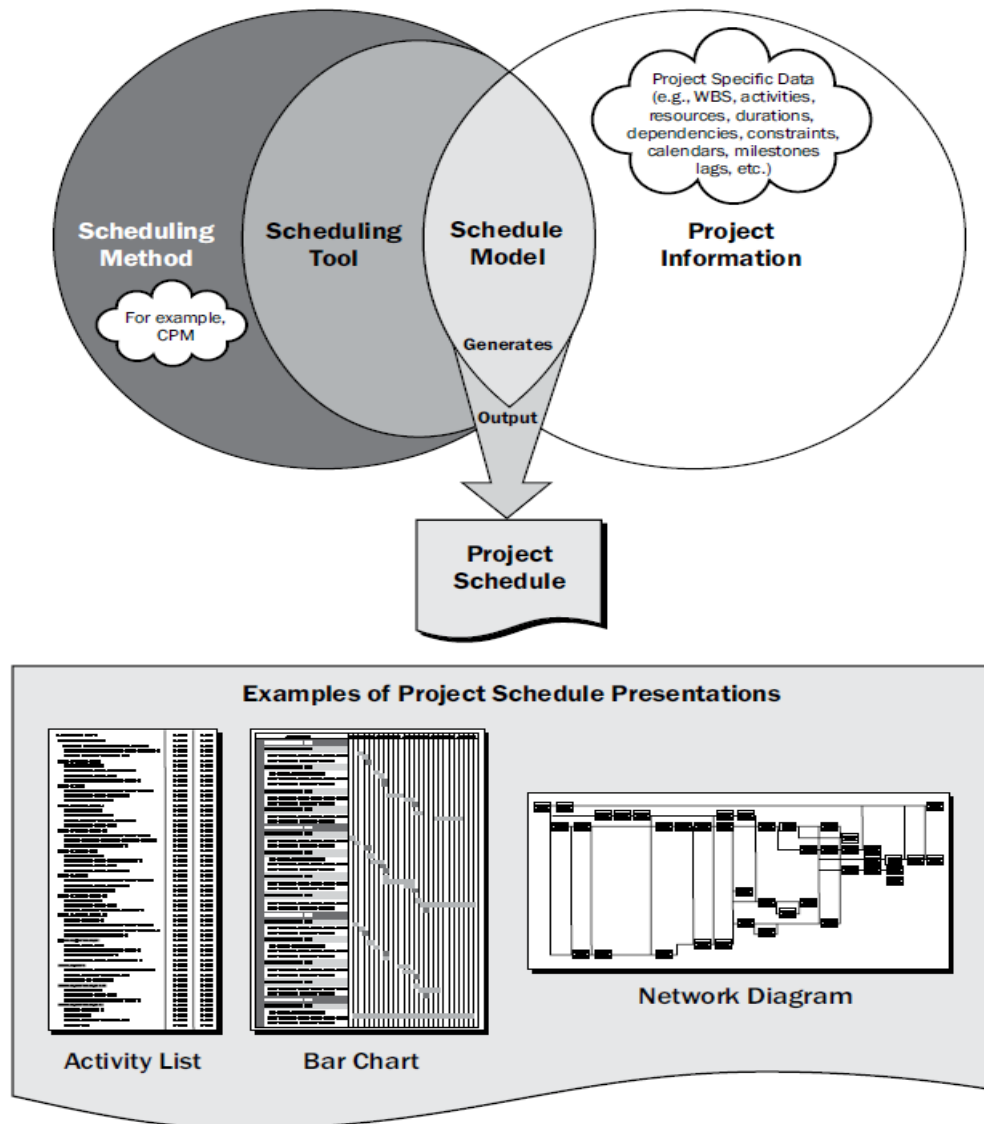
1. Plan Schedule Management
2. Define Activities

3. Sequence Activities
4. Estimate Activity Durations
5. Develop Schedule
6. Control Schedule

(A guide to the project management body of knowledge (PMBOK guide), 2017)

It is best to establish the precise order of tasks using a network that shows the connections between different events. Schedules and the work breakdown structure should be directly related. It becomes simple to identify work sequences in schedules using the same numbering system as in the WBS if the WBS is created in accordance with a defined sequence of work. At the very least, it should be clear where and when each task begins and ends. (Kerzner, 2017)

The following Figure 8 shows the overview of project scheduling as visualized by PMBOK guide.



**Figure 8: Project Scheduling Overview**

(Source: A guide to the project management body of knowledge (PMBOK guide) p.176, 2017)

### 1.6.1 Network Scheduling

By graphically representing the full program, network scheduling is a project management strategy meant to prevent crisis management. It offers vital management data, including interdependencies between tasks, estimated completion times, the effects of starting a project early or late, trade-offs between time and resources, the ability to conduct "what if" scenarios, the costs of accelerating the program, the identification of planning or performance delays, and an assessment of overall performance. In simplest terms, it aids in comprehending the timelines and structure of the project. (Kerzner, 2017)

Terms used:

- Event - comparable to a milestone signifying the beginning or end of an activity
- Activity - part of work/milestone that needs to be accomplished to move to another event.
- Duration – total time required for the activity.
- Effort - The amount of work that is actually completed in that time. For instance, an activity may take place over the course of a month, but the effort may only be put in for a couple of those weeks.
- Critical Path - The length of the project is determined by this, which is the longest path through the network. It is also the least amount of time (minimum necessary) required to complete the project.

(Kerzner, 2017)

### **1.6.2 Critical Path Method**

The method known as critical path is used to predict the minimal project length and the degree of schedule flexibility available on the schedule model's logical network paths. It denotes the longest path through a project and thus determines the shortest feasible time of a project. The least total float—typically zero—is found on the longest path. (A guide to the project management body of knowledge (PMBOK guide), 2017)

The total float or schedule flexibility of a network path refers to the amount of time a schedule activity can be delayed or extended from its start date without impacting the project's finish date or violating schedule constraints. (A guide to the project management body of knowledge (PMBOK guide), 2017)

### **1.6.3 Gantt Chart**

The initial visualizations that resembled Gantt charts were intended to "fix the habits of the industry." Gantt created visualization tools that let foremen and workers see which workers were over- or under-productive as well as assess each worker's current productivity level. The goal was to track idle time, cut it down, and make each individual feel more accountable for their output. (Geraldi, Lechler, 2012)

Gantt Chart is based on six following principles:

**Unidimensional** – The Gantt Chart directs management attention on efficiency as determined by timing and time. Projects, however, are about more than just time, and using a Gantt chart may encourage project managers to become excessively fixated on

timing at the expense of other important project management factors like value creation and realization, relationship building, and opportunity exploitation. (Geraldi, Lechler, 2012)

**Objective** – An objective perception of reality is facilitated by Gantt charts, which assume that the object—the project—exists apart from people and their thoughts. It is possible to ascertain that there is only one truth and one correct path. From a management perspective, the Gantt chart's bars provide an objective and accurate depiction of the tasks that needs to be completed and the estimated time required to do them. (Geraldi, Lechler, 2012)

**Deterministic** - Gantt charts work under the premise that everything that can happen can be predicted, given certain a priori criteria that cannot be changed. As a result, a plan can be comprehensive and address every possible obstacle a project may encounter. Put another way, we can anticipate that the world will be predictable as it is supposed to be. (Geraldi, Lechler, 2012)

**Analytic** - The foundation of a Gantt chart is **analysis**, or the capacity to dissect and break down a difficult task, assignment, or issue into smaller components to comprehend it better. (Geraldi, Lechler, 2012)

**Accountable** – Gantt Chart provides an overview of accountability for all tasks and issues that arise with them during the completion of these tasks which in the sum make the whole (project). (Geraldi, Lechler, 2012)

**Sequential** - The Gantt Chart shows the task execution process as a list of individual tasks. For tasks that have a clear flow, where each activity is finished and can be moved on to the next without having to revisit previous tasks, this visual depiction is ideal. The issue arises when related tasks must be repeated in a circle/cycle/loop until a solution is reached or a certain standard of quality is met. Gantt charts are ill-suited for these kinds of processes since it is impossible to predict in advance the number of times the loops will need to be repeated. (Geraldi, Lechler, 2012)

## 1.7 Project Budget

The project budget needs to be achievable, reasonable, and predicated on the statement of work and contractually agreed-upon costs. The budget is based on industrial engineering standards, best estimations, or historical costs. The projected labour needs,

contract-allocated cash, and management reserve must all be included in the budget. (Kerzner, 2017)

The process of combining the projected costs of individual tasks or work packages to create an approved cost baseline is known as determining budget. This process's main advantage is that it establishes the cost baseline that project performance can be tracked and monitored against. This procedure is carried out once or at specific project milestones. (A guide to the project management body of knowledge (PMBOK guide), 2017)

The whole budget should include the following parts/budgets:

- **Distributed Budget** – or normal performance budget is a time-phased budget which is made available through work packages and cost accounts.
- **Management Reserve** - needs to be determined by the risks associated with the project. A fifteen percent reserve may be necessary for certain projects, while no reserve may be needed at all for others.
- **Undistributed budget** - This budget is related to contract changes for which there is insufficient time to prepare and include the change in the performance budget.
- **Unallocated budget** - A logical classification of contract tasks that are not yet identified, approved, or both.

(Kerzner, 2017)

## 1.8 Business Environment

The aggregate of all conditions, events, and influences that surround and affect it is the definition of environment. For easier comprehension, it can be separated into internal and external components. The enterprise's personnel, strategy, and its functional, operational, marketing, financial, and technical capabilities are examples of its controllable internal variables. The enterprise cannot control the external elements, which include economic, technology, demography, geophysical, political, financial, regulatory, and legal, social, and economic aspects or factors. (Gupta et al., 2013)

## 1.9 Business Research

Business research pertains to the study of topics that are related to business environment and are relevant to business like marketing, operational research, human resources, or strategy. Developments or changes within a company may motivate this kind of research and we can distinguish several stages of business research:

1. Literature Review
2. Concepts and Theories
3. Research Question
4. Sampling
5. Data Collection
6. Data Analysis
7. Writing up the Findings

(Bell et al., 2022)

### **1.9.1 Quantitative Research**

Methods used to quantify and/or count social phenomena and their relationships are referred to as quantitative research. This method has been the standard for conducting business research for a long time and it still is, it also uses deduction when forming research findings. (Bryman et al., 2019)

### **1.9.2 Qualitative Research**

Qualitative research is a method of inquiry that aims to understand complex phenomena through the exploration of people's subjective experiences, beliefs, and attitudes. It is a type of research that uses non-numerical data such as interviews, observations, and case studies to gain insights and generate theories, overall, this research strategy is more focused on words and less on numbers. (Bell et al., 2022)

### **1.9.3 Structured Interview**

Interviews of this kind are a controlled method of gathering data from respondents. Put another way, it's a prearranged interview in which the researcher prepares the questions in advance of the meeting. An interview can be effectively kept narrowly focused on the intended topic by using a framework like this. Additionally, it allows the interviewers to compare one interview to another. However, the availability of in-depth data is limited, and the style of the interview is not as rich. The rigid interview process that is followed limits the variety of responses. As a result, there is less room for the interviewer to interrupt and for the interviewee to go into further detail. The literature makes it evident that researchers who are certain of the information they are looking for are most suitable for this kind of interview. (Alsaawi 2014)

More extensive coverage can be obtained through qualitative interviews. The researcher can choose participants for a qualitative interview with fewer restriction and can create a stratified sample more easily—for instance, one that includes people in different levels of organization’s hierarchy. Compared to participant observation, when interactions and observations are probably rather limited to a certain group of people, this allows for a wider scope of coverage. They are also less invasive of people's lives. Interviews are much quicker and have a time limit unlike techniques like participant observation. Therefore, the influence on people's life is probably going to be smaller than if a researcher had to stay for several weeks, months, or even years in some cases. (Bryman et al., 2019)

## **1.10 McKinsey 7S**

The McKinsey 7S framework connects strategy not just with structure but also with the other five parts, going beyond the traditional basic idea that "structure follows strategy." The additional components or variables of the framework in addition to strategy and structure, are shared values, staff, systems, and style. The seven components of the model, according to the authors, are reliant on one another. The authors believe that by doing this, they will draw attention to the complexity involved in making general management decisions and be able to address it more effectively. The authors conclude that a key component of a successful strategy's implementation is the "fit" or harmony that exists between the seven framework parts. (Channon, Caldart, 2015)

### **1.10.1 Strategy**

An organization's positioning and actions designed to gain a competitive edge in response to or ahead of changes in the external environment. (Kaplan, 2005)

### **1.10.2 Systems**

The organization's formal and informal management practices, such as planning, budgeting, resource allocation, and management information systems; management control systems; performance measurement and reward systems; and so on. (Kaplan, 2005)

### **1.10.3 Staff**

According to the framework, employees are a pool of resources that must be developed, protected, and well-distributed. The responsibility of senior managers is to ensure that the company recruits bright young professionals and provides them with well-planned career pathways that focus on making significant contributions to the "nuts and bolts" of the company's operations from their very beginnings. (Channon, Caldart, 2015)

The individuals, their experiences, and skills; the way the company hires, chooses, develops, works with, oversees their careers, and advances staff. (Kaplan, 2005)

### **1.10.4 Structure**

The mechanisms through which activities within the organization are coordinated, the division and specialization of tasks, the division of personnel, and the allocation of authority. (Kaplan, 2005)

### **1.10.5 Skills**

The organization's unique capabilities, or what it excels at in areas like people, technology, systems, processes, management techniques, and customer relations. (Kaplan, 2005)

### **1.10.6 Style**

Focuses on how management leads the organization by example and how this affects productivity, performance, and corporate culture. (Kenton, 2022)

### **1.10.7 Shared Values**

These values are the widely acknowledged guidelines and customs within the organization that impact and moderate the conduct of all employees and management. The workforce may be given company guidelines that go into detail about this. In practice, shared values are linked to the conduct that is considered appropriate in the workplace. (Kenton, 2022)

## **1.11 Change Management**

Organizations rarely change without outside pressure or a compelling/pressing reason. Changes might be broad, impacting numerous organizational functions, or specific,

affecting just a single department. They can be big and expensive in terms of money and personnel, or they can be small and inexpensive. (Smith et al., 2015)

### **1.11.1 Lewin's Three-stage Model**

Social psychologist Kurt Lewin described individual change as a three-stage process:

#### **Unfreeze**

Three activities are to be completed in this stage:

1. Clearly define the current situation. Collaborative efforts lead to greater effectiveness, individuals are more likely to be committed to a defined picture, and involving more individuals results in a more complete picture.
2. Create a vision of the desired outcome – more attractive the vision the better and even more so, if more people contribute to it.
3. Determine the driving and resisting factors of change, with a focus on enhancing the former and reducing the latter. This is best done with a group of people who are leading and/or are affected by the change.

(Smith et al., 2015)

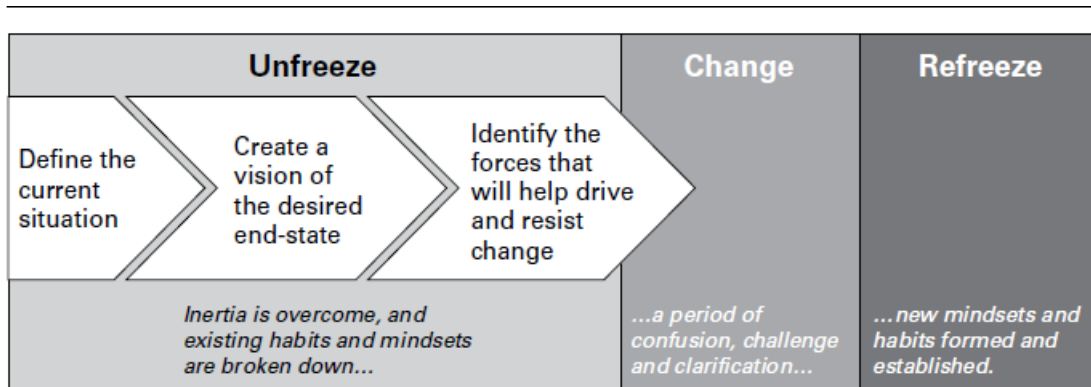
#### **Change**

During this stage, a plan is developed to implement the desired change(s). Maintain the same safe learning environment as throughout the unfreeze stage to encourage experimentation and problem-solving. Establish positive role models for those undergoing the change. (Smith et al., 2015)

#### **Refreeze**

This stage marks the transition of new work methods into habits and new ways of thinking into accepted conventional wisdom. Change leaders must be vigilant and address any tendencies to revert to old ways of thinking and behaviour. At this stage, it is appropriate to reward behaviours and outputs that match with the new environment. (Smith et al., 2015)

Following in Figure 9 is the graphical representation of the Lewin's model.



**Figure 9: Lewin's Three-stage Model**

(Source: Smith et al. p.37, 2015)

### 1.11.2 Gap Analysis

Gap analysis is a method or procedure that identifies gaps and differences between an organization's existing status and "what ought to be" in place. Through gap analysis, the company aims to improve its current state and achieve the desired state. The process of gap analysis plays a crucial role in formulating the implementation plan of an organization and enhancing its overall effectiveness across multiple fields. These can involve information technology, market forecasting, human resources, resource planning, and other management systems. The gap analysis is done in four steps:

1. Formulate the key needs of the organization in its current state
2. Determine the ideal / desired future state of the organization
3. Highlight the current gaps that need to be filled in order to reach the desired state
4. Modify and implement the plans that will fill in the gaps

(Kim, Ji, 2018)

### 1.12 Information Systems

To guarantee the effective implementation and utilization of the information system, specific organizational complements or prerequisites for each type of information system must be met. Among these complements are:

- Well-trained workers
- System support
- Better teamwork among users to achieve anticipated benefits
- Redesigned process

- New decision rights and roles

(Stair, Reynolds, 2018)

Most businesses use several distinct information systems. Information systems can be categorized into three categories: personal, group, and enterprise. This classification is helpful when thinking about how business managers interact with information systems. (Stair, Reynolds, 2018)

**Personal** information systems are designed to increase an individual user's productivity when they work independently on stand-alone tasks. Spreadsheet, word processing, and presentation software are a few examples of personal productivity software. (Stair, Reynolds, 2018)

**Group** information systems facilitate collaboration and enhance communication within a workgroup. Software for online conferences, wikis, and electronic business directories are a few examples. (Stair, Reynolds, 2018)

### **1.12.1 Enterprise Systems**

These systems encompass information systems that businesses use to define organized interactions with their suppliers, customers, government agencies, and other business partners, as well as with their staff. (Stair, Reynolds, 2018)

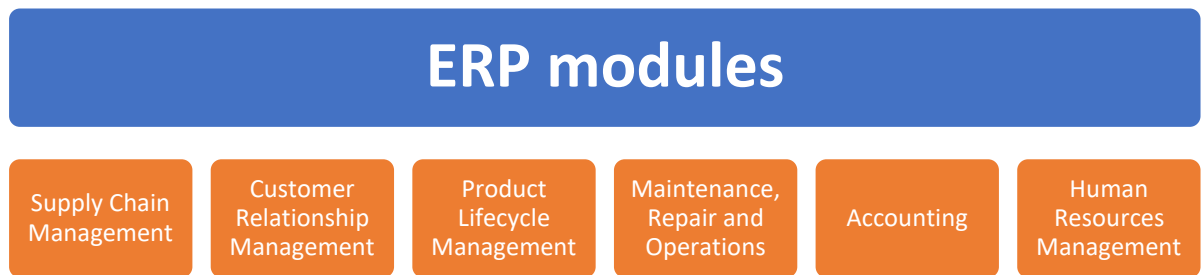
The automatization of new processes and the drastic restructuring of core work processes are frequently necessary for the successful implementation of these systems. (Stair, Reynolds, 2018)

Target processes can be those that support operations with external customers and suppliers (order processing and purchasing) or those that are only internal to the company (payroll, for example). Interorganizational, enterprise, and transaction processing systems are three examples of enterprise IT. (Stair, Reynolds, 2018)

#### **Enterprise Resource Planning (ERP) systems**

These systems offer comprehensive reporting and data analysis capabilities, support routine company processes, and keep records of these processes. They use a database of critical planning and operational data that is accessible to all staff members in all departments and, when necessary, to customers and suppliers. This eliminates the issues with inconsistent and missing data that arise from using multiple transaction processing systems to support different business functions or departments within an organization. (Stair, Reynolds, 2018)

There are different modules available within the ERP systems as seen in Figure 10 and the company can choose which ones to use now and which ones to possibly implement later if resources are limited or depending on the business' industry specifics. (Stair, Reynolds, 2018)



**Figure 10: ERP Modules Overview**

(Source: Own processing according to Stair, Reynolds p.23, 2018)

### 1.13 Event-driven Process Chain

The primary architecture of the integrated information systems (ARIS) model for describing processes is the event-driven process chain (EPC). It is a dynamic model that combines the firm's static resources (systems, organization, data, etc.) and arranges them to provide a series of operations or tasks (referred to as "the process") that increase value to the business. (The Event-driven Process Chain, 2007)

We can identify four types of objects used in the EPC:

- **Events,**

The "pre-conditions" and "post-conditions" for each process step are represented by events. Pre-conditions are factors that must happen or be in place before an action can begin. Post-conditions show what has changed because of completing the task.

- **Functions,**

Functions are the activities that lead from one event to another.

- **Rules,**

- **Resources (data, organisation, system, etc.).**

(The Event-driven Process Chain, 2007)

## **1.14 Minimum Viable Product**

The most basic version of a product that must be developed in order to be sold to a market is known as the minimum viable product, or MVP, Eric Ries, the mastermind behind Lean Startup (2011), first proposed this idea. (Raj, c2024)

The Minimum Viable Product (MVP) idea originated from the lean startup technique, which promotes scalability and iterative learning. Users like entrepreneurs or managers can reduce the financial risk associated with developing a product by first developing a basic version of their product by using an MVP. With this strategy, they may test, improve, and perfect their product gradually, reducing the risk of losses.

Steps to define and create an MVP:

1. Identify the main points of the problem
2. Check the competitive landscape
3. Test the validity of the MVP
4. Launch the MVP and continue the development

(Raj, c2024)

## **2 ANALYSIS OF THE CONTEMPORARY SITUATION**

This section begins with the introduction of the analyzed company and the main part in the analytical section of this diploma thesis are the structured interviews with key employees that will be the most affected by the change concerning the management of customers' information (=Customer Cards). The findings from those interviews are then complemented by the analysis of the current process of managing customer cards, the systems that are used in the process and the skills of the employees that are part of the process, and all those findings as a sum show a need and a possibility for the digitalization of the process. At the end of this section, the gap analysis and the overall summary of the analyses can be found.

The author of this paper has been working in the analyzed company for over two years as of writing this diploma thesis.

### **2.1 De Heus Czechia**

**Date of enrolment into business register:** 18th December 1996

**Legal form:** Public Limited Company (a.s.)

**IČO:** 25321498

**Seat:** Marefy 144, 685 01 Bučovice

**Startup capital:** 93 000 000 CZK

(De Heus a.s., 2023)

**Number of Employees:** 190 - Czechia and Slovakia combined (De Heus, 2024)

### **2.2 Company main activities**

De Heus a.s. is Czech branch of an international animal feed manufacturer De Heus Animal Nutrition which is a privately held company with headquarters in Ede, Netherlands. The Czech branch operates under name De Heus since 2007 and supplies Czechia, Slovakia, Hungary and Romania with high-quality compound feed, premixes, concentrates and feed specialties. It has one factory and headquarters in Marefy, Bučovice, one factory in Běstovice and another one in Kendice, Slovakia, which is a separate legal entity, but falls under the Czech branch. (De Heus, [2023a])

## **Animal Nutrition**

De Heus is a prominent producer of nutritional solutions and animal feed for a range of livestock industries. Creating and manufacturing feeds for poultry, cattle, pigs, and other animal species falls under this category. The company's main goal is to enhance livestock production and health by offering sustainable feed options that are nutritionally balanced. (De Heus, [2023a])

## **Research and Development**

The De Heus Group and thus De Heus a.s. is dedicated to continuous advancements in animal nutrition research and development. To improve the productivity and sustainability of livestock production, new feed formulations, nutritional approaches, and technological advancements must be developed. (De Heus Interviews, 2024)

## **Sustainable Practices**

De Heus places a strong emphasis on sustainability in its business practices. This entails initiatives to lessen the negative effects of its operations on the environment, lowering its carbon footprint, encourage ethical and ecological raw material procurement, and support the overall sustainability of the cattle and agriculture sectors. (De Heus, [2023b])

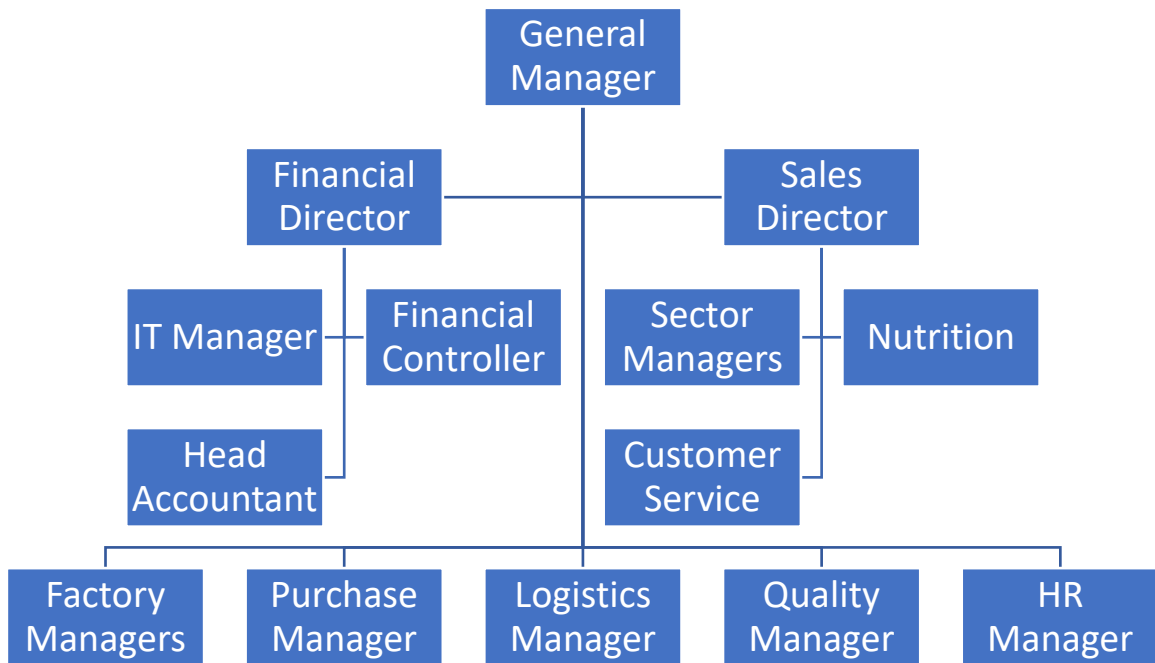


**Figure 11: De Heus Logo**

(Source: De Heus, [2023c])

## **2.3 Organizational Structure**

The organizational structure of De Heus is hierarchical with the highest position being the General Manager, then the Financial Director and the Sales Director, these three positions are also members of the Board. A simplified organizational structure diagram can be found in Figure 12.



**Figure 12: Organizational Diagram**

(Source: De Heus, 2024)

### 2.3.1 Global Reach

From an international perspective, the Czech branch is one of 20 country branches of De Heus Animal Nutrition. Other countries include Spain, Serbia, Netherlands, Poland, Vietnam, India, Ghana, and Brasil. In total De Heus has over 80 production locations and distributes to more than 75 countries. (Country Overview, c2020)

As mentioned before, all the general managers ultimately answer to the corporate headquarters in Ede. The interaction however is not limited to only the general managers and the headquarters, many of the managers and employees interact daily with their counterparts in other countries for example to cooperate in logistics, purchase, or the transfer of knowledge within the company. The purchase department for instance has a weekly update about the situation in commodity markets and shares the news about crop harvests, outlooks, or possible price changes. (De Heus Interviews, 2024)

### 2.3.2 Corporate IT Infrastructure

The corporate headquarters' strategy about the IT infrastructure within the branches is relatively unrestricted and each branch has a significant amount of independence when it comes to how they approach their ERP or data needs. The boundaries largely depend on the reporting requirements from the Netherlands as each branch must regularly report their data (financial, quality-assurance, production, sustainability...). Recently an

increased focus on common data structure within De Heus is noticeable, as reporting software like Power BI is gaining popularity and smart data platforms or cloud data storage are getting more common within De Heus group.

If a branch requires or needs assistance with some project within the IT department the headquarters in the Netherlands can either help directly, provide contacts, or function as a middleman and organize the meeting with some outsourcing company.

De Heus Animal Nutrition has an internal developer team that works on projects like data automation, warehousing, governance, and reporting. They cooperate with Nepalese developers from Proshore when developing applications for De Heus business units. This cooperation already has a proven track record with several applications.

(De Heus Interviews, 2024)

### **2.3.3 Proshore company**

Proshore company was founded in 2009 and has two main locations – Eindhoven, Netherlands and Kathmandu, Nepal. They offer services of their skilled remote development teams from Nepal; their core idea is to prevent the brain drain from developing countries such as Nepal by keeping these workers in Nepal so that they can benefit their country, with this comes a significant benefit of cost-effectiveness. (Embrace for Impact, c2024)

## **2.4 Problem Definition**

De Heus has been active in the market for some years now, during that time it has made good progress when it comes to digitization and optimization of internal processes, but this is the kind of work that never ends. One of the key aspects of business is getting new customers and then recording the information about those customers and managing it. All the main information about the customer is recorded in the Customer Card and each customer has their Card. Each new Customer Card is initially filled in by the salesman and the Card must be approved by the top management of the company – Financial Director, Sales Director, and General Manager. The process of recording the information about the customers and inputting it into the company's enterprise resource planning system has become outdated and does not meet the requirements for a smooth and to some extent secure process, and thus a digital transformation is needed. The driving impulse for this change has been a result of an internal audit, which has found some deficiencies in the current process. (De Heus Interviews, 2024)

### **2.4.1 The Current Process**

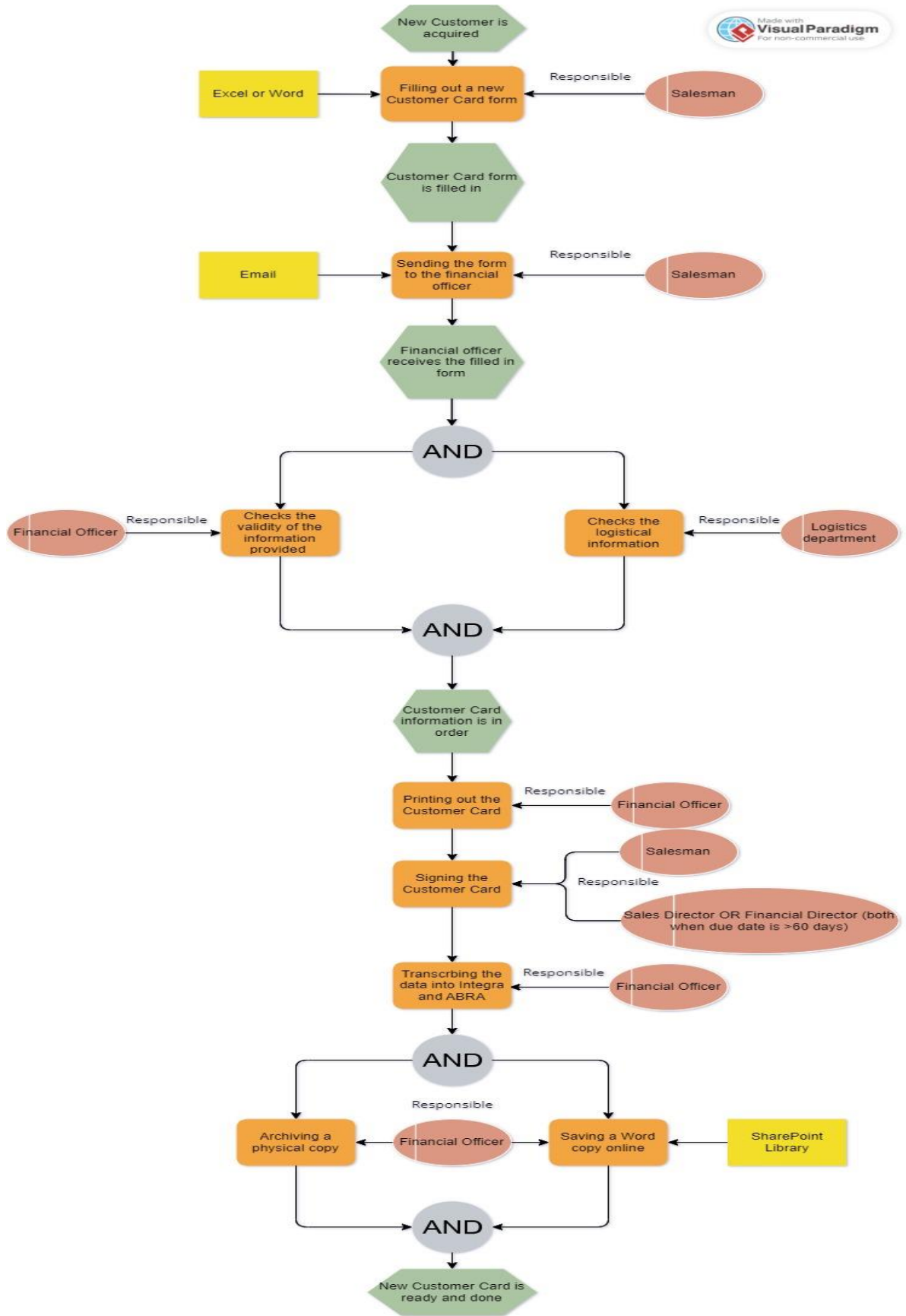
Currently, the process of creating a new Customer Card is unnecessarily “manual” and not up to date. The main person responsible for the process is the Financial Officer (FO) and their time could be better spent elsewhere if the process was made more automatic. The entire process of setting up a new Customer Card can be found in Figure 13. For clarity, Appendixes I and II show the current form for filling in the Customer Card in Excel.

To summarize the process:

1. Salesman uses the template or Customer Card and fills out all the fields, both the Invoice address (Appendix 1) and Delivery address (Appendix 2).
  - A Customer can have one or more delivery addresses (farms).
2. Salesman sends the filled-out form to the Financial Officer (FO), and they start the process of checking the data with the logistics department’s assistance.
  - The FO checks the data about the company and adds attachments (if it is correct, if the company exists, does not have any bad debt or any other problems).
  - The logistics checks the Delivery Address and the potential route to the farm.
  - If there are any problems the FO or the logistics corrects them in the form.
3. FO then prints out the form and gets the signatures of the Customer’s Salesman and of either Financial Director (CFO) or Sales Director (CSO) (both if due date is >60 days)
4. FO manually rewrites the data into ERP system.
5. FO archives the physical copy and digital copy in SharePoint library.

If there needs to be any change to the information then the FO gets this new information from the Customer Service or the Salesman and the FO then makes the change in the ERP system, if that change involves some important information like maximal balance or due date, then this change is also made in the physical copy of the customer card with the signature of at least one director.

(De Heus Financial Officer, 2023)



**Figure 13: Current Process**

(Source: Own Processing, 2023)

## 2.5 The Outputs of the Interviews

Following are the gathered answers from the interviews, some of the questions were either not answered by the interviewee or were not relevant to them due to the area of questions asked, only the main points from the answers were recorded. The critical feedback was from the planned main users of the proposed application namely the Financial Director who approves the IT projects, the Financial Officer who manages the customer cards, the IT Manager who takes care of the projects operationally, one Salesman from the Sales Department who represents salesmen who are the starting point for creating new customer cards and one member from Logistics Department that is also a part of customer card creation/update process. The outputs can be seen below with the main points from the interviews of each interviewee.

The abbreviations used for the 5 interviewees:

**FO** – Financial Officer

**Log** – Logistics Department employee

**IT** – IT manager

**FD** – Financial Director

**Sales** - Salesman

### 1. Current Process Understanding:

#### a. Do you find the current process of managing customer cards sufficient?

**FO** - No

**Log** – Mostly No

**IT** – No, outdated.

**FD** - No

**Sales** – There are some problems, no

#### b. What challenges or inefficiencies do you currently face or see in the current process?

**FO** – Incomplete or wrong information, manual transcription into the ERP system, physical copy updates are tedious, outdated information

**Log** – insufficient for the new logistics system, incomplete form

**IT** – lack of digitization

FD – results of the audit, need for tracking and recording of changes, signature speed

Sales – approval speed, need for signatures, sometimes uploading outdated formats

## 2. Information Accessibility:

### a. How easily can you access and update information on customer cards in the current system?

FO – the change must be made both in the ERP and on the physical copy manually, the physical copy can get a bit messy if many changes are made.

Log - not that problematic for them, the updates need to be approved, complicated communication.

FD - physical storage and finding the card takes time, need for signatures for updates.

Sales – Access is through ERP system, updating has to be done by communication with FO (mail) or Customer service that gives the new information to FO and they then update it in the system/card

## 3. Efficiency and Time Management:

### a. How much time, on average, is spent on managing and updating customer cards manually per card?

FO - usually about 10 minutes per card, at the beginning of the year, when there is change in customer's salesman it can be more time consuming, also depends on how many contacts there are, some data is not automatically transferred into the financial system, more manual work

Log – when a new delivery address must be added then it can be about 15 minutes per address.

### b. Can you identify any bottlenecks or time-consuming steps in the current process?

FO – Mail communication, update to physical copy and to ERP system has to be done separately, waiting for others, incomplete or wrong forms

Log – incomplete forms, manual transcription

IT – manual work (transcription)

FD – waiting on signatures, waiting for the approvals

Sales - waiting on signatures, waiting for the approvals,

## 4. Security and Confidentiality:

- a. **Are there concerns about data security or unauthorized access/changes to customer data?**

FO – physical copy is not that secure

IT – insufficient record of changes

FD – the process is prone to some unauthorized changes, need to track who, when and what did they change.

## 5. Digital Literacy:

- a. **What is the level of digital literacy within the team that will be responsible for using the new digital process, are there any challenges?**

FO – no problem, has experience with digital systems, ability to learn, expects some resistance from Sales department

Log – no problem, the process for them (Logistics) will remain mostly the same

IT – the application should not be complicated, so there should not be a problem

FD – already has to work in multiple different systems, their role in the application should not be difficult

Sales – there can be some problems with the less digitally capable colleagues, need for some training

## 6. Benefits of Digitization:

- a. **In your opinion, what potential benefits do you foresee in digitizing the customer card management process?**

FO – less manual transcription, quicker approval process, better archive of cards and easier updates

Log – speed, user friendliness

IT – security, speed and time saved

FD – time saved, better changes' record keeping, easy to use

Sales – quicker approval process, easier updates

- b. **How might a digital library for customer cards improve overall efficiency and effectiveness?**

FO – better navigation, better tracking of outdated information

Log – again speed and time saving

IT – better upkeep of older cards, more transparent process

**FD** – navigation and speed to find the right customer card

**Sales** – more transparency about the customer information

## **7. Adaptation:**

- a. Are there any concerns about resistance to change among team members/users?**

**FO** – No, looking forward to it.

**Log** - No

**IT** – No, some instructions will be necessary

**FD** - No

**Sales** – Some colleagues will need some time to get used to it

## **8. Future Flexibility and Scalability:**

- a. How adaptable and scalable do you think a digital system would be in accommodating future changes or growth?**

**IT** – The system should be flexible and there should be a possibility to relatively easy modify it if needed

**FD** – since the system should be done within De Heus, there should not be a problem to scale it

- b. Are there any specific features you would like to see in the proposed digital application?**

**FO** – bank account information, card database, transfer of existing cards into the database, connection with ERP systems, attachments,

**Log** – Requirements and limitations options that will work with the new logistics system

**FD** – record of who changed what and when, transparent approval process

**Sales** – phone optimization, easy-to-use, speed

### **2.5.1 Results**

From the interviews the outputs are quantified by identifying the pattern between the answers of individual employees, highlighted by the colours. Thanks to these quantifications, the main issues with the current process are identified based on how many times these issues were mentioned during the interviews:

1. Changes are unnecessarily prolonged by email communication and overall speed of the process. (mentioned 15 times)
2. The information from the Card must be manually transcribed into the ERP systems. (mentioned 8 times)
3. The changes made to the Card are not recorded and there is no record of the approval process for the major changes. (mentioned 6 times)
4. Keeping the physical copy and the Word copy in SharePoint is not ideal. (mentioned 5 times)
5. The Salesman might send incomplete form and leave some of the fields empty or they might fill them out wrong adding work to the FO or the logistics department. (mentioned 4 times)
6. Currently, bank account information is not part of the Customer Card. (1 time)

### **Summary:**

There are inefficiencies and risks in the Customer Cards operating processes at the moment, mainly because of the long delays in email communication—this issue has been brought up fifteen times. The manual transcription of Card information into ERP systems, mentioned eight times, adds to the delay and error risk. Data integrity is compromised by the lack of a tracking and approval procedure for Card changes, which has been mentioned six times. It has been mentioned five times that maintaining both digital and physical copies in SharePoint is ineffective. Workflow is further complicated by salesmen' incomplete or inaccurately filed forms, which have been brought up four times and furthermore, even though it is only mentioned once, the Customer Card's lack of bank account information presents a potential barrier to subsequent financial procedures.

These points highlight a critical need for process optimization and further digital integration to improve speed, accuracy, transparency, and accountability.

## **2.6 McKinsey 7S**

The proposed change concerns the internal environment of the company, thus McKinsey 7S framework is used to analyze the internal factors within the company and if they correspond with the proposed change.

### **2.6.1 Strategy**

De Heus's approach in the Czech Republic places a strong emphasis on adapting to the local market and identifying and providing customized feed solutions to satisfy the unique demands of Czech farmers. This strategy involves adhering to EU laws and using these standards as a quality and safety competitive advantage. The business unit makes investments in sustainability and innovative products with the goal of lessening the negative environmental effects of animal production. Supply chain optimization puts an emphasis on efficiency and local sourcing to help the Czech agriculture sector and provide prompt delivery services.

De Heus Czechia also puts emphasis on the “good neighbour” philosophy by engaging with and supporting the local communities around each factory location (e.g. sponsoring various events).

The adoption of data analytics and modern technologies promotes operational effectiveness and well-informed decisions that combine local demands and possibilities while aligning with the overall corporate demands coming from the parent company in the Netherlands.

(De Heus Interviews, 2024)

### **2.6.2 Systems**

De Heus makes use of multiple information systems based on their functions like manufacturing process, purchase, finance, reporting, or stock movements. The central ERP system has been updated and modified throughout its lifespan and its main functions are to manage sales, product, customer, and stock data.

This system would be critical within the new customer card management process to automatically save the information that has been filled in the Customer Card form to prevent manual transcription. It will be important to make sure that this system will be able to handle this change and make sure that it will be able to “ingest” the data from the proposed application. From the discussions with the IT Manager, it seems that it should not be a problem if the application will be able to generate a structured XML file for the ERP system.

(De Heus Interviews, 2024)

### **2.6.3 Staff**

Employees of De Heus are highly specialized based on which department they belong to. For instance, a Salesman must be well-oriented in the sector they belong to, the Salesman from the Cattle sector must know the physiology of cows, which feed is best for them, and the best composition of feed that will be most beneficial to both the animal and the farmer. The Logistics Department employees must be able to plan, be resistant to stress, and be well organized to handle any problems connected with the transportation of feed or raw materials.

All the employees, excluding the manufacturing workers, must have at least a bachelor's degree which ensures some minimal standard for the expertise of the employees. All the employees must be able to use MS Excel, ERP system and the other company information systems that they need for their work, thus at least the basic IT skills are covered.

Every year each employee must set their personal goals that they want to reach that year and in the middle of the year, the employees can evaluate their effort so far and possibly modify it and at the end of the year they evaluate their effort throughout the year with the supervisor.

Purchase and Sales departments have financial bonuses based on the volumes bought or sold, manufacturing has bonuses based on volumes produced. There are also possibilities for bonuses for coming up with projects within departments and reaching those projects' goals.

(De Heus Interviews, 2024)

### **2.6.4 Structure**

The structure of De Heus is hierarchical as can be seen from the diagram above. The General Manager is responsible for the operation of the Czech and Slovak business unit and answers to the mother company in Netherlands.

Generally, in case that some employee is unavailable it is possible to delegate their responsibilities to other employees from the department. For example, many of the General Manager's duties can be delegated for a time to other two Directors like signatures or not critical decision-making.

In the case of the proposed change the responsibility of the Financial Officer can be delegated to other employee from the Finance Department and the same can be said for the Logistics Department and other employees taking part in the process.

Despite having hierarchical structure there is good cooperation between all levels of the company and if there are some company events, all the employees enjoy it the same way. On the other hand, there are occasional problems when it comes to communication from the top management to the lower levels.

(De Heus Interviews, 2024)

### **2.6.5 Skills**

Animal feed manufacturing is a heavily regulated industry when it comes to feed standards that need to be met, in some ways, the feed for the animals is more regulated than that for the humans. This means that there is a heavy emphasis on quality management and processes that ensure high-quality animal feed and prevent cross-contamination, for example.

The company also makes use of a nearly completely automated manufacturing system, where the main factor is human supervision. There is also an increasing focus on decision-making based on data from the company operations in real-time, the company makes use of a data warehouse and Power BI reports to support higher-quality decisions. There is also cooperation between the individual business units and the sharing of best practices. Due to this cooperation, there is the possibility to develop the proposed application with the help from headquarters in Ede.

De Heus also prides itself not only on selling the feed to its customers but also on making use of the global best practices from the whole company and offers these practices to farmers as an added value, among other services, like connecting them with slaughterhouses and taking care of the supply chain for the farmer.

Because of the high demands for the education of the employees, it is sometimes more difficult to find salespeople as there are not that many people with enough sales experience combined with knowledge about animals.

(De Heus Interviews, 2024)

### **2.6.6 Style**

The Czech business unit of De Heus has a participative and innovative leadership style that emphasizes empowerment, adaptability, and collaboration at all organizational levels. The goal of this approach is to create a culture where staff members feel appreciated and inspired to share ideas by promoting open communication and teamwork,

this is represented by the possibility and encouragement of employees to come up with projects that can improve any aspect of their work. (De Heus Interviews, 2024)

### **2.6.7 Shared Values**

The common principles of excellence, innovation, partnership, cooperation, responsibility, and sustainability serve as the fundamental values of De Heus Czechia. These principles motivate a dedication to providing effective, high-quality goods and services and promote a mindset of ongoing development and innovative problem-solving. To maintain the unit's leadership in creating sustainable animal feeding solutions that adapt to changing market conditions and demands, innovation is essential. The value of cooperative connections with all stakeholders is emphasized by the partnership principle, which aims to promote growth on both sides and have a good impact on the community. Cooperation not only between the employees but also with suppliers and external partners is based on a “no-nonsense” approach which aims to promote efficiency but also honesty and responsibility for each’s own decisions and actions. The newest addition that is being incorporated into this “basket” of shared values is sustainability, even though De Heus has been finding sustainable ways to do business since at least the early two-thousands, in more recent years it has become a sort of a mandatory shared value within most organizations and De Heus is conducting initiatives promoting this value within and without.

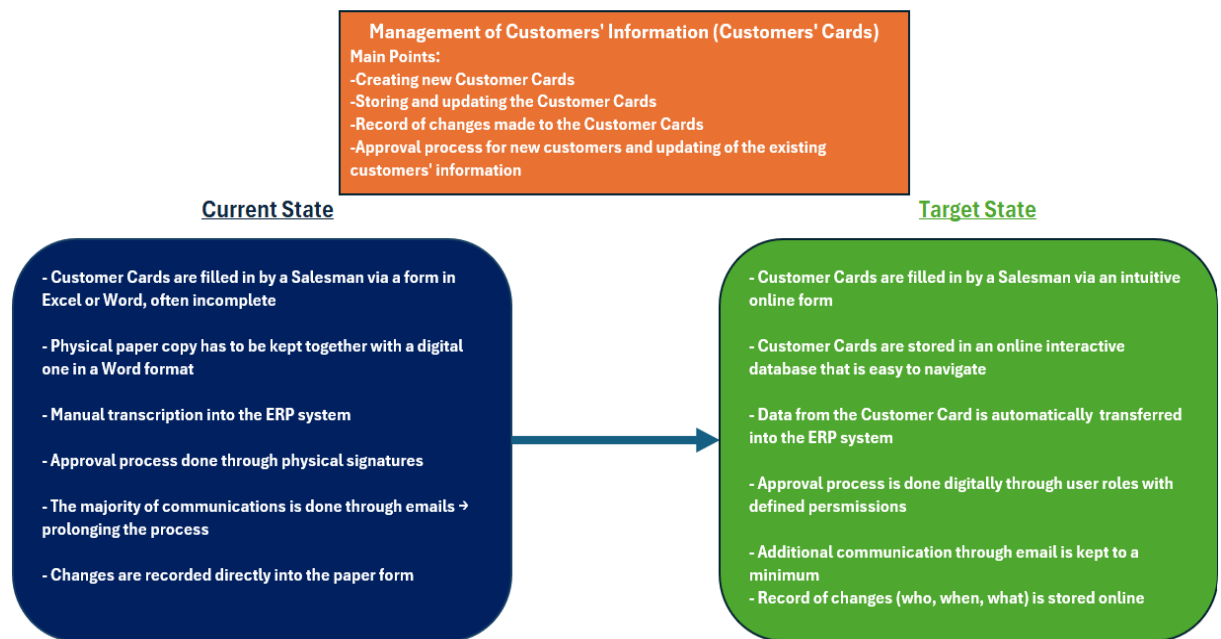
These guiding principles ensure resilience and long-term success by being both in line with De Heus's global vision and specifically tuned to address the opportunities and challenges faced by the Czech agricultural industry.

(De Heus Interviews, 2024)

## **2.7 Gap Analysis**

This part aims to conduct the gap analysis based on the previous findings. The area for the gap analysis is specified, then the current and target state is described, followed by identifying the gap between those two states and finally the actions that are necessary to fill this gap.

Figure 14 below shows the area analysis (orange), the current (blue) and the target (green) state.



**Figure 14: Gap Analysis**

(Source: Own processing, 2024)

### 2.7.1 The Gap

The digital transformation of the Customer Cards process is at the heart of the substantial gap between the existing and target states of customer information management, as shown in figure 14. Currently, salespeople fill out Customer Cards in Word or Excel, which makes the process labor-intensive and prone to errors. This frequently results in incomplete Customer Cards. The ERP system integration requires manual data entry, and a dual system of physical paper and digital Word files requires diligent manual maintenance. Physical signatures are required for approval, and over-dependence on email communication causes delays. In addition, the tracking of modifications is imprecise and dependent on paper forms with no organized digital record/trail.

Reaching the target state offers the possibility of a significant change in favor of precision and efficiency. The ideal scenario is for salespeople (and other necessary users) to use an easy-to-use online form that reduces the number of incomplete submissions. Errors in manual data entry would be eliminated by the direct automatic synchronization with the ERP system, and an organized online database would simplify accessing and storage. Digital approvals will strengthen data governance and expedite the process when they are enabled by well-defined user roles and permissions. In addition, communication would be optimized, limiting emails to only those that were necessary, the rest would be left to the automatic notifications, and a comprehensive online log would provide transparency

regarding the history of modifications made to the Customer Cards. In order to close this gap, it is therefore necessary to not only update the processes but to transform the customer information management overall for it to be more responsive and reliable.

### **2.7.2 Proposed Actions**

To bridge the gap between the current and target state a completely new method of managing the customer information must be devised, most likely by development of an online web application, and the following actions are proposed.

- Create a new target state process of managing Customer Cards, ideally through process flow diagram.
- Find the supplier for the new platform/application development and create a description or instructions for them → most likely supplier could be the already mentioned Proshore company since De Heus already has tested experience with them.
- Create an application for the management of Customer Cards

## **2.8 Summary of Analytical Part**

At the beginning of the analytical part the company De Heus Czechia is introduced with its main activities hierarchical structure and relation to its parent company in Netherlands, which opens an opportunity for cooperation with the Proshore developers. Then the current process of managing the Customer Cards is described and the outputs from the structured interviews are shown, both points highlight the need to not only digitalize the current process but create an entirely new digital management of Customer Cards. Systems, staff, structure and skills complement the previous findings/analyses by establishing that the change is possible within De Heus, that the ERP system is compatible, the staff are able, the structure is not an issue, and the skills are sufficient and will be improved by this proposed change.

As a summary the gap analysis is used, clearly defining the area of the change, the current and target states, and the substantial gap that can be bridged by the already mentioned new digital process, more specifically a new web application for the Customer Cards.

## **3 PROPOSAL OF SOLUTION**

Following in this chapter of this diploma thesis is the proposal for the solution of the issues identified in the previous chapter. The solution is based on a project for the development of the Customer Cards web application. First, the solution itself is described with the description of the assignment for the contracting company, the key points, functionalities, users of the application, and the proposal for the main page are presented. Next, the project management methodology is used to propose a functional project starting with the project charter with key project information, followed by the work breakdown structure, RACI matrix, risk analysis, project schedule, and budget, and this chapter ends by presenting the expected benefits of the solution.

### **3.1 Proposed Solution**

The proposed solution is to develop a web application for creating, updating, and storing of customers' information in their Customer Cards, both the invoice and delivery address card, via an intuitive online form.

Proshore developers would be used for this purpose since De Heus already has some experience with them with a good value-for-money ratio, and the Software Development Project Manager in the Netherlands business unit can mediate the communication with them and manage the technical development of the application.

#### **3.1.1 Key Points and Explanatory Notes**

First, the key points and explanatory notes are established:

- For the purposes of the structured file and the possibility to export the data into the ERP system some of the fields should have the specific format like the drop-down lists that include the ID and the Name / Title
- The unique identifier of all customers is the identification number (IČO), which is unique to each customer.
- Each Customer Card consists of two types of cards: the Invoice address card/form and the Delivery address card/form)
- Each Customer Card must include at most one Invoice address Card and at least one (or more) linked Delivery address(es) Card.

- The individual fields that are to be included within the Application and the Customer Card each have the person that is responsible for filling in the information, followed by the users that can make changes (“updates”) to the field, if necessary.
- “Required” field attribute denotes which fields the Salesman must fill in when setting up a brand-new Customer Card and subsequently forwarding it (through the application) to the FO and Directors for approval.
- “Critical” field attribute denotes the fields that contain information that is critical for the payment conditions of the customer and as such must be approved by the top management of the company (Sales and Financial Directors or the General Manager) and whenever any changes are made to these fields in the future they must be approved again in the same way.
- Any other changes that are not critical are to be approved by the FO.

There should be 3 states for the Customer Card:

- ❖ **In approval process** - when the process for the approval of the Customer Card is underway, or when the information within the Card is being updated, ends when the Card is Approved
- ❖ **Waiting for approval** – when at any of the approval points, the Card is not approved by the top management, the customer card is put on hold and only the top management can APPROVE (move to the Approved state) or decline/delete (delete from the database) it
- ❖ **Approved** – top management approved the Card, or the FO approved the non-critical changes

The entire proposed process is shown in the attached PDF file with the process diagram, which can be divided into 3 main sections that connect.

### 1. Salesmen and the Customer Service section (Input)



### 2. FO, Logistics Department and Receivables Manager section (Check)

- This section can either end with the Approval of the non-critical updated information by the FO or move to the last section for approval by the top management.



### 3. The Approval part, where the information is approved by the top management. (Approval)

#### 3.1.2 Functionalities

Based on the current problems of the process and the demands of the stakeholders the following functionalities of the web application were compiled:

*Blue Lines are not necessary in the MVP.*

- Linking invoice addresses to delivery addresses
- Customization of form opening on mobile phone
- Make the customer card database itself (address book) accessible to salesmen.
- Filtering and searching in the customer database (by name, ID number ...)
- Transfer of existing customer card data (from ERP; technical details such as type of structured file etc. will be specified later)
- Multi-language card templates (EN, CS, HU)
- Connection with ERP systems
- Import invoice and delivery customer master data from structured file.
- Export the invoice/delivery customer master data from "AZURE" customer card into the structured file when any change is done in the application and is approved, in XML file preferably.
- A record of those changes (who, when, what) with the possibility to view these changes at any time for internal purposes, thus a historic record must be kept.
- Track those changes and show them in the last updated and state field.
- Track the date of the last Approval, so that the FO will know when to run the approval process again.
- Possibility to attach files to individual Invoice Address Cards, e.g.: price list, framework agreement, etc.

- Approval process that works as a signature.
- Have a possibility to define “required fields” to prevent incomplete forms from Salesmen.
- Possibility to add, remove or modify roles for the users, in case that there are personnel changes in the company for Financial Officer for example
- Option to either Create a New Customer or Update Existing Customer Information
  - New Customer – IČO (Company Identification Number) is not in the system
  - Update Existing Customer Information – IČO (Company Identification Number) is already in the system
    - The update is complete only after it is approved by either the FO or the top management, the record of the changes to the individual fields must be recorded for later use
- Possibility to be able to modify the contents of the drop-down lists by hand on our side when needed (add contents, delete contents, modify contents)

### **3.1.3 Users**

The following user roles / groups will be accessing the application and should have their predetermined permissions the administrator should be able to easily modify those permission.

The groups will be determined by the security groups in active directory.

#### **Salesman**

- Is the starting point of the whole process
- Creates new Customer Cards and fills out the required fields
- Can update and view the customers in the Application

#### **Financial Officer (FO)**

- Fills out and checks the newly added/updated customer information
- Is the user that is responsible for the Customer Cards database
- Approves the Cards
- Can update and view the customers in the Application

#### **Customer Service**

- Updates the non-critical information.
- Can update and view the customers in the Application

### **Receivables Manager**

- Takes care of the credit report.
- Can update and view the customers in the Application

### **Logistic department**

- Takes care of their own fields in the Delivery address Card
- Can update and view the customers in the Application

### **Top Management**

- Approves new customers and whenever critical information has been updated.
- Aside from approval permission can also view the customers in the Application
- Whenever they approve customer, a notification is to be sent to FO and to the Salesman, that is connected to the customer (Salesman field in Invoice Address Card) as mentioned in the associated process flow diagram.

### **Guests**

Can view the customers in the Application

### **Administrator**

- Has permission to assign roles and permissions to users
- Can modify the drop-down lists

## **3.1.4 Main Page of the Application**

This page would allow the user to either create new, update existing, or view customer information. There should also be a “library” of customers after clicking update /view, through which the users could get to their desired customer’s information, and the overview of this library would also show the selected information about the customer.

- **To create a new customer**, the Salesman will click on the create new customer button and insert the identification number, the system checks if the number is not already in the system, if it is, the Salesman will have an option to update either the invoice address card, delivery address card or add another delivery address card, if the number is not in the system Salesman will proceed with the creation of the new customer (details in the process flow diagram)

- After clicking on the „save” and „send for approval“ buttons the card will enter the in-approval process state,
- Top Management can put the card into the waiting-for-approval state if some of the information is not sufficient according to their judgment (this applies to both the creation of a new card and updates to critical information)
- **To update or view information** about the existing customer, the Salesman, FO, Logistics Department, or Customer Service will click on the „update/view customer information“ button and then input either the identification number or the customer name and find the desired customer
  - After finding the desired customer the last updated and state field will be shown first, followed by the option to change/view the invoice address card or delivery address card and also the state of the Card
  - If changes are necessary, then the process flow is followed (as described in the detailed process flow diagram)
  - The changes are then confirmed by „save“ and „send for approval“ buttons, these changes are then recorded and the changes since the last approval are shown in the last updated and state field.
    - The Card changes from approved state to in-approval process and waits for the approval by the FO or the Top Management (in case of critical information)

### **Last Updated and State Field**

A field, which would show state of the customer card and individual changes made to the entire customer card since the last approval and would show:

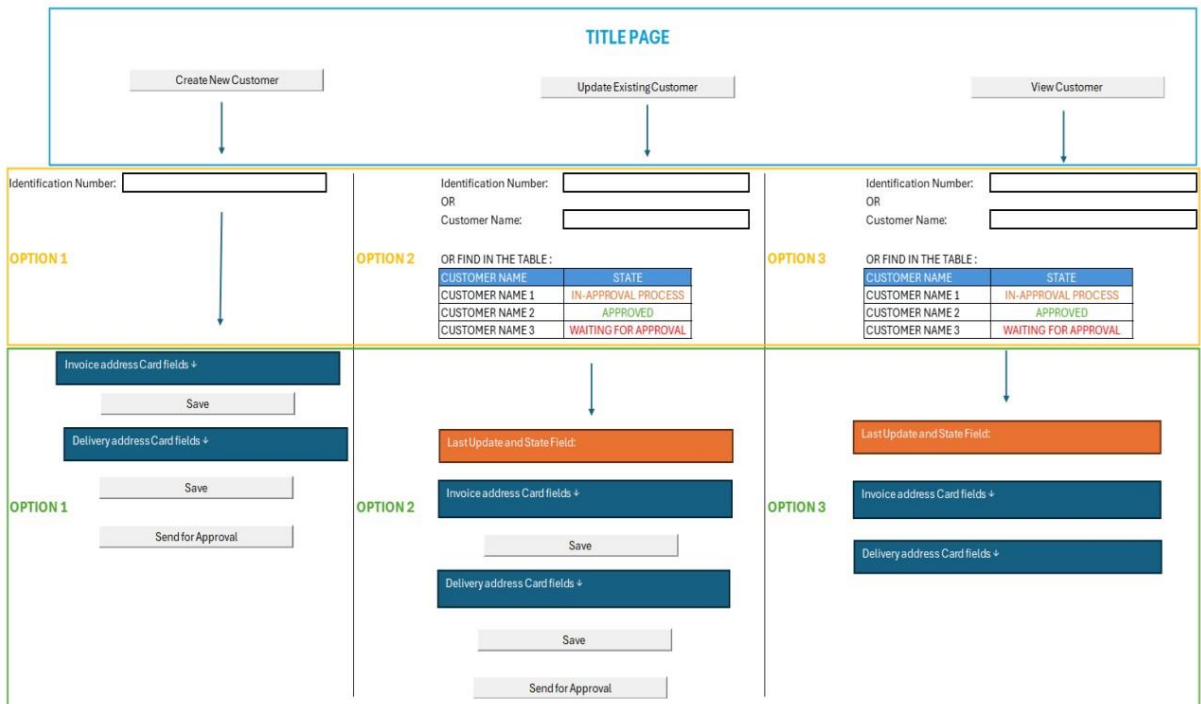
- **When** was the last approval of the Card completed
- **Who** was responsible for the updates to individual fields.
- **What** individual fields were updated with the original value shown as well.
- **When** the individual fields were changed/updated

If no changes were made since the last approval, only the date of the last approval would be shown with further notification: “No changes were made since the last approval.”

This field would be inactive during the first creation of the New Customer Card

## Proposal for the Layout of the Application

Below is a very rough idea of how the application could look, divided into 3 main parts and options/scenarios:



**Figure 15: Main Page Proposal**

(Source: Own processing, 2024)

**The first Section (blue)** would be the Title Page of the application which would give the user the option to either create new, update existing, or view customer information.

**The second section (yellow)** would be different depending on the chosen “scenario” when creating new customer, the Salesman would have to enter the identification number (IČO), the system would check if it is already in the system, if it is, there would be an option to update the information of the respective customer, if it is not in the system then the Salesman would move forward with creating a new Card. for the update and view scenarios, the second section would be identical where the user would either use the identification number or the customer name to find the Customer Card they need or they could use the table view of the Customer Cards’ database. This table view would also serve as an overview for the FO and other users, where the main information about the Customer Cards would be visible, and the user would be able to filter the table through them.

### **Information that should be included in the table view per customer:**

- Customer Name
- Identification Number
- State of the Customer Card (Approved, In-approval process, Waiting for approval)
- Salesman
- Category
- Maturity
- Maximum Balance

When the user finds the desired customer in the table, there should be the option to click through to the individual Customer Card / the third section of the application.

In Figure 15 a simplified version of this table view can be seen in the Option 2 part below the “OR FIND IN THE TABLE:”

**The third section (green)** of the application would contain the Invoice and Delivery address Cards with their respective fields, which would be open for modification only in the create and update scenarios, in view scenario the user would be able to only view the information without any additional interactions (aside from export for example).

The create and update scenarios would include the buttons for saving the data and the button “Send for Approval”.

The update and view scenarios would also include the Last Updated and State field.

### **3.1.5 New Process Flow**

The process flow can be found **in the attached PDF file “Customer Card - Process Flow Diagram”**.

The diagram depicts the proposed new process flow once the application is integrated into Customer Cards’ management process. It includes the legend for colors used and it is divided into 3 main sections – Input, Check, and Approval.

The method for creating the diagram was inspired by the Event-driven Process Chain

*The detailed description (functions, formats, explanations...) of the required fields necessary in the application is not part of this thesis paper due to its internal nature and it is not necessary for the thesis.*

### 3.2 Project Charter

The following table serves as a Project Charter for the project. It explains and shows its main elements like the project name, project lead, project's purpose and goal, objectives, scope, project team, stakeholders, beginning and end dates of the project, planned total expenditure, and a list of the milestones that are to be reached for the successful completion of the project.

**Table 1: Project Charter**

(Source: Own processing, 2023)

<b>Project Charter</b>	
<b>Project Name:</b>	Customer Cards Digitalisation and Automatization
<b>Project Lead:</b>	Project Manager Czechia
<b>Project Purpose and Goal:</b>	Digitalise and automate the process of managing customer cards while keeping track of any user-made changes through a web application that will be functional as a minimum viable product on August 9th, 2024, at the latest, not exceeding the planned total expenditures of 475 000 CZK
<b>Project Objectives:</b>	Creation of an application for creating, updating and storing of Customer Card information, both the invoice and delivery address card, via an intuitive online form with a reliable approval process and a record of any changes made to the Customer Card information by the users of the application

<p><b>Project Scope:</b></p>	<p><b>Deliverables:</b></p> <ul style="list-style-type: none"> <li>→ Customer Cards Web Application with the specified functionalities</li> <li>→ Automated Approval Process for creating/updating Customer Cards</li> <li>→ Record of Changes made to the customer's information</li> <li>→ Accessible Database of Customer Cards</li> </ul> <p><b>Out of scope:</b></p> <ul style="list-style-type: none"> <li>→ Smart Data Platform Integration</li> </ul>
<p><b>Project Team:</b></p>	<p>IT Manager - Czechia  Project Manager - Czechia  Software Development Project Manager - Netherlands  Proshore development team - Nepal</p>
<p><b>Stakeholders:</b></p>	<p>Approver: IT Manager  Sponsor: Financial Director  Users: Sales Department, Logistics Department, Sales Director, Financial Director, General Manager, Financial Officer, Receivables Manager, Customer Service</p>
<p><b>Planned Project Start:</b></p>	<p>01.11.2023</p>
<p><b>Planned Project End:</b></p>	<p>09.08.2024</p>
<p><b>Planned Total Expenditures:</b></p>	<p><b>475 000 CZK</b></p>

<b>Milestones:</b>	<b>Completion Date:</b>
Project Launch	20.11.2023
Requirements Definition	14.02.2024
System Design	03.04.2024
System Development	12.06.2024
Testing and Acceptance	28.06.2024
Deployment and Training	12.07.2024
Project Closure	09.08.2024

### **3.3 Work Breakdown Structure**

The project is divided into 7 milestones (as mentioned in the Project Charter) and each of those milestones then consists of several work packages with individual tasks, all these tasks and work packages need to be completed to reach the milestones, and when all of the milestones are reached the project goal should be fulfilled and project is concluded.

The Project Milestones are:

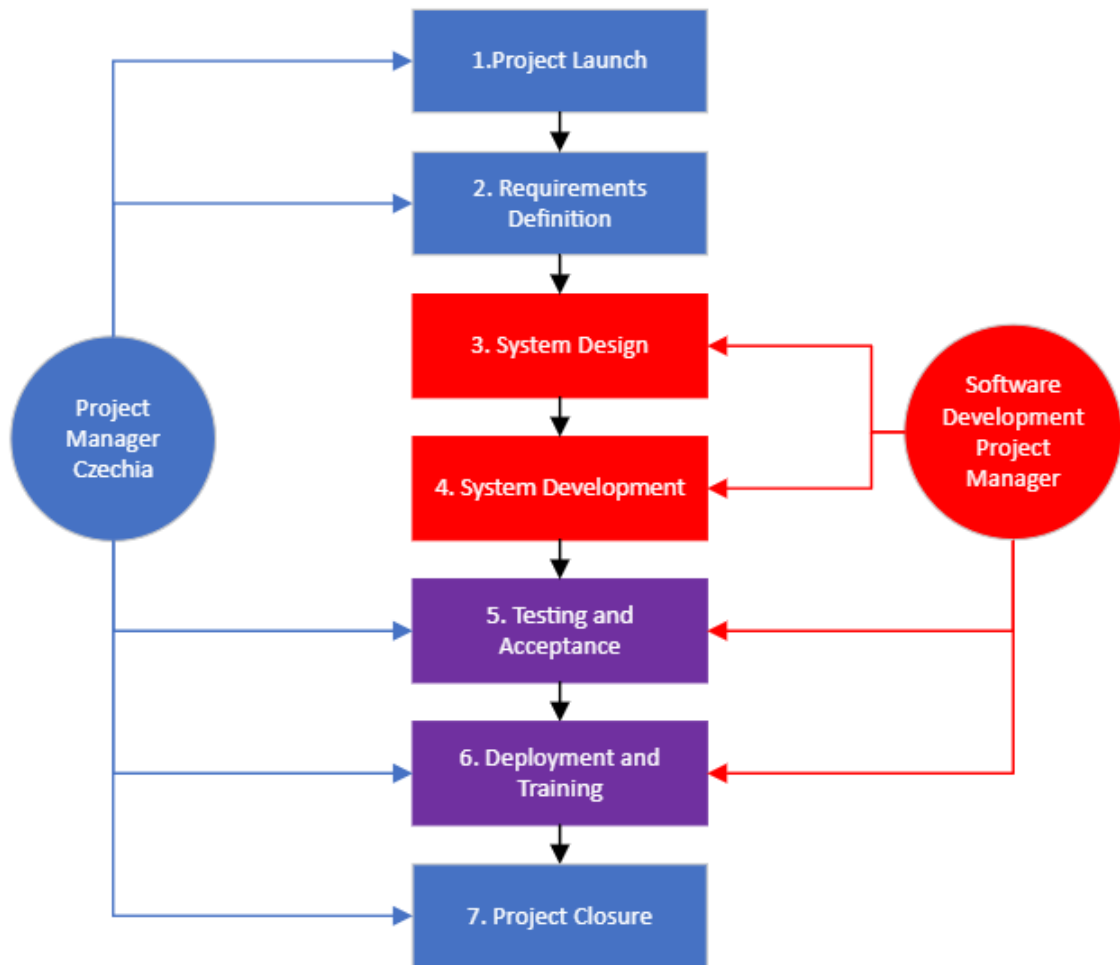
1. Project Launch
2. Requirements Definition
3. System Design
4. System Development
5. Testing and Acceptance
6. Deployment and Training
7. Project Closure

The project management work can be split between the Project Manager in Czechia and the Software Development Project Manager in Netherlands according to the set milestones.

The Project Launch and Requirements Definition fall under Czechia responsibilities, while System Design and Development are under the charge of the Netherlands Software Development Project Manager.

Milestones 5. - Testing and Acceptance and 6. - Deployment and Training are shared between them, whereas Czechia focuses on user Testing, Acceptance, and Training the Netherlands focuses on the technical testing, processing of feedback from testing, and then the subsequent deployment of the application to the production environment. Czechia then takes care of the Project Closure.

The following figure shows the graphical high-level division of work between the Netherlands and Czechia, more detailed view of the responsibilities can be found in the RACI Matrix in the next section of this paper.



**Figure 16: Division of Milestones Work**

(Source: Own processing, 2024)

The three-level Work Breakdown Structure overview can be found in the following table 2 with all the milestones (level 1) that are to be reached for the successful completion of the project, their associated work packages (level 2), and individual tasks within these packages (level 3).

**Table 2: WBS Overview**

(Source: Own processing, 2024)

<b>Customer Cards Digitalization and Automatization</b>	
<b>1. Project Launch</b>	
1.1. Project Team	
1.1.1. Setup the Project Team and Roles	
1.2. Project Definition	
1.2.1. Define Project Goal, Scope and Objectives	
1.2.2. Develop project schedule and budget	
<b>2. Requirements Definition</b>	
2.1. Stakeholder Identification	
2.1.1. Identify project Stakeholders and their Types	
2.2. User Requirements Gathering	
2.2.1. Conduct interviews with key stakeholders	
2.2.2. Document and prioritize the requirements	
2.3. Requirements Approval	
2.3.1. Review and refine requirements with stakeholders	
2.3.2. Finalize requirements documents and obtain approval from IT manager	
2.4. Kick-off Meeting	
2.4.1. Organize a kick-off meeting with the Project Team	
2.4.2. Present requirements, timeline, and expectations (+space for questions)	
<b>3. System Design</b>	
3.1. Architecture and Technical Specifications	
3.1.1. Define technology stack and development tools	

3.1.2. Design system architecture and data flow
3.2. Interface Design
3.2.1. Create UI designs and prototypes
3.3. Database and Security Design
3.3.1. Develop data models and database schema
3.3.2. Plan security measures and data protection
4. System Development
4.1. Development Environment Setup
4.1.1. Configure development, testing, and production environments
4.2. Front-end and Back-end Development based on designs
4.2.1. Implement UI interface
4.2.2. Develop server-side logic, database, and their integration
4.3. Integration
4.3.1. Integrate front-end and back-end components
4.3.2. Conduct initial integration testing
5. Testing and Acceptance
5.1. Testing
5.1.1. Unit Testing: Test individual components
5.1.2. System Testing: Testing of the Customer Card Application
5.1.3. User Acceptance Testing (UAT): Conduct UAT and finalize based on feedback
6. Deployment and Training
6.1. Deployment
6.1.1. Deploy the application to the production environment
6.1.2. Monitor system and address immediate issues

6.2. User Training
6.2.1. Develop training materials and documentation
6.2.2. Conduct training sessions for end-users
7. Project Closure
7.1. Final Documentation
7.1.1. Compile and deliver final project documentation
7.2. Project Review and Feedback
7.2.1. Conduct project closure meeting
7.2.2. Gather feedback and document lessons learned

### 3.4 Project Team and Stakeholders

As specified in the Project Charter the project team can be divided into two groups, the customers – Czechia business unit and the developers - Netherlands business unit and Proshore developers, both with their own Project Managers.

**The Czechia Project Manager** represents the “customer” side and is responsible for the overall project completion and coordination, the requirements documentation, testing, training, and closure of the project. As a junior Project Manager, they are supervised by the **IT Manager** who is usually responsible for most of these types of projects, in addition the IT Manager acts as the approver of the key activities of the projects and the project manager can consult with them if they need.

**The Netherlands group** is responsible for the technical side of the project and as such they have the Software Development Project Manager who is responsible in cooperation with Proshore for coordinating and delivering the design, development, and deployment of the application. He also mediates the communication between the Czechia and the Proshore developers.

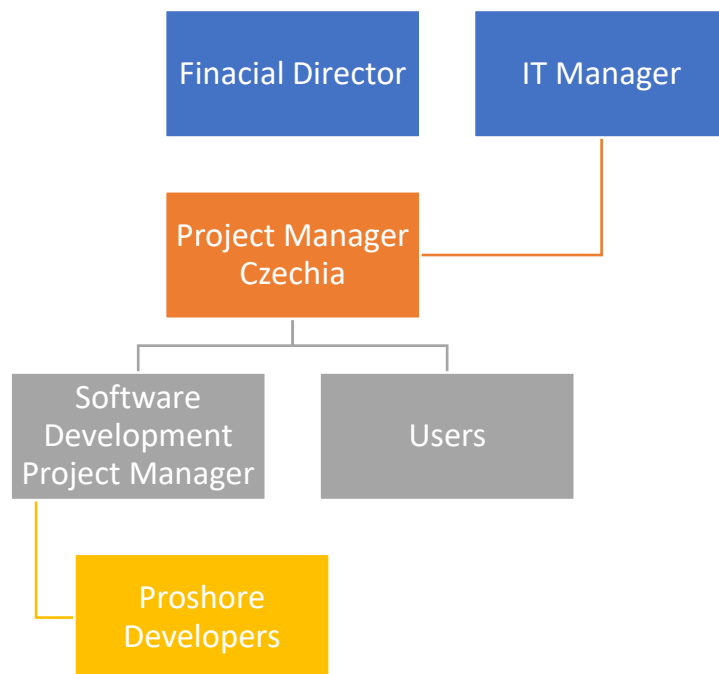
Other important stakeholders are:

**Financial Director** – they are the sponsor of all major IT projects and approve the projects their funds and budgets.

The rest of the stakeholders fall under the category of **users of the application**, their input is needed during the requirements gathering and testing of the application. The **Financial**

**Officer** oversees the management of the Customer Cards, making sure that the information is correct and up to date, the Sales Department employees are the starting point of the whole process, and the Logistics Department takes care of the delivery address information, the **Receivables Manager** checks the liquidity of the customers and provides, if possible, their credit report. **Customer Service** can update certain customer information and the **Sales Director** and **General Manager** together with the **Financial Director** approve the new Customer critical changes to the customer information. The rest of the stakeholders are the other “common” users which are those employees who would use the application for viewing the customers’ information.

The following figure shows the hierarchy between the individual stakeholders in relation to this project.



**Figure 17: Project Team and Stakeholders Hierarchy**

(Source: Own Processing, 2024)

The following table shows the power assigned to each stakeholder/group of stakeholders on scale from 1 to 10, the power is determined based on how much they can influence the outcome of the project.

The Financial Director has a power of 10, since they can end the project if the supplier’s offer does not meet the budget, if the financial costs are too substantial or there are any other strategic problems, the IT Manager has large influence on the outcome of the project since they approve most of the outputs of the Project Manager, who is responsible and

accountable for the operational tasks, the Project Manager thus has significant influence on the time schedule of the project, among other things. The Software Development Project Manager and the Proshore Developers have a significant influence on the outcome of the project and the general quality of the application, but a limited decision-making power, the users have a limited but not insignificant power since their participation in forming the initial requirements and user acceptance testing is not to be overlooked.

**Table 3: Stakeholders' Power**

(Source: Own Processing, 2024)

Stakeholder	Power
Financial Director	10
IT Manager	8
Project Manager Czechia	6
Software Development Project Manager	5
Proshore Developers	5
Users	3

### 3.4.1 RACI Matrix

The following table depicts the Responsible, Accountable, Consulted, and Informed matrix dividing the responsibilities for individual work packages and activities between the stakeholders.

For better clarity the work packages and tasks follow the WBS structure and some of the tasks were grouped into work packages. The System Design and Development tasks are grouped since from the point of view of the whole project the accountability for these tasks falls to Software Development Project Manager and the Proshore developers are responsible for carrying out the individual tasks, individual task is used when the responsibilities are split between Czechia and Netherlands (developers) for the milestones 5 and 6.

Some tasks involve multiple responsibilities but always only one person is accountable for the outcome of the task, for instance, User Acceptance Testing is the task with the biggest number of active stakeholders. The Project Manager is responsible for

coordinating the Testing in Czechia with the Users, they are also accountable for good quality results of the testing. The IT Manager and the Software Development Project Manager can be consulted during the task, the Developers are responsible for any necessary changes that would arise during the testing, Users are responsible for going through the testing and the Financial Director should be informed about the results.

**Table 4: RACI Matrix**

(Source: Own processing, 2024)

Work Package/Task	Financial Director	Project Manager Czechia	IT Manager	Software Development Project Manager	Proshore Developers	Users
1.1. Project Team	I	R	A, C			
1.2. Project Definition	I	R	A, C			
2.1. Stakeholder Identification	I	R	A, C			
2.2. User Requirements Gathering	C	R, A	C			R, C
2.3. Requirements Approval	C, I	R	A, C			I
2.4. Kick-off Meeting	I	R, A	C	R	C	

3.1. Architecture and Technical Specifications						
3.2. Interface Design						
3.3. Database and Security Design						
4.1. Development Environment Setup		I	I	R, A	R	
4.2. Front-end and Back-end Development based on designs						
4.3. Integration						
5.1.1. Unit Testing		I	I	A	R	
5.1.2. System Testing		R	C	A	R	
5.1.3. User Acceptance Testing	I	R, A	C	C	R	R
6.1.1. Deploy the application to the production environment	I	I	I	A	R	I
6.1.2. Monitor system and address immediate issues		R, A	C	C	R	I
6.2.1. Develop training materials and documentation	I	R, A	C	C		C

6.2.2. Conduct training sessions for end-users	I	R, A	C			R
7.1. Final Documentation	I	R, A	C	C		
7.2.1. Conduct project closure meeting	C	R, A	C	R, C		I
7.2.2. Gather feedback and document lessons learned	I	R, A	C	I		R

From the table 4 we can see that the IT Manager is mainly accountable during the first two milestones and the serves as a consulting stakeholder for the Czechia Project Manager, who takes accountability for when the application is introduced to the users, the testing and trainings are conducted, and the project is closed. The Software Development Project Manager is accountable for the more technical activities and milestones of the project.

### 3.5 Risk Analysis

This section covers the risk analysis of the project, first, the individual potential risks that can affect the project are identified then they are assessed according to the method described in the theoretical section, measures to mitigate the risks are proposed and finally the risk values without and with measures are compared.

**Table 5: Risks Identification**

(Source: Own processing, 2024)

	<b>Risk Name</b>	<b>Category</b>	<b>Scenario</b>	<b>Explanatory Notes</b>
<b>R1</b>	Insufficient Testing	Technical	The testing of the application overlooks some functionalities, resulting in bugs in production.	Test cases are insufficient, or complexity of the system prevents comprehensive testing within the set timeframe.
<b>R2</b>	Integration Challenges	Technical	The export file format from the application to the ERP system is not compatible.	Wrong description of the XML file for the ERP system.
<b>R3</b>	Insufficient Documentation	Technical	Lack of documentation about the application makes future maintenance and updates difficult.	Poorly documented code makes it difficult when original developers are no longer available or when others need to make changes within the code.
<b>R4</b>	Communication Failures	Project Management	Poor communication between Czechia and developers leads to lacking application functionalities.	The process flow diagram or some other functionality is misunderstood.

<b>R5</b>	Scope Creep	Project Management	Too many new features are being added without proper review, extending the timeline and increasing the budget.	Project scope is not well-defined leading to seemingly small additions or when stakeholders add more and more demands.
<b>R6</b>	Insufficient Application Effectiveness	Project Management	Some of the original issues (speed and incomplete forms) are not solved by the application.	Issues that are more difficult to solve "technically" like incomplete forms or approval speed are not improved by the application.
<b>R7</b>	Insufficient Human Resources	Project Management	The project falls behind schedule because there are not enough available developers or project team members are overloaded.	Initial human resources planning was poorly done or there are unforeseen sick leaves, reassignments, or resignations.

<b>R8</b>	Change Resistance	Organizational	Users will not want to transition to the new system, preferring using the old process.	Change from an established familiar process might be difficult with a lack of training, involvement in the development process or the users' fear of the unknown.
<b>R9</b>	Lack of User Training	Organizational	Users will struggle with the new application, reducing the effectiveness of the new process.	Inadequate training will make it harder for the users to adapt to the new process.
<b>R10</b>	Exceeding the Budget	Financial	Real project costs are higher than the estimated budget.	Initial budget estimations fail to account for all potential expenses and undervalue the application development costs.

### 3.5.1 Risk Assessment

The previously identified risks are assessed qualitatively according to the impact and likelihood of each risk on a five-level scale.

## Impact

The impact of each risk is assessed based on the impact it has on the cost, schedule, functionality, and quality of the project. Each of those attributes is given a score on the five-level scale and the highest score is the resulting impact.

Table 6 shows the scales that are modified to fit the project, in the following table 7 the impact scores can be found.

**Table 6: Impact Scales**

(Source: Own processing according to Graves (2000), 2024)

	1 Verly Low	2 Low	3 Medium	4 High	5 Very High
Cost	Insignificant cost increase	< 5% cost increase	5-15% cost increase	15-25% cost increase	>25% cost increase
Schedule	Insignificant schedule slippage	<2 weeks slippage	2 - 3 weeks slippage	3-4 weeks slippage	>4 weeks slippage (month and more)
Functionality	Functionality decrease barely noticable, minor bugs.	Minor areas of functionality are affected, workarounds are possible.	Major areas of functionality are affected, some specified functionalities are missing or not working, client must be consulted.	Level of functionality is unacceptable to the client, several specified functionalities are missing or not working.	Core functionalities are affected, rendering the application effectively useless.
Quality	Minor quality degradation, easily fixed in post-launch patches.	Quality degradation is noticeable, some minor documentation is missing.	Quality is reduced, documentation gaps make routine maintenance difficult.	The quality of the application is unacceptable to the client, user experience is poor, the users are reluctant to use the application.	The application does not solve any of the original issues and is unusable.

**Table 7: Impact Scoring**

(Source: Own processing, 2024)

	Cost	Schedule	Functionality	Quality	Resulting Impact
R1	2	2	2	2	2
R2	1	1	4	4	4
R3	1	1	1	3	3
R4	4	3	3	3	4
R5	3	2	1	1	3
R6	1	1	2	3	3
R7	2	3	1	1	3
R8	2	3	1	4	4
R9	2	2	2	4	4
R10	4	1	1	1	4

In table 7 we can see that the risks with the highest impact are risks 2, 4, 8, 9, and 10.

### Likelihood

The likelihood of the risk is scored based on the probability of occurrence and the intervention difficulty, for each risk a score from a five-level scale is given to these two attributes and the lower of those is the resulting likelihood. Figure 18 shows the scale for those two attributes.

Generic Likelihood Scales

Level	Probability of Occurrence	Intervention Difficulty
1	You would be surprised if this happened.	Your normal management processes should easily ensure an acceptable outcome.
2	Less likely to happen than not.	Careful oversight of your normal management processes will probably bring about an acceptable outcome.
3	Just as likely to happen as not.	Additional time and effort will be required to move toward an acceptable outcome.
4	More likely to happen than not.	Your resources and authority are sufficient to permit only a minor effect on the outcome.
5	You would be surprised if this did not happen.	Your ability to affect the outcome is effectively zero.

**Figure 18: Likelihood Scale**

(Source: Graves, 2000)

**Table 8: Likelihood scoring**

(Source: Own processing, 2024)

	Probability of Occurrence	Intervention Difficulty	Resulting Likelihood
R1	4	3	3
R2	1	1	1
R3	3	2	2
R4	2	2	2
R5	2	1	1
R6	3	4	3
R7	2	4	2
R8	3	4	3
R9	3	3	3
R10	2	2	2

From Table 8 we can see that none of the risks are more likely to happen than not and that at most risks 1, 6, 8, and 9 are just as likely to happen as not.

**Risk Value**

By multiplying the resulting impact with the resulting likelihood, we get the total risk value of each risk.

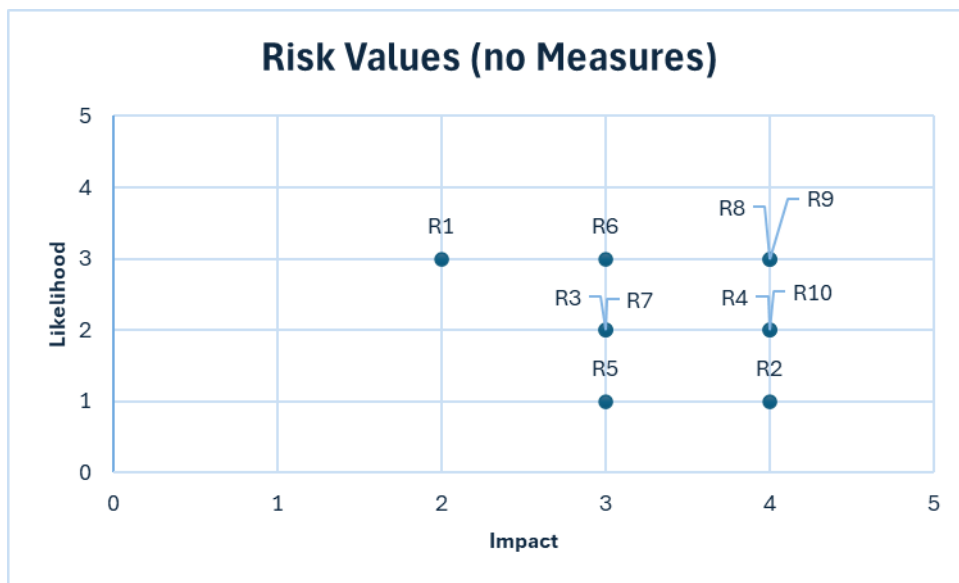
**Table 9: Risk Values**

(Source: Own Processing, 2024)

	Risk Name	Scenario	Impact	Likelihood	Risk Value
R1	Insufficient Testing	The testing of the application overlooks some functionalities, resulting in bugs in production.	2	3	6
R2	Integration Challenges	The export file format from the application to the ERP system is not compatible.	4	1	4
R3	Insufficient Documentation	Lack of documentation about the application makes future maintenance and updates difficult.	3	2	6
R4	Communication Failures	Poor communication between Czechia and developers leads to lacking application functionalities.	4	2	8
R5	Scope Creep	Too many new features are being added without proper review, extending the timeline and increasing the budget.	3	1	3

R6	Insufficient Application Effectiveness	Some of the original issues (speed and incomplete forms) are not solved by the application.	3	3	9
R7	Insufficient Human Resources	The project falls behind schedule because there are not enough available developers or project team members are overloaded.	3	2	6
R8	Change Resistance	Users will not want to transition to the new system, preferring to use the old process.	4	3	12
R9	Lack of User Training	Users will struggle with the new application, reducing the effectiveness of the new process.	4	3	12
R10	Exceeding the Budget	Real project costs are higher than the estimated budget.	4	2	8

The following graphical representation will make clear which risk values need to be mitigated:



**Graph 1: Risk Map before Measures**

(Source: Own processing, 2024)

As evident from Graph 1 risks 2, 4, 6, 8, 9, and 10 are on the edge of the critical zone and the rest are in the middle zone, so for all the risks some kind of response or measure is necessary.

### 3.5.2 Risk Measures Proposal

All the risks will be treated to some extent, in the following table for each risk a measure that should mitigate the impact and/or likelihood is proposed, along with the new values for impact, likelihood, and the resulting risk value.

**Table 10: Risk Values after Measures**

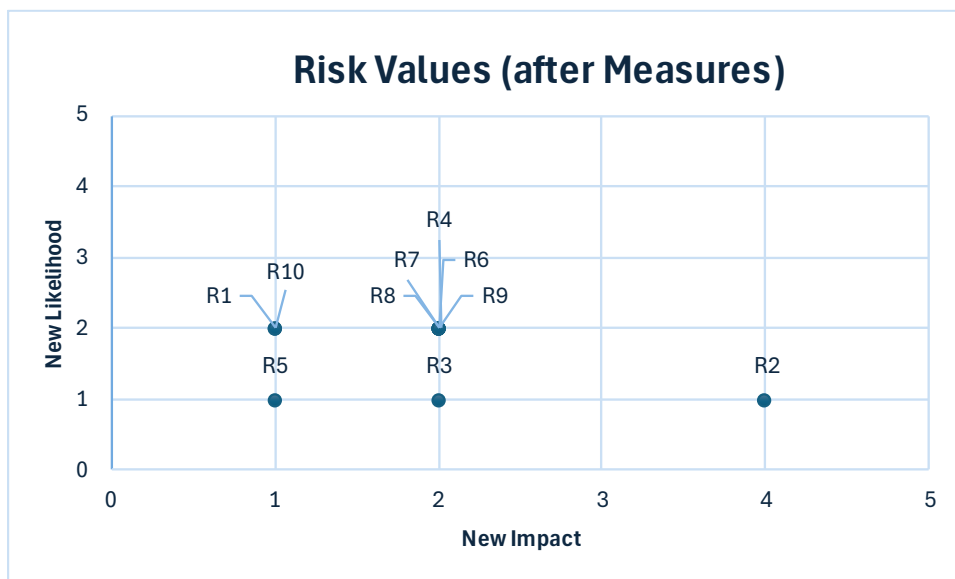
(Source: Own processing, 2024)

	<b>Risk Name</b>	<b>Proposed Measure</b>	<b>New Impact</b>	<b>New Likelihood</b>	<b>New Risk Value</b>
R1	Insufficient Testing	Double-check at the testing and acceptance meeting that all the main functionalities work and that only minor bugs could be expected, insignificantly affecting cost and schedule.	1	2	2
R2	Integration Challenges	Make sure that the XML format is compatible during the testing phase, eliminating the any chance this risk can happen.	4	1	4
R3	Insufficient Documentation	Prepare a list of necessary documentation and ensure that it is received from developers.	2	1	2

R4	Communication Failures	Have an open communication channel and make sure that the process flow diagram and the instructions are understood by the developers.	2	2	4
R5	Scope Creep	Have a well-defined scope, do not go beyond it and leave possible upgrades for the next versions of the application	1	1	1
R6	Insufficient Application Effectiveness	Monitor the usage of the application after launch and cooperate with users to motivate them to use the application correctly.	2	2	4
R7	Insufficient Human Resources	Have at least 2 buffer weeks to minimize the impact.	2	2	4
R8	Change Resistance	Conduct regular follow-up meetings, possibly with users' superiors, at least for the next two months after the launch to process any feedback from users and motivate them to use the application.	2	2	4

R9	Lack of User Training	After the initial training sessions keep an open channel for users in case of queries, Measures of risks 6,8, and 9 can all be shared on the regular follow-up meetings.	2	2	4
R10	Exceeding the Budget	Have a realistic budget with a reasonable reserve of about 30 000 CZK.	1	2	2

As evident from Graph 2, following the measures, the risks moved to the non-critical zone where they should not have any major negative impacts on the project anymore and the risk 2 likelihood is minimal.



**Graph 2: Risk Map after Measures**

(Source: Own processing, 2024)

If we compare the risk values before and after the measures, there is a clear decrease (as seen in Graph 3), most notably for risks 4, 6, 8, and 9. and thus lower negative impact if the measures were taken and the risk were to come true.

The measures are not financially intensive, but they will require some extra effort mostly on the project management side in Czechia.



**Graph 3: Risk Values Comparison**

(Source: Own processing, 2024)

### 3.6 Project Schedule

This section deals with the proposal for the schedule of the project. For each activity from the WBS, a certain amount of time is assigned during which the activity and any of the sub-activities should be completed to complete the work packages, milestones, and finally the entire project, while respecting the deadlines that were specified in the Project charter. In the following table, each activity has its ID and each activity (except the first one) has a preceding activity, that must be completed for the next activity to begin, and the following activity. For each activity the start and end dates were set, based on this the duration of the activity was determined, considering only workdays without weekends or state holidays.

Some of the activities can be done in parallel with each other or for example activity T can begin the initial integration testing during the activity S after a certain progress has been reached and enough components have been integrated, but in order to move to activity U, both activity S and T must be fully completed.

**Table 11: Project Schedule Overview**

(Source: Own processing, 2024)

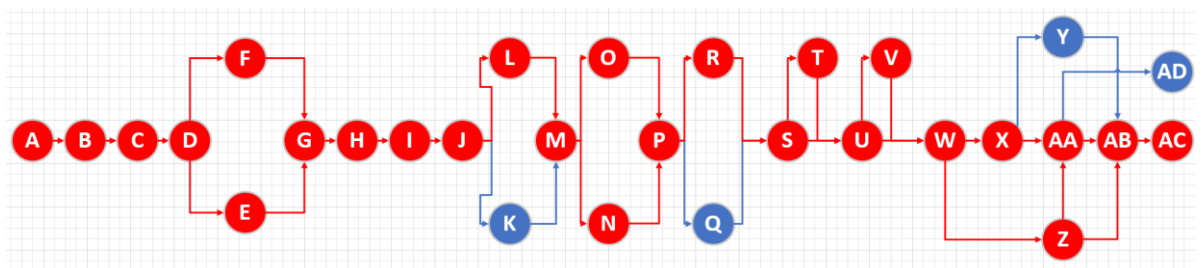
Activity ID	Activity Description	Previous Finished Activity / ies	Following Activity	Duration in workdays	Start Date	End Date	Notes
A	Setup the Project Team and Roles	/	B	3	01.11.'23	03.11.'23	
B	Define Project Goal, Scope, and Objectives	A	C	5	06.11.'23	10.11.'23	
C	Develop project schedule and budget	B	D	5	13.11.'23	20.11.'23	
D	Identify project Stakeholders and their Types	C	E, F	4	21.11.'23	24.11.'23	
E	Conduct interviews with key stakeholders	D	G	15	27.11.'23	15.12.'23	Can be done in parallel with F
F	Document and prioritize the requirements	D	G	15	27.11.'23	15.12.'23	Can be done in parallel with E
G	Review and refine requirements with stakeholders	E, F	H	16	18.12.'23	11.01.'24	
H	Finalize requirements documents and approval from IT manager	G	I	8	12.01.'24	23.01.'24	

I	Organize a kick-off meeting with the Project Team	H	J	7	24.01.'24	01.02.'24	
J	Present requirements, timeline, and expectations (+ space for questions)	I	K, L	9	02.02.'24	14.02.'24	
K	Define technology stack and development tools	J	M	5	15.02.'24	21.02.'24	Can be done in parallel with L
L	Design system architecture and data flow	J	M	10	15.02.'24	28.02.'24	Can be done in parallel with K
M	Create UI designs and prototypes	K, L	N, O	12	29.02.'24	15.03.'24	
N	Develop data models and database schema	M	P	11	18.03.'24	03.04.'24	Can be done in parallel with O
O	Plan security measures and data protection	M	P	11	18.03.'24	03.04.'24	Can be done in parallel with N
P	Configure development, testing, and production environments	N, O	Q, R	2	04.04.'24	05.04.'24	
Q	Implement UI interface	P	S, T	10	08.04.'24	19.04.'24	Can be done in parallel with R

R	Develop server-side logic, database, and integration	P	S, T	25	08.04.'24	10.05.'24	Can be done in parallel with Q
S	Integrate front-end and back-end components	Q, R	U, V	23	13.05.'24	12.06.'24	
T	Conduct initial integration testing	Q, R	U, V	18	20.05.'24	12.06.'24	Can start during S after enough components are integrated
U	Unit Testing: Test individual components	S, T	W	6	13.06.'24	20.06.'24	
V	System Testing: Testing of the Application	S, T	W	5	17.06.'24	21.06.'24	Can start during U after enough units are tested
W	User Acceptance Testing (UAT)	U, V	X, Z	5	24.06.'24	28.06.'24	
X	Deploy the application to the production environment	W	Y, AA	3	01.07.'24	03.07.'24	
Y	Monitor system and address immediate issues	X	AB	6	04.07.'24	12.07.'24	Starts after X and active until end of Z and AA

Z	Develop training materials and documentation	W	AB	9	01.07.'24	12.07.'24	Can start after W and ends with AA
AA	Conduct training sessions for end-users	X	AB, AD	5	08.07.'24	12.07.'24	Z should be at least partially done
AB	Compile and deliver final project documentation	Y, Z, AA	AC	3	15.07.'24	17.07.'24	
AC	Conduct project closure meeting	AB	/	1	18.07.'24	18.07.'24	
AD	Gather feedback and document lessons learned	AA	/	5	15.07.'24	19.07.'24	During AB and AC (the last week of the project)

The critical path of the project was created to better understand the dependencies between activities and to see which activities are critical to the timely completion of the project and which activities have some amount of float time, so that if they would have some delay, it would not affect the timely completion of the project. The critical activities are marked by red colour.



**Figure 19: Project Critical Path**

(Source: Own processing, 2024)

The critical path shows that the majority of the activities are critical for the timely completion of the project and if there were any delays to one of these activities, then the subsequent activities would be delayed as well. Activities K and Q are not considered

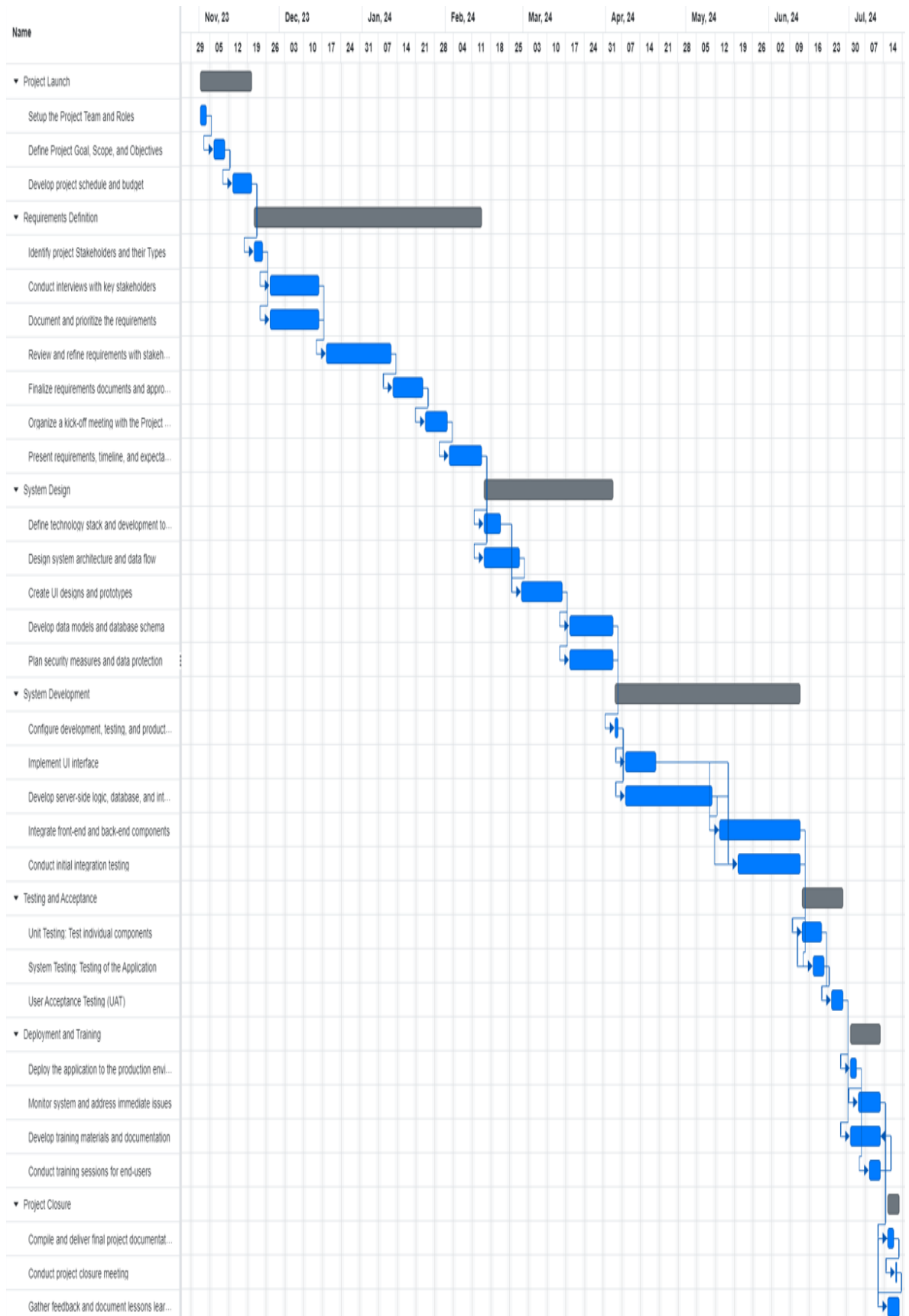
critical because they start with their parallel activities (L and R) but are expected to finish ahead of them, giving them some float time. Activities Y and AD are not necessary for the successful completion of the project.

Activities T and V can start after certain progress has been made within activities S and U, respectively, but they both must end on the same date to start the following activity. In total, the longest path for the project is 180 workdays or 261 days.

### **3.6.1 Gantt Chart**

Based on the established schedule and the dependencies between the activities a Gantt Chart is used to graphically represent this connection and better track the progress of the project.

The milestones with their activities according to the WBS are on the left side, the chart is then divided into months, weeks, and days and the length of the boxes depicts the duration of the milestones (dark grey boxes) and their activities (blue boxes), there also connectors between the activities depicting dependencies, like the critical path. The project lasts from the 1<sup>st</sup> of November 2023 till the 19<sup>th</sup> of July 2024. There is some float in case there are some delays due to insufficient HR resources (Risk 7) for example, but the strict deadline is the 9<sup>th</sup> of August 2024.



**Figure 20: Gantt Chart**

(Source: Own processing, 2024)

### **3.7 Project Budget**

This section proposes the budget for the entire project, as mentioned in the project charter the total allocated budget for the project is 475 000CZK, 450 000CZK should be used as a distributed budget, and 25 000CZK as a management reserve, which can be used to mitigate potential risks, problems, or delays.

In the following table, the estimated costs of each activity are calculated by multiplying the total work time hours per activity with the hourly rate either for the Project Manager or the Developers. The hourly rate for the Project Manager is derived from their standard hourly wage and the hourly rate for the Developers is the hourly wage that is asked by the Proshore company.

The expected work time per day is estimated based on the time availability of either the Project Manager or the Developers and the difficulty of the activity. The project is not time-sensitive, which is why it is spread out over 180 workdays.

Only the Project Manager and Developers costs are considered as the IT Manager costs can be considered insignificant for the project budget and the costs for the Software Development Project Manager should be part of the costs for the Developers.

The hourly rate for the Project Manager has been set for 260 CZK, this amount includes the mandatory tax payments for the employee by the employer. This means that the gross wage equals to 34 000 CZK, the social security payment (24,8%) and health insurance (9%) combined is 33,8% from this amount, which is 11 492 CZK, equalling in 45 492 CZK in total costs for the employer, the final hourly wage has been rounded to 260 CZK.

The hourly rate for the Developers was set by Proshore as 28 EUR, which at the rate of 25,3 CZK per 1 EUR equals to 710 CZK, rounded up.

**Table 12: Project Costs Estimate**

(Source: Own processing, 2024)

Hourly rate					
Project Manager:	260	CZK/hour			
Developers:	710	CZK/hour			
Activity Description	Duration in workdays	Expected work time per day (hours)	Total work time(hours)	CZK/hour	Cost per Activity
Setup the Project Team and Roles	3	2	6	260	1 560 CZK
Define Project Goal, Scope, and Objectives	5	2	10	260	2 600 CZK
Develop project schedule and budget	5	2	10	260	2 600 CZK
Identify project Stakeholders and their Types	4	1	4	260	1 040 CZK
Conduct interviews with key stakeholders	15	1	15	260	3 900 CZK

Document and prioritize the requirements	15	2	30	260	7 800 CZK
Review and refine requirements with stakeholders	16	2	32	260	8 320 CZK
Finalize requirements documents and approval from IT manager	8	2	16	260	4 160 CZK
Organize a kick-off meeting with the Project Team	7	1	7	260	1 820 CZK
Present requirements, timeline, and expectations (+ space for questions)	9	1	9	260	2 340 CZK
Define technology stack and development tools	5	2	10	710	7 100 CZK

Design system architecture and data flow	10	2	20	710	14 200 CZK
Create UI designs and prototypes	12	2	24	710	17 040 CZK
Develop data models and database schema	11	2	22	710	15 620 CZK
Plan security measures and data protection	11	3	33	710	23 430 CZK
Configure development, testing, and production envs	2	3	6	710	4 260 CZK
Implement UI interface	10	4	40	710	28 400 CZK
Develop server-side logic, database, and integration	25	6	150	710	106 500 CZK
Integrate front-end and back-end components	23	6	138	710	97 980 CZK

Conduct initial integration testing	18	3	54	710	38 340 CZK
Unit Testing: Test individual components	6	4	24	710	17 040 CZK
System Testing: Testing of the Application	5	4	20	710	14 200 CZK
User Acceptance Testing (UAT)	5	3	15	260	3 900 CZK
Deploy the application	3	1	3	710	2 130 CZK
Monitor system and address immediate issues	6	2	12	260	3 120 CZK
Develop training materials and documentation	9	3	27	260	7 020 CZK
Conduct training sessions for end-users	5	1	5	260	1 300 CZK

Compile and deliver final project documentation	3	2	6	260	1 560 CZK
Conduct project closure meeting	1	2	2	260	520 CZK
Gather feedback and document lessons learned	5	2	10	260	2 600 CZK
<b>Total:</b>	<b>180</b>	<b>73</b>	<b>760</b>	<b>/</b>	<b>442 400 CZK</b>

The estimated cost for the work on the project is **442 400CZK** which is within the planned budget of 450 000CZK with the 25 00CZK managements reserve.

The total hours worked by the Developers is 544 (386 240CZK) hours which corresponds to the offer from Proshore that estimated around 550 (390 500CZK) hours of work time, this financial cost was approved by the Financial Director.

The total hours worked by the Project Manager in Czechia is 216 hours, which equals 56 160CZK.

No other one-time costs or subscriptions to any software are expected as the application should be built within the existing IT infrastructure available to De Heus, the subsequent maintenance is not expected to be financially significant, and the potential updates or next versions are not part of this project.

### **3.8 Benefits of the Proposed Solution**

Since the theme of this thesis is a change in the internal process within the company regarding customer information management the benefits will not be in terms of direct financial benefit but rather in terms of process-flow benefits such as process optimization, automatization, transparency, quality, and indirect benefits.

As described in the Gap Analysis section of this paper the current state of Customer Cards management is this:

- Customer Cards are filled in by a Salesman via a form in Excel or Word, often incomplete.
- Physical paper copy must be kept together with a digital one in a Word format.
- Manual transcription into the ERP system
- Approval process done through physical signatures.
- Most communication is done through emails → prolonging the process.
- Changes are recorded directly into the paper form.

The solution proposed in the preceding segments aims to bring about the desired target state and its benefits:

- The Salesman can start the new customer approval process by filling in the intuitive online form that is part of the web application.
- In the same web application, the Customer Service employee or the Salesman can update the customer information.
- The required fields limit the number of incomplete forms sent for approval.
- By saving the new/updated information the approval process begins, the required users are automatically notified, and they check or fill in additional information and send it via the application to the management for approval, the management can approve the new customer/changes whenever they access to the web and the application, no physical signature is needed.
- No physical paper copy is needed.
- No manual transcription is needed, the transfer to ERP is done automatically.
- Automatic notifications limit unnecessary email communication.
- Transparency is ensured by keeping a digital record of all changes made to the Customer Card (who, when what)
- Better security and information integrity because all changes will be done in the application and must be approved through an approval process.
- Overall optimization of the customer information management

The proposed solution's timeline is set to end on 19<sup>th</sup> of July 2024, thus meeting the project completion deadline of 9<sup>th</sup> of August with an adequate reserve of 3 weeks. Most

of the activities are on the critical path, meaning that if one is delayed then the whole project will be delayed, the reserve of 3 weeks should cover this risk.

From the budget point of view the project fits into the limit of 475 000CZK with the expected total expenditures being 442 400CZK. This also leaves 32 600CZK in reserve if some additional costs are incurred.

## CONCLUSION

This diploma thesis aimed to propose a project for a change of an internal process within De Heus while using the project management methodology to reach this aim additional 3 subgoals were set:

1. Identify the reasons and arguments for why the change is necessary.
2. Apply the project management methods for this change.
3. Identify the benefits and risks of this change.

**The first chapter** set the theoretical concepts of project management methodology and the thesis-specific themes that were used in the next two chapters.

**The second chapter** was concerned with analyzing the current situation within De Heus regarding Customer Cards management, and the results from the structured interviews that were conducted with the key stakeholders of the project were presented, giving reasons why the change is necessary. Among those reasons were the process's overall speed, the manual transcription to the ERP, or the lack of record of changes made within the Card. McKinsey's 7S was used to complement these findings and see if the analyzed factors could support the change. The chapter was completed by the gap analysis used to identify the gap between the current state and the desired target state, where the gap was mostly caused by the previously mentioned reasons and the incomplete forms from the Salesmen, manual transcription or the physical copy and signatures.

**The third chapter** proposed a solution on how to bridge that gap, by digitizing and automatizing the process. It started by describing the proposed application and the new process diagram that would be used as an assignment for the contracting company. This was followed by the project and its key points for this purpose. Represented first by the project charter, where the key project information can be found, followed by the work breakdown structure, which broke down the project into milestones, work packages, and individual tasks. In the RACI matrix main responsibilities and accountabilities were divided among the stakeholders and in the risk analysis potential risks were identified and measures proposed. Project schedule was created to set the timeline of the project while respecting the project deadlines, the dependencies between individual tasks were detected, the critical path was identified, and Gantt chart was used to illustrate the project timeline. Next, the project expenses that fit within the budget were estimated.

The last chapter was finalized by providing an overview of the expected benefits that should bridge the previously identified gap and optimize the process after the successful completion of the project.

**The reasons for the change** were discovered in the second chapter, project management methods were used in the third chapter together with the identification of potential risks and expected benefits connected to this change. To conclude this thesis, based on the previous chapters and the preceding summary, the goal of proposing a project for a change in an internal process within De Heus while using project management methodologies was fulfilled.

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	<h2>Customer Card - Invoice Address</h2>			Sekce: FO 5.1.
				Revize: 07
				Datum: 6/04/2016
				Strana: Strana 1 z 2
<b>Customer Name</b>				
<b>Invoice Address</b>				
<b>Identification Number</b>		<b>VAT ID</b>		
<b>ERP Number</b>		<b>Phone Number</b>		
<input type="checkbox"/> E-Delivery Note	email:	<input type="checkbox"/> E - Invoice	email:	
<b>Category</b>	A - hotově	<b>Send Invoices by:</b> (tick)	<input type="checkbox"/> post <input type="checkbox"/> email	
<b>Maturity</b>	platba předem	<b>Invoice Currency</b>	CZK	
<b>Maximum Balance</b>		<b>CZK</b>	<b>Language:</b> Anglický	
<b>Insured Balance</b>		<b>CZK</b>		
<b>Salesman</b>	1 - Musil Pavel	<b>Pricelist</b>	1 - STANDARTNI CENIK	
<b>These attachments are part of the form:</b>				
(tick those that apply + signature of those that made the attachments)				
<input type="checkbox"/> Extract from the Commercial Register				
<input type="checkbox"/> Extract from the Trade Register				
<input type="checkbox"/> Certificate of the VAT number				
<input type="checkbox"/> Framework Contract				
<input type="checkbox"/> Method of reinsurance (if any) →	vybrat ze seznamu			
<input type="checkbox"/> Credit report				
<b>Date</b>				
<b>Salesman signature</b>				
<b>Sales or Financial Director signature</b>		Date:	# Maturity > 60 days, both signature necessary	Date:
		Sales Director signature		Financial Director signature

### Appendix I: Customer Card, Invoice Address

(Source: De Heus, 2022)

	<h2>Customer Card - Delivery Address</h2>		
<b>Customer Name</b>			
<b>Delivery Address</b>			
<b>ERP Number</b>		<b>Factory:</b>	Marefy
<input type="checkbox"/> E-Delivery Note	email:	<input type="checkbox"/> E - Order Confirmation	email:
<input type="checkbox"/> Order Departure SMS	mobil:	<b>Default Packaging</b>	
<b>Latitude</b>		<b>Longitude</b>	
<b>Travel time - Marefy</b>		Distance from Marefy (km)	
<b>Travel time - Běstovice</b>		Distance from Běstovice (km)	
<b>Travel time - Kendice</b>		Distance from Kendice (km)	
<b>Discount Zone</b>	Zvolte položku.	<b>Opening Hours</b>	neupřesněno
<b>Requirements / limitations</b>	<input type="checkbox"/> hydraulické čelo	<input type="checkbox"/> natáčecí náprava, kratší cisterna	<input type="checkbox"/> sypat (nefoukat)
	<input type="checkbox"/> vozidlo se zadním vyprazdňováním	<input type="checkbox"/> vyšší podvozek	<input type="checkbox"/> ne vany
	<input type="checkbox"/> jen cisterny nebo vany	<input type="checkbox"/> jen externí doprava (ne De Heus)	<input type="checkbox"/> vše mimo auta Vapasu
	<input type="checkbox"/> ne Nijhof (platí pro všechny CZ a Sk zákazníky)	<input type="checkbox"/> .....	<input type="checkbox"/> .....
	Other - write down		
		<b>Date</b>	

Appendix II: Customer Card, Delivery Address

(Source: De Heus, 2022)