



SAVONIA

THESIS – BACHELOR'S DEGREE PROGRAMME

TECHNOLOGY, COMMUNICATION AND TRANSPORT

DEVELOPMENT OF PROJECT MANAGEMENT PROCESSES USING MICROSOFT 365

Case: Caverion Industria Oy

AUTHOR:

Makar Nalimov

Field of Study Technology, Communication and Transport	
Degree Programme Degree Programme in Mechanical Engineering	
Author(s) Makar Nalimov	
Title of Thesis Development of Project Management Processes Using Microsoft 365	
Date 1 May 2024	Pages/Appendices 37/6
Client Organisation /Partners Caverion Industria	
<p>Abstract</p> <p>This thesis work was focused on devising a new Microsoft365-based Project Management tool for the supervision of small-scale projects for the Caverion Industria unit in Kuopio. The need for the new tool was rooted in discomfort working with the current application and its insufficiency in keeping up with the latest states of the projects. Moreover, Kuopio's Caverion Industria unit was in the process of customer base expansion.</p> <p>To realize the desired results, various methods were employed to collect and analyze relevant data. In particular, many digital and print resources were studied to accumulate information. Additionally, an interview and a survey were conducted to further enrich the data collection process. Whereas analysis was done using the Multi-Attribute Utility Decomposition (MAUD) matrix in combination with the personal working experience of stakeholders. Additionally, multiple methods were utilized, such as testing cycles and a workshop, to effectively deploy and integrate the new tool.</p> <p>As a result, the most suitable and beneficial software was identified based on constraints research and the results of the Multi-Attribute Utility Decomposition (MAUD) matrix. Additionally, all new or enhanced features were created to align best with the preferred Project Management style of the company, which was identified during the research phase. Finally, the User Interface and overall appearance were tweaked and refined during the testing phase to maximize usability and convenience.</p> <p>While the transition to and proficiency in the new tool might take time, this shift positively influenced the workflow of the unit. The new application not only simplified existing procedures but also introduced innovative features that could potentially conserve time and energy, leading to enhanced productivity. Finally, various ideas for further development were discovered during the thesis work, which, hopefully, will be implemented in the future.</p>	
<p>Keywords Project Management, Microsoft 365, Microsoft Lists, Research and Development</p>	

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1 INTRODUCTION

The goal of the thesis work was to introduce a new Project Management tool for Caverion Industria to supervise and manage small-scale projects. The need for an update became apparent since the unit manager found it challenging to keep the contemporary tool comprehensive, logical, and up-to-date. In addition, at the time Caverion Industria was actively expanding its customer portfolio, thus a streamlined and improved application was in great demand. Moreover, the Kuopio unit held weekly meetings to discuss projects' progress and timely add new information, therefore, a good chunk of the workday can be saved by optimizing the workflow.

Previously, small-scale projects were tracked and managed in the Excel spreadsheet, which was not very modifiable and versatile. Consequently, the workflow was quite rigid with little room for variation, which slowed the work down. Therefore, one of the purposes of a new application should be adaptability to adjust for various work scenarios and needs.

All in all, the main deliverable of the thesis work was a Project Management tool to track, supervise, analyze, and manage small-scale projects. Nonetheless, this tool did not extensively cover whole Caverion operations since large-scale projects are still tracked using other software, for instance, Microsoft Project. The new application aimed to substitute the initial Excel document - where all tracking and management is happening at the moment - and tried to streamline and improve the workflow.

1.1 Research questions

As this thesis work aimed to examine the complexities surrounding projects, project management, and new application template development, the following key research questions were addressed:

- What are projects and project management?
- What project management methodologies and frameworks exist?
- How significant projects are for Caverion? What methodology/framework is used to manage them?
- Who are the main stakeholders? What is their interest and how they are affected?
- What application is used right now? What is the current workflow?
- How the existing application should be improved? What features should be added?
- What applications are suitable and within set requirements and constraints?
- How the new tool should be deployed? What should be done and taken into consideration?
- How the work can be improved further? What can be added?

2 THEORY BACKGROUND

2.1 Caverion & Caverion Industria

Caverion Oy, founded in 2013, is a Finnish company that offers intelligent technical solutions and services for buildings, industrial processes, and infrastructure. They specialize in areas like HVAC, electrical and security systems, automation, and control systems as well as energy efficiency and sustainability. Caverion's comprehensive product line includes everything from design and construction to projects, technical and industrial maintenance, facility management, and advisory services. They operate in several European countries, including Finland, Sweden, Norway, Denmark, Germany, Austria, and Poland (Caverion Corporation, 2023). Caverion focuses on making built environments smart and sustainable, thus enhancing performance and people's well-being.

In June 2020, Caverion fully integrated the operations of Maintpartner in Finland into its Industrial Solutions division. As a result, this division was renamed Caverion Industry, but the legal company name stayed to be Caverion Industria Oy. Essentially, Caverion Industria's operations focus specifically on industrial operation and maintenance services, while the broader Caverion covers a wider range of technical solutions for both buildings and industries (Caverion Corporation, 2020.)

All in all, projects are a core activity for Caverion since their whole business model revolves around working with and delivering projects for customers. From initialization to closure, Caverion cooperates with customers to deliver the best custom solutions. This comprehensive approach guarantees that clients receive holistic support at every stage.

2.2 Projects and Project Management.

Before proceeding to the work, it was vital to deal with the basics. First of all, it was important to specify what is regarded as a "project" and what hallmarks it has. Secondly, as work was focused on Project Management development, defining what is Project Management, why is it needed, and in what forms it may manifest itself is essential as a foundation for the upcoming work and research.

A project has a list of distinctive traits unique to it. According to Nicholas & Steyn (2017, 3), work can be considered a project if it is an interim, unique endeavor that has a specific objective with defined results and deliverables as well as uses workers and other resources from various functions and organizations and, due to its uniqueness, has some level of risk and ambiguity. Not to mention a vast kaleidoscope of project forms, which depends on the sector, industry, type, and many other variables. Therefore, the need for management and control is strongly apparent.

The main purpose of management, including Project Management, is to fulfill and obtain the company's goals by planning, organizing, and integrating tasks and resources. This is achieved by implementing various actions managers have in their arsenal. As shown in Figure 1, these actions can be categorized into five operations (Nicholas & Steyn 2017, 21.) Although, in the beginning, the planning stage foregoes other operations, usually, these stages are performed depending on the need rather than in sequence since, throughout the whole project lifecycle, a need for some operation always arises.

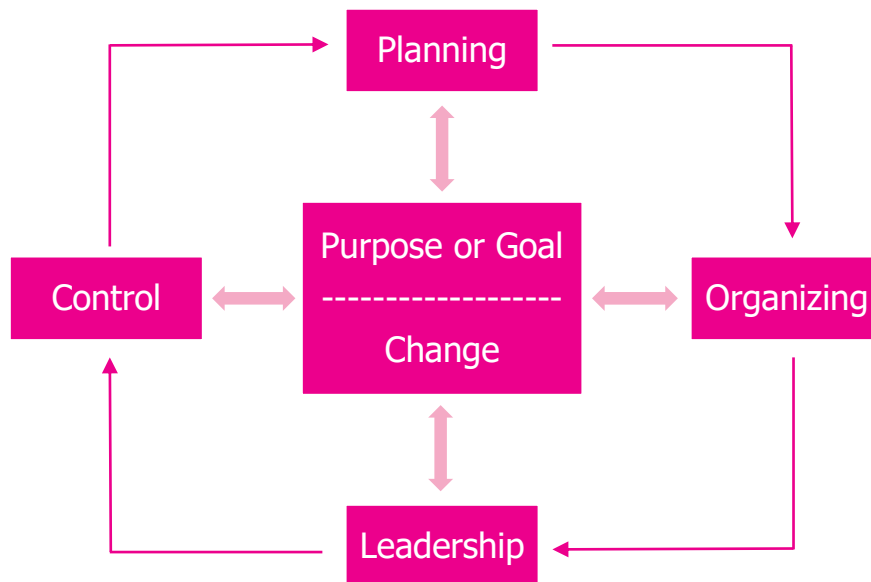


FIGURE 1. Manager's operations (Nicholas & Steyn 2017, 22)

All in all, the Project Management goal is to support and facilitate the fulfillment of requirements and achieving goals despite time, cost, and resource constraints in an ever-changing world. Project Management is especially important as projects become greater, more complex, and more high-stake.

2.2.1 Project Management methodologies and frameworks

Therefore, there are various Project Management frameworks and methodologies, which are selected based on the organization, its needs, and structure, the project client, or the project itself and exist to facilitate the project work and help the project manager. But what are these frameworks and methodologies?

To begin with, the Project Management framework and Project Management methodology are two distinctive approaches (see Table 1), even though these definitions are used interchangeably.

TABLE 1. Differences between framework and methodology (Kissflow, 2024).

Framework	Methodology
Gives an overview of how guidelines can be implemented	Offers rigid rules and practices for completing a project
Offers space for creative adaptation	Is pretty rigid and prescriptive
Preferred by experts	Preferred by beginners
Makes it hard to develop and implement performance metrics	Spells out all performance guidelines in granular detail
Leaves room to include other practices and tools	Cannot be embedded with other practices and tools
Traditional project management (PMBOK) is a framework	PRINCE2 is a well-known project management methodology

Although these definitions are different, a project management society generally disagrees about the proper application of these terms. For example, the majority of project management professionals regard "Agile methodology" as a framework despite the "methodology" being a part of the name. Nonetheless, the bottom line is how well the framework or methodology fits the project and helps it achieve and fulfill its goals (Kissflow, 2024.) Thus, even though it is important to know the difference, the focus will be on their application and features, not linguistic and definitional subtleties.

Project management is a complex and diverse field, thus numerous frameworks and methodologies exist to suit the project needs. Some companies even create their tailored methodologies and frameworks for their unique and sophisticated needs and there are a variety of popular and well-known ones (Teamwork.com, 2024). Nonetheless, this thesis presents seven of the most common project management methodologies and frameworks (see Figure 2).

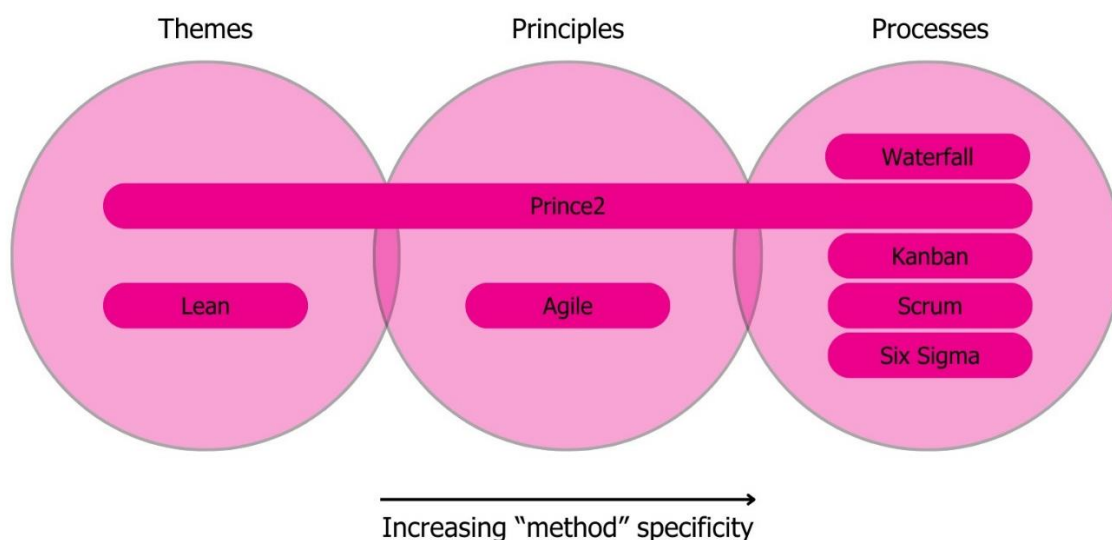


FIGURE 2. The most common project management methodologies and frameworks (Infinity, 2024).

As shown in Figure 2, project management "methods" not only have diverse approaches, but they also differ in specificity. Higher specificity implies that a method has highly defined workflows and

tools, whilst lower specificity indicates that a method serves more as a guideline or philosophy. This may also be a significant factor when selecting a “method.” Moreover, this distinction allows to combine multiple frameworks and methodologies within one project to yield even better results.

One of the earliest project management methodologies is the Waterfall model. It is considered one of the most conventional and sequential methodologies. Introduced in 1970 by Winston W. Royce, the waterfall model usually consists of six distinctive but dependent on each other phases, recreating a path a waterfall follows, thus its name (see Figure 3) (Infinity, 2024.).

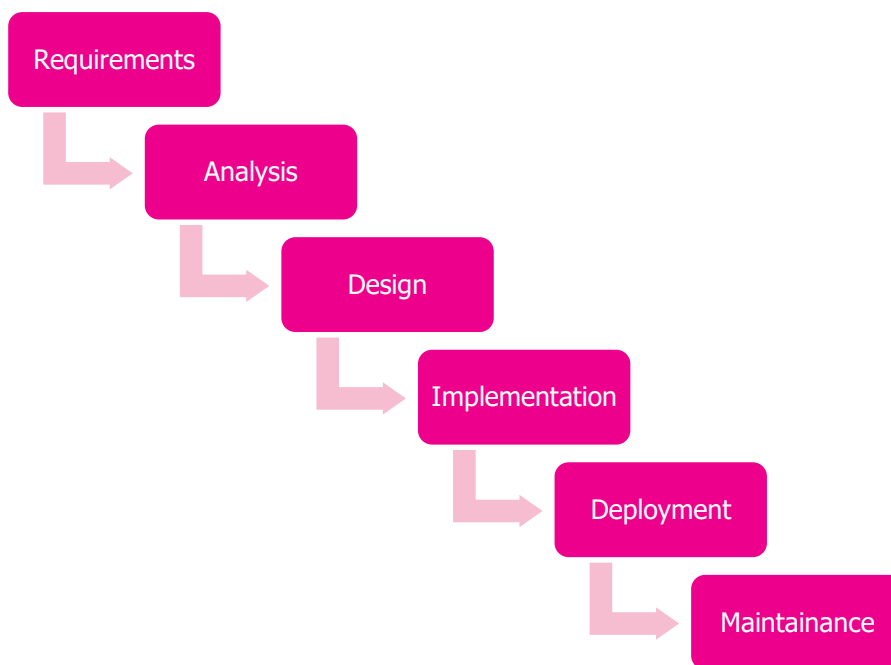


FIGURE 3. Waterfall model stages (Infinity, 2024).

One of the biggest advantages the Waterfall model offers is a comprehensive and thorough plan. This includes well-structured objectives, milestones, and plans, which are great for project benchmarking and tracking. On the other hand, the waterfall model requires exhaustive documentation, which would be beneficial to bring new workers up to speed but also takes a lot of time. This model is also stiff and inflexible since all the planning is done at the beginning of the project, which makes it hard to adapt and change the project scope or react to challenges and opportunities. Overall, the waterfall model is attractive and used a lot because it is highly adaptable, easy to understand, and produces valuable documentation for future projects. Nonetheless, it works best, when project requirements are well-defined, and a goal is clear as well as work is consistent and predictable. (Infinity, 2024; Kissflow, 2024; Teamwork.com, 2024.)

The next alternative is the agile methodology. Officially introduced in 2001 by software development experts in the Agile Manifesto, this methodology strived to improve waterfall model imperfections and propose a different approach to managing complex projects. It is based on four core values (see Table 2) as well as laid the foundation of some auxiliary methodologies and frameworks, such as Scrum and Kanban. Agile methodology divides a complex project into smaller pieces – sprints – to deliver it gradually, therefore allowing for change and modification between the sprints making the work more agile, thus the name. (Tarver, et al., 2024; Infinity, 2024)

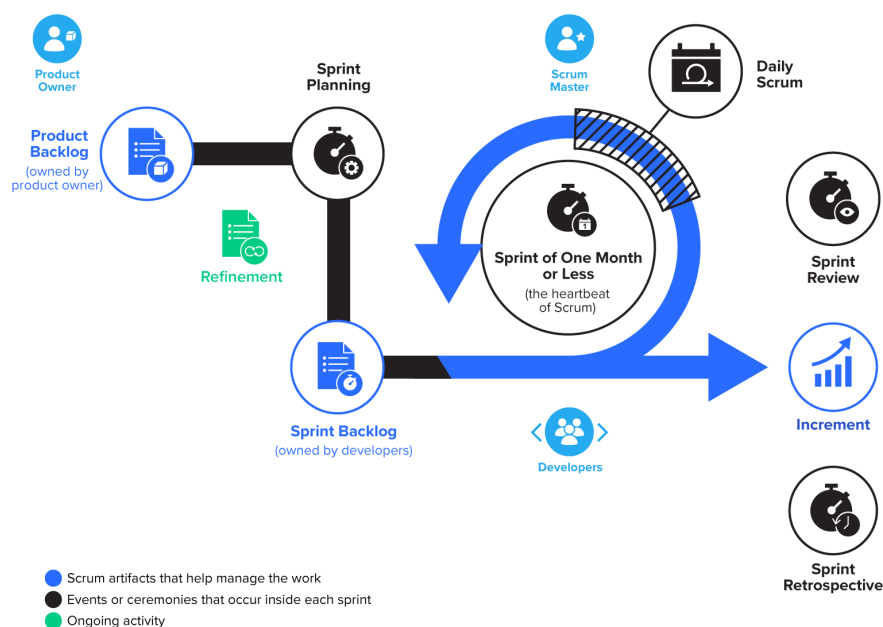
TABLE 2. Agile methodology core values (Masseti, et al., 2017, 2)

Individuals and Interactions	Over	Processes and Tools
Working Software	Over	Comprehensive Documentation
Customer Collaboration	Over	Contract Negotiation
Responding to Change	Over	Following a Plan

One of the biggest advantages of Agile methodology is adaptiveness and flexibility. Building sprints using a backlog of all project tasks makes it easy and natural to respond to change and new requirements, which is great for more creative and innovative projects. On the other hand, for the agile model to work tight cooperation between stakeholders and the project team is required, otherwise, the work might derail from the right track. Additionally, according to PwC research, agile projects are also 28% more successful than projects based on traditional model – Waterfall (Masseti, et al., 2017). Nonetheless, the agile model lacks predictability and fixed plans, making accurate estimates and schedules hard to produce. Overall, the agile model works best, when project results ought to change, work needs to progress fast, and stakeholders are eager to be highly involved in the project. (Teamwork.com, 2024; Infinity, 2024; Massetti, et al., 2017.)

According to the 16th Annual State Of Agile Report, Scrum was the most popular Agile framework in 2022 as 87% of responders utilized it (Digital.ai, 2022). Originally a rugby term, Scrum was put into a manufacturing perspective for the first time in 1986 by Hirotaka Takeuchi and Ikujiro Nonaka in a Harvard Business Review article (Hagman, 2024). The Scrum framework is an iterative and incremental approach for executing sophisticated and large projects. This framework is mainly distinguished by Product Owner, Scrum Master, and Developer roles as well as time-fixed “sprints”, which usually last 2-4 weeks. Scrum is also known for a structured and well-defined workflow (see Figure 4) (Sutherland, et al., 2020; Infinity, 2024.).

The Scrum Framework: A Bird's-eye View



Source: Adapted from Scrum Alliance, 2020



FIGURE 4. Scrum Framework overview (Hagman, 2024)

Scrum teams are multifunctional enough to possess enough knowledge and skills to perform the work, small enough to remain quick and mobile, but big enough to produce a valuable increment during every sprint. Commonly, a team is ten people or less and they all embrace Scrum's five main values – Commitment, Focus, Openness, Respect, and Courage. The biggest advantages of the Scrum framework are better risk management and improved ability to respond to change due to its iterative nature. On the other hand, Scrum requires highly qualified and organized teams since they work almost independently. Overall, Scrum performs best in highly volatile and unpredictable environments and industries where changes are frequent and often (Infinity, 2024; Sutherland, et al., 2020.).

Another well-known and famous methodology is Lean. The concept of Lean originates from the Toyota Production System (TPS), a machine industry concept introduced in the 1950s by Sakichi Toyoda, Kiichiro Toyoda, and Taiichi Ohno, which concentrated on eliminating waste and improving manufacturing efficacy (Hagman, 2018.). As Clifford (2013) and Sayer & Williams (2012) summarized, Lean defines three types of waste, commonly known as the three M:

- Muda – from Japanese “waste”, means a variety of non-value-adding actions within the manufacturing process. A non-value-adding action is an operation, which does not add customer value but adds additional costs. Interestingly, TPS distinguishes seven forms of Muda.
- Mura – from Japanese “unevenness” or “irregularity”. As the name states, depicts volatility and fluctuations in production, which should be eliminated.
- Muri – from Japanese “overburden”, refers to excessive equipment and people within the manufacturing line. The goal of this M is to stay away from overburdening and maintain an even distribution of workload during an assembly.

Even though Lean is rooted in the machine industry, its principles found application in many other industries, including project management. As Sayer & Williams (2012) summed up, the first two principles are customer satisfaction and respect for people, which are fundamental for the third and top principle of Lean – continuous incremental improvement. The main benefits Lean methodology brings are process optimization and streamlining as well as aligned focus to a customer. It is also highly adaptable and versatile since it does not have any defined processes or workflow. Nonetheless, one might see this as a hurdle and not a benefit. Additionally, Lean requires a strong commitment from every member involved in a project, which can also be a great challenge. All in all, Lean is the most beneficial for thoroughly planned and consistent long-term and big projects (J. Sayer, et al., 2012; Infinity, 2024.).

Next, is a framework associated with both Agile and Lean methodologies – Kanban. Originally occurred from the Toyota Production System in the 1940s, Kanban has become the second most popular Agile framework according to the 2022 State of Agile Report (Digital.ai, 2022). From Japanese Kanban translates as “signboard”, and, therefore, it has been used to visualize available workload and regulate work-in-progress. Virtually, this framework uses only one tool – the Kanban board. It consists of three main parts – a board, lists, which represent process phases, and cards, which represent individual tasks (see Figure 5). The Kanban board workflow is rather simple –

moving cards from one list to another – but it facilitates many benefits. The main Kanban gain is improved workload management and visibility. Another advantage of this framework is its simplicity. Kanban does not have thoroughly planned phases nor prescribes specific team roles, thus it can be implemented and taught in no time. On the other hand, the Kanban board requires timely updates and revisions to sustain high transparency and visibility of the workload. Kanban framework would be a good choice for every project team, which strives for improved performance, or process, which does not work well and need some renovation (Kissflow, 2024; Infinity, 2024; Hagman, 2024.).

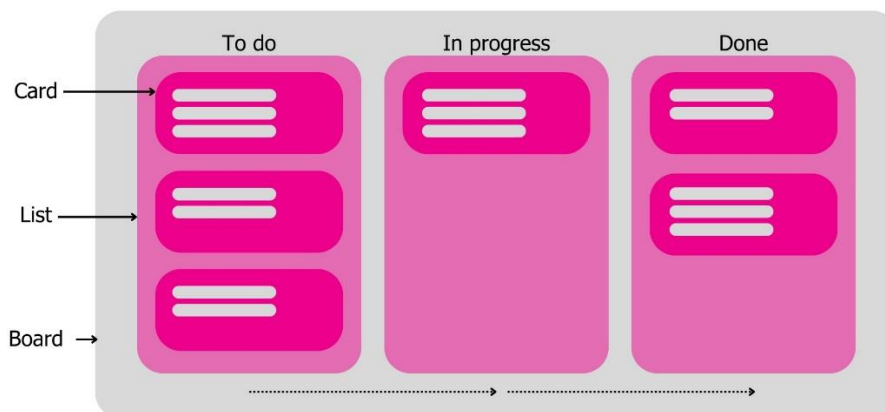


FIGURE 5. Kanban board (Kissflow, 2024)

Another well-known and largely used methodology is PRINCE2. Developed by the United Kingdom government and released in 1996, the PRINCE2 acronym deciphers as “PROjects IN CONTROLLED ENVIRONMENTs”. This methodology is process-oriented, consistent, and sequential as well as strongly relies on thorough and comprehensive documentation of roles, responsibilities, and processes. Like the Waterfall methodology, PRINCE2 divides a project into distinct stages, determines milestones for each of them, and creates meticulous plans to eliminate uncertainty and reduce risks (Infinity, 2024; Laoyan, 2024.).

There are seven principles, seven themes, and seven processes, which together represent and form the PRINCE2 methodology. The principles operate as a framework for good practice that each PRINCE2 project should obey. PRINCE2 themes represent knowledge areas, which shed light on how a project should be managed and used to set a project’s baseline. Finally, seven processes are grouped PRINCE2 practices to streamline project phases (Turley, 2022.).

The main benefit of PRINCE2 is better resources, costs, and risk management. This methodology also offers well-defined roles and a structured framework, which makes it easy to adapt and use. On the other hand, the broadness and thoroughness of PRINCE2 make it harder to use for smaller projects and might hinder progress. Moreover, PRINCE2 is a linear and stiff methodology, therefore it would be challenging to deal with changing requirements. Overall, PRINCE2 works best with large-scale projects with predictable and well-defined outcomes and requirements (Infinity, 2024; Laoyan, 2024; Wrike, 2022.).

Another universal Project Management methodology is Six Sigma. Presented in 1986 by Motorola engineer Bill Smith, Six Sigma is a data-driven cyclic approach to eliminate or reduce waste and inconsistency. Six Sigma is sometimes thought of as more of a philosophy or quality control method, which can be combined with other methodologies and frameworks to yield better results. The most common combinations are Lean Six Sigma and Agile Sigma. In practice, Six Sigma employs problem-solving techniques to improve existing or create new processes. The two most widely known and applied techniques are DMAIC, or Define, Measure, Analyze, Improve, and Control, which is used for existing processes, and DMAVD, or Define, Measure, Analyze, Design, and Verify, which is used to create new processes (Teamwork.com, 2024; Infinity, 2024; Wrike, 2021.).

The main benefit Six Sigma offers is improved efficiency because it primarily concentrates on eliminating waste. It is also proactive and continuous, which results in regular improvements and benefits for the business. Nonetheless, Six Sigma is a high-cost process with all the certifications and training needed as well as resources allocated. Also, the data-driven approach hinders creativity and slows down the implementation. Principally, Six Sigma would be a good choice for big enterprises with quality databases to boost their efficiency and eliminate defects (Teamwork.com, 2024; Infinity, 2024; Wrike, 2021.).

Going back to the thesis work, this broad Project Management research was done to better understand the environment and workflow the thesis's product would be used in. As the main focus of this work is on small-size projects the workflow for them was observed, interviewed, and re-searched.

It was concluded that to deal with small-size projects Caverion utilized a combination of Waterfall methodology and Agile-based framework Scrum. The overall project lifecycle and structure resembled a Waterfall methodology approach since projects had distinct phases and, usually, detailed requirements and well-defined goals. Nonetheless, the implementation phase was similar to the Scrum framework because of frequent meetings, semblance of backlog, incremental delivery, and sprint review and planning during the weekly meetings. These findings served as an insight and hint to what features might suit the application and in what form they would perform their best.

3 STARTING POINT OF THE THESIS

3.1 Overview of Initial Project Management Tool

The starting point for the thesis work was an Excel document, which was at the time used to monitor and manage small-scale projects. The document was an ordinary Excel spreadsheet with several information fields required for a project, such as title, working number, contact and responsible person, and notes as well as tracking fields, such as progress (shown in percentage) and deadline. The spreadsheet was also manually sorted by the "responsible person" field, which gave an overview of all tasks assigned to a worker one by one.

Caverion held a weekly meeting where they discussed the current status of projects as well as adjusted available work and added new projects and information. The Excel file was managed and owned by the unit manager, who was, therefore, completely responsible for all manipulations and actions in the file. Nonetheless, all employees had access to the file to track and check their work and projects.

3.2 Stakeholders

The primary stakeholders of the thesis work were members of the thesis team, the unit manager, Caverion Industria employees in the Kuopio unit, and Caverion's customers. Nonetheless, each member of the stakeholder group had its own interest and was affected uniquely.

Firstly, the thesis team had a main interest in delivering work, which would satisfy and fulfill all, or most of, the requirements within the given timeframe, to realize benefits for the company and the student. The impact on the student side was in the time allocated to research the topic and development of required features. Similarly, the company side's time was affected but it was allocated to formulate the requirements and evaluate the work.

Secondly, the unit manager and Caverion Industria employees had a similar main interest in streamlining and improving the work tool. Consequently, the primary effect was on their workflow and processes, which also affected their work time, which would need to be used for training and familiarization with the new application.

Finally, Caverion's customers had a main interest in optimizing productivity and in an overall increase in work efficiency. The main impact on their side was a slight short-term efficiency decline of their contractor caused by the time spent on the adoption of the new tool and personnel training.

3.3 Assessment and Evaluation of Initial Situation (Questionnaire)

To have a net positive change for both primary stakeholders, a survey was conducted. The survey focused on the user experience employees have had with the existing Excel document to identify ideas and improvements that would make work faster, better, or more efficient. After conducting a questionnaire, the results would be used later for upcoming research and design stages.

The survey consisted of a total of six questions to make sure that the respondents were not overwhelmed and would answer questions elaborately. There were also two categories in the survey –

owner and user category – based on the level of involvement in working with the tool. The questions were:

“Owner” category:

1. What annoys you, does not work, or works poorly in the current tool?
2. What is the thing, feature, or metric you would add to the tool?
3. What would streamline/speed up the work during the weekly meetings?

“User” category:

4. How easy and convenient is it to keep track of your tasks during work and meetings? What would improve your score?
5. How easy and convenient is it to assess work progress/status? What would improve your score?
6. How easy and convenient is it to estimate your workload? What would improve your score?

As there was only the unit manager in the ‘owner’ category, the first three questions were a personal working experience and answers were gathered during the personal interview. On the other hand, ‘user’ category questions were answered by multiple employees using Microsoft Forms (see Appendix 1), thus the results were more of a summary of collective opinion about the current situation. This was done to depict a holistic situation regarding the Excel document and present as many defects as possible.

Firstly, the “owner” category answers. The results were as follows:

1. What annoys you, does not work, or works poorly in the current tool?

The current tool is always behind schedule and usually lacks recent information due to the slow workflow (Vainikainen, 2024).

2. What is the thing, feature, or metric you would add to the tool?

Comment/Guideline field to give directions to the employees regarding a project as well as work priority field (e.g., urgent, important, low priority, etc.). Also work status (e.g., in progress, done, archived) would be a good addition to supervise projects efficiently. Additionally, work priority (e.g., high, medium, low) is important to analyze the overall situation. Finally, it would be great to make the new application a centralized space for work numbers and eliminate the extra step of saving them in a separate Excel document first. (Vainikainen, 2024.)

3. What would streamline/speed up the work during the weekly meetings?

Clear work listing and ability to rapidly update work status (Vainikainen, 2024).

Then, the “user” category answers. The results are presented as an average score given to each question, plus a short description of every idea provided by the Caverion Industria employees (see Appendix 2). The results were as follows:

4. How easy and convenient is it to keep track of your tasks during work and meetings? What would improve your score?

The average score for the current Excel document – 7,00. Improvement ideas included:

- A field that clearly states what tasks are remaining and what are the goals of the project,
 - A field with a due date or countdown of the days till a deadline,
 - A more clear and efficient application than Excel.
5. How easy and convenient is it to assess work progress/status? What would improve your score?

The average score for the current Excel document – 5,09. Improvement ideas included:

- A field such as subtasks or to-do list,
 - Compare estimation and implementation assumptions' accuracy of similar projects,
 - Standardized milestones, which define the completion percentage,
 - Tailored sub-goals for every project, which define the completion percentage.
6. How easy and convenient is it to estimate your workload? What would improve your score?

The average score for the current Excel document – 5,00. Improvement ideas included:

- Database of delivered projects to estimate new ones based on the previous results,
- A feature to mark the project's priority,
- Remove all suspended or delivered projects to declutter the view,
- A field that shows the time left till a deadline.

Altogether, this was an invaluable insight into the existing situation and application. This information was extremely important and shed light on the new tool's design and possible features. Later on, it was used in the implementation phase, and the next chapters describe approaches to fulfill and accommodate these ideas.

4 RESEARCH AND DEVELOPMENT STAGE

4.1 Constraints and Requirements

Before proceeding with the development and working with some particular software, initial constraints and requirements should be set for the desirable software to narrow down the search and identify potential candidates. The requirements set were tuned to meet company policies as well as ensure smooth and fast integration of the new application. The requirements encompassed:

1. Easy and fast integration with the existing tools and applications
2. Minimum expenses (preferably none)
3. Quick deployment after the design stage
4. User-friendly or familiar tool to cut the possible training time.

Caverion Industria used the Microsoft 365 product family across all its branches and units and, like many other companies, would require an extensive and long buying process in case of any software acquisition. Therefore, the best option to fulfill the first three requirements was to find an application within the Microsoft 365 product family. Nonetheless, many of the Microsoft 365 tools lack one of the two essential functions – collaboration. For instance, in Excel, it is possible to organize and track huge amounts of data fairly effectively but, on the other hand, it is quite tedious and difficult to assign tasks to particular employees, communicate effectively within the spreadsheet, or add any automation, such as reminders. Therefore, an application with effective collaboration capabilities should be selected and, in the case of Microsoft, this application is Teams. Microsoft Teams provides users with a variety of functions from chatting and calling to storing and managing information and documents. Moreover, the Caverion Industria unit in Kuopio uses Microsoft Teams daily for other tasks and activities, thus the fourth requirement was also fulfilled.

However, the plain Teams app was not enough to track and manage project data. Fortunately, Teams allows one to integrate other Microsoft 365 products seamlessly and use them inside Teams or on an automatically created SharePoint channel page (Hu, et al., 2023). After a thorough research, two main alternatives were selected – Microsoft Planner and Microsoft Lists. Both applications specialized at structuring tasks and were filled with tracking and managing features, including the ones useful for project management and company needs in particular.

As the base application and two add-ons were selected, the work continued with the actual design and implementation of the tool.

4.2 Overview of Microsoft Lists and Microsoft Planner

Both Planner and Lists applications are a part of the Microsoft 365 product family and can be used for project management tasks. They are quite similar in many ways but where do they stand from the point of view of this thesis work? How they could be described keeping in mind the already existing Excel application?

Microsoft Planner was quite different from what Caverion Industria already had and used. Even though it provided the same spreadsheet view as the Excel document, its main focus was on the Kanban view. This change would have brought a significant change in the workflow and project

management overall. Finally, Microsoft Planner was not nearly as customizable as Excel, which imposed new challenges but at the same time opened new possibilities.

On the other hand, Microsoft Lists was quite similar to the existing Excel document, which Caverion Industria used. It provided as much freedom in customization as Excel and overall had the same look and layout. This would mean less time for adaptation and training as well as preserved workflow, which is a great advantage. Nonetheless, Microsoft Lists required an extensive setup to seize all the benefits, which was also a substantial trade-off.

4.3 Comparison of Microsoft Lists and Microsoft Planner

Both Microsoft Planner and Microsoft Lists are mainly focused on solving the same kind of tasks and provide users with similar capabilities and features. Nonetheless, they still have differences, which make them more or less powerful in particular scenarios. Therefore, these alternatives were compared first to see how well they fit the company's needs and which one would be the best to continue with.

To make the comparison more straightforward and the results more tangible and clearer, a framework should be selected to judge candidates on their merits. Nonetheless, the list of merits is quite long and each of them has a different effect on the decision or "weight", thus a framework should consider that as well. One good alternative is a Multi-Attribute Utility Decomposition (MAUD) matrix or simply a rating chart (Croft, 2023). In the scope of this thesis work the merits or features were first selected together with the unit manager and thesis supervisor to ensure that selected features are important and relevant.

The idea was to survey a representative from an "owner" group – in my case, unit manager – and "user" group – in my case, my thesis supervisor – to gather the "weight" on the scale from one to five – presented as a "factor" in the matrix – of each feature based on their experience with and understanding of the tool. After that, the writer would score Microsoft Planner and Microsoft Lists on a scale from one to ten based on how well they perform preselected features. As a result, a numerical value would be produced, which would represent how well the application would suit the company's needs. This value would help the writer and Caverion Industria make a more informed and educated decision regarding the most suitable application. Table 3 depicts the chart's layout and selected features.

TABLE 3. Rating chart layout and selected features

<i>Feature</i>	<i>Factor</i>	<i>MS Planner</i>	<i>MS Lists</i>	<i>MS Planner</i>	<i>MS Lists</i>
Subtasks field/column					
Data analysis tool (charts, etc.)					
Calendar view (weekly, monthly)					
Progress percentage column/field					
Visible "customer name" column					
Tag employees inside the task					
Workflow pace and optimization					
Automatic reminders					
Tasks classification (industry, etc.)					
			Total		

After a quick discussion and a round of grading, factors for each feature were selected as shown in Table 4. Interestingly, the results were quite near. However, some major differences were noticed, too. For instance, a huge contrast in data analysis necessity, which is a great example of how responsibilities and work are divided regarding this project management tool between owner and users.

In addition, scores for both applications were also selected. As seen in Table 4, they had their advantages and disadvantages, proving a great need for a grading tool. Matrix came in handy to sort "nice-to-haves" from "must-haves" and allowed to analyze applications holistically.

TABLE 4. Graded rating chart

<i>Feature</i>	<i>Factor</i>			
	<i>Owner</i>	<i>User</i>	<i>Planner</i>	<i>Lists</i>
Subtasks field/column	4	3	10	2
Data analysis tool (charts, etc.)	4	1	7	4
Calendar view (weekly, monthly)	3	1	6	4
Progress percentage column/field	5	5	5	10
Visible "customer name" column	5	5	4	10
Tag employees inside the task	4	3	2	9
Workflow pace and optimization	2	2	10	7
Automatic reminders	4	3	6	7
Tasks classification (industry, etc.)	3	4	7	7

Finally, the results are shown in Table 5. In both cases – owner and user point of view – Microsoft

Lists was the more preferable option. Even though initial scores were almost the same – 57 for Microsoft Planner and 60 for Microsoft Lists – the differentiation between “nice-to-haves” from “must-haves” made this gap significantly more apparent.

TABLE 5. Final results of the rating chart

	<i>Owner</i>		<i>User</i>	
	<i>MS Planner</i>	<i>MS Lists</i>	<i>MS Planner</i>	<i>MS Lists</i>
	40	8	30	6
	28	16	7	4
	18	12	6	4
	25	50	25	50
	20	50	20	50
	8	36	6	27
	20	14	20	14
	24	28	18	21
	21	21	28	28
Total	204	235	160	204

As a result, Caverion Industria decided to proceed with the Microsoft Lists alternative as it better fitted the company's requirements and better filled the need for the vital features.

4.4 Progress and Developments

As the setup and structure of the new tool and its core capabilities were discussed and selected, the next step was to devise and implement the application. To do so, also the main challenges (see Chapter 3.3) in the existing Excel document should be addressed and fixed, as well as suggestions should be implemented as much as possible. In this chapter, ideas to design and arrange the tool's capabilities and approaches to accommodate suggestions are discussed.

4.4.1 Brand-new Features and Capabilities

Despite the new Microsoft Lists tool being alike prior Excel document in appearance, it provided Caverion Industria with a variety of new features and capabilities that were not present previously. These add-ons had different functionality and advantages, so it is important to introduce and describe them as well as discuss what improvements or objectives they were trying to achieve.

First of all, Microsoft Lists offers more powerful and versatile sort and filter capabilities (see Figure 6). Records could be sorted in text fields in alphabetical order, in date fields by recency, and in numerical fields by magnitude. Entries could also be filtered by values specified in a field, for instance, a particular date or priority level. This improvement allowed for faster and easier finding and concentrating on a particular block of projects, which, in turn, increased the flexibility and workflow speed of the new application.

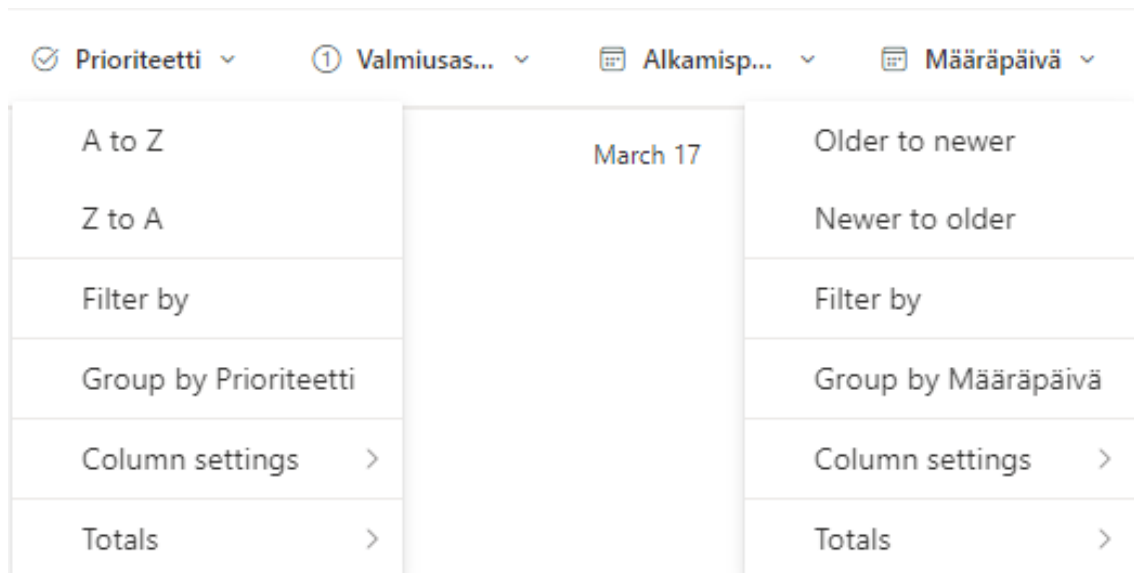


FIGURE 6. Examples of sort and filter menu for columns

Additionally, Microsoft Lists offer customizable automation capabilities. In practice, this means that a file owner can configure a reminder for any date field that would be sent a selected amount of days before the actual date (see Figure 7) or a rule can be created for any other data field to send an email to an employee/group of employees after a particular action has been performed in the list (see Figure 8).

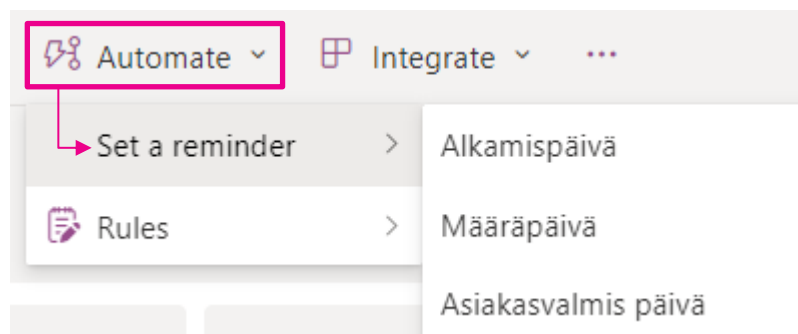


FIGURE 7. Reminder menu with date field options

Create a rule

Create rules to take action when data changes in this list. Choose a condition that triggers the rule and the action that the rule will take. [Learn more](#)

Notify someone when

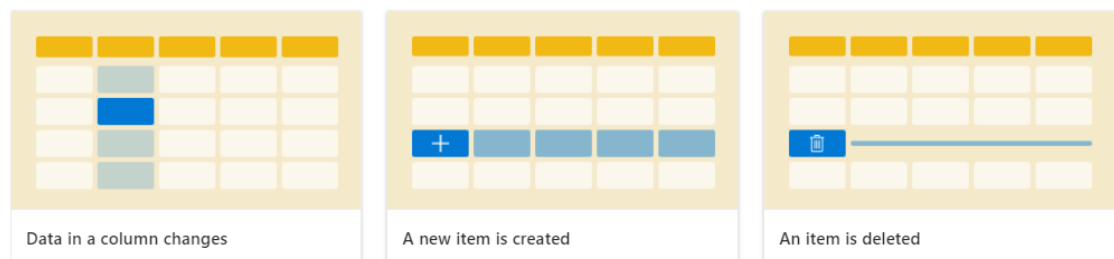


FIGURE 8. Rule configuration menu

Moreover, text fields, such as "Guidelines" (Suuntaviivat), "Description" (Kuvaus), "Subtasks" (Osatehtävät), and "Notes" (Muistiinpanot), were equipped and supplemented with "enhanced rich

text" feature, which enabled text formatting, such as font changes, bullet point, text highlight, and allowed to add pictures and hyperlinks to the text field (see Figure 9). This addition made all text fields more effective and adaptable, which led to better and clearer information storage and display.



FIGURE 9. Text formatting ribbon and enhanced rich text example

Microsoft Lists also allows to create and save various types of predefined views (see Figure 10). This capability in combination with Sort and Filter tools had several objectives. Firstly, it focused on bringing a standardized and unified view for various work scenarios. For instance, only active projects or Weekly meeting view, only archived projects or Keeping track of the work done, only particular customer projects or Sensitive information protection, etc. Secondly, this feature aimed to improve and streamline the workflow to save time since all the useful views would be predefined. Finally, this add-on allowed for simple data analysis capabilities since the view is fully customizable – columns can be selected, filters applied and saved, and view type can be changed to Kanban cards or gallery view, list view, and calendar view.

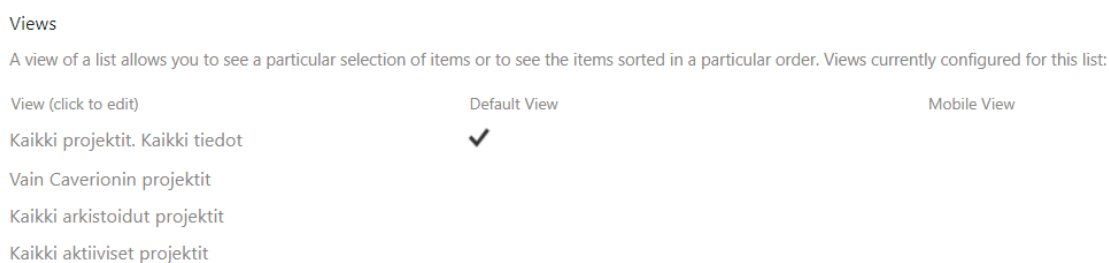


FIGURE 10. Views examples

The highly customizable Microsoft Lists layout allowed to addition of new useful fields, which brought more flexibility and possibilities in sorting and filtering.

First, is the "work type/area" field. Caverion Industria has numerous projects ongoing at the same time, and, naturally, they relate to various work types. Thus, the purpose of this column was to allow the company to divide projects into groups based on their work type (see Figure 11). This, in addition to sorting and filtering, would help employees understand, which steps they need to accomplish or workflow to follow, and help the unit manager to quickly analyze the activities dispersion and think of guidelines employees might need.

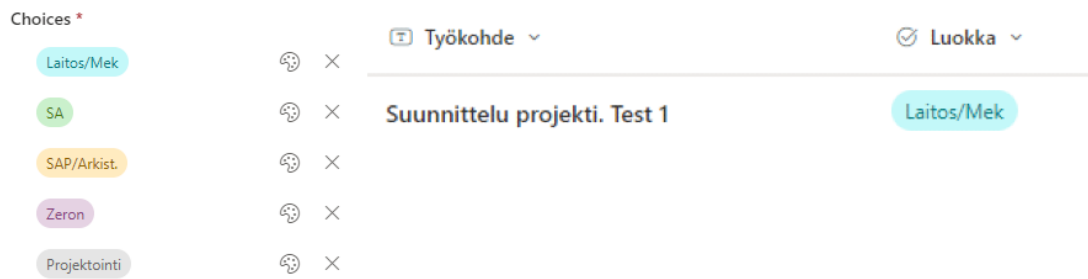


FIGURE 11. Work types and table view example

Second, is the "work priority" field. Caverion Industria has projects with diverse timeframes and workloads. Also, urgency strongly affects the priority of the project and is usually imposed by the customer, which makes this field even more significant. Therefore, the objective of this column was to depict the priority of a project (see Figure 12) to represent, which projects should be worked on first, or needed close attention. This, along with filtering and sorting improvements, would enhance the visibility of specific projects to ensure that important or urgent work does not go under the radar.

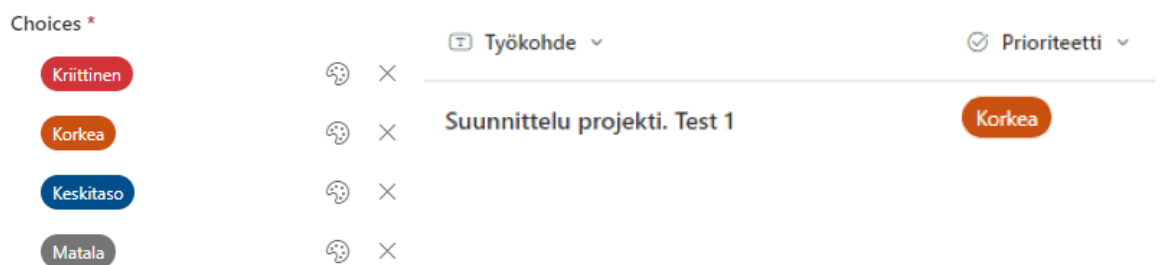


FIGURE 12. Priority types and table view example

Finally, there is the "work state/status" field. Caverion Industria takes care of many projects simultaneously, and they are at different levels of completeness at a point in time, such as "ready", "in progress", etc. Moreover, what makes this feature even more important, is the fact that Caverion only works with customer projects. Therefore, some stages/statuses might be imposed by the customer, such as "on hold", and others might depict unique and important phases, like "archived" or "awaits review" (see Figure 13). Because of these cases, it is important to keep track of the situation a project has since its status can change rapidly and multiple times during its lifecycle. In addition to filtering and sorting, this aimed to help the unit manager analyze the unit workload and situation as well as sort projects based on their status to discuss them with a customer and upper management or quickly make changes to a particular group of projects or individual projects.

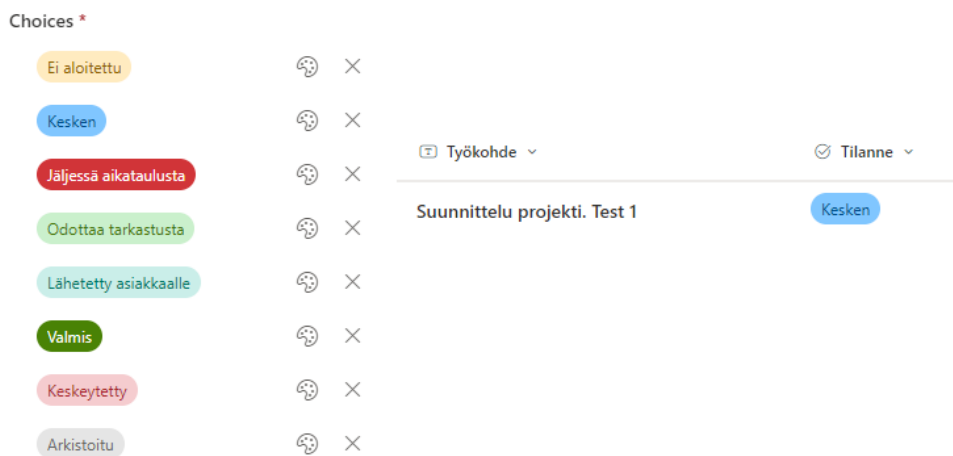


FIGURE 13. State/Status types and table view example

All of these fields were inspired by the survey and the interview conducted in Caverion Industria, which once again points out the importance of user experience in development (see Appendix 2 and Chapter 3.3).

In addition to the filtering and sorting enhancing fields, the new application's layout involved columns to streamline work governance and management.

First, is the "Guideline/Comments" field. It was specifically created for the unit manager to leave advice and recommendations to the employees regarding a project. This, firstly, would help to tidy up the notes field, and, secondly, this field endeavored to create a centralized space to share valuable insights regarding projects.

Second, is the "Customer company" field (see Figure 14). The purpose of this addition was an attempt to improve analysis capabilities and streamline the collaboration work between Caverion Industria and its customers. This field would allow to selection particular customer, which would bring two benefits: the possibility to assess the workload coming from one customer as well as a way to hide the project and protect sensitive company information.

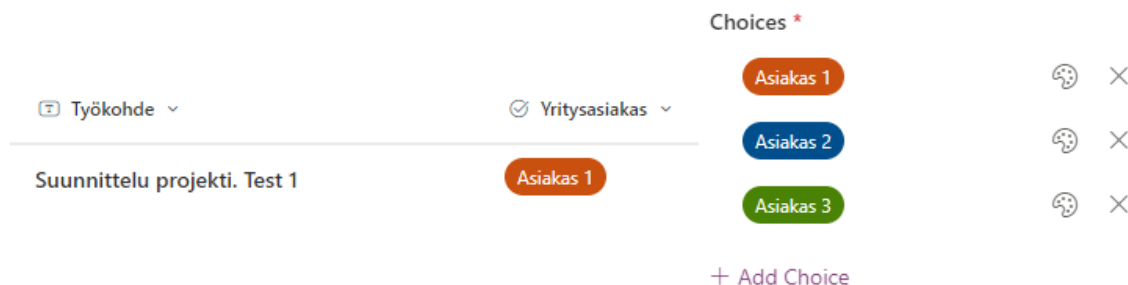


FIGURE 14. Table view example of Company Customer field

Moreover, rows, where project information is filled in, became more powerful.

The first addition is the version history feature (see Figure 15). Yes, most apps, including Excel, have a version history capability, however, Microsoft Lists does it a bit differently – it keeps track of versions for each item separately. The versioning feature in Microsoft Lists can hold up to 50 thousand versions and can be automated to save a version after an item is modified. It is also possible

to delete all or just specific versions of an item or set a cap on versions amount to clear them automatically. Since every item in a list is a project, that was a great addition that would increase the flexibility of the tool and enhance collaboration with the customer by being able to discuss multiple versions and keep track of the project development.

Version history

15.0	3/24/2024 1:29 PM	<input type="checkbox"/> Makar Nalimov
	Tilaaaja/Yhteishenkilö Matti Esimerkki	
14.0	3/24/2024 1:29 PM	<input type="checkbox"/> Makar Nalimov
	C-flow Työnumero 665544	
13.0	3/24/2024 1:29 PM	<input type="checkbox"/> Makar Nalimov
	Asiakasviite/KP-numero 112233	
12.0	3/24/2024 1:28 PM	<input type="checkbox"/> Makar Nalimov
	Suuntaviivat Muistahan mitata koneen pituus	
	YT, Pekka	
11.0	3/24/2024 1:28 PM	<input type="checkbox"/> Makar Nalimov
	Osatehtävät	
	<ul style="list-style-type: none"> Järjestää palaveri Pekan kanssa Tarkistaa koneen mitat Löytää ohjeita SFS 12345 standardista 	
10.0	3/24/2024 1:26 PM	<input type="checkbox"/> Makar Nalimov
	Muistiinpanot Ensi viikolla vierailu tehtaalla	
9.0	3/24/2024 1:24 PM	<input type="checkbox"/> Makar Nalimov
	Asiakasvalmis päivä 4/26/2024	
8.0	3/24/2024 1:24 PM	<input type="checkbox"/> Makar Nalimov

FIGURE 15. Version history view

The second upgrade is the file attachment feature. Microsoft Lists allows to linking of multiple files to each item. Caverion Industria works with technical and complicated projects, thus they contain a lot of paperwork, such as requirements, dimensions, blueprints, receipts, meeting minutes, etc. The file attachment allowed to store all of these documents in one place linked directly to a specific job. This improvement would streamline and accelerate the documentation search and use as well as would make workers' lives easier.

The third addition is the comment field feature. The main power of the comment field is mentioning capability. This allows the unit manager or other employees to tag their colleagues and draw their attention to a project. The recipient gets an Outlook notification with the comment message in it as well as comment stays visible in a project record. This improvement would enhance collaboration capacity and feedback visibility.

All in all, Microsoft Lists introduced a wide spectrum of new capabilities and features, which were aimed to streamline and enhance the work in many ways. Nonetheless, some features could not be considered new but rather an upgraded version of the Excel version. The next chapter is devoted to introducing this group of application attributes.

4.4.2 Refined features and capabilities

In addition to all new features and capabilities, the new Microsoft Lists tool also improved a number of existing attributes the Excel document had. The majority of all improvements were inspired by the survey conducted and feedback about contemporary workflows. This chapter presents the ideas that were chosen, how they were implemented, and the improvements and objectives they were trying to achieve.

Firstly, "Initial/starting notes" (Aloitusmuistio) have been divided and transformed into "Project goals/objectives" (Kuvaus), and "Notes" (Muistiinpanot) (see Appendix 3). This change was realized to bring clarity and transparency in note-taking to the new application for the employees.

Secondly, "Final/closing notes" (Lopetusmuistio) have been used for all sorts of notes and guidelines and, thus, were disordered and chaotic. To change this, a new column was added "Subtasks" (Osatehtävät), which will be specifically used for keeping track of smaller parts of the project (see Appendix 3). This idea was suggested via both "owner" and "user" surveys and, in combination with "Notes" (Muistiinpanot), is implemented to improve clarity, readability, and usability of new fields and the application in general.

Moreover, the main working view of the new tool was decluttered by filtering out all non-active (archived, ready, suspended/on hold) projects (see Figure 10). This idea was suggested via the "user" survey and is aimed at improving the readability of the new tool and, in turn, increasing the workflow speed.

Finally, Microsoft Lists has become a centralized space for work numbers. This idea was suggested during the "owner" survey and was focused on streamlining the current workflow by eliminating the excessive step of using another file to store work numbers there first.

Overall, Microsoft Lists has notably expanded the abilities and potential in managing and supervising projects compared to the previous Excel document. Nonetheless, all changes – and the application overall – have to be tested first to assess their viability and significance. Additionally, these changes have to be presented to the employees and integrated into the daily operations. The next chapter is dedicated to this group of challenges.

4.5 Deployment

Deployment is one of the most important stages of every project. It tests the viability and efficiency of a new product when it is used in real work scenarios. This chapter focuses on the deployment process used during the thesis work and the benefits it yielded.

For the thesis product, the deployment was implemented gradually through multiple cycles during the unit's weekly meetings. The main idea was that with each cycle more employees and projects would be added to the application. After that, each new cycle was tested live during the weekly meetings, where it was used as intended. This would slowly make the testing more demanding each time and, simultaneously, give employees and the unit manager more time to get used to and learn the new tool. These testing cycles revealed some imperfections and prompted fruitful feedback from

the employees. Therefore, in between the weekly meetings, the thesis team held feedback discussion sessions, where imperfections were discussed and fixed as well as employees' comments were implemented and added. For instance, after the first cycle, the order of columns was changed to suit the workflow of the meetings best, as well as after the second and third cycles custom views were created to streamline particular work scenarios. Additionally, after every testing cycle, the selection of columns and their sizes were refined.

As a result, the transition to the new tool was smooth and uniform for both parties. The selected method prolonged the deployment timeframe, which helped to avoid chaos and confusion. The thesis team had enough time to accommodate all the feedback and deal with the tool's imperfections, while the unit's employees got an opportunity to deliberately accept and understand the new tool and its new features.

4.5.1 Workshop

The final step of the deployment was to conduct a workshop to present the final version of the tool, recap its features and workflow as well as signalize the end of the development work. The workshop was organized at the Caverion Industria premises during one of the weekly meetings. It also was streamed in Teams to make sure that as many employees as possible could attend the workshop.

Essentially, the workshop was a big Q&A session as employees were already introduced to the tool. The main purpose of this event was to make sure that employees were familiar with the application and ready to use the tool to master it further. Additionally, this was an opportunity to clarify topics and things that remained unclear to ensure a smooth start.

All in all, the workshop was a useful piece of the puzzle and a helpful finishing touch to sum up the thesis work.

5 CONCLUSION

This thesis work presents a comprehensive overview of the research and development cycle involved in creating a new project management application based on Microsoft 365 software, intended to replace an existing work tool. The process encompassed five distinct phases: initial situational research, information, and requirements gathering, analysis of user experience feedback, design and refinement of the new application, and deployment. The primary objective of this thesis was to enhance and improve the project management capabilities of Kuopio's Caverion Industria unit. Specifically, the focus was on evaluating the existing tool used by Caverion Industria for managing small-scale projects and exploring how it could be further developed and refined using Microsoft 365 software.

Based on the research, the Caverion Industria unit in Kuopio utilized a combination of Waterfall methodology and Agile-based framework Scrum in their Project Management workflow and employed Excel as their main Project Management tool for small-scale projects. The questionnaire and interviews facilitated issues and objectives identification while the Multi-Attribute Utility Decomposition (MAUD) matrix supported the selection and prioritization of features and the tool. As a result, a new application was selected and designed to align with the company's project management workflow and preferred style. A final step was to deploy and introduce a new application. The deployment part was implemented cyclically by adding more employees and projects to the tool and gathering as well as accommodating feedback after each new cycle. The introduction to the new application was done in the form of a workshop, where the main features and capabilities were described and explained.

Even though the adoption and mastering of Microsoft Lists would take some time, this change had a positive effect on the unit's workflow. The new application streamlined existing processes and brought in brand-new features that potentially save time and effort, which would result in improved efficiency. Overall, the Caverion Industria unit in Kuopio was satisfied with the results of the thesis work and proceeded to utilize Microsoft Lists as their main tool to manage small-scale projects.

5.1 Further development

Despite all the progress and research that were done during the thesis period, the new application would still be a work in progress and continue to evolve and develop over time. Even though these ideas were brought up during the thesis work's timeframe, some of them were out of the scope, while others would need more time and resources to implement and test them. Therefore, this chapter is dedicated to showing possible ways the thesis work might evolve and ideas that might be adopted to improve the work even more or expand its capabilities.

Caverion Industria employees suggested numerous great ideas, which helped to move the development work forward. Nonetheless, some ideas were left out of the current versions due to their complexity and additional software integration required. One example is the project length estimation based on the database of similar projects (see Appendix 2). The main challenge here was to neatly extract and integrate projects' timeframes because it required to access data in the other software Caverion Industria uses to create work numbers for projects. Moreover, it was troublesome to

properly divide projects into groups to have an accurate estimation since many of Caverion Industria's projects are unique and one-time endeavors. Another good example would be a field showing the remaining work time left till the deadline (see Appendix 2). The main issue with this feature was its complexity. To implement this feature integration of Microsoft PowerApps or Microsoft Automate was required as well as some know-how in Power Fx low-code language. Additionally, time left should be represented in business days, which added an extra challenge in realizing this feature. Finally, the integration of PowerBI was highly anticipated by the unit manager to create graphs, charts, and other visuals to depict various projects' aspects and insights. Alas, due to integration difficulties and software complexity, this feature was not added during the thesis timeframe.

Implementing these features would significantly expand and advance the new application's capabilities. They would make the tool more comprehensive, allowing users to have a more holistic overview of projects. Additionally, these improvements would provide analytical and data benefits, such as better planning and more accurate workload estimation. As a result, making the tool even more useful and effective in executing Project Management tasks. Hopefully, as the tool continues to live on, solutions to overcome the challenges and ways to implement the mentioned features will be found.

REFERENCES

- Caverion Corporation. 2023.** About us: Caverion Corporation. *Caverion Corporation Web site*. [Online] 2023. [Cited: February 9, 2024.] <https://www.caverion.com/>.
- Caverion Corporation. 2020.** Caverion Industry is born – Finland's largest provider of industrial operation and maintenance services. *Caverion Corporation Web site*. [Online] June 1, 2020. [Cited: February 9, 2024.] <https://www.caverion.com/newsroom/releases/2020/caverion-industry-is-born--finlands-largest-provider-of-industrial-operation-and-maintenance-services/>.
- Clifford, Joe. 2013.** Toyota Production System – what it all means. *Toyota UK Magazine Web site*. [Online] Toyota UK Magazine, May 31, 2013. [Cited: March 29, 2024.] <https://mag.toyota.co.uk/toyota-production-system-glossary/>.
- Coursera. 2024.** Kanban vs. Scrum: What's the Difference? *Coursera Web site*. [Online] Coursera, March 15, 2024. [Cited: March 29, 2024.] <https://www.coursera.org/articles/kanban-vs-scrum>.
- Croft, Chris. 2023.** *Problem-Solving Techniques*. [Online Course] s.l. : LinkedIn, 2023.
- Digital.ai. 2022.** *16th Annual State Of Agile Report*. 2022.
- Hagman, Darren. 2024.** Today's Project Management Blueprint: A Comparison of Lean, Agile, Scrum, and Kanban. *Toptal Web site*. [Online] Toptal, 2024. [Cited: March 29, 2024.] <https://www.toptal.com/project-managers/agile/project-management-blueprint-part-1-agile-scrum-kanban-lean>.
- Hu, Rui, et al. 2023.** Overview of Teams and SharePoint integration. *Microsoft Learn Web site*. [Online] November 10, 2023. [Cited: March 8, 2024.] <https://learn.microsoft.com/en-us/sharepoint/teams-connected-sites>.
- Infinity. 2024.** Project Management Methodologies. *Infinity Web site*. [Online] 2024. [Cited: February 26, 2024.] <https://startinfinity.com/project-management-methodologies>.
- J. Sayer, Natalie and Williams, Bruce. 2012.** *Lean for Dummies*. Hoboken : John Wiley & Sons, Inc., 2012.
- Kissflow. 2024.** Project Management Methodologies and Frameworks Explained. *Kissflow Web site*. [Online] 2024. [Cited: February 23, 2024.] <https://kissflow.com/project/project-management-methodologies-and-frameworks/>.
- Laoyan, Sarah. 2024.** What is the PRINCE2 project management methodology? *Asana Web site*. [Online] Asana, January 6, 2024. [Cited: April 8, 2024.] <https://asana.com/resources/prince2-methodology>.
- Massetti, Marco, et al. 2017.** *Agile Project Delivery Confidence*. s.l. : PwC, 2017.
- Nicholas, John M. and Steyn, Herman. 2017.** *Project Management for Engineering, Business and Technology*. London : Routledge, Taylor & Francis Group, 2017.

Rehkopf, Max. 2024. Kanban vs. scrum: which agile are you? *Atlassian Web site*. [Online] Atlassian, 2024. [Cited: March 29, 2024.] <https://www.atlassian.com/agile/kanban/kanban-vs-scrum>.

Sutherland, Jeff and Schwaber, Ken. 2020. *The Scrum Guide. The Definitive Guide to Scrum: The Rules of the Game*. [Document] 2020.

Tarver, Evan and Holznienkemper, Lauren. 2024. Project Management Methodologies & Frameworks You Should Know. *Forbes Advisor Web site*. [Online] Forbes, January 17, 2024. [Cited: February 18, 2024.] <https://www.forbes.com/advisor/business/project-management-methodologies/>.

Teamwork.com. 2024. Project Management Methodologies. *Teamwork.com Web site*. [Online] 2024. [Cited: February 26, 2024.] <https://www.teamwork.com/project-management-guide/project-management-methodologies/>.

Turley, Frank. 2022. PRINCE2 wiki. *PRINCE2 wiki Web site*. [Online] January 14, 2022. [Cited: April 8, 2024.] <https://prince2.wiki/processes/>.

Vainikainen, Jarkko. 2024. Kuopio, February 5, 2024.

Wrike. 2022. What Is PRINCE2 in Project Management? *YouTube Web site*. [Online] January 13, 2022. [Cited: April 8, 2024.] <https://www.youtube.com/watch?v=bsIvbr0we8w>.

Wrike. 2021. What Is Six Sigma in Project Management? *YouTube Web site*. [Online] November 10, 2021. [Cited: April 10, 2024.] <https://www.youtube.com/watch?v=jSiHS-S46WA>.

APPENDIX 1: SURVEY STRUCTURE AND QUESTIONS

Projektihallintatyökalu. Opinnäytetyö tutkimus

Nykyisen Excel-tiedoston sijaan tulee uusi projektihallintatyökalu. Opinnäytetyön osana, kerään palautettanne varmistaakseni, että otan oikeat haasteet vastaan ja kehitän hyödyllisiä ominaisuuksia ennen kaikkea **teille**.

Teidän mielipide on erittäin tärkeä! Kiitos etukäteen!

T. Makar

1. Kuinka helppoa ja kätevää seurata omat projektit ja niiden tehtävät työn ja palaverin aikana? *



2. Mikä muutos työkalussa parantaisi arvosanaasi?

Voisi olla uusi ominaisuus, kenttä/sarake, näkymä tai jotain muuta.

Enter your answer

3. Kuinka helppoa ja kätevää arvioida työsi edistymistä/valmiusastetta? *



4. Mikä muutos työkalussa parantaisi arvosanaasi?

Voisi olla uusi ominaisuus, kenttä/sarake, näkymä tai jotain muuta.

Enter your answer

5. Kuinka helppoa ja kätevää arvioida työmääräsi? *



6. Mikä muutos työkalussa parantaisi arvosanaasi?

Voisi olla uusi ominaisuus, kenttä/sarake, näkymä tai jotain muuta.

Enter your answer

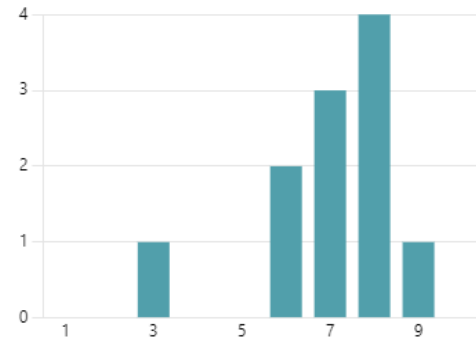
APPENDIX 2: SURVEY RESPONSES

1. Kuinka helppoa ja kätevää seurata omat projektit ja niiden tehtävät työn ja palaverin aikana?

[More Details](#)

[Insights](#)

7.00
Average Rating



2. Mikä muutos työkalussa parantaisi arvosanaasi?

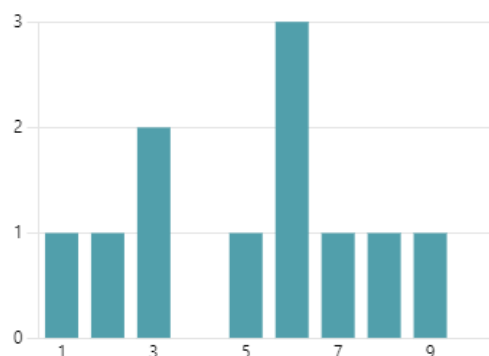
9 Responses

ID ↑	Name	Responses
1	anonymous	Selkeämpi selitekenttä mitä työssä on vielä kesken.
2	anonymous	Meneillään olevien projektien seuranta on mielestäni nykyisellä formaatilla on ihan ok. Tosin yksittäiseen projektiin liittyviä työtehtäviä on hieman hankala seurata palaverin aikana.
3	anonymous	Aikajanat eivät toimi, työkalu ei siten huomioi mm. sen hetkistä ja tulevaa työkuormaa kunnolla.
4	anonymous	selkeät tavoitteet selkeästi esille ja mihin päivään menessä pitäisi olla tehtynä
5	anonymous	Jokin selkeämpi/tehokkaampi resurssienhallintatyökalu kuin Excel
6	anonymous	Uusi sarake/kaava, missä lukee jäljellä oleva suunnittelu-aika päivinä. Tähän voisi ottaa käyttöön vaikka värejä kun suunniteltu työn valmistumispäivä lähenee.
7	anonymous	Jos nyt on kyse siitä käytössä olevasta excelistä, niin se on aivan liian kankea, eikä siinä voi edistymistä oikein muuten seurata kuin arvioimalla valmiusastetta.
8	anonymous	Mielestäni tämä omien projektien ja tehtävien listaus toimii nykyisin hyvin.
9	anonymous	Rivejä voisi olla vähemmän kerrallaan näkyvissä niin seuraaminen olisi helpompaa. Näkymä voisi olla visuaalisempi, värejä tai jotakin muuta? Esimerkiksi Mondin työt ja muiden asiakkaiden työt voisi olla selvemmin eroteltuna

3. Kuinka helppoa ja kätevää arvioida työsi edistymistä/valmiusastetta?

[More Details](#)[Insights](#)

5.09
Average Rating



4. Mikä muutos työkalussa parantaisi arvosanaasi?

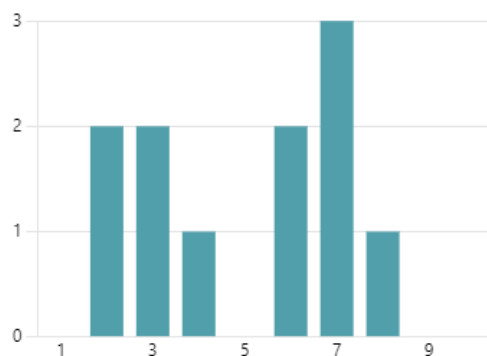
9 Responses

ID ↑	Name	Responses
1	anonymous	Ehkä tekemättä jääneet tehtävät voisi joskus olla hyvä tuki arvioinnissa.
2	anonymous	Eri vaiheiden edistymistä on välillä hankala arvioida, joten varsinkin projektien alkuvaiheessa työn valmiusastetta on hankala muuttaa prosenteiksi. Monesti myöskään projektin loppuvaiheilla punakyniä ja dokumentointia ei välttämättä oteta tarpeeksi huomioon valmiusastetta määrittäessä.
3	anonymous	Aikajanaat eivät toimi, työkalu ei siten huomioi mm. sen hetkistä ja tulevaa työkuormaa kunnolla.
4	anonymous	edellisten töiden arvioinnin ja toteuman osumisprosentti
5	anonymous	Työtehtävien pilkkominen pienemmiksi palasiksi
6	anonymous	Suunnitteluprojekteissa, esimerkiksi hoitotason suunnittelussa voisi käyttää työn etenemisen mittarina sitä missä vaiheessa suunnittelutyötä ollaan. Onko kaikki osat mallinnettu, osat sijoitettu paikalleen 3D-ohjelmistossa, kysytty asiakkaan näkökulmia, tehnyt valmistuspiirustuksia jne. Esim. 20% = Muutamia osia tehty valmiiksi 40 % = Osat mallinnettu 60 % = Osat sijoitettu paikalleen 80% = piirrustusten aloitus 100% = Piirrustukset valmiit.
7	anonymous	Jokaisella isolla työllä olisi jonkinlaiset välitavoitteet, joita voisi kuitata valmiiksi. Etusivulla voisi näkyä kaikki työt yksinkertaisesti valmiusasteineen, mutta työn nimellä klikkaamalla pääsisi toiselle sivulle, jossa juuri kyseistä työtä käsiteltäisiin tarkemmin.
8	anonymous	Työn valmiusasteen arviointi on toisinaan vaikeaa, erityisesti laajoissa tehtäväkokonaisuuksissa. Työn arvioitu kesto (tuntimäärä) ja työhön jo käytettyjen tuntien määrä antaisi suuntaa edistymisestä/valmiusasteesta. Toki jos työn kesto (tuntimäärä) on alunperin arvioitu väärin voidaan siinä tapauksessa saada virheellinen kuva työn edistymisestä/valmiusasteesta.
9	anonymous	Töiden pilkkominen pienempiin osiin, eli voisi olla vaikkapa välitavoitteita apuna kokonaisvalmiusasteen arvioinnissa

5. Kuinka helppoa ja kätevää arvioida työmääräsi?

[More Details](#)[Insights](#)

5.00
Average Rating



6. Mikä muutos työkalussa parantaisi arvosanaasi?

9 Responses

ID ↑	Name	Responses
1	anonymous	Olisiko jokin historiatieto miten kauan aiemmin on mennyt vastaavissa työtehtävissä. Esim. hoitotasojen keskimääräinen suunnittelu-aika. Tämä vaatisi datan keräämistä.
2	anonymous	Työmäärän arviointi on kohtuullisen selkeää nykyiselläkin työkalulla. Excelissä tulee ihan hyvin esille meneillään olevat projektit sekä mahdollisesti sellaiset, jotka ovat jäädytettyinä syystä tai toisesta.
3	anonymous	Aikajanaat eivät toimi, työkalu ei siten huomioi mm. sen hetkistä ja tulevaa työkuormaa kunnolla.
4	anonymous	Priorisointityökalu, jolla voisi merkata tärkeitä ja todella tärkeitä työt
5	anonymous	Työtehtävien pilkkominen pienemmiksi palasiksi
6	anonymous	Erialaisten työtehtävien kohdalla työn arvioiminen on hankalaa, jos ei ole tehnyt vastaavaa työtä ennen. Työmäärä pystyisi seuraamaan myös paremmin jos valmiit projektit (100%) eivät näkyisi aktiivisella työlistalla sekä töiden jäljellä oleva aika näkyisi päivinä myös sarakkeella vieressä. Tähän voi ottaa aiemmin mainittuja värejä mukaan, hahmottamaan päivämäärän loppumispäivää.
7	anonymous	En tiedä
8	anonymous	Kokonaistyömäärän arviointi on vaikeaa jos on monta projektia samaan aikaan menossa. Olisiko jonkunlainen summaus arvioiduista projektien/tehtävien kokonaistuntimäärästä/henkilö toimiva ratkaisu työmäärän esittämiseen/arviointiin toimiva?
9	anonymous	Listassa voisi näkyä vain aktiiviset työt ja valmistuneet työt piilotettu, niin lista olisi lyhyempi kuin nykyinen ja rivejä vähemmän

APPENDIX 3: OVERVIEW OF OVERALL MICROSOFT LISTS LAYOUT

This is a Microsoft Lists layout divided into three screenshots to make all columns readable. In fact, all these columns were going from left to right as one big list.

Työkohde	Kuvaus	Luokka	Tilanne	Prioriteetti	Valmiusaste
Suunnittelu projekti. Test 1	Tämän projektin tavoitteena on suorittaa nämä tulokset:	Laitos/Mek	Keskeytetty	Korkea	50%
	<ul style="list-style-type: none"> Tulos yksi Tulos kaksi Tulos kolme 				
	Caverion				
Arkisto projekti. Test 2	Tämän projektin tavoitteena on suorittaa nämä tulokset:	SAP/Arkist.	Ei aloitettu	Matala	0%
	<ul style="list-style-type: none"> Tulos yksi Tulos kaksi Tulos kolme 				
	Caverion				
Ylläpito projekti. Test 3	Tämän projektin tavoitteena on suorittaa nämä tulokset:	Projektointi	Jäljessä aikataulusta	Kriittinen	50%
	<ul style="list-style-type: none"> Tulos yksi Tulos kaksi Tulos kolme 				
	Caverion				
Alkamispäivä	Määräpäivä	Asiakasvalmis päivä	Vastuhenkilö	Muistiinpanot	Osatehtävät
March 17	April 30	May 7	Makar Nalimov	Viime viikolla oli palaveri X ja Y kanssa.	<ul style="list-style-type: none"> Rungon suunnittelu ja tarkastus Piirustuksen tekeminen
April 7	April 22	April 29	Makar Nalimov	Lisätietoa tarvitaan!	<ul style="list-style-type: none"> Tarkista hylly 1 ja 2 Laminoida ohjeet
March 10	April 12	April 26	Makar Nalimov	Ensi viikolla vierailu tehtaalla	<ul style="list-style-type: none"> Järjestää palaveri Pekan kanssa Tarkistaa koneen mitat Löytää ohjeita SFS 12345 standardista

Suuntaviivat	Asiakasviite/...	C-flow Työnumero	Tilaaaja/Yhteishenkilö	Yritysiasiakas
Mustahan tarkistaa standardi SFS-EN 12345 YT, Pekka	123456	654321	Pekka Esimerkki	Asiakas 1
Hyllyltä 1 puuttuu standardi SFS 12345 YT, Matti	654321	987654	Maria Esimerkki	Asiakas 2
Muistahan mitata koneen pituus YT, Pekka	112233	665544	Matti Esimerkki	Asiakas 1