Graduation Thesis

Project Name: Develop & Improve Current File Storing System and Process

Company Name	ICL Amfert		
Project Name:	Develop & Improve Current File Storing System and Process		
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Summary

This thesis document is aimed at the development and implementation of a new storage system and process within several departments operating in the ICL Amfert facility. The departments are currently storing their data in two hard drives and wanted to migrate their information in a SharePoint environment because they are starting to experience more and more problems and issues with their everyday use and reliability of the current storage system and process. The main problems are the lack of structure within the department's workspace and lack of standardization and organization of files, file names, and ways of work, and the current method of sharing files and documents through communication channels is very time-consuming and unreliable.

To tackle these issues I performed research, literature study, and analysis on file naming, structure, sharing, and change management for the new environment and collected and analyzed all relevant and necessary information about the departments and their data storage and usage. Furthermore, I developed a change management strategy & framework which supports the change process and the employees' integration by applying the relevant change approaches and steps and activities from the Implementation plan. The change management strategies and approaches ensure the successful implementation and integration of the change by following the established data structure, applying and regulating the use and application of the rules and guidelines, and minimizing or eliminating doubts and concerns of employees.

The results from all the research, methodology, and analysis is a final complete data model and structure for each department that is based on all the information collected and analyzed beforehand. To ensure and further improve the correct and accurate use of the data model, the departments are trained and informed of the rules & guidelines of the system and supported by the change management strategies and approaches that promote and explain the reasoning and benefits behind the changes. In conclusion, the data model and manuals represent the development of the new storage system and introduced standardization, consistency, and reliability within and across the departments.

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1. Introduction

ICL Amfert is an old fertilizer plant and for over 100 years fertilizers have been produced at this location in Amsterdam. Throughout all these years the company accumulated a lot of documents, reports, files, etc. which were stored in hardcopy in their archives. Later all these documents were digitized and stored on external hard drives. After years of accumulating data and files they decided to improve the way they store and manage their data and documents. ICL would like to introduce and implement a clear process, model, and structure on how and where they store all of their files, reports, documents, etc. They are planning to implement this new process and model with the migration of all of their information to a SharePoint environment from the external hard drives.

This process involves and affects the HSE, Maintenance, Laboratory, HR, and Finance departments operating within ICL Amfert. Within this document the analyses, methodologies, strategies applied and advised surrounding the change of file storing system and process.

Reading Guide for the document and its chapters:

- ➔ Chapter 1 - Business Understanding
  - The current situation is identified and outlined, followed by the problem statement and its research questions. The desired future situation is also explained through deliverables and outcomes, but limited and specified by the project scope and constraints.
- ➔ Chapter 2 - Organizational Context
  - Within this chapter the company, its context and culture is described and explained.
- ➔ Chapter 3 - Theoretical Framework
  - In this chapter the related theoretical frameworks relating to project and change management are described and discussed with their application within the project.

- ➔ Chapter 4 - Methods of Research
  - ◆ In this chapter the research questions are further explained and supported with relevant research methodologies that can be applied to successfully produce the necessary deliverables and products.
- ➔ Chapter 5 - Results
  - ◆ In the results chapter all of the subquestion results and products are explained and analyzed in detail. All relevant descriptions, figures, tables, and deliverables are included.
- ➔ Chapter 6 - Conclusion & Advice
  - ◆ In this chapter the conclusion, recommendations, and discussion are explained. The conclusion is based on the subquestion results from the previous chapter and the advice is the recommendations and discussion afterwards which provide guidance and feedback for the future of the project and its implementation.
- ➔ Chapter 7 - Sources & References
  - ◆ This chapter contains all of the sources, tables, references used in this project.

Chapter 1 Business Understanding

2. Problem Analysis

2.1 Problem Description & Current Situation

The departments within the ICL Amfert facility (HSE, Maintenance, Laboratory, Finance, HR) have been experiencing problems and issues with their way of storing and using their data (files and folders). Currently the departments store their information within two hard drives - *Global* and *Department*. Each department has its own workspace (consisting of one or more root folders) within these two hard drives and stores information about their processes, reporting, documentation, laws & regulations, communication files, and other everyday usage of files. The departments have been experiencing loss of data, troubles finding specific files/documents and using the system in general for the intended purpose of storing their information. These issues have been affecting their everyday usage for a long time and its effects are getting more and more noticeable with time passing [Appendix E].

Within the departments workspaces there is no established organized model and structure for storing the relevant information and consequently there is no standardization and guidelines of file naming, managing, and control. Every employee from the departments has their own way and process of using the storage system which leads to many problems such as inconsistency and unreliability of file naming and versioning, difficulty in using the stored information by new and current employees, security and stability of stored data and files, and slowing down of productivity and efficiency of storage system because of hard-to-find or sometimes even lost documents or files. Also, sharing and/or providing access to files takes a long time since it relies on online communication which is unreliable, inconsistent, and slow. These issues can be crucial because they involve and affect important documents and processes related to the facility's license to operate, following of laws, regulations & standards, and other important documents involving the government or other important organizations/institutions. The effects of that can lead up to stoppage of the facility's production and operation due to not being able to provide the necessary documents and reports [Appendix E].

2.2 Problem Statement

Ideally the storage system and process used and managed by the employees within the departments (HSE, Maintenance, Laboratory, HR, Finance) has an established organized and clear data model and structure, followed by applied rules and guidelines on storage system use (file naming, versioning, sharing, giving access).

However, in reality everybody has their own way of using, storing, and managing files and information within their department and the current storage “structure” and processes were created on the spot based on need or necessity. Currently there is a lot of information everywhere and it is not unusual for a file or document to take a long time to be found, received access, or sometimes even gets lost within the pool of folders and files.

Therefore, the departments suffer consequences due to the lack of standardization and organization in their storage system and process. These consequences lead to a decrease in productivity and efficiency of the storage system and process, wasted time & loss of data, access issues, and trouble reporting to the government and other institutions/organizations which can be critical to the production process.

So to tackle these issues I will determine the current usage and storage of data, establish an organized data model and structure that will suit the departments’ needs and uses, accompanied by rules and guidelines on how to use the storage system and files within. This will introduce standardization and organization of the ways of working and interacting with the storage system in order to increase productivity, efficiency, consistency, reliability, and security.

3. Main Question & Sub Questions

Main Question: *How to develop and implement a new information storing system and process in order to improve document storage efficiency, consistency, and reliability?*
The departments are lacking organization, standardization and structure within their information storage workspaces which leads to many difficulties with the usage of the system and process and it actually providing benefits to the employees involved and their processes and activities.

Sub Questions:

1. *What is the current usage and storage of information and what is its importance?*

This will provide me with an understanding of what the department is currently storing as information in the hard drives, and how its related to their processes and activities. Furthermore, it will show me what files are currently active, and/or important. This is related because it gives a base of what has been accumulated and is currently happening with the files within the storage system and process

2. *What problems are the departments experiencing with the current file storing system and process?*

The context of the subquestion is to collect and define all problems and issues the departments have encountered or observed with the current storage system and process. This will help me identify key existing issues from the system user in order to understand the problems affecting the system that will need improvement and development in the proposed change.

3. *What are the requirements and needs of the departments for the desired solution?*

This subquestion will contribute to the main one with defining and prioritizing the requirements that the departments have and seem lacking from the current system and fit their uses and needs for the future system. Understanding the departments needs, uses, and requirements of and for the storage system will be key to designing the implementation plan through prioritization.

4. *What is the best design of a data file system that would support the needs and uses?*

In this subquestion the formation of the data model & structure and system design and guidelines will be explained. This covers how the research and data analysis done was used,

and applied to help build and formulate the data model. This model is important since it covers all of the information gathered and analyzed from before and compiled into a data structure that follows the requirements and satisfies the needs and uses of the departments.

5. *How can the design be implemented and integrated within ICL Amfert by applying change management strategies & methodology?*

This subquestion will help with defining and applying the change management strategy and framework accompanied by the relevant change approaches. Since the new storage system and process are a change of the way employees work (store and manage information), it is a necessity to use and apply change management techniques in order to manage the change, control the resistance, and ensure successful implementation and integration. This will be followed by a description of the implementation plan accompanied by the relevant change management techniques and finalized data model. This chapter will provide an understanding of what and how needs to be done in order for the created storage structure and process to be integrated within the company culture.

4. Project Goals

In order to describe, support, and validate the project's goals I will be applying the SMART methodology which helps with identifying, clarifying, and validating the goals [23].

The main goal of the project is to establish and implement an official organized and standardized information storage system structure for the departments involved. This will be validated through the data model & structure and implementation plan. This goal is achievable because for this goal's completion all necessary information and resources from the storage system and departments are available and can be gathered through analyses and communication. This goal is relevant because it solves the main problems the departments were experiencing such as no standardized and consistent way of storing and using their information, losing or not finding documents, and introduces an organized way of working that will be consistent and reliable. The realisation of this goal is within the project's time constraints and will be the first step into the change of the storage system and process.

The second goal of the project is to accompany the data structure and model with necessary rules and guidelines on the use of the new storage system and process for the departments. This goal will be supported and represented by the data management plan and other trainings and manuals that will describe and guide employees in the information storage system and process. This includes file naming, versioning, sharing and providing access which is relevant because it will solve several problems such as the lack of consistency and standardization, clear file use, management, and control, and will increase the productivity, speed, and efficiency of the employees usage of the storage system and process. This goal is achievable within the time frame of the project because research and testing can be done in order to determine and finalize all of the manuals, rules, and guidelines.

The third goal of the project is to establish and start implementing a change management strategy and framework accompanied by change approaches that will help guide and manage the change process and support the employees during it. It will be validated through the change management strategy and framework chapter where all applied and relevant approaches and techniques are contained and through the implementation plan which will provide insight and advice into how to further control and manage the change with the change management

strategy. This goal is relevant because it is beneficial and responsible for guiding and managing the change process and providing support and clarity to the stakeholders involved. The goal is achievable within the time frame since the change management strategy and framework guides and supports the implementation of the new data model and structure and the accompanying training and guidelines.

5. Deliverables & Outcomes

In this chapter I will describe and list all the relevant deliverables and explain their outcomes.

- ➔ Official data model & structure for all departments involved (HSE, Maintenance, Laboratory, HR, Finance)

This deliverable is very important because it will introduce clarity, consistency, organization within the departments' workspaces. Furthermore, through that it will improve the efficiency, speed, and productivity of the departments' processes and activities. Employees will have a clear structured way of storing and using their information. From the continuous use of the data model and structure the reliability and security of the system will also improve because employees will be more used to it, start adapting themselves and their activities to it and thus making the system more complete and secure in terms of access or loss of data.

- ➔ Data Management Plan - Official rules & guidelines on file naming and versioning that is applicable for all departments

This deliverable will consist of rules and guidelines on how to use and properly store information within the data model & structure. This includes the determined naming convention which explains how to properly name files and use versions supported by reasons and benefits for these rules and the change to further convince and support the employees involved in the change process. The data management plan will help by introducing standardization and clarity in the file titles which in turn benefits the employees by improving the efficiency, speed, and reliability of how files are named and stored. This would lead to an increase in productivity since employees are aware where their files are and how they are named to be able to find and use them.

➔ Manual and guidelines about storage system use and control

This document will consist and describe the intended usage of the new storage system and process and how to control and manage access within. This will help all employees (no matter technical ability) have an understanding of how to use the new storage system and process and how to be able to share and set up access for the relevant people/groups. This document will be beneficial to establishing and guiding the employees and helping them adapt to the new system and process.

➔ Data Analysis document for each department

The data analysis document will contain a list and overview of the information the department currently stores within its workspace. The aim and outcome of this document is to establish an overview of the information stored that can be used as a base to identify information duplicates, adjustments, combinations, improvements that can and will affect the data model and structure.

➔ Implementation Plan of technical solutions accompanied by the change management framework

This will consist of a defined change management strategy and framework for each department that is relevant to its needs. The change management strategy and framework will be used to guide and manage the change process, but also set the base for the implementation plan. The Implementation plan will explain how to successfully implement and integrate the desired change process into the departments.

6. Project Scope & Constraints

Project Scope

- The folder and file structure and model will affect departments operating within the ICL Amfert facility.
    - Departments: Maintenance, HSE (Health, Safety, Environment), Finance, Laboratory, HR
- The General hard drive will be ignored since it doesn't store necessary, needed or current information.
    - Therefore, the analysis, structure, and model will be determined from the Global and Department hard drives.
- Departments store data & information within other cloud and web-based platforms, but only data and information stored within the hard drives will be taken into consideration for this project
- The new structure and model will be applied and implemented in a Microsoft SharePoint environment that has been created for the end solution of this project.
    - The departments have decided and already created a sample and empty SharePoint environment with the intended use of migrating the data there
- A new way/method of file and information storing and maintaining will be applied in the related departments and taught to the employees to make sure everyone adheres to the instructions, rules, standardization of the model.

Project Constraints

- Limited to using software and applications already in use in the company
    - Microsoft Suite & Apps (SharePoint, OneDrive, Office, Teams)
- Not being able to open and access certain files / folders that are locked for me
    - Therefore, only folders I have access to will be used for the data analysis, structure, and migration.
- Most of the files (documents, reports, data, etc.) are in Dutch, hence for my use I will be translating them in English. However, for the application of the new system in the company it will be in Dutch because most employees are Dutch speaking and it will be more efficient and comfortable for them to use.

- The time limit of the internship and project to fulfill all necessary requirements (new data system and process for all departments involved).

7. Stakeholder Analysis

The main stakeholder of this project is the company (ICL), however the main actors and people involved are the several departments that operate in the ICL Amfert facility. In the table below the list, description, and communication frequency with the related parties is explained in detail.

Stakeholder(s)	Description	Communication
ICL Fertilizers/Amfert	company where project is carried out at	-
Departments within ICL Amfert	Maintenance - manager Nicole Kommer, HSE - manager Bo Ridder Finance - manager Tim Ligthart Laboratory & QA - manager Enzo Buscemi HR - manager Anita van Geffen	3 Interviews of each department Minimum meeting every 2-3 weeks to communicate progress, feedback, ideas
Bo Ridder	company supervisor for internship, HSE Manager	Minimum Weekly Meeting
Martin Wesselink	internship supervisor from Saxion University	Minimum Monthly Meeting

Table 1. Stakeholder description and communication

After understanding the parties involved in the project I performed a stakeholder analysis using the power/interest grid method in order to prioritize them based on their power within the facility, interest in the project. The departments' position in the grid determined the necessary actions that had to be taken with them [24]. The position of the departments on the grid was determined by using the ICL Amfert facility organogram and the information collected from the initial interviews about the departments' processes, responsibilities, and current problems because this is all relevant information for this project [Appendix D] [Appendix E]. Based on that the departments' requirements and needs can later be assessed and prioritized. Below is the figure

and explanation of the departments and their prioritization and location in the power/interest grid.

The departments are mostly equal in power with the only exception of the Laboratory & Quality Assurance department. The Finance and HR department don't have as much power or interest in this project because their operations and functions are not only towards the ICL Amfert facility but also ICL Europe or ICL Global. The HSE and Maintenance departments have the highest interest because they have the biggest amount of files that are necessary to continue their everyday operations in the facility and comply with laws, regulations, and audits.

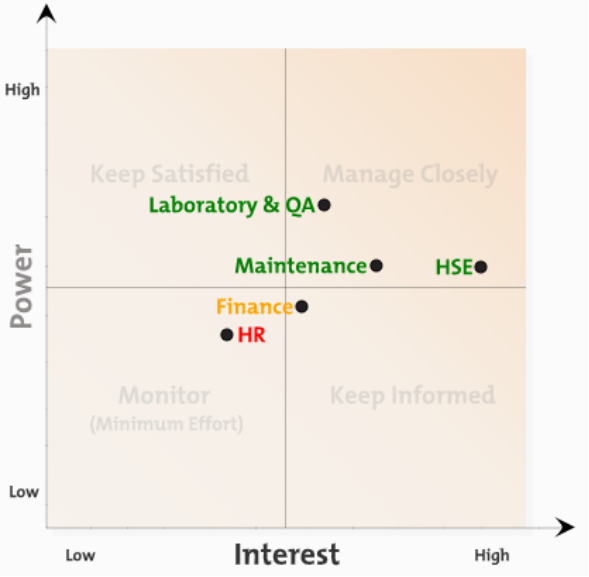


Figure 1. Department Power/Interest Grid

- Manage Closely - high power, high interest
  - Must be fully engaged with and make sure their requirements and needs are met
    - HSE department - medium power, high interest because in control and responsible for many safety documents, as well as licenses to operate which are critical for the facility's operation
    - Laboratory & QA - high power, medium interest because in control and responsible for laboratory regulations and quality assurance of projects and procedures which are important for higher management
    - Maintenance - medium power, high interest because in control and responsible for installations, work instructions, projects and procedures which are vital for the everyday operations of the facility and its workers
- Keep Informed - low power, high interest
  - Inform these people on developments and progress on project
  - Through these discussions helpful and important feedback or details can be obtained

        - Finance - medium power, medium interest because not necessarily many files, but responsibility and necessary access to other departments' information for management reports and summaries
- Monitor - low power, low interest
    - Monitor and inform about project, however don't bore or take unnecessary time
        - HR - medium power, low-medium interest because not many files that are relevant to ICL Amfert, but needs visibility and ability to share to other departments

8. Project Tools

- Assignment Tools
    - File Explorer - this tool will be used to analyse and use the current file system and to transfer from to the desired environment
    - Microsoft SharePoint environment - this is the desired environment where the desired solution must be deployed
    - Microsoft Office (Excel, Word, PowerPoint, Outlook) - these tools will be used to access all necessary files to establish understanding of all data. Furthermore, the training, instruction manual, and support will be provided and distributed to employees using those tools.

- Communication Tools
    - Microsoft Teams - for formal and informal communication with supervisors and departments involved
    - Outlook - for formal communication and news within the organization
    - WhatsApp - for informal communication in case of an incident, emergency, etc

Chapter 2 Organizational Context

9. History & Markets

ICL Group is a worldwide manufacturer of unique mineral products in agriculture, food, and engineered materials. It has 42 production sites worldwide, 30 logistics & sales services in over 30 countries, and over 11 thousand full time employees [1]. ICL produces a third of the world's bromine, is the sixth biggest potash producer in the world, and in the top providers of pure phosphoric acid. People in more than 180 countries eat healthier and better-quality food because of the fertilizers that ICL produces. The food additives contribute to broader access to higher quality and variety of food. Potash and phosphate products are vital in the pharmaceutical industry. The bromine-based materials and phosphates help for a more energy efficient and environmentally friendly planet. ICL Group has expanded and grown a lot over the years and has engaged all types of markets such as agriculture, food, transportation, health and personal care, electronics, building and construction, energy, and textile [7] [28].

ICL is the world's leading fertilizer manufacturer and has production facilities all around the world. ICL Fertilizers/Amfert is responsible for the agriculture branch. It provides farmers, growers, manufacturers with a wide variety of high-performance agriculture solutions such as potash, polysulphide, phosphoric acid, specialty fertilizers, phosphate rock, compound fertilizers, and animal feed additives. These products help farmers with vital nutrients necessary to increase yield and improve the quality of crops [28]. The ICL Amfert facility located in Amsterdam has been at that site since 1907, however under the name of "Amsterdamsche Superphosphate Factory". This facility is responsible for the production of around 500,000 tonnes of fertilizers every year. Within the facility many minerals and materials are being processed such as phosphoric acids, polysulphides, regular and mineral fertilizers [6] [15].

10. Vision & Mission

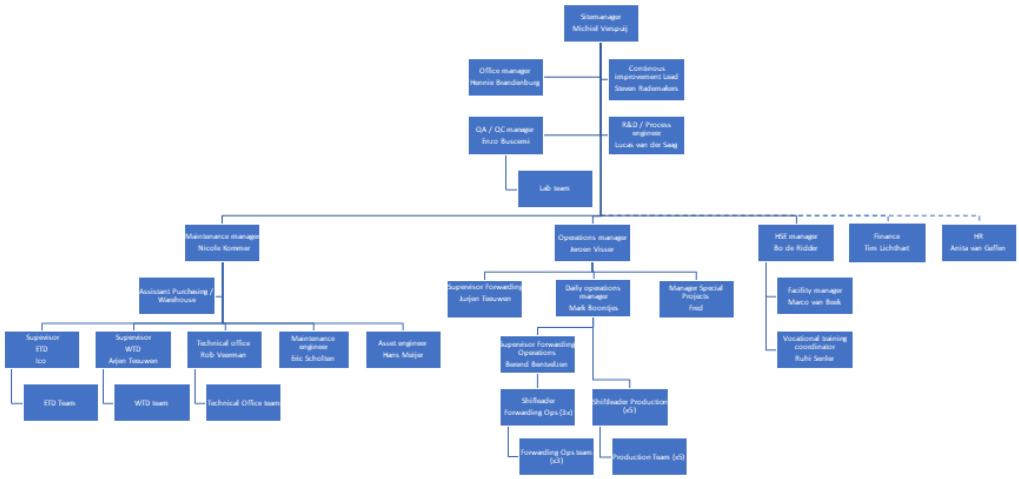
ICL's mission statement: "*ICL is committed to eliminating EHS&S incidents and complying with all regulatory requirements, by taking a proactive approach that empowers employees to identify at-risk conditions and behaviors and learn from them to minimize risk.*" [10]

It is a dedication towards solving and eliminating any Environment, Health, Safety, and Security incidents and occurrences and are the core values of ICL. This includes focus on ensuring employee health and safety, protection of the environment in which ICL operates, and compliance with all regulations, laws, and requirements. ICL's mission statement about the EHS&S policy is also correlated with their vision and set goals for their contribution to worldwide sustainability and sustainable development. ICL's vision for sustainability is set till 2030 and consists of decreasing greenhouse gases emissions, increasing renewable energy use, more discussion and transparency with the public and environmental organizations, and procuring sustainability assessments with suppliers [1] [30].

11. Culture & Departments

The company has around 11 000 employees around the globe [1]. In the location where the internship will be carried out (Amsterdam, ICL Fertilizers/Amfert) consists of 114 employees. I will be part of the HSE department working in close cooperation with different departments such as Maintenance, HSE, Finance, Laboratory, HR. The culture at the Amfert facility is welcoming and motivating, emphasizes on safety and environmental concerns, promotes innovation and knowledge. Due to the 100 year old history of the Amfert site and its location it consists of mostly primarily Dutch-speaking employees, however that didn't have an impact on communication, participation, and efficiency of the project and its progress [Appendix E - 24].

In the diagram the different actors and departments operating at the Amfert facility are visualized. Throughout the project I will be engaging with the HSE, Maintenance, Laboratory, HR, Finance and their managers to communicate and progress on the project. In terms of reporting, the office manager and site manager are the highest in responsibility and in control of the facility and therefore this project.



Appendix D 1. ICL Amfert facility departments diagram

Chapter 3 Theoretical Framework

12. Literature Study

12.1 File Naming & Structure

From my online research on file naming and structure I will be using and applying frameworks established by universities through case studies and field research. I will be using and taking into consideration Stanford, Princeton, and Pennsylvania universities research and framework to determine file naming, versioning, and structure [2] [5] [18].

These sources contain information on how to determine file naming structure and guidelines on how to properly name files and folders for most efficient use and functionality. This includes date, character type & use guidelines which would help formulate a Data Management Plan. This document should contain and establish the desired rules and guidelines on how to name files/folders and follow the data structure and the explanation and reasons behind these rules.

Summary of findings and results from the research:

- ➔ Keep file name within 30 characters
  - ◆ Not a MUST follow rule, but more user-friendly to use and differentiate for user and 3rd-party software
- ➔ Use date format ISO 8601: YYYY-MM-DD
  - ◆ Worldwide established standard, useful for sorting, ordering, and filtering
- ➔ Never use special characters or spaces in file names
  - ◆ Special characters: ~ ! @ # $ % ^ & * ( ) ` ; < > ? , [ ] { } ‘ “ |
  - ◆ Most of the characters have a special function or meaning within the Windows system and therefore must be avoided to ensure no errors occur; they are also usually not recognized by 3rd-party software
  - ◆ Spaces can also be not recognized by 3rd-party software, removing them also saves space; spaces add the “%20” in file names on the web and it can make it harder to use and manage
- ➔ Use capitals and underscores instead of spaces in file names
  - ◆ More user-friendly, recognizable by user, system & software
  - ◆ Useful for sorting and filtering
- ➔ Never use non-English characters in file names
  - ◆ They are most likely not going to be recognized by the host system and by 3rd-party software
  - ◆ Generally, must be avoided since they are not user-friendly and make it harder to sort and filter
- ➔ Use Version number in file names
  - ◆ Helps differentiate past and current versions of documents
- ➔ Don’t use abbreviations in folder names
  - ◆ Folders are usually the identifier for what content will be inside
  - ◆ This is also beneficial to new users using the new structure/system

This research is very beneficial, useful, and relevant to the project because it will help with determining a general storage system use. This includes the determination and structure of the data model and introducing standardization, consistency, and reliability by implementing a document naming convention. Therefore, a Data Management Plan will be designed and used

as guidelines and explanation for the way and method of naming documents and using versions. These guidelines will be helpful in tackling the problem of having no consistency and order as it is currently in the current storage system and process. The Data Management Plan will consist of the rules and guidelines for file naming and versioning and the reasons and benefits behind them in order to further solidate and motivate employees to follow and adapt to these guidelines to start benefiting from them.

12.2 SharePoint Research

12.2.1 File Explorer Synchronization

SharePoint and OneDrive environments have the ability to be synchronized and therefore allow you to view your files and folders from the SharePoint environment in File Explorer. This ability allows for further functionality and use of files and folders. In the SharePoint document environment you synchronize the whole Document environment with OneDrive which lets you also use and manage all files and folders within the environment using the normal File Explorer. Therefore, any files or folders created/modified/deleted/etc will be the same in both the SharePoint environment and the OneDrive folder on the computer [3] [25].

The syncing functionality will be very useful because it will allow dual use of the same document system. For example some employees are more comfortable using the File Explorer which will still be possible. Normal everyday use and managing of files and folders can be done through the File Explorer and for further functionality of access, sharing, use will be done through the SharePoint environment.

12.2.2 Sharing & Access

SharePoint has two functionalities for document collaboration - link sharing and access management. Link sharing is useful when the purpose is short-term collaboration or access to specific people or a group of people. The link can be sent through the SharePoint document environment and emailed through Outlook or copied and sent through other communication channels. Access management is more useful for longer-term collaboration or access to specific people or groups of people. Managing access can be done from the SharePoint document environment and can be done for both folders and files [20] [21].

Understanding the ability and way of setting up access and sharing for files and folders will be beneficial to the creation of the desired storage system and process. This research will help with tackling the problem of eliminating the need to search and wait for people to provide you access to a file or folder. The SharePoint environment provides the functionality of providing a fast and easy way to share files or folders if necessary and set up long-term access to other people and departments.

12.3 File Detail Columns

A consequence of the synchronization between the SharePoint document library and File Explorer is the translation and synchronization of file detail columns. Both document environments have the ability to manage and control the columns that describe the files and folders. These columns usually contain relevant information and data about the specific file or folder since its creation [4] [11].

This can be very useful in terms of further describing, sorting, and filtering files and folders. It allows for more space in the file/folder title to be used for its description and identification. This character space can be freed from automatically created and tracked columns such as dates, author, file type, and size. Furthermore, columns can be used as labels for a more advanced way of sorting and filtering files.

12.4 Change Management Research

12.4.1 Lewin’s Change Management Model

This model is very useful and beneficial to use when changing and/or recreating a business process. The problem and its consequences with the current storage system and process are identified and this model is useful in helping and managing change. The model splits the process into three stages - Unfreeze, Make changes, Refreeze. In the Unfreeze stage the current process is analyzed and a need for change and strong support for change is created among the parties involved. In the Make changes stage the change is deployed and implemented. Strong communication, education, and support must be provided to the stakeholders to limit any concerns and/or difficulties with the change. In the Refreeze stage the

change(s) are anchored and ways to manage and sustain the change are developed and implemented through support and training [9] [13].

This model is relevant and useful for this project because it provides a framework around which to manage and sustain the proposed change (business process of storing and managing data). The three stages allow the change to be smoothly implemented with the support and involvement of stakeholders.

In the first stage, Unfreeze, the current process and ways of things being done is established and analyzed. This helps understand what is currently happening with the file storage system and process. Based on the current situation analysis it is better known what and why needs to change. Furthermore, the current information and analysis will be used for the storage system model and structure later on. By communicating and educating the departments about the change and how I am planning and progressing on the change process, the initial resistance (consisting of doubts, concerns, distrust) to the change is eliminated because employees are aware of the change happening, are directly involved with the change process, and have the possibility to express their opinions and suggestions.

Afterwards, in the Make changes stage the information and analysis done in the previous stage is used and applied. In this stage the desired changes are deployed alongside good communication and support to ensure its success. The employees can still voice their suggestions, opinions, doubts, and concerns which stimulate their involvement and interest in the project and its success. The agreed storage system structure is implemented within the desired environment in order for it to be established and any final changes and adjustments can be done before the data migration.

Finally in the Refreeze stage the change is implemented and for the employees to adapt their way of work and integrate it with the new storage system and process. To ensure the success of the change's implementation and turning it into a new habit for the departments, training and guidelines need to be set up to support and guide the employees. Regular checks and control over the new system and process need to be performed as well to make sure employees are complying with the set rules and guidelines for the storage system.

12.4.2 ADKAR Model

This model is a bottom-up method which focuses on the people involved in the change. It is used to set goals - Awareness, Desire, Knowledge, Ability, and Reinforcement. By completing each goal the change is more effective to plan, implement, and sustain. These goals consist of making the employees aware of the change and the reasons behind it, creating desire among the employees in favor of change, teaching and supporting employees of the change and its consequences, transforming the employees knowledge into ability to complete change, and making the change permanent via maintaining, supporting, and rewarding [13] [29].

In the table below the stages of the ADKAR model are described more in-detail with relevant substeps and activities surrounding them.

ADKAR model	Description
Awareness	This stage is all about the departments and their employees being aware of the change and understanding the reasons and benefits behind it. - Explanation & reasons behind change, process and progress of change, involvement in change process - Through frequent communication consisting of meetings and discussions
Desire	In this stage you are supposed to get the employees on your side to ensure their total commitment and desire to the change - Promotion of reasons & benefits of change, prototypes & examples, involve employees by asking for suggestions & feedback
Knowledge	In this stage all of the departments need to be made aware of the plan of implementation of the change and what their specific role/part in it is - Ensuring departments are aware of what's happening with the change, what's the plan, and what is their role and responsibilities - Through frequent communication informing about the process and progress of change and surrounding activities - Presentation of implementation plan and specific roles and

	responsibilities everybody has
Ability	In this stage it is important to understand and assess the department's employees ability to understand and reliably use the new storage system and process. Based on that ability assessment, necessary steps such as training, manuals can be taken to be able to make sure everyone can use the system comfortably and reliably. - Understanding of abilities of departments involved - Design of rules and guidelines usable and available to everybody to provide the necessary steps to learn and adapt to the change
Reinforcement	In this stage it is important to make sure the change is followed, managed, and maintained in order to become the new norm and standard - Implementation of trainings, manuals, rules & guidelines to standardize and ensure everybody is following one method - Ensure the implementation of rules by performing regular checks and communication in case of errors

Table 2. ADKAR model stages and description

This model is very useful for the project because it is aimed at the people involved and empowering them through set goals. By achieving these goals the change is easier to implement since it happens with the support, knowledge, and help from the stakeholders. Progressing through the stages the necessary analysis and understanding is established for the change which is implemented and standardized through official rules & guidelines which are designed to be used by everybody and thoroughly communicated throughout the change process. This is a smooth way to implement the change since employees will embrace it through involvement and make it their habit.

12.4.3 PDCA-cycle

This model is used for process control and represents a loop which helps monitor and evaluate if the desired result is achieved. In the Planning part the desired output is agreed upon and contains what results need to be achieved and how. In the Do stage the approved plan from before is implemented and consists of operational activities. The Check stage compares the actual results with the planned results in the Plan phase. The differences and causes that have occurred are described. In the Act stage necessary adjustments are made if any and new further research/advice for the next PDCA cycle can be developed [14].

The PDCA-cycle is beneficial to the change management strategy and overall approach. It enables careful planning, execution, and checks for a smoothly running process and change. It lets the departments get involved by providing their feedback and suggestions and be aware of the overall process, timeline, and progress of the activity. This framework is relevant and useful since the change is a change of the business process of storing and managing files and data. The PDCA cycle is beneficial to process management and control because every stage is planned and carried out with necessary checks and plans. This cycle also allows for the change to enter a new process loop of continuous improvement.

12.4.4 Kotter & Schlesinger Six Change Approaches

This model consists of six change approaches used to support the change process, minimize resistance, resolve doubts and concerns about the change. The six approaches differ in application and therefore in consequences and possible side effects. Furthermore, depending on the change situation, their success and reliability can differ [22]. In the table below the six approaches are listed and explained how they minimize and eliminate resistance.

Change Approach	Description
Education & Communication	Educate and communicate with everybody involved to inform, understand, and prepare for change
Participation & Involvement	To minimize and manage resistance, involvement and participation of parties (most resistant to change) in the design or test process will increase commitment and understanding to the proposed change

Facilitation & Support	Provide people involved with training, education, support for the change to manage and minimize resistance
Negotiation & Agreement	To minimize resistance possible negotiations and agreements with resisting parties can be drawn up and agreed upon
Manipulation & Co-optation	This approach involves using information in selective ways to persuade resisting parties or to involve them in the change management team
Explicit and Implicit Coercion	This method includes threatening team members to accept the change and overcomes all types of resistance

Table 3. List and description of Kotter & Schlesinger Six Change Approaches

However, to apply these change approaches to battle resistance, the resistance should be first identified and defined. People can react to change in different ways varying from happiness and support to denial and withdrawal. Understanding the reaction of resistance of the employees will consequently lead to a better and more appropriate choice in change approach in order to overcome the resistance. There are four common ways people resist change - Parochial self-interest, Misunderstanding and lack of trust, Different assessments, and Low tolerance for change [22]. In the table below the four types of resistance are listed and explained.

Type of Resistance	Description
Parochial Self-Interest	This type of resistance usually occurs when the affected from change feel that they are going to lose something of value through the change process. They are more interested in how this change affects themselves and their activities and not on the success or impact on the organization. This resistance can evolve into finding ways to undermine and stop the change from happening and/or completing.
Misunderstand & Lack of Trust	People can display resistance because of not understanding

	the process of the change itself and/or its consequences, benefits, and reasons. Also, employees can have a lack of trust in their management and/or in the system and process that is being proposed. However, this lack of trust can be used in order to improve the change and its process.
Different Assessments	Employees can also have different opinions, vision, and assessment of the change. They might see more costs, time-consuming work, and no benefits or reasons in the change. This type of resistance can be used as an advantage because through their resistance employees might make very relevant and unforeseen issues or suggestions that can help with the success of the change.
Low Tolerance for Change	Some employees have been working in the same way for many years and have developed this way of work as their habit. They fear that due to the proposed change of way of work they will be unable to adapt and learn to the new way. Despite the benefits or reasons for the change, people can display a low tolerance for change due to fear and uncertainty of how the change will affect their way of work.

Table 4. Description of four common types of resistance

The six change approaches are relevant because they are about minimizing resistance to the proposed change. The model proposes six ways of reducing resistance and ways to work with people to successfully implement the change which will definitely be beneficial while implementing the change and managing the people. Furthermore, before the change approach is determined the types of resistance displayed by employees is identified in order to be able to choose a suitable and fit change approach. This will help throughout the project because it will identify resistance and allow for the choice of the best change approach to minimize it.

12.4.5 Kubler-Ross Change Curve

This model helps with understanding how the people involved are emotionally experiencing and feeling about the change. People are used to their current routines and ways of work, so when change comes people can resist because they feel threatened. The change curve consists of four stages and seven emotions which describe the emotional journey employees go through during change [26] [27]. In the table below the list and explanation of the seven stages of the change curve is described.

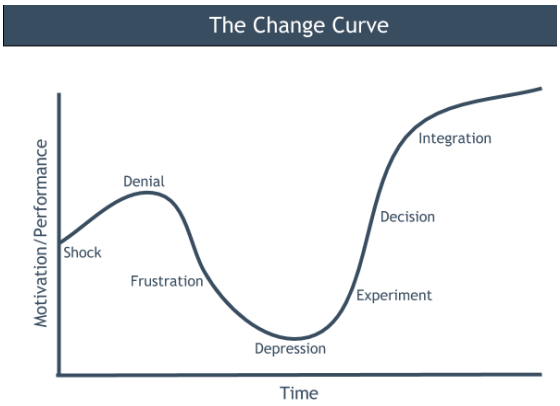


Figure 2. Change Curve Chart

Change Curve Stages	Description
1. Status Quo	1.1 Shock - The initial shock of understanding about the change. 1.2 Denial - Opinion of change isn't relevant and/or necessary
2. Disruption	2.1 Frustration - Not allowing the change to happen 2.2 Depression - The inefficient and result-less block of change decreases the resistant parties confidence
3. Exploration	3.1 Experimentation - Accept change is happening no matter what and start working on designs, scenarios, etc 3.2 Decisions - Feeling positive about the future, making decisions on functionality and what works
4. Rebuilding	4.1 Integrations - What was once a change and considered new is now the way of work

Table 5. Description of 7 Stages of Change Curve

This model is also relevant and useful for this project because it allows us to see the perspective of the employees that are getting affected by the change. The change provides an overview of the common and general journey an employee takes during change. By understanding their experience and feelings throughout the change better approaches to minimize resistance and increase support and positive reinforcement for the change.

Chapter 4 Methods of Research

13. Sub Question Approach & Methodology

All of the sub questions need to be analyzed and answered to successfully contribute and answer the main question. To be able to answer the sub questions in an accurate and efficient manner a specific approach needs to be designed and implemented. For the formulation of the approach I will be using and applying the ICT research methods to answer and support the sub questions which will consequently answer the main question. The sub question chapters are separated and consist of descriptions of approach, research methods used, and relevant products [12].

13.1 What is the current usage and storage of information and what is its importance?

This sub question is important and vital to the understanding and success of the project. It will establish a current understanding of the departments' purpose of use and what data is stored and managed. All of this information needs to be gathered from the departments themselves, therefore interviews will be set up with the heads of the departments.

The interview is a good and efficient method to introduce the project and consequently ask and collect the relevant and necessary information. These initial interviews with the departments will be organized at the start of the project through online video meetings. The questions from these interviews will be related and aimed towards what the departments current processes are, their document workspaces, and current usage of storage system. The information collected from the interviews will be used to establish an understanding of what the departments do with the

storage system to support their processes and activities and the location of their workspace where they store their information and documents. This method is valid and reliable because the heads of the departments will provide me with the best insight into their processes and workspaces and how they use and manage their data.

Through observation, data analytics, and analysis on the available documents a data analysis on the current stored information can be determined. These methods will provide an overview of all the information currently being stored by the departments which will help with clarity and transparency on the current storage system and process. These methods will be applied based on the results from the initial interviews. Therefore, a deep-dive in the workspaces of the departments is done to create an overview of all the information stored which will result in a data analysis document containing a detailed list of data stored. These methods are valid and reliable because I will be able to see and look through all the information and its structure without any prejudice, feelings, or opinions. This would provide for a better analysis on the structure and content of what is being currently stored by the departments.

Through peer review and task analysis the importance, use, and status of the documents can be determined. The peer review consists of a discussion meeting where the data analysis document is discussed. The task analysis is done and taken into consideration based on the information collected from the initial interview about the department's processes and activities. This will result in understanding of the importance, use, and status of the documents stored which will be useful later on for determining and building the data model and structure.

Research Methods	Interviews, Observation, Available Document analysis, Data Analytics, Peer review, Task analysis
Products	Understanding of usage of storage system and process, Data Analysis on current stored information (overview and importance of files and folders)

13.2 What problems are the departments experiencing with the current file storing system and process?

To be able to establish a complete understanding of the problems and issues surrounding the current storage system and process interviews will be organized with the heads of the departments to gather their encounters and observations of problems with the current document storage system.

The interview is a valid and reliable method to collect the relevant and necessary information from the primary users of the system. These interviews with the departments will be organized after completion of the data analysis part and will be conducted through online video meetings. The interview will be aimed at understanding all types of issues and problems related to the current storage system and process. The results collected from the interviews will be used as the basis of what the current existing issues are and will contribute in identifying the problems and their consequences.

Through all the interviews and observations done so far throughout the project a problem analysis can be performed. This method will help list all the problems and issues with a description, consequences, and effects on departments. The results from this will contribute in determining and formulating the requirements and their priority of the desired solution.

Research Methods	Interviews, Observation, Problem Analysis
Products	Current Problems description, consequences, and effects

13.3 What are the requirements and needs of the departments for the desired solution?

To be able to determine the requirements and needs of the departments, interviews will be organized in order to collect this information and have the ability to prioritize it after. The interview is conducted after the establishment of the current storage situation and problems. From the information collected in the interview a compiled and clear list of the requirements and their description is created.

An exploration of the stakeholder analysis will be done based on the information collected beforehand through observation, interviews, and stakeholder analysis. Through that method the requirements can be prioritized using the MoSCoW methodology. This methodology is a common way of showing and understanding the significance of stakeholder requirements and provides a clear and simple way of separating the necessity and importance of a requirement [31]. This will result in a clear list of the stakeholder requirements, their description and significance regarding the new storage system and process.

Research Methods	Interviews, Observation, Stakeholder analysis, Explore stakeholder requirements, Requirements prioritization (MoSCoW)
Products	Description and prioritization of system & user requirements

13.4 What is the best design of a data file system that would support the needs and uses?

All of the information collection and analysis done beforehand results in a good basis for the determination of the desired design of the storage system and process. However, additional literature study and research of available solutions and practices has to be done to support the validity and reliability of the desired storage model and structure. Through these methods I will be able to apply and translate all the information into a data model and structure accompanied by system design. To make sure all of this research and methods are valid, reliable, and relevant to the project I will create prototypes through testing and through peer review organize feedback meetings with the departments. This will provide me with insight and suggestions from the departments in order to finalize the data model and structure that would fully support and benefit the department and its processes and activities. Furthermore, in these feedback meetings, usability testing will be performed with the heads of the departments of the system design and guidelines. The usability testing will consist of receiving feedback and suggestions on the design and guidelines of file naming, versioning, and use and system testing will consist of prototyping and testing the possible solutions and suggestions. The results from this would be a data model and structure for the departments with a system design consisting of guidelines on file naming, versioning, and use.

Research Methods	Literature study, Best good and bad practices, Community research, Prototyping, Peer review, Usability & System testing
Products	Data Model & Structure, System Design & Use Guidelines

13.5 How can the design be implemented and integrated within ICL Amfert by applying change management strategies & methodology?

Through literature study and all the products up till now a decision has to be made on the change management strategy & framework. It will allow for the implementation and integration of the desired solution in an accessible, secure, and future proof way for all departments involved. The results from the research and literature study will be a list and description of the relevant and applicable change management strategies and approaches for each department. This will be used to select strategy to guide, manage, and control the overall change process of storing and using data and identify, manage, and minimize resistance throughout the change process. Afterwards based on the selected strategies and methodologies from the research, an implementation plan of the change for each department is designed in order to provide a guide and control the change process and its implementation and integration.

Research Methods	Literature study, Best good and bad practices
Products	Departments Change Management Strategy & Framework, Implementation plan

Chapter 5 Results

14. Sub Question Results

14.1 What is the current usage and storage of information and what is its importance?

To be able to establish an understanding of the current usage and storage of information by the departments, individual interviews with the heads of the departments were organized. There is no other more efficient, accurate, and reliable method to acquire this information, but from the departments themselves (primary users of the storage system). The interview's goal was to gather information about the department's processes, activities, and usage of the current storage system. The results from these interviews were used to establish an understanding of the departments themselves and to gather information about the used workspaces where departments store and use their data and documents.

Currently ICL Amfert stores all of its data in 3 hard drives, from which only 2 are active and currently utilized. The two active hard drives are Global and Department. Each department has folder(s) stored within these two HDDs and they access and use their information through the File Explorer application [Appendix E - 24]. In the table below I provided the results from the interviews as a description of the departments and their usage of the storage system.

Department	Description & Use
HSE	The HSE department is responsible for the regulatory processes, procedures, inspections, training, compliance with licences and regulations, hazards recognition, safety, and more. Currently the HSE department stores and uses lots of different files and data around their many processes. However, the most important and recently used and applicable are files related to permits, projects, reports, safety, inspections, licenses, and the PDCA cycle reports. The HSE department stores all of its data in 3 root folders within the Global and Department HDDs [Appendix E - 18].

Maintenance	The Maintenance department is engaged and responsible for many projects, procedures, instructions, checklists and manuals related to all machinery within the ICL Amfert factory. Currently the Maintenance department stores information about installations, instructions, tests, processes, projects, procedures, production stops, planning, and figures & photos. The Maintenance department stores all of its data within 2 main folders in the two hard drives [Appendix E - 7].
Laboratory	The Laboratory department is responsible and involved in all lab-related activities. The head of the department is also the QA Manager which has relevant activities to the Laboratory department. It has an established web-based platform for all measurements, testing data and databases. However, the web platform doesn't store all of the rest of the department's data and files. Those contain files about meetings, reports, EU standards & other legislation, complaints, certificates, and product information and specifications. The Laboratory department uses 3 main folders within the Global hard drive [Appendix E - 1].
HR	The HR department is responsible for operations and processes within the whole ICL Global therefore it has and operates with many other people, departments, and documents outside of the ICL Amfert facility, so for this project only information related to the ICL Amfert facility will be considered. These include training, questionnaires, forms, company policies, rubrics and booklets. The HR department uses 2 main folders in the Global hard drive [Appendix E - 25].
Finance	The Finance department is responsible for gathering data and analyzing it to make management reports and summaries from the gathered data. They produce Excels and PowerPoints on a monthly basis for purchasing, production, inventory, enhancements, personnel, and more. Since the Finance department is also involved in other processes and activities only

	information related to the ICL Amfert facility will be considered. The Finance department has 2 main folders in the two hard drives [Appendix E - 13].

Table 6. Departments description & usage of storage system

After establishing the understanding of the departments processes and activities, the deep-dive into the current workspaces was next. The information was very useful in performing the data analysis and observation on the department workspaces to be able to have an understanding of what was being stored, where, and why. The data analysis of the departments' workspaces consisted of me going through each folder and file and taking note of the file/folder position, last time usage, and relevance to processes & activities. Through observation during the data analysis I could already start noticing information patterns, duplication, and discrepancies. The data analysis separated and covered all folders that were relevant to the departments processes, activities, and usage and provided an understanding of what type of information was stored, in what way, and where. The full in-detail data analyses performed for each department were also attached to the submission of the graduation file [Appendix A]. In the table below the in-detail data analyses of the departments are described consisting of summary and findings for each department.

Department	Data Analysis Summary	Data Analysis Findings

HSE	• 3 Main Folders in 2 Hard Drives
	  ○ Global HDD Folders - HSE Manager, HSE-Manager
	  ○ Department HDD Folder - HSE Manager
	• Main processes/folders/files based on data in all folders
	  ○ Safety documents (reports, incidents, regulations, instructions, acids, emissions, radiation)
	  ○ Inspections (internal, external,
		• The HSE-Manager folder acts as a sort of archive because it contains files and folders from 2018 and before.
		• The HSE Manager folders from the two HDDs are almost the same, however the Global HDD folder is the one currently used and therefore is more complete, current, and relevant.
		• A lot of folders and files' content

	reports) ○ Projects (Amfert facility, Global) ○ Communication files ○ Photos	is relevant to 'Safety', therefore could be combined and ordered ● Many permits, laws, regulations, licenses folders and files ● Many images stored everywhere ● Many old folders and files not ordered or separated
Maintenance	● 2 Main Folders in 2 Hard Drives ● Department HDD Folder - Technical ○ Projects, Procedures, Meetings ○ Inspections, Certificates ○ Work instructions, manuals, safety documents, stops, incidents ○ Checklists, weekly maintenance documents, reports, installations ○ Product & Factory descriptions ○ Outside company contracts and documents ○ SCADA system ○ Drawings, Photos ● Global HDD Folder - Project Commissie ○ Formuliers, Projects, Procedures, Project management report	● Several of the folders within *Technical* belong to the Electrical-Technical Department. ○ Therefore they should be combined within one root ETD folder. ● Many similar files/folders in subject that can be combined ○ Such as checklists, work instructions, inspections & certificates, stops, photos ● Many old folders and files that have not been used for years ● Project Commissie folder is the official folder for reporting and storing official documents about projects, procedures, and a project management report.
Laboratory	● 3 Main Folders in Global HDD ● Main processes/folders/files in folder QAmanager: ○ Certificates, Complaints, EU	● Several folders that are old and unused that will be archived (such as MSDS, Deflagration tests folders)

	legislation & standards, Product specs, Meetings ● Main processes/folders/files in folder Laboratorium: ○ Laws & Legislation, Deflagration tests, Monthly acids reports, other reports ● Folder Project Commissie ○ Project management Excel file	● There is a duplication of the EU standards & legislation files in both *QAmanager* and *Laboratorium* folders ● The inner structure of complaints and product specs is already good (using country or number id) ● Many monthly acids reports (monthly & yearly), therefore should have its own folder
HR	● 2 Main Folders in Global HDD ● Folder HR documenten: ○ Booklets, policies, formuliers, questionnaires ● Folder Handboek Arbeidsregelingen ICL FE CV ○ Rubrics about work rules and guidelines	● Not many files because these are the HR files relevant to the ICL Amfert facility, the rest belong to ICL Europe/Global ● However, for long-term usage, separate folders for policies, forms, questionnaires, agreements should be made
Finance	● 2 Main Folders in Global HDD ○ Project Commissie Folder ○ Controlling folder ■ No access, therefore ignored	● The *Project Commissie* folder is used to find and collect different information and data for the Finance department to produce their reports and analyses.

Table 7. Summary and findings of data analysis from departments' workspaces

Sub Question Conclusion:

The first subquestion is a very important necessary step for the success of the project and the initiation of the change. I separated it into two parts - establishing understanding of the departments and their processes, activities, workspaces and performing data analysis on the provided workspaces to establish an understanding of how and where the data is currently stored. By organizing interviews with the department managers, I gained an understanding of the most important and relevant processes and activities of the department and the workspaces where they store all of their information and documents (Table 6, Table 7). As a result I had a complete overview of the departments processes, activities, and detailed analysis of the folders and files within their workspaces.

14.2 What problems are the departments experiencing with the current file storing system and process?

After having an understanding of what the departments do and what, where, and how they store their data and information to support their processes and activities, it is important to also understand and establish the problems and issues the departments have experienced and observed of the storage system and process. Therefore, I organized an interview with each of the departments through which to collect all of the relevant problem information. In each interview I took notes of the problems and issues the departments had encountered with the storage system which let me be able to compare the results of each department. By comparing the department's problems I found many similarities such as lack of structure and official rules and guidelines on the use of the storage system and process that were found in most of the departments [Appendix E - 2, 8, 14, 19, 26]. The result of the interviews and problem analysis was a compiled detailed list of all the relevant problems with the current storage system and process accompanied by their description, consequences, and departments affected. In the table below the summary and results of the above mentioned methods are described consisting of the problems, their description, consequences, and departments affected.

Problem	Description & Consequences	Departments Affected
No File Naming Standard	There is no established standard and organized way of naming all of the files that are being created and managed within the workspace. All departments are affected by it and share similar consequences: ● Files get lost and can't be found via name ● Hard to use or find files when somebody else is also working with similar documents ● No clear way to distinguish file versions	All
No File Structure and Model	There is no established organized data structure in which files and folders are being saved and stored. All departments share the same problem and lack any official data structure for their employees to follow and use and store information accordingly. ● Files get lost and can't be found via location ● Files & folders get piled up and the process of using and managing them becomes difficult and uncomfortable ● Hard to use or find files and folders when somebody else is also using and working within a similar workspace	All

Sharing & Access Issues	Another common problem that was reported by all of the departments with the current storage system is access and sharing. Often employees have to message each other for access or sharing a file which is tedious and time consuming. Currently the admin and access rights in the hard drives and SharePoint are governed by the IT department and Admins. ● Harder & slower to get access to desired file/folder ● Access rights fully dependent on Admins and their response ● Sharing through other communication channels can get tedious, unfriendly and can negatively affect security and privacy	All
Duplication of Data	Another very common problem is duplication of information. Due to the lack of structure and organization within the departments workspaces, duplication of data can easily happen. All of the departments reported that they had noticed or are aware of duplications of data within their workspaces. ● Duplication of data can lead to loss of progress and/or data ● Duplication of data takes up unnecessary storage and structure space	All
Sharing Files to Government	It is hard to share files and documents to the government because they are too big in size and too hard to collect to send in time. These files include licenses and other important documents and reports necessary for the further operations of the factory. This problem was mainly reported by the HSE department. ● Not being able to share necessary documents to the government in time can result in unnecessary troubles, fines, or even stop of the production process	HSE

Storage of Images	The Maintenance and HSE departments are storing lots of images and photos for different purposes such as projects, safety, and procedures. The images are usually stored everywhere within the department's workspace without any structure or consistent naming. This makes it hard to use the images which sometimes can also be for a singular or temporary use. ● Images are getting piled up without any structure and organization within the department's workspace which makes it hard to also use the rest of files and documents ● Important or necessary to keep images are not stored in a structured and ordered way ● Images that are for singular or temporary use are not cleaned/deleted	HSE, Maintenance

Table 8. Departments problems with description & consequences

Sub Question Conclusion:

After having an understanding of the departments and their data and documents storage, I collected their problems and issues with the current storage system and process through interviews. Afterwards I was able to find similarities between the departments through comparison of the interview notes (Table 8). This resulted in a clear and definite list of the problems the departments have with the current system. The list provided details and explanations of the problems, their consequences, and departments affected.

14.3 What are the requirements and needs of the departments for the desired solution?

To answer this subquestion, I organized another interview with the purpose of collecting all the requirements and specific needs the departments would like to see in the new storage system and process. This contributed to the creation of a list of requirements that are desired for the end solution for each department. By taking into consideration the information gathered and analysed from the previous interviews (Chapter 14.1, 14.2) and afterwards making comparisons between the requirement lists, I found similarities and patterns in the requirements and needs of the departments. Furthermore, I applied the MoSCoW methodology to be able to prioritize the different requirements. This methodology introduced priority and significance to the requirements by taking into consideration the stakeholder analysis (Chapter 7). Therefore, the criteria for a requirement are the amount of departments it affects, the severity of the consequences, and current necessity and ability to implement within the department [Appendix E - 3, 9, 15, 20, 27]. In the table below is the result of the methods applied above, a list of the department's requirements accompanied by description and prioritization.

Requirement	Description	MoSCoW	Departments Affected
1. Universal File Naming Standard	A clear and standardized naming guideline must be established to be universally used and applied throughout all departments. This will allow for better cooperation and use within and between departments in terms of files. With this established naming standard everyone will be able to easily use all files across all departments. Furthermore, it will be easier for newly hired employees to understand and use the files.	Must	All
1.1 User-friendly file naming	The naming standard must be easy to use and implement by everyone. The naming standard	Must	All

standard	shouldn't be a hassle and should fit all technical backgrounds of employees.		
1.2 System-friendly file naming standard	The naming standard must also be system-friendly, meaning that it should make it easy and efficient to sort and filter through files. This will help with locating files within the system and with the use of the files in other software systems.	Must	All
1.3 File Version Control & Use	There are many files that have many versions of them, but due to inconsistent naming it is hard to understand which is the current and latest version. Therefore the new universal file naming standard must include a way to understand and control the file versions. This way everybody will be using only the latest versions of files and no progress or information will be lost.	Must	All
2. Organized Folder Structure for all departments	An organized and structured data model must be established for all departments. This way there will be no random locations of files, duplications of files, random folders, etc. This model will introduce and establish an information order and structure that will help with the use of the necessary files themselves and the use of the system by employees.	Must	All
3. Sharing & Access in SharePoint environment	In the SharePoint environment it must be easy to share and provide access to colleagues within and across departments. All employees need some type of access (view,edit) to files and folders within	Must	All

	and outside of their department.		
4. Sharing files to government & other institutions	It should be easy and user-friendly to compile the necessary documents from the storage system and be able to share them securely to the government and other institutions. This requirement is primarily aimed at and needed by the HSE department.	Could	HSE
5. Automatic cleaning of unnecessary images	The Maintenance and HSE department have the need to store and use images to support their processes and activities, however not all are necessary for long-term storage. An automatic way of cleaning a specific folder with unnecessary and unneeded images could be implemented in the new storage solution.	Could	HSE, Maintenance
6. Automatic archiving of information	An automatic way of archiving the department's information could be implemented in order to not deal and manage with archiving manually. This can save time and mistakes in how archiving is performed.	Could	All

Table 9. Departments requirements with description and prioritization

Sub Question Conclusion:

By taking into consideration the departments understanding and data storage and usage, and their problems with the current storage system and process, I organized another set of interviews to collect the departments requirements of the desired solution. By comparing the department's requirements I managed to identify patterns and similarities such as the lack of information structure and standardized rules and guidelines for the storage system and process. The result was a compiled list of the requirements desired in the end solution accompanied by their description, prioritization, and departments affected (Table 9).

14.4 What is the best design of a data file system that would support the needs and uses?

This subquestion consists of two parts - the design of the data model & structure for each department and the design of the rules and guidelines surround the model's use. In order to determine and build the data model and structure, all of the department and data information & analysis done in the previous stages was used and taken into consideration (Chapter 14.1, 14.2, 14.3). By compiling all of that information an initial data model and structure was drawn up. This will be used as a prototype of the desired and final data model and structure and was mainly based on the data analysis, the requirements it had to cover, and the problems it had to solve. These initial models were used and presented in a discussion meeting with the heads of the departments for the purpose of receiving feedback, opinion, and suggestions on it in order for it to improve [Appendix E - 4, 10, 16, 21, 28]. Through this peer review a more elaborate and accurate design of the data model & structure was created. The department's feedback was reviewed and tested to determine if it was possible and worthy to implement. This better version was once again presented and discussed in a meeting with the heads of the department with the purpose of finalizing it and seeking agreement and approval from the departments [Appendix E - 5, 11, 16, 22, 28]. Once approval was given from the department the final model was ready to be implemented within the SharePoint environment. In case of disagreement or not yet finalized model, the same process of discussion meetings and model versions improvement was repeated. In the table below is a summary of the result from the methods and processes described above. It includes a brief summary of the department's data model and structure which was also attached as a diagram to the submission of this graduation file [Appendix B].

Department	Summary of Data Model & Structure
HSE	All of the many files and folders from the original three root folders were compiled in this model by taking into consideration the department's relevant processes and activities. The HSE department's data model and structure consists of 1 department root folder, 4 main folders

	(License-to-Operate, Safety Management, Projects, Communication) and an image and archive folder.
Maintenance	The Maintenance department's data model consists of many folders, however with a heavily improved structure and logic. The main folders in the Maintenance department's workspace are the ETD (Electro-Technical department) folder with its relevant information and sub folders, safety procedures, external company information, tanks/pipes, stops, checklists, projects, and manuals.
Laboratory	The Laboratory department's data model and structure is similar to what had already been in place. The model eliminates some duplication of data such as laws & regulations, and also provides a folder to sub-process that have regular reporting or amount of files that deserve their own space. The model is split in two main folders - QA Manager and Laboratorium. The first contains information about laws, regulations, complaints, certificates, and meetings and second relevant reporting documents about the Laboratory facility and department.
HR	The HR department's data model and structure is similar to what existed in the previous storage system. However, the model standardizes and organizes the available information and future proofs the model. The model consists of 1 department root folder, 2 main folders (Handboek Arbeidsregelingen and HR documenten) and sub folders to contain agreements, forms, and questionnaires.
Finance	The Finance department only makes use of the common folder *Project Commissie*, which is structured in the same way, however in its main folders (procedures, projects, forms) a sub folder for archive and current versions is implemented to separate and differentiate between active and past information.

Table 10. Departments data model and structure summary

To ensure successful and efficient use of the data model and structure, a storage system design & use rules and guidelines training/document had to be created. These rules and guidelines would support the efficiency and reliability of the model and structure by showing and teaching employees on how to properly use and make use of it. The system design & use guidelines are based on the problem analysis and requirements which were taken into consideration for their formulation (Chapter 2, 14.2, 14.3). In order to create a reliable, consistent, and clear design and use of the system additional research, literature study, prototyping and testing was done. The research and literature study was aimed at collecting and understanding the best practices and ways for the system design and use (Chapter 12.1, 12.2, 12.3). The prototyping and system testing was done in order to fit, adjust, and apply the information collected from the research. The prototype rules & guidelines were presented and discussed during discussion meetings in which the departments could provide their feedback through applying usability testing methods such as testing the application of the guidelines within the system and its context [Appendix E - 6, 12, 17, 23, 29]. The system design and use guidelines resulted in two training documents which represent a manual with rules and guidelines on using and understanding the system, its design and use [Appendix C]. The first document is the Data Management Plan and the second is the SharePoint Use & Synchronization. These two documents contain information, steps, rules and guidelines on how to properly name files, use versions, and make use of the SharePoint environment. Furthermore, each document contains reasons and benefits supporting the decisions within them. The training and guidelines documents are attached to the submission of this graduation file [Appendix C].

Sub Question Conclusion:
Using the gathered information about the departments, their data, problems with the current storage system, and requirements for the desired system, I built an initial data model and structure for each department. This model was discussed with the departments and necessary and agreed to adjustments and improvements were implemented. This resulted in a finalized data model and structure for each department which compiled and fit all relevant department processes and documents together, solved structure problems, and fit the requirements (Table 10). Furthermore, official standardized training and rules & guidelines had to be established to support the data model and structure and ensure further long-term success of the change. They were focused on the new storage system and process's design and use. Therefore, I created

two documents - Data Management Plan and SharePoint use & synchronization. The first one describes and explains the document naming and versioning method with examples, reasons, and benefits. The second one describes the intended use of the new storage system and process and how to synchronize the process within (SharePoint and File Explorer). These documents acted and will act as training and rules & guidelines for every employee within the involved departments to work in a standardized way and support the change process.

14.5 How can the design be implemented and integrated within ICL Amfert by applying change management strategies & methodology?

To answer this subquestion I split it in two parts - departments change management approach and the implementation plan of the change, and make use of the change management research and theoretical framework (Chapter 12.4). The departments change management approach describes the relevant, applied, and applicable change approaches for the departments and their position and journey throughout the change curve. The implementation plan is based on the relevant and applicable change management strategies and framework and provides a step-by-step guide on how to implement and integrate the change (storage system and process) within the departments.

14.5.1 Departments Change Management Approach

The change management approach for each department is based on the research, literary study, and analysis done beforehand on the departments and Kotter & Schlesinger Six Change Approaches and Kubler-Ross's change curve (Chapter 7, 12.4.4, 12.4.5, 14.1). Therefore, the change management approach was determined based on the type of resistance displayed by the department and on the requirements and needs of the project.

HSE Department

- ➢ The HSE department manager and my internship company supervisor, Bo Ridder, is the initiator of the project and its overall supervision with the other departments; therefore he and his department displayed no resistance, but support for the change process [Appendix E - 24]. A reason for the displayed support for the storage system and

process change by the HSE department is that they are experiencing troubles and issues with their current storage system and process and because licenses and regulations with the government are involved the consequences can be critical to the production and operations process of the facility.

- ➢ Therefore, the necessary change approaches taken throughout the duration of this project and that have to be continued until the change is fully implemented and integrated within the department are *Education & Communication*, *Participation & Involvement*, and *Facilitation & Support* (Chapter 12.4.4).
    - Throughout this project I organized many meetings and interviews with the HSE department in order to educate and communicate the change, consisting of understanding of the departments processes, activities, storage and information usage and informing on the progress and process (models, trainings, rules & guidelines) of the change to the new storage system and process [Appendix E - 18, 19, 20, 21, 22, 23]. During these meetings I was asking for the department's feedback, suggestions, and ideas because they could be valuable and beneficial to the project since the department was in full support of this project and was experiencing issues with important processes and documents in the storage system. This way I was making the department more involved and invested in the project and its success. Throughout the establishment of the department's understanding, data analysis, data model & structure and system training and rules & guidelines, I provided support, help, and further explanation in the meetings if necessary to guide the department in the change process and its implementation. This consisted of presenting the training and rules & guidelines of the storage system and providing reasoning and benefits to argue the made decisions and choices [Appendix C].
- ➢ Using and applying the change approaches decided for the HSE department in the Change Curve (Chapter 12.4.5), the HSE department started its journey from the *Exploration* stage which consisted of the department's understanding, data usage and analysis, problems, and requirements. It had accepted that the change was going to happen and was open to ideas, suggestions for the desired solution and was providing ones of their own. After that the department was embracing and supporting the change and agreed to decisions for data structure and rules & guidelines, and started the

process of reorganizing their ways of work, and adapting to the new storage system and process in the SharePoint environment.

Maintenance Department

- The Maintenance department was interested and supportive of the idea of the project, however displayed some resistance to the change throughout the interviews and meetings [Appendix E - 7, 8, 9, 10, 11, 12]. The department was experiencing issues with their information storage and usage due to the lack of structure, standardization, and organization, so it was optimistic and interested in the project and its end solution. The resistance displayed was *Misunderstanding & Trust* and *Different Assessments* (Chapter 12.4.4). The department had doubts and concerns about the naming convention and its format and a different vision and opinion of the time constraints and work. However, that allowed for different suggestions and issues to improve the end solution. They consisted of the addition and better structure of several folders, *Inspections & Certificates* and *ETD department* (Chapter 14.4), and the improvement and adjustment of the naming convention by removing the file creation date in the file title and replacing it with the addition of the file descriptor column date created (Chapter 12.3).
- Therefore, to minimize and reduce the displayed resistance I applied the *Education & Communication (by Manipulation)*, *Participation & Involvement*, and *Facilitation & Support* change approaches (Chapter 12.4.4).
    - Throughout the interviews and meetings organized with the department I educated and communicated about the change process and its purpose. That was done through the establishment of the current situation and understanding of the department and its data, and afterwards informing about the change process, their roles, and the training and manuals to support the change process (Chapter 14.1-14.4) [Appendix E - 7, 8, 9, 10, 11, 12]. This way the department was always informed of the change's process and its progress. During these meetings the department's feedback, suggestions, and ideas were taken into consideration in order to allow the department to participate and be involved in the change process and feel valuable to its success with its contribution. The department's feedback resulted in reformatting the naming convention by the removal of the

need to input the creation date in the file title and use the file column descriptor for date created. Furthermore, to guide the change process and the department's adaptation to it I provided support and help through training and explanation of rules & guidelines for the new storage system and process [Appendix C]. This was accompanied by their reasons and benefits in order to eliminate the doubts and concerns the department had.

- The Maintenance department's journey in the Change Curve starts from the *Status Quo* stage because they were aware of the existence of the project (change of storage system and process), but not that it had started and somebody (me) had started working on it (Chapter 12.4.5) [Appendix E - 7]. However, the department didn't express initial denial, frustration, or depression because they were aware of the project, were experiencing similar problems as the other departments with the current storage system and process, and the training and rules & guidelines were minimizing their doubts and concerns. Afterwards, in the *Exploration* stage they were fully accepting of the change and were experimenting with their data model and making decisions on the naming convention. This was done through the several interviews and meetings and testing of the different possibilities and opportunities of the department's suggestions.

Laboratory

- The Laboratory department displayed resistance to the change process during the interviews and meetings because it wasn't aware of the project and had trust issues with the proposed end solution [Appendix E - 1, 2, 3, 4, 5, 6]. The resistance displayed consisted of *Misunderstanding & Lack of Trust* and *Low Tolerance for Change* (Chapter 12.4.4) The department had had bad experience with SharePoint before and doesn't trust the environment anymore since it would initiate issues with loss of rights and access. The department had been working with the current storage system and process for a long time and had established a habit and was worried how the change would affect their work. However, the department had an overall positive view of the solution because it was also experiencing problems with its data structure and file naming standardization.

- ➢ Therefore, to minimize and eliminate the department's doubts and concerns I applied the *Education & Communication*, *Participation & Involvement*, and *Facilitation & Support* change approaches (Chapter 12.4.4).
    - Throughout the interviews and meetings with the Laboratory department I ensured to educate and communicate the change process, its reasons and benefits. This was done through the use of the training and manuals which promoted the benefits and reasons of the change accompanied by a description [Appendix C]. This way the employees were educated on the change and informed on the change process. Their lack of trust in SharePoint's ability to manage sharing and access to documents was eliminated once the benefits and functionality was explained through the training and rules & guidelines. During the meetings and interviews the department was allowed and motivated to provide feedback and suggestions on the analysis, structure, and use of the storage system and process and through that discussion the finalized versions of those products were decided. This way the department was getting involved and further invested in the project and its success which would allow them to adapt easier and faster to the new storage system and process. To further minimize the resistance displayed by the department I used the designed training and manuals for the storage system use and by communicating them to the department and promoting their reasons and benefits.
- ➢ The Laboratory department's journey on the Change Curve starts on the *Status Quo* stage because they were unaware that the project had started and were in denial of the use of the proposed SharePoint environment (Chapter 12.4.5). However, the department didn't express frustration and depression from the change, but in turn were motivated by the training and manuals and their reasons and benefits to progress to the *Exploration* stage. In it the department became more accepting of the change and that it is happening no matter what and was helping with the decisions on their final data model & structure [Appendix E - 1, 2, 3, 4, 5, 6].

HR Department

- ➢ The HR department didn't display much resistance throughout the change process because it didn't have much interest or power in this project (Chapter 7). The only

resistance (*Misunderstanding & Lack of Trust*) displayed throughout was throughout the initial interview in which there was a little misunderstanding and confusion on what the specific processes and workspaces were related to the ICL Amfert facility (Chapter 12.4.4) [Appendix E - 25].

- ➢ Therefore, to eliminate the displayed resistance I applied the *Education & Communication* and *Facilitation & Support* change approaches (Chapter 12.4.4).
    - Throughout the interviews and meetings with the HR department I was communicating the change, its purpose, reasons & benefits, and processes [Appendix E - 25, 26, 27, 28, 29]. The department was always well-informed on the change's progress, the necessary steps that had to be taken, and their responsibilities. Through the communication the misunderstandings the department had were eliminated and the specific workspaces and information was provided for analysis. To support the change process and ensure the HR department starts progressing through it successfully, I provided support and help using the training and rules & guidelines on the new system and process use [Appendix C]. This further promoted understanding and comprehension of the reasons and benefits of the change and why the department should embrace it.
- ➢ The HR department's journey on the Change Curve is more simple because of their lower interest and lower overall benefit of the project and consists of the *Exploration* and *Rebuilding* stage (Chapter 12.4.5). The department had accepted that the change is taking place and was willing to cooperate and follow the training and manuals to integrate and understand the change easier and faster. The department was more optimistic and made more decisions about the structure and necessary access to its information [Appendix E - 25, 26, 27, 28, 29].

Finance Department

- ➢ The Finance department didn't display any resistance to the change and was optimistic and motivated to help and contribute to the change's success. Even though the department has medium power and interest in the project, it understands the benefits and reasons for the change which are also relevant to them (Chapter 7). The Finance department uses the workspaces of the other departments to gather information, so the change and proposed solution would provide benefit in their work by having easy and

consistent access to the necessary information and being able to use it since it would be structured and organized [Appendix E - 13, 14, 15, 16, 17].

- ➢ Therefore, the necessary change approaches taken were *Education & Communication* and *Facilitation & Support* (Chapter 12.4.4).
    - The Finance department was consistently informed about the change, its progress and next steps, and the department's responsibilities during the interviews and meetings with it. Furthermore, the department was educated on the change process and its consequences and benefits such as introducing standardization and organization across the involved departments at the ICL Amfert facility.
    - During the meetings and interviews I also provided support and help with the understanding and process of the change and used the training and manuals with rules & guidelines to support the reasons and benefits of the change.
- ➢ Based on the resistance and change approaches, the Finance department's journey on the Change Curve consists of only the *Exploration* and *Rebuilding* stage (Chapter 12.4.5). The department was positive and supportive of the change and made decisions regarding its data structure and necessary access it needed to the other departments. It was also adapting its ways of work to the new structure and complying with the rules & guidelines from the training and manuals [Appendix E - 13, 14, 15, 16, 17].

For the Integration stage to be completed, all of the departments and their employees have to be integrated and adapted to the new ways of work to start experiencing the benefits of the new storage system and process. In order for this to happen the designed training and manuals need to be in use and followed and the chosen change management approaches implemented. These methods need to be continued to be practiced until the change is fully implemented and integrated within the department to ensure its long-term and future success.

14.5.2 Implementation Plan

The Implementation plan was designed using the research and literature study done beforehand on change management (Chapter 12.4.1, 12.4.2, 12.4.3) and applying these strategies and framework accompanied by the gathered information and performed analysis done up to this moment (Chapter 14.1-14.4). The change management strategy and framework for the project is formed by Lewin's Change Management model and the ADKAR model, both supported by the PDCA-cycle. It represents a series of steps, separated in the 3 stages (Lewin's Change Management Model, Chapter 12.4.1), and goals (ADKAR model, Chapter 12.4.2) that would ensure the successful long-term implementation and integration of the change. Furthermore, the products of the change process such as the data analysis, data model & structure, and training documents are created and managed by the PDCA-cycle method (Chapter 12.4.3). This involves the planning, doing, checking, and acting upon suggestions or issues. The Implementation plan is created with the intent to be followed and if wanted implemented for other departments within the ICL Amfert facility, therefore would explain the whole change process from start to finish.

Stage 1: Unfreeze

In this step the current process and ways of things being done is established and analyzed. This will help understand what is currently happening with the file storage system and process. Based on the current situation analysis it is better known what and why needs to change. By developing an initial data model based on all the current information the suggested changes and benefits can be easier explained and communicated to employees in order to help convince them of the need and necessity to change the data system & process.

- ➔ Establish who are the stakeholders (departments) and what their processes and activities are
- ➔ Establish what data (files & folders) the stakeholders are currently using and storing
  - ◆ Perform data analysis on the provided workspaces to collect what is currently being stored by deep-diving in the department's folders and files
- ➔ Establish what are the current problems and issues that have been observed and encountered

- ➔ Establish what are the requirements and needs of the departments that are lacking the current system & process
- ➔ Design an initial data model and structure based on all the gathered current information and data analysis. This model will be used to visualize the current situation to the departments which in turn would help with the recognition and decision on the changes, their effects and benefits within the data system and process in the next stage.

Furthermore, to support this stage and its success these goals from the ADKAR model need to be successfully achieved.

- ➔ *Awareness* - Through frequent communication and education the departments are made aware of the overall change, its process, and their roles. The departments are informed on the change plan, process, and progress during the meetings in order to solve any doubts or concerns. It is important for the departments to be aware of the problems and issues within the storage system and process and be convinced with initial reasons and benefits of the new storage solution.

- ➔ *Desire* - Through this goal the employees would be on the side of change and that will be achieved through the making of prototypes and/or simple examples of the implementation or parts of the change. These prototypes and examples will be used to promote and showcase the benefits of the change and show how the change adds value to the department, its processes, and everyday activities. Furthermore, most doubts or concerns that the departments had about the change would be eliminated in this way.

- ➔ *Knowledge* - To ensure the success of this goal, in every meeting the department has to be informed on the plan of the change (from first introduction meeting, to implementation, to after implementation). This includes informing the departments of the planned steps to establish a complete current situation, arrange, manage, and control the implementation of the change, and sustain and support the change after its implementation. Also informing the departments about their role and their necessary actions in order to support and get involved in the change process such as:
  - ◆ Providing initial information for the current situation and data usage
  - ◆ Providing feedback on data analysis and model

- Using and following the manuals and guidelines for the storage system and process
- Migrating data and information to the SharePoint environment

Stage 2: Make Changes

To implement the changes to the storage system and process the current situation information and analysis is used. From the previous stage the established data analysis and initial data model are used to create the desired new data structure and model. In this step all the requirements, current situation, initial model, and information are collected, compiled, and discussed with the departments to establish a data structure and model that is in line with the requirements.

- ➔ Discuss & receive feedback on the initial data model from the departments
  - This way any questions or concerns about processes, folders, and information are answered
- ➔ Build a final data model and structure for the departments considering the feedback
  - With the departments help and input earlier, the initial data model can be transformed into a final version, with which the departments agree, is in line with the requirements, and covers all necessary processes and activities the departments have.
- ➔ Implement data model and structure within the SharePoint environment
  - Implement the agreed folder structure in SharePoint and apply the proper naming convention
- ➔ Start data migration into the SharePoint folder structure
  - With the help and support of the departments the most important and currently used and actives files were moved with the proper naming guidelines

Furthermore, to support this stage and its success these goals from the ADKAR model need to be successfully achieved.

- ➔ *Knowledge* - Regular meetings are organized to show & update the departments on the plan and progress of the implementation of the change. The departments are also informed and made aware of their specific role and activities that they are responsible for during the change implementation. This includes getting to know and start adapting to

the new data structure and model, initial training and guidelines, and also start to rename and move files to the SharePoint environment and start using it in order for it to become a habit and the new norm as fast as possible.

- ➔ *Ability* - The departments have employees from varying age groups and technical abilities, therefore the change should be understandable, accessible, and beneficial to all users in order for it to be really successful and beneficial. Therefore, from the start the planned change of storage system and process and its implementation and use are aimed to be as simple and clear as possible in order to make it reliably usable by all employees. To further support the change and its implementation, necessary trainings, manuals, and guidelines on the different parts of the change are created, so the employees can follow them and help them adapt to the change and new storage system and process.

Stage 3: Refreeze

In the Refreeze stage it is important to make sure all the changes that were determined, adjusted to feedback, and implemented to be established as the new norm. The old habits, standards, and mistakes from the previous storage system and process shouldn't be repeated because that makes the change pointless and useless. In this stage the training, manuals, guidelines on how to use and work with the new storage system, structure, and process are finalized and distributed to the departments and their employees. This is done in order to help sustain and normalize the change.

- ➔ Perform regular checks in order to see if the change is being followed by the departments
- ➔ Provide support and communication to the departments in case of issues, questions, and concerns
- ➔ Provide training, manuals, and guidelines on the "How-to's" of the system
    - ◆ Map of the new information structure and model for data storage
    - ◆ Manual on using SharePoint environment use which also includes syncing, access and sharing
    - ◆ Rules and guidelines on the naming convention and versioning accompanied by its benefits and reasons

Furthermore, to support this stage and its success these goals from the ADKAR model need to be successfully achieved.

- ➔ *Reinforcement* - All mistakes, neglected things in the earlier stages were identified and fixed throughout the change by the department's feedback, suggestions, and concerns. Therefore, in this stage all of the training, manuals, and guidelines were finalized, distributed to the departments and started their implementation. All of the manuals and guidelines have supporting reasons and benefits below them to eliminate any further doubts and concerns the employees can have while trying to follow the training and manuals. These reasons and benefits for the changes provide a further incentive and understanding of why the change is beneficial, useful and worth striving for. Regular checks are made to make sure the departments are following the training and using the new storage system and process accordingly.

Sub Question Conclusion:

To be able to successfully implement the change within the organization the displayed resistance by the departments needs to be minimized and eliminated through the application of the relevant change approaches. Through mainly communication, education, and support the change was able to be communicated and understood by the departments and the arisen doubts and concerns managed and eliminated. To guide, manage, and steer the change process I created an Implementation plan that the departments should follow to successfully adapt and integrate to the new storage system and process and make it a success. The Implementation plan splits the change process in three stages which describe the step-by-step process of how to progress with the change and take the necessary steps and measures with the departments involved in.

Chapter 6 Conclusion & Advice

15. Conclusion

The first subquestion is a very important necessary step for the success of the project and the initiation of the change. I separated it into two parts - establishing understanding of the departments and their processes, activities, workspaces and performing data analysis on the provided workspaces to establish an understanding of how and where the data is currently stored. By organizing interviews with the department managers, I gained an understanding of the most important and relevant processes and activities of the department and the workspaces where they store all of their information and documents (Table 6, Table 7). As a result I had a complete overview of the departments processes, activities, and detailed analysis of the folders and files within their workspaces.

After having an understanding of the departments and their data and documents storage, I collected their problems and issues with the current storage system and process through interviews. Afterwards I was able to find similarities between the departments through comparison of the interview notes (Table 8). This resulted in a clear and definite list of the problems the departments have with the current system. The list provided details and explanations of the problems, their consequences, and departments affected.

By taking into consideration the departments understanding and data storage and usage, and their problems with the current storage system and process, I organized another set of interviews to collect the departments requirements of the desired solution. By comparing the department's requirements I managed to identify patterns and similarities such as the lack of information structure and standardized rules and guidelines for the storage system and process. The result was a compiled list of the requirements desired in the end solution accompanied by their description, prioritization, and departments affected (Table 9).

Using the gathered information about the departments, their data, problems with the current storage system, and requirements for the desired system, I built an initial data model and structure for each department. This model was discussed with the departments and necessary and agreed to adjustments and improvements were implemented. This resulted in a finalized

data model and structure for each department which compiled and fit all relevant department processes and documents together, solved structure problems, and fit the requirements (Table 10). Furthermore, official standardized training and rules & guidelines had to be established to support the data model and structure and ensure further long-term success of the change. They were focused on the new storage system and process's design and use. Therefore, I created two documents - Data Management Plan and SharePoint use & synchronization. The first one describes and explains the document naming and versioning method with examples, reasons, and benefits. The second one describes the intended use of the new storage system and process and how to synchronize the process within (SharePoint and File Explorer). These documents acted and will act as training and rules & guidelines for every employee within the involved departments to work in a standardized way and support the change process.

To be able to successfully implement the change within the organization the displayed resistance by the departments needs to be minimized and eliminated through the application of the relevant change approaches. Through mainly communication, education, and support the change was able to be communicated and understood by the departments and the arisen doubts and concerns managed and eliminated. To guide, manage, and steer the change process I created an Implementation plan that the departments should follow to successfully adapt and integrate to the new storage system and process and make it a success. The Implementation plan splits the change process in three stages which describe the step-by-step process of how to progress with the change and take the necessary steps and measures with the departments involved in.

In conclusion, from the results and processes of the sub questions the efficiency, reliability, and consistency of the storage system and process have been improved. The new data structure and model are based on all relevant information collected and analyzed such as the department's processes, data storage & usage, problems, and requirements. This makes the final structure complete and considerate of all requirements and necessities from the departments. However, to support the structure, two documents consisting of rules, guidelines, and explanations of the new storage system and process were accompanied by reasons and benefits were created to guide the departments. These manuals introduced standardization and consistency across the departments because all departments had to follow the same file naming and versioning method, use the general system and its functionalities in a similar manner, and

each have one concrete data model and structure. This allows every employee to use and guide their own way in all workspaces (they have access to) and find the necessary files and documentation which means the system will be more reliable and efficient by removing time-consuming work such as searching for and sharing documents. Furthermore, to support this change of storage system and process, I identified and chose change management strategies and approaches with which to minimize departments resistance and develop a change management framework with an implementation plan. Through the change management methods consisting of education, communication, support, training, and more, the change will be implemented and integrated successfully within ICL Amfert and its benefits will have a longer lasting effect.

16. Recommendation

During this project I managed to collect and analyze all necessary and relevant department information and build a data model and structure for each department. Furthermore, I developed a change management strategy and framework accompanied by an implementation plan to support the change process and the departments involved. However, the change hasn't been fully implemented and integrated within the organization yet. Also, after these departments start adapting to the change and working with it, more departments would want to join the established SharePoint environment and cleanly and neatly migrate their data from the hard drives.

Therefore, the main advice from this project is to follow the implementation plan and continue the application of the relevant change management approaches to support the departments in the change process. The implementation plan provides a guide and a step-by-step list of the necessary steps and actions that were taken and need to be taken for every department that was involved and would want to get involved in this project in the future. The change management approaches provide ways of minimizing doubts and concerns within the department. If followed and applied, the implementation plan would lead to a successful implementation of the change and a successful adaptation of the change by the department's employees. Furthermore, to ensure that the employees are using and working with the new storage system and process correctly and accurately, regular system checks need to be performed of the system to ensure everything is in order and by the established rules &

guidelines and if any issues found a meeting needs to be organized for the issue to be discussed and resolved. This way the departments will adapt to the change and make it as their new habit and way of work.

17. Discussion

The results from the thesis provide a solution to the most impactful problems the departments were experiencing. Through the establishment of a structured and organized data model, accompanied by an adequate naming convention, and guidelines and rules on system use, I introduced and improved the structure, consistency, and reliability in the new storage system and process. However, if that effect will be long-term and if it will even take place depends on the departments and their adaption and cooperation with the new system and process.
Due to the time constraint of the internship and therefore project, the final implementation and adaptation of the change are not complemented and consist of a change management strategy & framework with an implementation plan. The departments should follow and hold each other accountable and responsible for the use of the new storage system and process by respecting and following the established change management framework, data structure and supportive rules & guidelines.
Furthermore, to satisfy the '*could* ' requirements which include the automation of photo cleaning and folder archiving, research on SharePoint's workflows has to be done. These workflows allow the creation of automatic actions within the document system which can solve these requirements [8] [16]. The necessary workflows aren't complex because they would consist of an image folder which is ordered to delete its contents every week/month and an archive folder which copies, pastes, and moves the relevant folder into the archive folder (Chapter 14.3). These workflows can further improve the efficiency of the new storage system and process by automating these very time consuming manual tasks.

Chapter 7 Sources & References

18. Bibliography

[1] About ICL Group: Our Commitment to a Sustainable Future. (2021). Retrieved 7 June 2021, from https://www.icl-group.com/our-mission/

[2] Best practices for file naming. (2021). Retrieved 7 June 2021, from https://library.stanford.edu/research/data-management-services/data-best-practices/best-practices-file-naming

[3] Corne, N. (2019). Sync OneDrive for Business or SharePoint site libraries. Retrieved 7 June 2021, from https://onlinehelp.cloud.telenet.be/article.php?id=3035

[4] Create a column in a list or library. (2021). Retrieved 7 June 2021, from https://support.microsoft.com/en-us/office/create-a-column-in-a-list-or-library-2b0361ae-1bd3-41a3-8329-269e5f81cfa2

[5] Guides: Data Management Recommended Practices: File Organization. (2021). Retrieved 7 June 2021, from https://guides.library.upenn.edu/datamgmt/fileorg

[6] ICL Amsterdam - ICL Benelux. (2021). Retrieved 7 June 2021, from https://www.icl-group.nl/icl-amsterdam-2/

[7] ICL Group Ltd. - Wikipedia. (2021). Retrieved 7 June 2021, from https://en.wikipedia.org/wiki/ICL_Group_Ltd.

[8] Introduction to SharePoint workflow. (2021). Retrieved 7 June 2021, from https://support.microsoft.com/en-us/office/introduction-to-sharepoint-workflow-07982276-54e8-4e17-8699-5056eff4d9e3

[9] Lewin's Change Management Model: Understanding the Three Stages of Change. (2021). Retrieved 7 June 2021, from https://www.mindtools.com/pages/article/newPPM_94.htm

[10] Management Approach - ICL. (2021). Retrieved 7 June 2021, from https://icl-group-sustainability.com/reports/management-approach/

[11] MDTechVideos. (2021). How to Add Column & Settings to All Subfolders [Video]. Retrieved from https://www.youtube.com/watch?v=wkGY2Knq_vM&ab_channel=MDTechVideos

[12] Methods - ICT research methods. (2018). Retrieved 7 June 2021, from https://ictresearchmethods.nl/Methods

[13] Mulholland, B. (2017). 8 Critical Change Management Models to Evolve and Survive | Process Street | Checklist, Workflow and SOP Software. Retrieved 7 June 2021, from https://www.process.st/change-management-models/

[14] Nieuwenhuis, M. (2006). The art of management (13th ed., pp. http://123management.nl/0/020_structuur/a212_structuur_05_processtructuur_pdca.html). [Apeldoorn: Art of Management].

[15] Our nutrients. (2021). Retrieved 7 June 2021, from https://www.iclfertilizers.com/our-nutrients

[16] Overview of workflows included with SharePoint. (2021). Retrieved 7 June 2021, from https://support.microsoft.com/en-us/office/overview-of-workflows-included-with-sharepoint-d74fcceb-3a64-40fb-9904-cc33ca49da56

[17] Problem statement - Wikipedia. En.wikipedia.org. (2021). Retrieved 7 June 2021, from https://en.wikipedia.org/wiki/Problem_statement

[18] Research Guides: Research Data Management at Princeton: File naming and structure. (2021). Retrieved 7 June 2021, from https://libguides.princeton.edu/c.php?g=102546&p=930626

[19] Shaffer, D. (2015). Cooking Up Business Analysis Success - Business Analyst Articles, Webinars, Templates, Jobs. Business Analyst Articles, Webinars, Templates, Jobs. Retrieved 7 June 2021, from https://www.batimes.com/articles/cooking-up-business-analysis-success/

[20] Shanahan, D. (2020). How to manage file access with SharePoint in Microsoft Teams -

OnMSFT.com. Retrieved 7 June 2021, from https://www.onmsft.com/how-to/how-to-manage-file-access-with-sharepoint-in-microsoft-teams

[21] Sharing & permissions in the SharePoint modern experience - SharePoint in Microsoft 365. (2021). Retrieved 7 June 2021, from https://docs.microsoft.com/en-us/sharepoint/modern-experience-sharing-permissions

[22] Six Change Approaches. (2021). Retrieved 7 June 2021, from https://expertprogrammanagement.com/2018/05/six-change-approaches/

[23] SMART Goals: – How to Make Your Goals Achievable. Mindtools.com. (2021). Retrieved 7 June 2021, from https://www.mindtools.com/pages/article/smart-goals.htm.

[24] *Stakeholder Analysis: Winning Support for Your Projects. Mindtools.com. (2021). Retrieved 10 June 2021, from https://www.mindtools.com/pages/article/newPPM_07.htm.*

[25] Sync SharePoint files and folders. (2021). Retrieved 7 June 2021, from https://support.microsoft.com/en-us/office/sync-sharepoint-files-and-folders-87a96948-4dd7-43e4-aca1-53f3e18bea9b

[26] The Change Curve: Accelerating Change, and Improving Its Likelihood of Success. (2021). Retrieved 7 June 2021, from https://www.mindtools.com/pages/article/newPPM_96.htm

[27] The Change Curve. (2021). Retrieved 7 June 2021, from https://expertprogrammanagement.com/2010/11/the-change-curve/

[28] Unequivalent Producer of Fertilizers for All Applications. (2021). Retrieved 7 June 2021, from https://www.icl-group.com/our-business/agriculture/

[29] Using the ADKAR Model for Change Management | Lucidchart Blog. (2021). Retrieved 7 June 2021, from https://www.lucidchart.com/blog/using-the-adkar-model-for-change-management

[30] Vision & Commitments - ICL. (2021). Retrieved 7 June 2021, from https://icl-group-sustainability.com/reports/vision-commitments/

[31] What is MoSCoW Prioritization? | Overview of the MoSCoW Method. (2021). Retrieved 7 June 2021, from https://www.productplan.com/glossary/moscow-prioritization/

19. Figures & Tables List

20. Appendices

20.1 Appendix A Data Analysis Documents

The Data Analysis files of the involved departments are located within the graduation file in folder *”Departments_DataAnalysis”*

- ➔ Consists of Finance, HR, HSE, Laboratory, and Maintenance Data Analysis files

20.2 Appendix B Data Model Documents

The Data model files of the involved departments are located within the graduation file in folder *”Departments_DataModels”*

- ➔ Consists of Finance (Project Commissie folder), HR, HSE, Laboratory, and Maintenance Data model files

20.3 Appendix C Trainings & Guidelines

The Trainings and guidelines files of the involved departments are located within the graduation file in folder *”Departments_Trainings_Guidelines”*

- ➔ Consists of the two guidelines files - the Data Management Plan and the SharePoint Use & Synchronization

20.4 Appendix D Other files & documents

These files are attached in the Graduation file.

1. ICL Amfert facility departments diagram

20.5 Appendix E Interviews & Meetings

[1] Buscemi, E. (2021). Laboratory Dept. Interview #1 - Current Situation, Process, Data Usage [online]. Microsoft Teams.

Interview Notes:

- ➢ Responsible for all lab-related process & activities and also QA manager
- ➢ Have web-based platform for measurements and other data tracking
- ➢ Workspaces: *Laboratorium* and *QAmanager* folders and *Projectmanagement* file in *ProjectCommissie* folder in the *Global* HDD
    - Complaints, laws & regulations, project management related information is very important

[2] Buscemi, E. (2021). Laboratory Dept. Interview #2 - Problem Analysis [online]. Microsoft Teams.

Interview Notes:

- ➢ No trust in SharePoint and thinks it is unreliable
    - Due to loss of rights/access to folders in previous experience with it
- ➢ Currently there are many files that are not organized and with inconsistent naming and versioning, so it's hard to sometimes find the correct file
- ➢ Also availability of Laboratory department's information, need to share files through communication channels

[3] Buscemi, E. (2021). Laboratory Dept. Interview #3 - Requirements & Needs [online]. Microsoft Teams.

Interview Notes:

- ➢ Consistent way of naming, versioning
- ➢ Better more organized structure
- ➢ Easy & reliable sharing and providing access

[4] Buscemi, E. (2021). Laboratory Dept. Meeting #1 - Data Model & Structure discussion [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of duplication of data in laws & regulations related folders

        - Combine in one folder to eliminate duplication
    - ➢ Discussion of old folders files
        - *MSDS* folders is not used anymore
        - Other old files are either irrelevant or for archive
    - ➢ Discussion on already built structure and naming
        - Some folders like *Product specs* and *Complaints* had good structure and already a naming standard close to the one I was developing

[5] Buscemi, E. (2021). Laboratory Dept. Meeting #2 - Data Model & Structure finalization [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of improved model from last meeting
    - Agreement on folder structure
- ➢ Agreement on implementation of folder structure
- ➢ Informing about next meeting - training & guidelines for the new system & process

[6] Buscemi, E. (2021). Laboratory Dept. Meeting #3 - Rules & Guidelines discussion and testing [online]. Microsoft Teams.

Meeting Notes:

- ➢ Presentation of SharePoint Use & Synchronization
    - Eliminate initial doubts, concerns about SharePoint and use of the new storage system and process
- ➢ Presentation of Data Management Plan
    - File naming convention & column addition

[7] Kommer, N. (2021). Maintenance Dept. Interview #1 - Current Situation, Process, Data Usage [online]. Microsoft Teams.

Interview Notes:

- ➢ Important and most used information within the department - installations, instructions for inspections & work, standardized information about instructions, tests, processes, procedures, projects (separate from installations), production stops, planning, drawings
- ➢ Workspace: *Technical* folder in *Department* HDD and *Project Commissie* folder in *Global*

HDD

[8] Kommer, N. (2021). Maintenance Dept. Interview #2 - Problem Analysis [online]. Microsoft Teams.

Interview Notes:

- ➢ No structure and organization of files and documents within the workspaces
- ➢ No standard in naming files, using versions
- ➢ Lack of transparency - no easy way to share information
- ➢ Due to lack of structure and organization files are hard to find and sometimes lost
- ➢ There are too many photos and they are usually not needed for long-term use

[9] Kommer, N. (2021). Maintenance Dept. Interview #3 - Requirements & Needs [online]. Microsoft Teams.

Interview Notes:

- ➢ Organized and structured model for the department
- ➢ Standardized naming and use of versions
- ➢ Easy way to share and provide access to increase transparency and speed of information transfer
- ➢ A way of storing and cleaning the photos that are no longer necessary to be stored

[10] Kommer, N. (2021). Maintenance Dept. Meeting #1 - Data Model & Structure discussion [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of built model based on information from the previous interviews
  - ○ Add tanks/pipes to model
- ➢ Discussion of old and unused files
  - ○ In archive because irrelevant

[11] Kommer, N. (2021). Maintenance Dept. Meeting #2 - Data Model & Structure finalization [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of improved model from last meeting

        - Agreement on folder structure
    - ➢ Agreement on implementation of folder structure
    - ➢ Informing about next meeting - training & guidelines for the new system & process

[12] Kommer, N. (2021). Maintenance Dept. Meeting #3 - Rules & Guidelines discussion and testing [online]. Microsoft Teams.

Meeting Notes:

- ➢ Presentation of SharePoint Use & Synchronization
    - Showcase the synchronization between SharePoint and File Explorer and the intended use of the new storage system and process
- ➢ Presentation of Data Management Plan
    - File naming convention & column addition
        - Reasons and benefits

[13] Ligthart, T. (2021). Finance Dept. Interview #1 - Current Situation, Process, Data Usage [online]. Microsoft Teams.

Interview Notes:

- ➢ Gather data and documents from other departments and analyse them to make management reports and summaries
- ➢ Excel & PowerPoints are done on a monthly basis for purchasing, production, inventory, enhancements, personnel, fixed cost
- ➢ Workspace: *Project Commissie* folder in Global HDD (only access to gather info) and *Controlling* folder in the *Department* HDD

[14] Ligthart, T. (2021). Finance Dept. Interview #2 - Problem Analysis [online]. Microsoft Teams.

Interview Notes:

- ➢ Hard to find find due to lack of standardized naming
    - Therefore sometimes files are even lost
- ➢ Too much sharing of files and its als slow through communication channels and unreliable

[15] Ligthart, T. (2021). Finance Dept. Interview #3 - Requirements & Needs [online]. Microsoft Teams.

Interview Notes:

- ➢ Easy sharing and access to files and folders
- ➢ Clear structure of data storage
- ➢ Consistent naming in order for departments to work together in the same structured way

[16] Ligthart, T. (2021). Finance Dept. Meeting #1 - Data Model & Structure discussion & finalization [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of *Project Commissie* folder
  - ○ Overall same structure as before, but 2 separate folders within for archive and current files
  - ○ Agreement on structure & implementation within SharePoint

[17] Ligthart, T. (2021). Finance Dept. Meeting #2 - Rules & Guidelines discussion and testing [online]. Microsoft Teams.

Meeting Notes:

- ➢ Presentation of SharePoint Use & Synchronization
  - ○ Showcase the synchronization between SharePoint and File Explorer and the intended use of the new storage system and process
- ➢ Presentation of Data Management Plan
  - ○ File naming convention & column addition
    - ■ Reasons and benefits

[18] Ridder, B. (2021). HSE Dept. Interview #1 - Current Situation, Process, Data Usage [online]. Microsoft Teams.

Interview Notes:

- ➢ Responsible for regulatory processes, procedures, training, inspections, compliance with license to operate, hazards recognition, safety management, incidents
- ➢ Workspace: *HSE Manager, HSE-Manager* folders in *Global* HDD and *HSE Manager* folder in *Department* HDD
  - ○ The currently used and active one is *HSE Manager* folder in *Global* HDD

[19] Ridder, B. (2021). HSE Dept. Interview #2 - Problem Analysis [online]. Microsoft Teams.

Interview Notes:

- ➢ No structure for storing all of the information
  - Hard and slow to find and use files and documents
  - Loss of files and documents
- ➢ No standardization of document naming
  - Hard to find files and sometimes lost
  - No clear way on how version is being used, loss of data and progress
- ➢ No easy way of sharing folders and files to the government
  - Usually file size is too big
- ➢ No easy way of controlling access to documents and files

[20] Ridder, B. (2021). HSE Dept. Interview #3 - Requirements & Needs [online]. Microsoft Teams.

Interview Notes:

- ➢ Structured way of storing the department's data
  - Data model & structure
- ➢ Standardized naming convention including versions
- ➢ Easy way to control sharing and access to files and documents
- ➢ Ability to share folders and documents to government

[21] Ridder, B. (2021). HSE Dept. Meeting #1 - Data Model & Structure discussion [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of model based on workspace analysis
  - Key folders - License to Operate, Safety Management, Projects, Communication
  - Also an image and archive folder
- ➢ Old and unused files in an archive folder because they are irrelevant

[22] Ridder, B. (2021). HSE Dept. Meeting #2 - Data Model & Structure finalization [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of improved model based on feedback and previous discussion
  - Agreement on structure & implementation within SharePoint

- ➢ Informing about next meeting - training & guidelines for the new system & process

[23] Ridder, B. (2021). HSE Dept. Meeting #3 - Rules & Guidelines discussion and testing [online]. Microsoft Teams.

Meeting Notes:

- ➢ Presentation of SharePoint Use & Synchronization
  - Showcase the synchronization between SharePoint and File Explorer and the intended use of the new storage system and process
- ➢ Presentation of Data Management Plan
  - File naming convention & column addition
    - Reasons and benefits

[24] Ridder, B. (2021). Personal Communication [in person]. ICL Amfert facility.

Meeting Notes:

- ➢ Showcase of company organogram and departments involved in project [Appendix D - 1]
  - HSE, Maintenance, HR, Finance, Laboratory
- ➢ Explanation on ICL as a company, ICL Amfert facility and departments
  - ICL has worldwide operations
  - ICL Amfert is an old facility and has a long history
  - Employees vary in age and some have worked at ICL for decades
    - Employees also vary in technical abilities, therefore solution of storage system and process should be simple and efficient and probably will include trainings and guidelines
  - Explanation on project - migration of data to Sharepoint
    - New structure for departments and more standardization and guidelines for a common way of working
  - Explanation on overall current way of storing data (3 Hard drives) and problems
    - General, Global, Department hard drives
- ➢ Tour of facility and its production process, initial meeting for introduction with departments involved

[25] van Geffen, A. (2021). HR Dept. Interview #1 - Current Situation, Process, Data Usage [online]. Microsoft Teams.

Interview Notes:

- ➢ Main processes are payroll, advisor, training, protocols, policies & instructions
  - ○ Overall not many files that are specific to ICL Amfert facility
    - ■ Files without any privacy issues, so no restricted access necessary
- ➢ Workspace: *HR documenten* and *Handboek Arbeidsregelingen ICL FE CV* folders in *Global* HDD

[26] van Geffen, A. (2021). HR Dept. Interview #2 - Problem Analysis [online]. Microsoft Teams.

Interview Notes:

- ➢ No consistent use of naming and versioning
  - ○ Loss of files
- ➢ Hard to share and make files visible to everyone regarding policies,training, and other public documents

[27] van Geffen, A. (2021). HR Dept. Interview #3 - Requirements & Needs [online]. Microsoft Teams.

Interview Notes:

- ➢ Easy way to control sharing and access of documents and files
  - ○ Long-term access is important
- ➢ Consistent and organized way of naming files and including versions
- ➢ Data structure to improve organization and provide future-proof document folders

[28] van Geffen, A. (2021). HR Dept. Meeting #1 - Data Model & Structure discussion & finalization [online]. Microsoft Teams.

Meeting Notes:

- ➢ Discussion of data model based on interview information and analysis
  - ○ Overall similar structure, every “topic” such as *Formuliers, Questionnaires, Agreements*, etc. have their own folder
  - ○ Agreement on structure & implementation within SharePoint
- ➢ Informing about next meeting - training & guidelines for the new system & process

[29] van Geffen, A. (2021). HR Dept. Meeting #2 - Rules & Guidelines discussion and testing [online]. Microsoft Teams.

Meeting Notes:

- ➢ Presentation of SharePoint Use & Synchronization
  - Showcase the synchronization between SharePoint and File Explorer and the intended use of the new storage system and process
- ➢ Presentation of Data Management Plan
  - File naming convention & column addition
    - Reasons and benefits