

Translating User Expectations from Mainstream Web to Internal Enterprise Tools

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When using digital services, users have expectations from previous experiences on how the service should behave. These expectations can transform over time but are present in every interaction with digital systems. This thesis aims to discover how can the expectations enterprise employees form outside of work be used to improve internal tools, particularly Wärtsilä's Master Data Portal.

This study focuses specifically on home pages. It examines the anatomy of a successful home page. The use of interface elements on home pages of popular online tools is analysed to recognize consistent elements among related websites. To gain further insight on users' experiences with the existing portal home page, frequent users are surveyed on their experience with the portal.

All the information gathered is used to create a new design for the Master Data Portal home page. An interactive prototype of the design is created to conduct user testing. Volunteer users participate in short user testing interviews and answer a survey afterwards, providing both qualitative and quantitative data.

The findings of the research imply that the test participants were satisfied with the new design. In the interviews, users gave predominantly positive feedback on the prototype. Ratings of usefulness, perceived usability, and visual look all improved across the two surveys. Familiar design choices reduced the burden of usage and increased discoverability. Ultimately, the results indicate that the design improvements of Master Data Portal's home page were successful. This creates a starting point to improve Wärtsilä's data asset management processes further.

Key words: interface element, user interface design, home page, internal enterprise tool, consistency

Table of contents

1	Introduction	1
2	Interface Design	3
2.1	User Interface	3
2.2	Evaluating a User Interface	4
2.2.1	Usability	4
2.2.2	User Experience	5
2.3	Striving for Consistency	6
2.4	Familiarity Creates Comfort	8
2.5	Balancing Discoverability and Information Overload	9
3	Internal Enterprise Tools	11
3.1	Self-Service Tools & Wärtsilä Master Data Portal	11
3.2	Challenges in Enterprise UI/UX Design	12
4	The Entry Point: Home Pages	15
4.1	The Lobby of the Website	15
4.2	Common Website Interface Elements	16
4.2.1	Buttons	16
4.2.2	Text Input Fields	18
4.2.3	Cards	19
4.2.4	Navigation	21
4.2.5	Responsiveness	21
4.3	Analysis of High Visitor Websites' Home Pages	23
4.4	Website analysis insights	24
5	Designing the New Master Data Portal Home Page	27
5.1	Evaluation of the Current Home Page UI	27
5.2	User Survey About Current Home Page	29
5.3	New Design	36
5.4	Prototype Creation	40
6	User Testing Interviews	44
6.1	Methodology and Hypotheses	44

6.2	Interview Structure	45
6.3	Post-Interview Survey Structure	46
7	User Interview Results	49
7.1	Interview Findings	49
7.2	Results of Post-Interview Survey	52
7.3	Hypotheses	57
8	Discussion	59
8.1	Core Findings	59
8.2	Limitations of the Study	60
9	Conclusion	62
	References	64
	Appendices	70
	Appendix A – Links to Websites Under Analysis	70
	Appendix B – Pre-Design Survey of Existing Master Data Portal Home Page	71
	Appendix C – User Interview Structure	75
	Appendix D – Post-Interview User Survey	78

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1 Introduction

Whenever users are interacting with a digital service, they have expectations on how it behaves. These expectations are driven by their mental models. The term refers to the things users know from their past experiences, which guides their own behaviour with the system. The expectations are formed and modified every time users access digital services. (M. Chan, 2024.) This outlines the concept of this thesis: Can we improve internal tools by adapting them to serve the mental models users create for themselves outside of the work environment?

This study aims to investigate how can replicating design of widely used websites improve the home page of Wärtsilä's Master Data Portal. Wärtsilä is an international technology company with nearly 18000 employees in 78 countries, providing innovative solutions in the field of marine and energy (Wärtsilä, n.d.). The Master Data Portal is an important internal tool for Wärtsilä, used to manage key data assets of the company. Improving the home page has the potential to boost the work of hundreds of daily users, increasing the overall productivity of the enterprise. The portal will be presented in more detail later.

In the research we will particularly focus on the placement, style, and role of common interface elements on popular websites. The current home page is evaluated, and users are surveyed on their opinions on it. The gathered findings will be used to re-design the portal home page, which will be tested with users.

The thesis aims to answer the following research questions:

RQ1. What are the key aspects of a successful home page?

RQ2. How does replicating interface elements from widely used websites affect the usability of an internal tool home page?

The answer to RQ1 is compiled through examining appropriate literature, mainly in Chapter 4, with support from Chapter 2. To answer RQ2, the usage of specific interface elements across different online tools is analysed. Users are surveyed on the current portal home page and user testing is conducted with a prototype created based on the gathered insight. The content for answering RQ2 is compiled through Chapters 4–7. The research questions are explicitly answered in Chapter 8.

This study is divided into multiple segments. Chapter 2 presents the theoretical background of interface design. It consists of multiple concepts related to interface design. Next, in Chapter 3

we present the Master Data Portal of Wärtsilä and the process surrounding the use of it. Additionally, the chapter discusses self-service tools and recurring challenges in design work within enterprises.

Chapter 4 is the first part of hands-on research. We start the chapter by defining the anatomy of home pages. Five common interface design elements are presented and analysed on their usage on home pages of popular online tools. The design work begins in Chapter 5. The current Master Data Portal home page user interface is evaluated. Users are surveyed on their thoughts about the portal design. Based on the insight, a new design and an interactive prototype are created.

Chapter 6 describes the methodology behind the user testing interviews. It consists of creating hypotheses and the structures of both the interviews and a post-interview survey. Chapter 7 examines the results of the interviews. The results of the post-interview survey are compared to the one taken before the design work. The hypotheses are validated based on the results of the research.

The research questions are answered in Chapter 8. We will also reflect on the limitations of the study and give a view on current research. Finally, the whole paper is summarised in Chapter 9.

2 Interface Design

In this chapter, we focus on the user interface and present the concept of user interface. Evaluation methods of an interface are described on a conceptual level. The final section presents common human-computer interaction impressions that have an impact on the success of an interface.

2.1 User Interface

User interface (UI) is the key for the interaction between humans and computers. UI takes an input from the user and responds with a fitting output (Sardjono & Perdana, 2023). Everyday examples include using a scale to weigh out vegetables at a supermarket, travelling to another floor via elevator and buying a bus pass from a ticket machine at the station. With everyday, modern life being imbued with technology, humans are met with interfaces wherever they go (Li et al., 2022).

In the modern world, an appealing UI is important for websites and applications (Sardjono & Perdana, 2023). However, visual aesthetics alone do not make for great interface. A successful design makes completing tasks effortless for the user. The designer's goal is not drawing attention to the design, but rather the opposite of it. (Shamaa, 2022.) A comparison can be made to the role of a referee in a football match; if they go unnoticed during the match, it typically indicates the game progressing smoothly.

A well-designed interface “lures” the user into using the application, whereas a suboptimal interface design pushes people away from using it (Sardjono & Perdana, 2023). An important criterion for evaluating the quality of a website is the level of comfort felt by users (Ratri et al., 2022). In a study conducted by Sardjono & Perdana (2023), nearly half (45.1%) of 110 participants strongly agreed with the statement that a good user interface design increases the perceived effectiveness of using a platform.

As this thesis focuses on an internal web tool interface, the theoretical focus is on the standard graphical user interface (GUI). A GUI presents the available controls to users as visual elements that users can interact with (IxDF - Interaction Design Foundation, 2016c). Despite the abundance of devices users can use to access the internet today, this thesis focuses mainly on desktop and laptop interfaces. Mobile device interfaces such as smartphones and tablets are excluded, as most of the work at Wärtsilä is done via laptops. Technological

advancements have made the creation of new forms of interfaces possible. Newer recognisable formats include voice-controlled interfaces (VUI) and gesture-based interfaces. (IxDF - Interaction Design Foundation, 2016d.) These newer forms are also excluded, as they are very rare use cases in the enterprise setting.

This thesis examines the use of interface elements. UIs are built using components. Components are interactive elements, which can be arranged based on the need and purpose of the design (Google, n.d.-b). Recurring problems can be solved by organising the components in established ways, known as design patterns. Design pattern usage saves time and resources, as there is no need to figure out a new solution for an existing task. (Interaction Design Foundation - IxDF, 2016b.) With basic background of UIs presented, we can move on to evaluating interfaces.

2.2 Evaluating a User Interface

There are variety of ways to assess the effectiveness of a UI. The two most common concepts are usability and user experience (Baj-Rogowska & Sikorski, 2023; Hassan & Galal-Edeen, 2017.) The upcoming sections give a detailed overview of each of these concepts.

2.2.1 Usability

Usability is an attribute that is used to define how easy is an interface to use (Nielsen, 2012). As we look to improve an internal tool's home page interface, usability is a key concept for this thesis. Nielsen (2012) divides usability into five main qualitative categories:

- **Learnability:** The ease of performing fundamental tasks of the design when first encountered.
- **Efficiency:** After becoming familiar with the design, the rate of performing tasks.
- **Memorability:** The ease of re-familiarizing themselves after a break from using the design.
- **Errors:** The frequency, severity and ability to correct errors.
- **Satisfaction:** The pleasantness of using the design.

Great usability is viable, as poor usability is off-putting to users, directly impacting usage numbers negatively. There are multiple additional qualities contributing to the success of the

interface. Functions in a user interface must be relevant to the end users. (Nielsen, 2012.) This relevance is described as utility (Nielsen, 2012; Sardjono & Perdana, 2023). When a feature is usable and necessary to the user, it can be described as useful (Nielsen, 2012).

The most known guidelines for interface design are industry pioneer Jakob Nielsen's 10 usability heuristics. The heuristics were originally published in 1994 (Nielsen, 2024). The heuristics are classified as strong recommendations rather than strict rules. A benefit of the heuristics being loose is the adaptability to virtually all interfaces. Nielsen (2024) states that the heuristics are highly likely to stay relevant with future implementations of interfaces.

2.2.2 User Experience

User experience (UX) is a prevalent term building around general usability, increasing in popularity in the recent years. It aims to cover other surrounding factors past usability in completing a task that influence users' perceptions of a product. (Baj-Rogowska & Sikorski, 2023.) An efficient way to visually framework UX is Morville's Honeycomb user experience model. Figure 1 shows UX categorised in the seven different segments (Morville, 2004):

- Useful: The product must provide something of value to the end user, such as solving a specific task. As mentioned earlier, Nielsen defines usefulness as a combination of needed functionality and pleasure of using them.
- Usable: The product must fulfil the necessary usability requirements, presented in the last section. Usability is a key part of the UX but inadequate on its own.
- Desirable: The product must be attractive in user's perspective. Effective ways are taking advantage of image, brand and identity.
- Findable: The user must be able to find the product and navigate to relevant segments within the product.
- Accessible: The product must be accessed by all people regardless of disabilities and difficulties of use.
- Credible: The end user must be able to feel comfortable using the product and trust that it will complete the tasks.

- Valuable: The product must provide value, for example by monetary measurements or increasing knowledge.

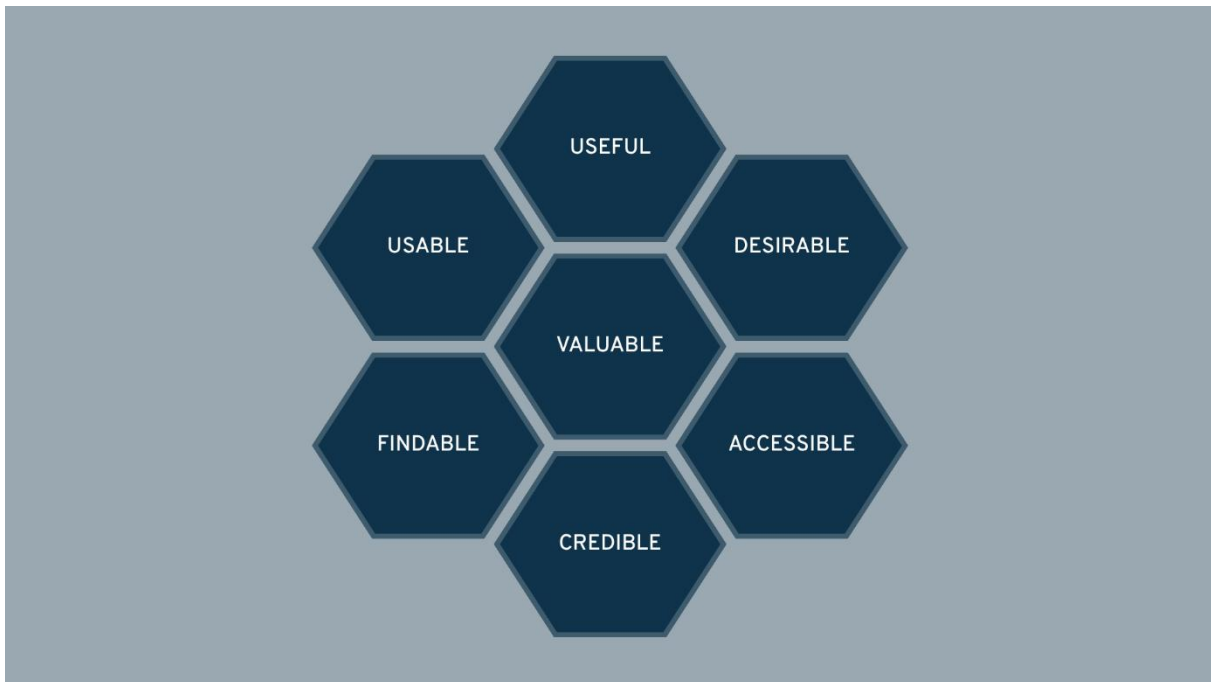


Figure 1 Morville's honeycomb model. Adopted from Morville, 2004.

While the honeycomb model offers the theoretical framework from a user's viewpoint, achieving the goals is left for professional in the field. The model does provide standards and regulations on how to capture each aspect of UX thoroughly. (Baj-Rogowska & Sikorski, 2023.) That is simultaneously the beauty and challenge of design work: Essentially, a designer is told what to do but not how to do it.

2.3 Striving for Consistency

Jakob's Law of Internet User Experience presented in 1999 (Nielsen, 2017) is in the core of the idea behind this thesis:

“Users spend most of their time on other websites than your website.”

Still relevant over two decades later, it refers to users spending nearly all their time on other websites, which moulds their expectations on how websites should work in general. When creating a website that functions similarly as other websites, users know how to use it. Then they can focus more on the content and functionalities provided, rather than spending more time in learning how to use it. Creating designs that fail to follow the general website

expectations violates Jakob's Law and leads to confused users that exit the website. (Nielsen, 2017.)

The fourth usability heuristic of Nielsen "Consistency and Standards" (Nielsen, 2024) provides guidance into taking the Jakob's Law in account when designing. Validated design solutions are the backbone of websites today (Krause, 2021). Iconography provides a concrete example: A magnifying glass icon represents search functionality and clicking a house icon will likely take the user to the home page. Memory storage diskettes have no longer been the preferred technology for decades, but a diskette icon is to this day the standard for representing a save functionality. An example of consistency outside of the digital world is hotels having a service counter at the lobby (Nielsen, 2024).

In the context of usability, consistency is split into internal and external consistency. The consistency within an application or across multiple applications under a single product family create internal consistency. The elements of internal consistency can be found in colours, similar layouts and functionalities. A design system supports internal consistency. Familiar components provide easier, more familiar experiences for users. Concurrently, development teams can re-utilise the same resources. An example of internal consistency is the text editing tools in Microsoft's tools Word, Excel and PowerPoint. (Krause, 2021.)

External consistency relies more heavily on Jakob's Law. It resides consistency across an industry or the web in general. As users create their expectations of behaviour on other websites, one should keep the primary functionalities consistent comparing to websites alike. Providing consistent functionality helps users reach their goals easier. (Krause, 2021.)

A clear example of external consistency is social media. Social media applications had over five billion users worldwide in 2024 (Statista, 2026). Many modern social media applications share a similar look and feel, while offering nearly identical features (Shamaa, 2022). Shamaa (2022) argues that this similarity has a simple and logical explanation: they work. Figure 2 provides an example of external consistency across social media platforms. All four applications have a bottom navigation of five items. The content is browsed by swiping. The right side of the screen has options for users to share and interact with.

Making everything look identical is not the main goal whilst striving for consistency. It is about fitting to user expectations and lowering the usage burden, as users do not have to learn

new things. (Krause, 2021.) This concept is known as familiarity, which is presented in more detail in the following section.

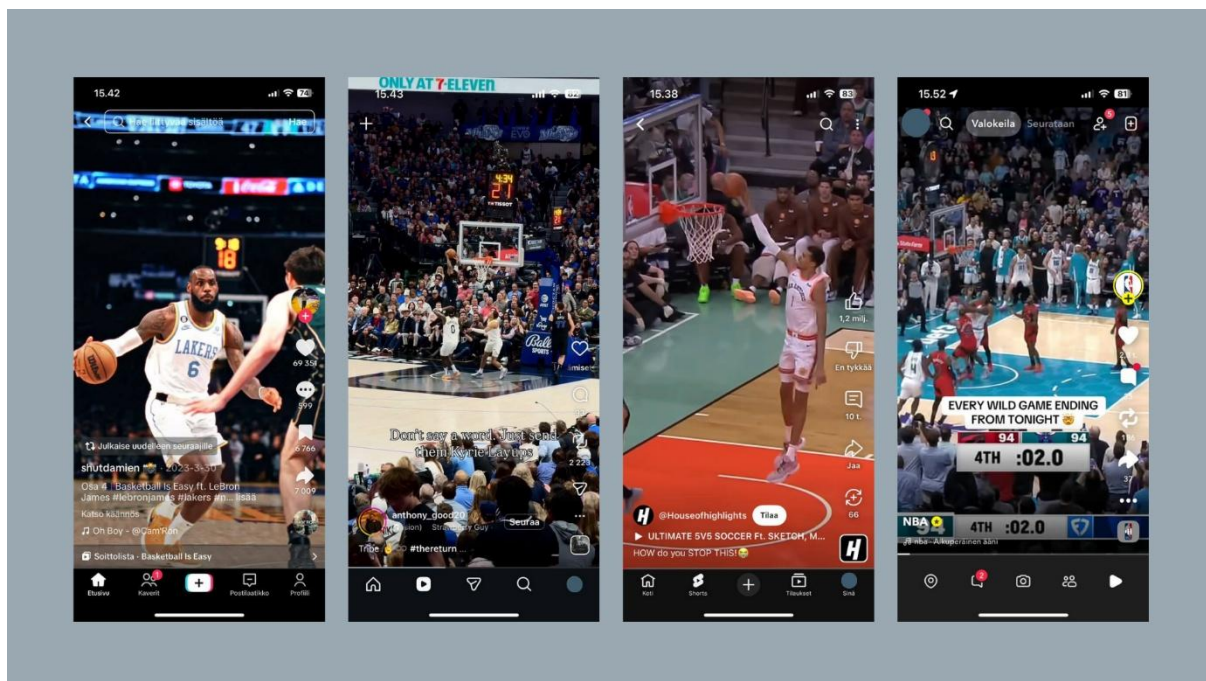


Figure 2 External consistency across social media applications offering short-form video content. Applications from left: TikTok, Instagram, YouTube and Snapchat. Screenshots from iPhone 13 Pro.

2.4 Familiarity Creates Comfort

Familiarity in the context of UI/UX refers to the extent a user is comfortable and confident in doing something. Familiarity in design can enhance usage efficiency. (H. Yu et al., 2022.) In the field of e-commerce, user's familiarity with a website has a positive effect on customer satisfaction and loyalty (Kaya et al., 2019). Xu (2025) seconds this, arguing that good interface design and interactivity have a positive effect on familiarisation.

Returning users to a website experience higher level of familiarity (H. Yu et al., 2022). Yu et al. (2022) present isomorphism as a cause for this phenomenon. They argue that different web browsing tasks can be identified as isomorphic by users, meaning that their structure is homogeneous. Users can utilise the same means for solving multiple different tasks, which elevates the feeling of familiarity.

Recognizable interfaces create a sense of comfort for users. With consistent usage, users learn to predict the interface's behaviour. A fallback is that the gained comfort may influence users to becoming resistant to changes. (Wimmer et al., 2025.) Even though a new interface design

iteration is objectively better, users might prefer the old one out of initial fear towards the new version. This thesis investigates whether similar trends of increases in efficiency based on familiarity can be identified in internal enterprise tools. It is essential to weigh in both benefitting new employees with simplicity as well as serving long-time users with their existing ways of working. The next section continues assessing features of a UI through discoverability.

2.5 Balancing Discoverability and Information Overload

A general definition for discoverability is a user encountering something they had not perceived before, or, to put it shortly, discovering it (Mackamul et al., 2024). In the field of UI/UX, the goal is to make the required functionalities of the interface easily accessible for the user (IxDF - Interaction Design Foundation, 2016d). Mackamul et al. (2024) divide discoverability into three sub-categories:

- System discoverability: Discovering that a system exists and can be interacted with.
- Interaction discoverability: Discovering possible interaction methods within the system.
- Feature discoverability: Discovering distinctive features and parts of a system.

In the scope of this thesis, the focus is more on the interaction and feature discoverability. Users become aware of the internal self-service tool through employee onboarding and links from other systems, making system discoverability a marginal topic. Continuously renewing technology makes users generally oblivious of all functionalities available, with many new features being discovered through coincidences or online articles presenting lesser-known tips and tricks (Mackamul, 2022). Modern online products are developed further constantly by modifying, removing and implementing new features (Baj-Rogowska & Sikorski, 2023). Mackamul (2022) argues that when users fail to identify or utilise a new feature, there is no advantage gained with its implementation. They also argue that it is rarely considered how users might discover newly presented interaction possibilities.

Cramming a vast number of features visually as a part of the interface quickly turns into a discoverability hurdle called information overload. Information overload refers to the overabundance of presented information (IxDF - Interaction Design Foundation, 2016b). When a user is faced with a task, presenting an extensive amount of information can lead to

poor execution or even abandoning the task completely. Finding the balance on the fitting amount of information displayed is a vital part of the interface design process. The amount must be aligned with the users' needs and expectations. (IxDF - Interaction Design Foundation, 2016c.) Information overload is not a stand-alone challenge in designing discoverability. Difficulties with navigation and search functions, irrelevant content and rising user expectations are some of the central challenges designers are faced with. (IxDF - Interaction Design Foundation, 2016d.)

User research is paramount for improving discoverability. Gaining input from end users helps in making crucial design decisions, understand user needs and their mental models of information structure as well as limit designers' premises (IxDF - Interaction Design Foundation, 2016d). Mackamul et al. (2024) summarize five recommendations from online articles about designing discoverability:

- Aim for familiarity: Meeting universally known current design standards ease the usage for everyone.
- Group elements logically: Related and similar items should be placed near each other.
- Simplicity: Amount of content should be reduced to feature only the most relevant.
- Size is a factor: Users' attention can be guided by making relevant items larger.
- Hints and visual cues: Guide users towards the next step.

Finding the balance between aesthetic whitespace and displaying lots of relevant information will be a key challenge in the redesign process of this thesis work. While an important part of the design goal is making the portal home page less intimidating for new users through increased discoverability, it must also serve the frequent users. Aesthetics are unnecessary if there is not relevant information to visit it. All this ought to be considered in detail in internal enterprise tools, which is the key topic of the next chapter.

3 Internal Enterprise Tools

This chapter focuses on internal enterprise software tools. The first section discusses self-service tools and presents the Master Data Portal, which will go under the redesign. The latter section describes common issues with design work in enterprises: culture problems, business complexity, and lack of user-centricity.

3.1 Self-Service Tools & Wärtsilä Master Data Portal

With the swift pace of digitalization, web application tools have evolved into a vital part of business for enterprises (Xu, 2025). The global COVID-19 pandemic increased the need for digital self-service tools that serve users of all technical skill levels (Matloobtalab & Ferati, 2025). In external facing self-service products, users are easily driven off by obstacles, such as poor design of the user interface (C. Y. T. Chan & Petrikat, 2022; Newhook et al., 2015).

According to Chan & Petrikat (2022), a well implemented self-service tool can provide large savings after the initial costs. In customer service, a human interaction can cost up to \$12 per inquiry, whereas a self-service query can be solved with as little as \$0.25 (C. Y. T. Chan & Petrikat, 2022). In addition to financial savings, self-service tools are designed to improve efficiency in everyday work operations (Matloobtalab & Ferati, 2025).

The functional goal of this thesis is to re-design the home page of Wärtsilä's internal Master Data Portal. It is a self-service tool created to make master data management reachable and centralized across the company. Master data management refers to a framework for handling key data assets of data-centric enterprises (Pansara, 2024). Master data encompasses slowly mutating resources, such as information about personnel, products and finances. The overall business complexity combined with the vast amount of data present in an enterprise makes keeping the data available and consistent paramount. (Pansara, 2024.)

In the Master Data Portal, employees can submit update requests to Wärtsilä's master data through multiple different forms relevant to the domains. In this context, a domain refers to a category of Wärtsilä's master data. There are six domains available in the portal. Each domain has their own respective tab in the portal, containing access links to forms relevant to the domain and other relevant information. The different tabs can be accessed through a navigation bar at the top edge of the portal. Figure 3 shows a simplified version of Wärtsilä's master data modification process. The theme of this thesis is in the start of the process. It

starts by user identifying the correct form in the portal. Improving the home page of the portal can ease the process of locating the form. The user fills the selected form. Once the form is filled correctly with all validations of the fields passing, the user can submit the request. Most cases, a submitted request creates an approval task for domain expert employees, known as gatekeepers. After gatekeepers approve the request, the data can be updated to Wärtsilä's enterprise resource planning systems. Advancements in master data management processes have made most tasks of manually updating the data automatic, reducing the need for repetitive human labour.

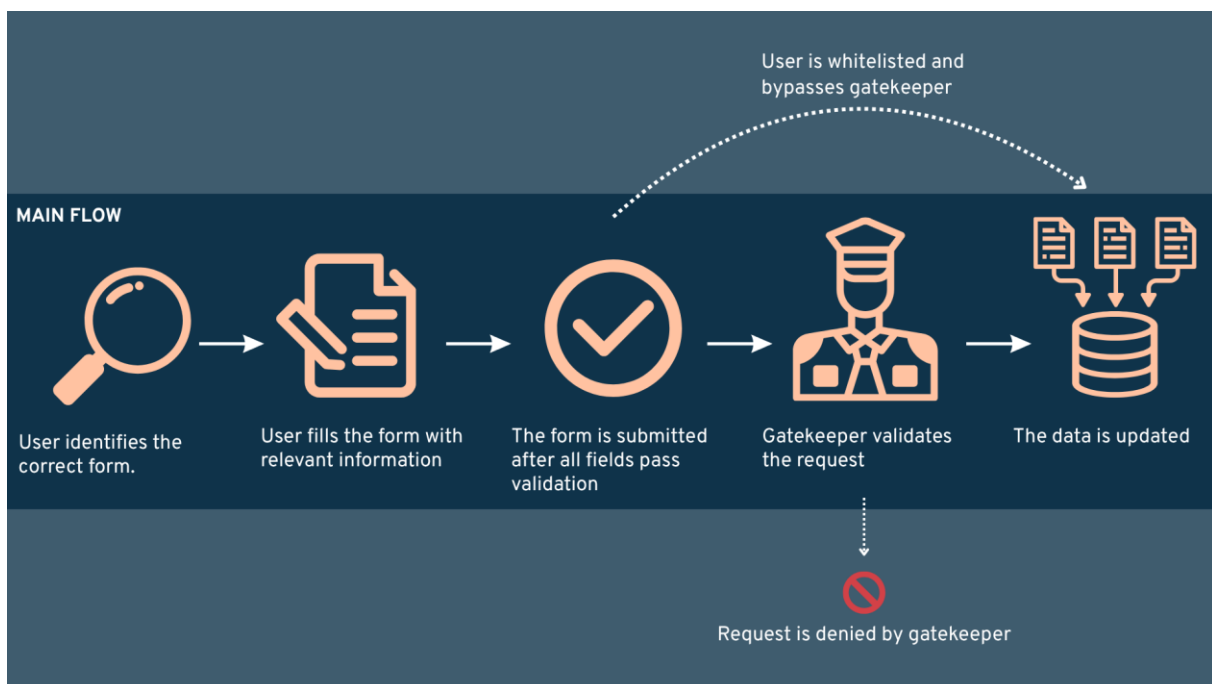


Figure 3 Simplified flow of master data modification process.

The overall process is vital for keeping the data accurate and available to support the enormous array of business needs in the company. By improving the home page design to be more straightforward and intuitive, starting the request processes can be made easier. In complex enterprise tasks, the process is far more than simple UI design. Next, we will discuss common impediments hindering the design processes in enterprises.

3.2 Challenges in Enterprise UI/UX Design

Highlighting the need for design of internal enterprise tools is a partial motivation of this study. It is rarely seen as a priority (Gylling, 2025). Often with internal applications, quality gets overruled by quantity of features (Newhook et al., 2015). This easily leads to the interface being crowded and cumbersome to work with.

A company's design process and cultural issues may lead to necessary design improvements not being implemented. Existing poor design hints issues in the process. (Ede & Dworman, 2016.) Internal development budgets are not matching the rising expectations of users (Newhook et al., 2015). Nielsen (2012) suggests seeing funds allocated to internal design projects as savings in onboarding and improving employee efficiency. Newhook et al. (2015) second this, arguing that internal enterprise applications deserve equally as much attention as external consumer applications. According to Kaplan (2024), resources of UX design are often among the first to face cuts when companies are challenged with budget constraints. Newhook et al. (2015) list many other challenges in enterprise application acquisition:

- Higher management makes the decisions, sometimes relying only on a bullet-point list of features without seeing the service in action.
- Training budget is larger than development budget. Threshold of allocating funds to teaching end users to work with complicated solutions is lower than investing in fixing complexity issues.
- Boosts in productivity are more difficult to measure in cash than savings.

Section 3.1 mentioned that obstacles in external facing self-service tools fend off users. Internal tools are interfaces same as external facing counterparts, therefore subjected to similar problems. According to research by Yu et al. (2023), vital internal tools are used by users regardless of their personal preference over it. Based on this, user abandonment as feedback method gets somewhat excluded with business-critical internal tools compared to commercial products. The issues scatter to other areas: Xu (2025) states that poor design hinders productivity and pleasure of use.

Another common design pitfall is the overall complexity of the business processes, making them more difficult to design than for regular external products (D. Yu et al., 2023). Internal tools are seen as difficult to use and repulsive, but still proficient to help with completing work tasks. (Newhook et al., 2015). In-depth knowledge about key business processes of the enterprise is a vital prerequisite when designing enterprise applications (Xu, 2025). Enterprise environments often have a large user base with multiple different roles. The business operations are paramount, having users operating with huge transactions daily. (Rahman & Jyoti, 2022.) In contrast to external facing consumer applications, enterprise applications have

a broad user base and must fulfil a collection of needs and wishes from users (Newhook et al., 2015).

Onboarding is a key process for new employees (Kendrick, 2020). With complicated business processes, it is lengthy and costly. There are similarities to complex interfaces and applications. Kendrick (2020) states that it is better to allocate funds into improving the interface usability over developing instructions on how to use it. This can be tied to the business process; excessive time spent onboarding could indicate a need for improvement within the process itself. As pointed out in Section 2.5, the modern style of continuous software development does not make tool onboarding process any easier. Discoverability of new and modified features ranging from legislatively mandatory changes to intended process improvements takes place continuously. Employees might easily be left of the loop, as the communication is likely to be left to demo sessions, blog posts and temporary alerts like banners. All employees are not going to see these publications or have the possibility to abandon their work tasks to attend demo session.

Finally, the lack of user-centricity in design work. Users are at the core of the success of any design. User-centred design as a concept and an operation keeps users in the loop through each stage of the design process (Alao et al., 2022). The focus in internal tools is typically described to emphasise the ability to perform business-related tasks over their user friendliness (Bawa, 2024). In the concept of user-centric design, the necessities, restrictions and wishes are key aspect of the development work (Rahman & Jyoti, 2022). All levels of design prototypes ought to be reviewed and validated with users. Necessary changes arisen in the validation process must be carried out before beginning the development phase. (Paiva et al., 2022.)

Enterprises have started recognising the importance of involving end-users to improve usability and overall efficiency (Rahman & Jyoti, 2022). This has shifted the focus away from solely offering as many technical possibilities as possible (Tewari, 2025). Lack of user-centricity tends to lead to low usage numbers, unstable work processes and increases in training expenses (Rahman & Jyoti, 2022). However, common issue is that often management has stronger requirements for a product, leaving the end users, employees, little possibility to affect the outcome of the development process (Sekar, 2017). In the upcoming chapter, we will observe home page design and start creating foundations for the design work and user research of this study.

4 The Entry Point: Home Pages

This chapter is centred around home pages. To start, we characterise home pages and their purpose in the wider context of websites. Afterwards, five common interface elements used to build websites are presented: buttons, text inputs, cards, navigation bars and responsiveness. We will also analyse the use of the described elements on popular websites to see what kind of patterns users are facing during their everyday browsing.

4.1 The Lobby of the Website

Most websites have a distinct home page. Wang (2024) argues that a home page is frequently the first step of a user journey to the website, making it the one of the most essential pages of a website. A website's first impression is crucial, mirroring it to a short sales pitch. To support this, the content of the home page should be concise and understandable. Most relevant content should be placed above the fold (Wang, 2024). The fold refers to the area immediately visible on the website without any scrolling. If there is more content available, the design itself ought to subtly hint users to scroll down. (Schade, 2015.)

The term landing page is sometimes used interchangeably with home page. Despite often having very similar content, the functionality differs slightly (Leadpages, 2026). The goal of both such pages is to showcase available options on the site and influence users into exploring and carrying them out. The main focus is clear and efficient communication of information to the user. (Fabisiak & Jagielska, 2023; Wang, 2024.) The key difference is when a home page promotes all possibilities, landing page aims to accomplish a specific goal, such as getting the user to interact with a call-to-action (CTA) (Ardani et al., 2025). An example of such CTA can be signing up to a newsletter (Fabisiak & Jagielska, 2023). It can be the sole primary goal for a landing page but not so vital for a whole website with multiple features.

Regardless of the slight differences in purpose, the design principles are the same for both terms. If the functionality of the page is not clear, the user is highly likely to leave the site (Nielsen, 2012). In this context, the to-be re-designed Master Data Portal falls more into the category of home pages. The user comes to the site because it is an internal tool used at Wärtsilä. There are multiple actions to take in the portal. The aim is to incorporate similar elements of displaying information so that the user can proceed with their task efficiently. A well-designed interface onboards the user efficiently to the available operations (Xu, 2025). All operations might not be visible by default, which might require additional onboarding

methods, like instructional onboarding or feature promotion. Such onboarding methods are not supposed to cover for design flaws. (Kendrick, 2020.)

4.2 Common Website Interface Elements

When building a UI, designers have dozens of elements to use. For the scope of this thesis, we selected five different elements of modern UI development: They are buttons, text inputs, cards, navigation bars and responsiveness. The reasoning behind the selection was assessing the requirements of creating a multi-page interface. Actions are performed with buttons, while inputting user information is most convenient with a text input field. Cards are a modern way of grouping website content, and a navigation bar makes navigating the site effortless. Finally, with the plethora of device types and screen sizes, responsive design makes one solution adjust to all. In this chapter, the anatomy of mentioned elements is characterised in detail.

Other important elements are microcopy and other textual content, whitespace, imagery, colour, graphics and accessibility. They are all vital components for building a modern interface, but excluded in this analysis, with the focus of this thesis more on the interactive elements of a user interface. Interactive elements are not as dependent on the context of the page compared to, for example, text paragraphs. They are also universally familiar, offering the same functionality across multiple different interfaces in separate domains. The upcoming sections include more detailed descriptions of the elements under analysis.

4.2.1 Buttons

A button is among the most important elements on any website. Actions such as saves, submits and deletes are finalised with the push of a button. Digital buttons share characteristics with real physical buttons (Budi & Rivenbark, 2025), mimicking the likes of everyday buttons of elevators, vehicles and other electrical machinery. The principle of both digital and physical buttons is the same. Pressing a button triggers an action to be executed (Budi & Rivenbark, 2025). Buttons have five common states are attached to the use of buttons (Gordon, 2025):

- Enabled: The default state, where a user can interact with the button.
- Disabled: If the specific action is not available to be executed, the button is disabled and cannot be interacted with.

- **Hovered:** When a user is hovering their pointer on the button, the button reacts by communicating interactivity. Typical hover feedback means are a modest change of colour and swapping user's cursor type.
- **Pressed:** The button is currently being or was very recently clicked by the user. It communicates the action being registered, usually with a darkened background colour change or another fitting animation.
- **Focused:** Focus state refers to the button being active on the keyboard. On a standard keyboard, all interactable elements on a website or an application can be toggled with the Tab key. The focused button can be then interacted with Enter key.

Building on top of states, buttons typically have three different style tiers: primary, secondary and tertiary. The visual emphasis of the button is based on its respective style (see Figure 4). The style tier is chosen by the designer based on the significance of the button for the success of the interface. (Gordon, 2025.) Specific colour and text design encourages users to proceed with CTAs (Ratri et al., 2022). Primary buttons are emphasised the most. Their visual outlook is the most prominent of the styles. They are used for highlighting important actions, like submitting a form or adding an item to shopping cart. Secondary buttons are in the middle ground. They can be clearly identified but have less visual presence than primary buttons. They are dedicated to display less used secondary actions. (Gordon, 2025.) Secondary actions are often paired next to primary ones, such as cancelling a purchase instead of confirming it, continuing to edit an essay answer instead of submitting it and skipping a software update instead of doing it right away. Tertiary buttons are barely highlighted, as they convey complementary tasks (Gordon, 2025).
















Style	Enabled	Focus	Hover	Pressed	Disabled
Primary					
Secondary					
Tertiary					

Figure 4 Button styles varying across different states. Adopted from Gordon, 2025.

Button labels are significant for communicating the button's purpose to the user, improving the overall discoverability (Gordon, 2025). Moran (2019) presents the four Ss of good labels: specific, sincere, substantial and succinct. Firstly, the label should communicate what clicking it does. Opposite of such specific label is the popular "Learn more", which is heavily dependent on surrounding content. In addition to communicating the purpose, a label sets an expectation. If the label of an e-commerce site button is "Add to cart", it must fulfil the expectation of a adding the item to the user's cart, making it sincere. Thirdly substantial, meaning the label alone should be necessary to communicate the user what resource does the link lead to. Finally, succinct, meaning the label communicates its purpose precisely without needing a larger number of words. (Moran, 2019.)

4.2.2 Text Input Fields

The whole concept of computers is dependent on user inputs. User gives an input and the computer responds with a fitting output. There is an array of possibilities to collect user input on a website. Common examples of such components are radio buttons, checkboxes and sliders (Budiu & Rivenbark, 2025). All the mentioned are standardised inputs that control a preset type of a value, like the amount of a product added to user's cart on an e-commerce site.

Perhaps the most important input control are text inputs. They are flexible to be used in multiple scenarios, handling non-standardised input from a user (IxDF - Interaction Design Foundation, 2020). Use cases include giving search input and filling user information forms, such as payment or contact information (Google, n.d.-d; IxDF - Interaction Design Foundation, 2020). Text inputs are still the sole mean for collecting input in command line interfaces.

Communication the state of the input is crucial for a good experience (UXPin, 2022). There are numerous states should be taken into account by the designer (Google, n.d.-d), also visualised in Figure 5:

- Enabled: The input field is ready to be interacted with.
- Focused: When the user is typing on a specific field, the field in question has an additional visual cue to indicate that it is focused.

- **Hovered:** User hovers the cursor over the input field. The input field shows a hover animation, indicating that it's interactable.
- **Disabled:** User cannot interact with the field.
- **Populated:** User has entered text in the field.
- **Error:** User's input is faulty and does not pass field validation. Error is raised and communicated to the user, such as an e-mail text field missing a @ character.

Text inputs should have a label, describing the content user is asked to input. The label should be concise and remain visible throughout the process. (UXPin, 2022.) Designers should not rely on placeholders alone to describe the input. When the user starts typing, the placeholder disappears. Especially with slightly longer inputs in extensive forms, the user might forget what they are supposed to type.

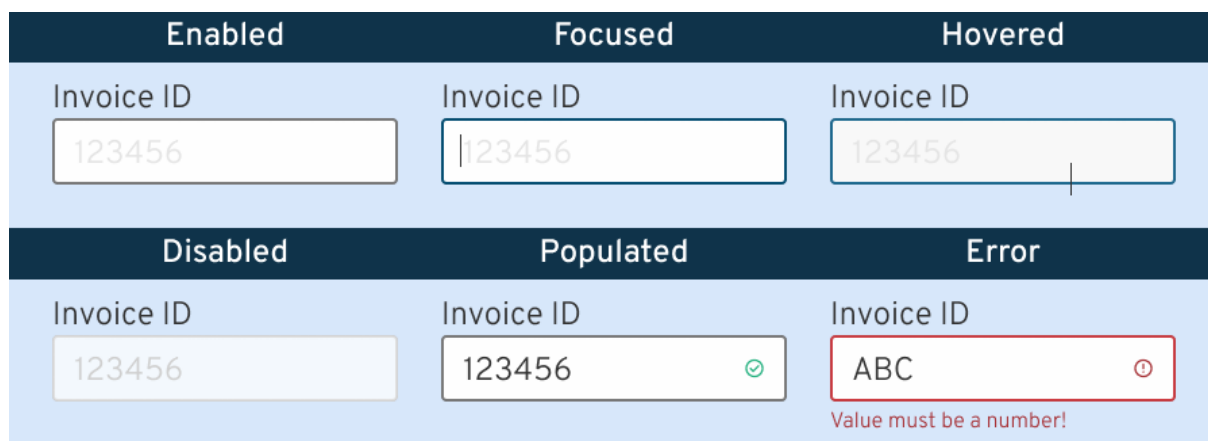


Figure 5 Different input field states. Adopted from Google, n.d.-e.

4.2.3 Cards

Cards are really popular design trend. It is a relatively new component, being a popular design component to group content modularly and adapting to different screen sizes (Laubheimer, 2016). They are a convenient way to display information of a specific topic (Google, n.d.-a). Cards have four basic characteristics (Laubheimer, 2016):

- Grouping information
- Summarised information with a link to more details
- Appearance like a physical card

- Flexibility across layouts

The concept of card is visualised in Figure 6. The most advantage of using cards is achieved when displaying different types of content (Laubheimer, 2016; Stevens, 2024). The principle behind the success of cards is the concept of proximity. Elements that are close to each other are observed to be related to each other. (Harley, 2020.) Cards are often used in social media and e-Commerce websites, but have also gained popularity in different tools, such as dashboards and project management tools (Stevens, 2024).

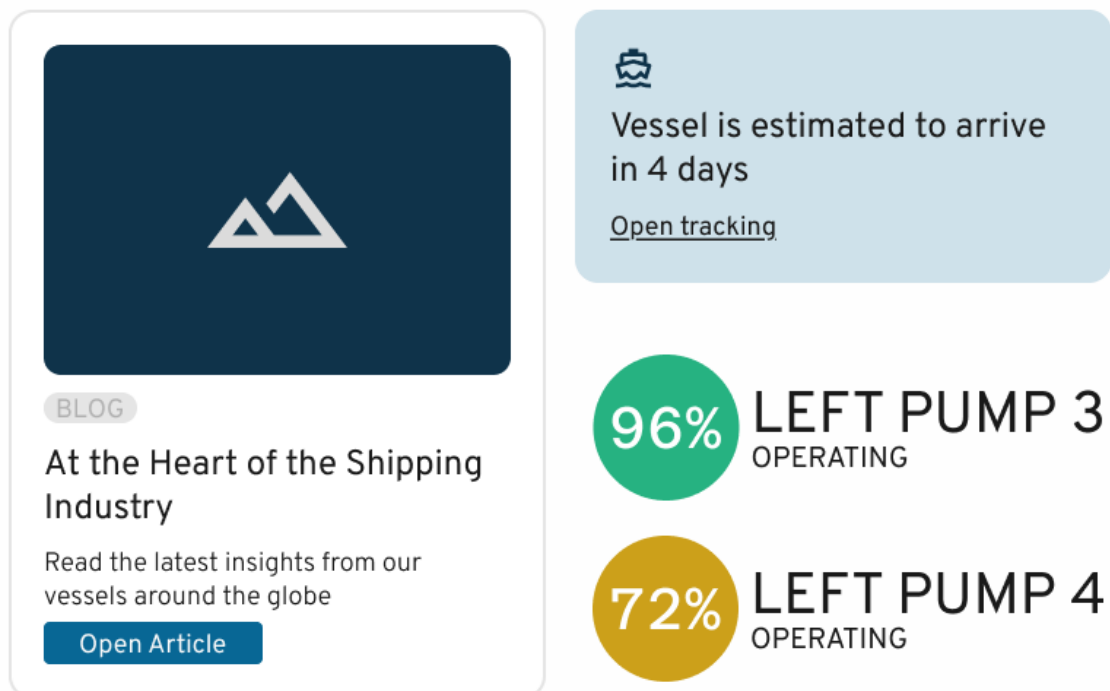


Figure 6 Use cases of cards. Adopted from Google, n.d. -b.

According to Google's Material Design guidelines (n.d.-a), the container of the card is the only necessary element to identify the element as a card. The card content can be contained two ways: Implicitly, meaning the card visual effect relies on positioning close to one another, or explicitly, with a clear visible border to distinguish the card. (Google, n.d.-a.) The implicit version is popular in minimalism, with the proximity perception doing the grouping. Common elements include (Google, n.d.-a; Stevens, 2024):

- Image / other media
- Heading (and possibly subheading)
- Short information text

- A call-to-action, such as a button or a link

A clear benefit contributing to cards' success is scannability (Stevens, 2024). Using cards divides information into small pieces that a user can process effortlessly (Laubheimer, 2016; Stevens, 2024).

4.2.4 Navigation

A successful website is heavily reliant on having intuitive navigation. It provides many key benefits, such as increase of usage speed and improved user engagement, which in turn positively impact the usability of a website. (Vayadande et al., 2024.) Nielsen (2012) summarises the importance of navigation by arguing that if a user is unaware of their whereabouts on a website, they will leave. The opportunity to navigate to the home page from other pages must also be effortless. The home page is a safe area to return for many users when they are lost. (Wang, 2024.)

The most popular way of implementing website navigation is the navigation bar placed at the top of a screen. With multiple options, it can also be placed on the side of the screen, preferably left (Laubheimer, 2024). Navigation bar has multiple clickable links, sometimes expanding to drop-downs and search inputs. With increasing mobile usage, applications now do bottom menus, having the clickable section at the bottom of the screen, easier to reach with thumbs. With limited space in mobile applications, navigation items should be limited to three to five items (Google, n.d.-c).

A decade ago, a new way to hide navigation was the hamburger icon. It is a three-bar icon that opens a menu overlay when interacted with. When gaining popularity, it was initially making the usage worse, as users did not recognise it as something that can be interacted with. In the past ten years it has become a universally recognised symbol. (Kaplan, 2025.) Despite being recognisable, hamburger menu should not be used, if the screen has room to display all navigation items (Laubheimer, 2024).

4.2.5 Responsiveness

Website responsiveness is mentioned in multiple articles. Rather a technique, responsive design refers the interface fluidly adapting to multiple different screen sizes and device types (see Figure 7), such as mobiles, tablets and desktop computers (Vayadande et al., 2024).

Responsive design increases usage efficiency with faster loading rates, thus having an impact

on the UX (Li et al., 2022). In responsive design, the website content and component are divided into blocks. Having the content in blocks allows for organising them in multiple different ways. (Mikulszky et al., 2017.) On a desktop screen two content blocks can be next to each other, but as the screen width decreases when switching to a mobile device, same blocks can be put on top of each other vertically.

In recent years, responsive designs have increased in popularity, while their fixed design competitors have been on a steady decline (Vayadande et al., 2024). According to Vayadande et al. (2024), the number of responsive websites has nearly tripled in just a few years, with their share increasing from 30.3 % in 2016 to respective 85.7% in 2022. Responsive websites have quickly evolved from a luxury feature to a necessity for survival in the highly competitive market of demanding end users.

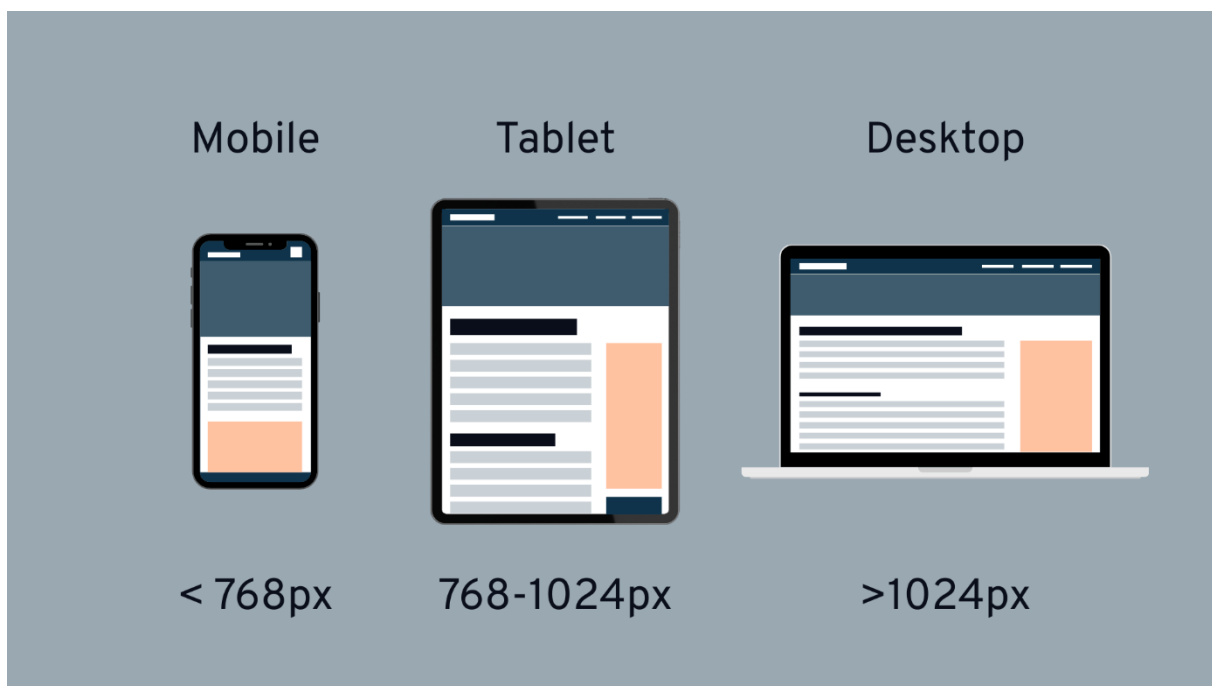


Figure 7 Layout changes across different screen sizes with responsive design. Adopted from Duò, 2026.

The next chapter analyses use of the elements portrayed in Sections 3.2.1–3.2.5 on popular public websites' home pages.

4.3 Analysis of High Visitor Websites' Home Pages

For the analysis multiple categories of websites was considered. As Master Data Portal is an internal enterprise tool, the primary goal is task efficiency. Websites that aim to have the user spend as much time as possible on their platform, were excluded. Such categories include but are not limited to news outlets, social media, entertainment, games and e-commerce. After this exclusion, seven different categories of online tools were selected, with three websites within each category. Table 1 shows the list of categories and the three selected websites in each category. We attempted to get numerical data on the usage, but valid free-of-charge sources were not available. Therefore, the websites were handpicked based on being popular in their respective categories. The websites were accessed between 9–11 January 2026. Links to the websites accessed can be found in Appendix A.

Table 1 Website home pages selected for analysis

Category	Website #1	Website #2	Website #3
Search engine	Google	Bing	DuckDuckGo
Encyclopaedia	Wikipedia	Encyclopaedia.com	Britannica
AI assistant	ChatGPT	Copilot	Gemini
Dictionary	Merriam-Webster	Cambridge	Oxford
Translator	Google Translate	DeepL	Lara Translate
Programming	React	Python	TypeScript
Learning platforms	W3 schools	GeeksForGeeks	CodeAcademy

Pages are analysed after closing pop-ups like cookie consent forms and advertisements. All pages are accessed through Google Chrome. To help with the analysis of each respective element, a few supportive questions was formed:

- Buttons: How many? What different types of buttons? How are they placed? Where do they point to?
- Text inputs: How many? What is the functionality? How are they placed? Do the inputs have labels?
- Cards: How many? How are they grouped? Are they interactive? What types of content do they have?

- Navigations bars: Where is it placed? How many links? Is it always visible? Are there multiple bars?

Responsiveness is tested on multiple screen sizes. The default size is a 27-inch (1920×1200 pixels) external display. Two different device sizes are tested with Chrome Dev Tools, iPad Air (820×1180 pixels) and Samsung Galaxy S8+ (360×740 pixels). Finally, the website is tested with a physical iPhone 13 Pro (390×844 pixels) through the Google Chrome application, to serve as a confirmation for the development tools.

4.4 Website analysis insights

Starting with button usage. On most pages, clear primary buttons cannot clearly be identified. This is due the page offering a vast number of resources for the user, without single one of them being emphasised. Exceptions are Python, Britannica and CodeAcademy websites, where the clear intention is to make the user perform a specific action. In Python's case it is getting donations, whereas for Britannica and CodeAcademy want the user to subscribe to a premium service.

Search engines, AI assistant applications and translators can be categorised most as online tools rather than websites. The number of buttons seems to correlate to scope of the website's purpose. There are barely any clear CTA buttons available on these nine websites, DeepL being an exception, though past the fold of the page. This is beneficial, as user can focus on the single or few tasks on the page, without being flooded with options. The opposites are the learn-to-code platforms W3 Schools and GeeksForGeeks, with the former especially offering far too many buttons to interact with. As those pages are commonly used by curious beginners eager to learn, the information overload likely pushes some people from the field away completely.

The second element analysed is text inputs. The purpose, placement and role are nearly identical on most of the reviewed pages. In nearly every single one of the pages, a text input is the first interaction element visible. Most cases it is a search input for getting resources. Exceptions are AI assistants and translators, which have a more clearly defined use case. AI assistants have a text input field for the language model prompt and translators receive the input user wishes to be translated.

The search bar is positioned in the navigation bar or the hero section of the page, often present in both. Hero section refers to the visible area upon entering a website, beneath the site menu

(Derrick, 2020). Derrick argues that the hero section of the page should provide the visitor answers to four questions about company behind the website:

- What does the company have to offer?
- Why should the visitor trust the company?
- What are the benefits in working with said company?
- With a clear CTA, what is the next action that the visitor should take?

While these tips are more relevant to businesses trying to sell services, similar conclusions can be made with the website groups analysed here. Upon entering, the user should be aware of where they are and what can they do next on said page. Having the search input immediately presented gives a good option for the user to search a relevant resource immediately.

As mentioned in Section 3.2.2, input fields should have a concise descriptive label.

Surprisingly, nearly all analysed websites with a search input are missing labels. Most search input fields only have a placeholder text, such as “Search Dictionary” of Merriam-Webster, or “Search Docs” of TypeScript. One can argue it is better than nothing, but the placeholder disappears on user input. Context alone is not always sufficient in communicating the purpose of the search input to the user. Websites like Google Search and Wikipedia have disregarded communication completely, having only an empty input without any text. These websites are so well-known internationally that the purpose of these text inputs is clear. Simultaneously, pairing the inputs with proper textual information would be preferable.

Lastly, the search input field is often paired with a button for initiating the search. The button either has descriptive text like “search” or a magnifying glass icon, which is the commonly known icon for searching. In today’s websites it acts more like a back-up, as pressing Enter on the keyboard will also submit the search.

Moving on to cards. Card elements are present in about half of analysed websites. As described in the theory earlier, they format content effectively across different screen sizes multiple websites. There is some difference whether the entire card is interactable or only the button or link within. Most websites with cards have one or two sections of them, totalling somewhere between three and nine cards.

Some of the analysed sites overuse the card component. Clear exceptions are the three learn-to-code platforms as well as DeepL translator, which have dozens of cards. Despite the modern style and suitability for responsive design, the overload of cards easily becomes a disadvantage. It can be compared to the use of accent colour or primary buttons: They guide the users' attention effectively when used sparsely, but as the amount increases, the effectiveness is lost. The result is an unappealing mass of information, which only hinders completion of goals set by the user and the designer.

The navigation bars of analysed websites function like expected. Apart from Wikipedia, all the home pages have at least some navigational elements visible, placed at the top of the page. Copilot is an exception, with the navigation placed vertically on the left side of the page. Most cases the navigation bar consist of a logo placed in the top left corner, three to seven links in the middle and a profile section on the top right corner. The profile section has a button or buttons for logging in, signing up and checking profile settings and preferences.

The navigation bar is a convenient way to communicate the user where they currently are and where are they able to go. During research it stood out that on five different pages the scrollbar is stuck at the top of the page, meaning it does not stay visible once the user scrolls the page further down. This is harmful for the overall usability, as these navigational options should remain visible whenever possible.

Finally, the responsiveness of the websites. As one can expect, all analysed websites are responsive across multiple different screen sizes. Some homepages have some minor hiccups to deal with on smaller sizes, but all keep a sensible level of usability. An interesting choice was made on three different websites. Britannica, W3Schools and GeeksForGeeks do not hide their lengthy list of navigation links behind a pop-up navigation menu but rather make the navigation list horizontally scrollable. This generally is not a great solution, as the available options cannot be seen at once.

Learnings from the home page analysis can be now carried over to the creation of new home page design. In the next chapter, we will focus more on the interface of the existing home page and begin the design process.

5 Designing the New Master Data Portal Home Page

This chapter presents the design process of the new home page UI. We start by evaluating the UI of the existing home page. User opinions are brought into the design process by conducting a survey of the existing home page. The obtained information from the evaluation, the user survey as well as the website analysis (see Section 4.4) are then merged into the basis of the new design. Finally, we describe creating the interactive prototype for user testing.

5.1 Evaluation of the Current Home Page UI

Figure 8 shows the current design. This is the starting point for the design work. At the top, there is a navigation bar with the company logo, nine navigation links as well as a profile section. The navigation is clearly laid out. It supports internal consistency within Wärtsilä applications, as many applications have the same style navigation bar, consisting of a dark colour, placed up top with the Wärtsilä logo inside a white trapezoid. The profile section is placed top right follows consistency from commercial applications, such as social media sites. In a large enterprise, user accounts are managed on a much higher level than single applications. Clicking the profile section opens a dropdown menu that has the user's name. It acts like a clickable item by having its background colour change on hovering but does not have any functionality. The navigation bar does not stick to the top of the screen while scrolling. It also does not transform into a burger menu or any other recommended mobile screen menu implementation but rather becomes horizontal scrollable.

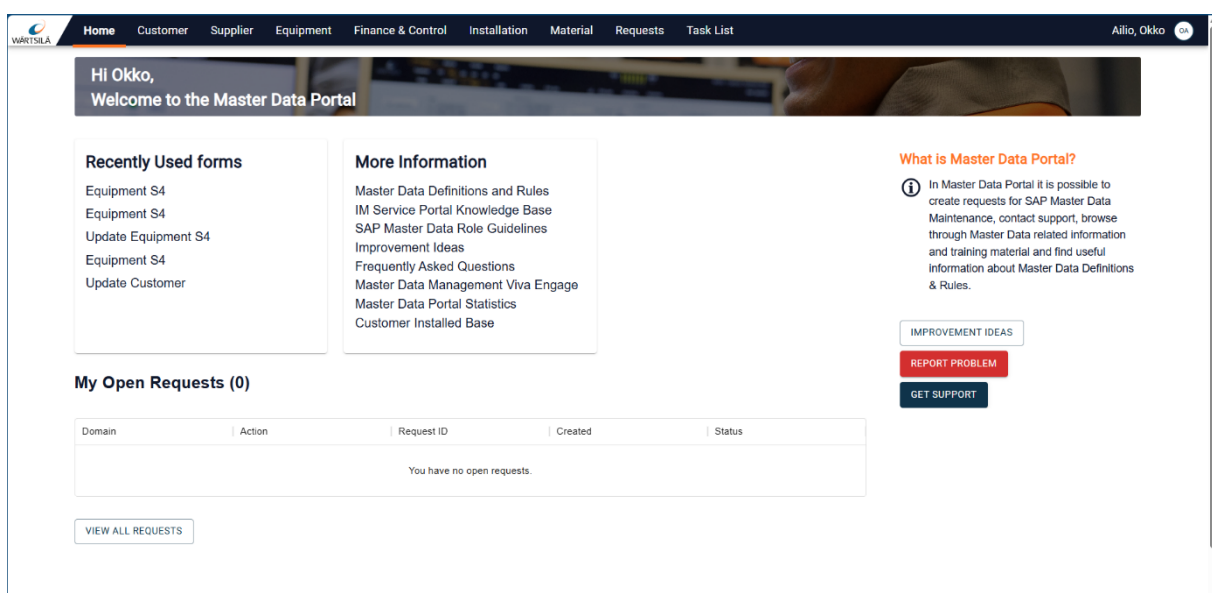


Figure 8 UI of the existing Master Data Portal home page, December 2025.

Beneath the navigation is a large image banner with a welcome message. The message is personalised with the user's first name. The image itself is heavily cropped due to the stretched-out resolution. Therefore, it acts merely as a background colour change. The UI is mostly white, so the dark hue image stands out too much for a simple welcome banner.

Beneath the banner is the actual page content. The content is divided into a two-column grid. The left column takes the three fractions of the available space, and the right column takes one fraction.

The content of the left column has three sections. All three sections have clearly marked headings. First section is a card labelled "Recently Used Forms". It stores quick links to the forms the user has accessed. Next to it is another card with textual content, labelled "More Information". The section has links to Master Data related content. Although the clear labelling and categorisation of content, these two sections have some flaws. First, it immediately stands out that the spacing between content is inconsistent across two nearly identical components. Furthermore, despite being links that lead outside of the home page, they look like plain black text. Only after hovering a link the text becomes light blue with an underline, which are clear characteristics for a link component. The "More Information" section consists of links leading to external websites outside the portal, which is not indicated clearly to the user. The way the content is divided in the left column, there is space for another rectangle of the same size. This ends up giving the layout an awkward look. Likely resulting from content being removed from the page, the two cards could divide the space evenly for a cleaner look.

Beneath the two cards, is a section with a table of user's pending requests, titled "My Open Requests ([number of open requests])". This offers users a great overview on the status of their requests, as the information is immediately available on the home page. Clicking an open request opens it for the user. Beneath the table is a button that takes the user to requests page in the portal.

The right column of the page content is titled "What is Master Data Portal?". It has a brief description on the function of the portal. Beneath it is three buttons:

- An outlined button "Improvement Ideas", leading to feedback gathering platform for the portal.

- A bright red coloured error button “Report Problem”, which opens a pop-up modal for reporting an issue in the portal. The modal has instructions for submitting the report, with user inputs of title, domain, description and attachments.
- A primary button “Get Support” which also opens a pop-up modal with similar content as the problem report.

During the time of writing, the problem report button was renamed “Report a Bug”, to help users distinguish between technical problems and business process related issues. The button design makes especially the primary and error buttons easily recognizable. The user’s eye catches them quickly.

The home page is fully responsive and adapts to different screen sizes smoothly. A tiny improvement is the fact the navigation bar becomes horizontally scrollable on smaller screens. Implementing a hamburger pop-up menu would improve the experience for mobile users. Overall, the page is very simple, with lots of whitespace. The content on the page is informative and relevant for the purposes of the portal. Some potential is lost on how to content of the page is presented.

5.2 User Survey About Current Home Page

To gain insights on user behaviour and preferences on the portal home page, a survey was created. We also investigated problem reports and improvement ideas that users had recently created. Nothing related to the portal’s home page was found.

The survey was conducted via Microsoft Forms questionnaire, which can be found in Appendix B. The survey was sent to top 500 most active users of the portal, aiming for a minimum response rate of 10% or 50 participants. Activity was assessed through analytics tool Datadog, listing the amount of API calls done from the Master Data Portal. The survey was open for one week, closing February 4th, 2026. The survey received 89 responses, clearly exceeding the response rate expectations. Originally, it was planned to keep the survey open for two weeks, but we determined the large number of responses to be sufficient for this thesis and cut the response period short. Five (5) responses were excluded from the survey results as they addressed topics beyond the home page scope, indicating a misunderstanding of the form’s purpose.

In questions one and two, participants were asked their job title and the way they use the Master Data Portal. These questions were used as warm up questions, without clear relevance for the research. Using such questions has been successful in improving the response rate in other similar user surveys conducted by the team at work. After them, questions three, four, and five were mandatory questions, where users were asked to select an answer through one through five stars. Table 2 shows the answer statistics of mentioned rating questions. The questions are:

3. How useful is the home page for your work?
4. How usable do you find the home page?
5. How do you rate the visual look of the home page?

Table 2 Placeholder Answers to three start questions, n=84

Question	Min. Value	Max. Value	Average	Median	St. dev.
3. Usefulness	1.00	5.00	4.23	4.00	0.93
4. Usability	1.00	5.00	4.11	4.00	0.97
5. Visual look	1.00	5.00	3.87	4.00	0.94

Usefulness got the highest rating, at a high average of 4.23/5.00. Usability scored slightly lower at 4.11/5.00. Visual look of the page was ranked the lowest of three metrics, at an average of 3.87/5.00. Based on the evaluation done in Section 5.1, all three of these numbers are relatively high compared to expectations. All three metrics had the minimum rating of 1, maximum rating of 5, with the median rating being 4. The standard deviations of all three metrics were in the range of 0.93-0.97, just under 1. Figures 9, 10, and 11 show the distributions of answers in questions three, four, and five.

Questions six and seven were used to gain insight of the usage numbers of existing home page features:

3. How often do you visit the Master Data Portal?
4. How often do you use these features on the home page?

Figure 12 shows the distribution of the portal's usage frequency. At 55, nearly two thirds (65.5%) of total 84 respondents are frequent users, visiting the portal multiple times a week or

daily. 24 respondents (28.6%) visit the portal weekly or few times a month. Only five respondents (5.9%) use the portal rarely, visiting only few times a year or less often. The numbers indicate a good sample of the portal's users.

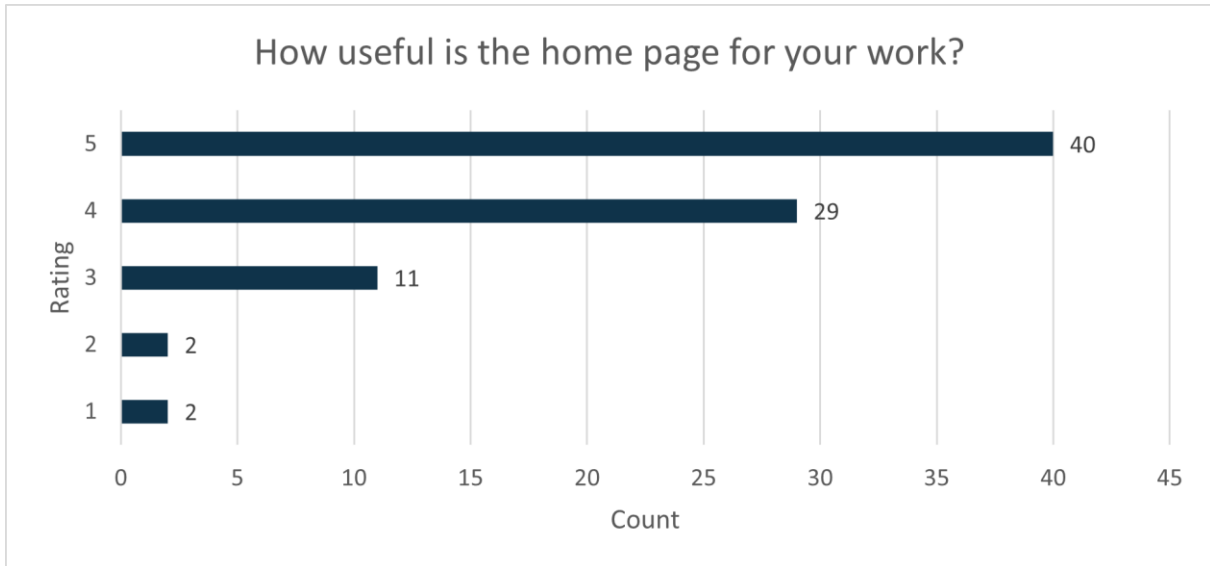


Figure 9 Answer distribution on survey question three "How useful is the home page for your work?" (n=84).

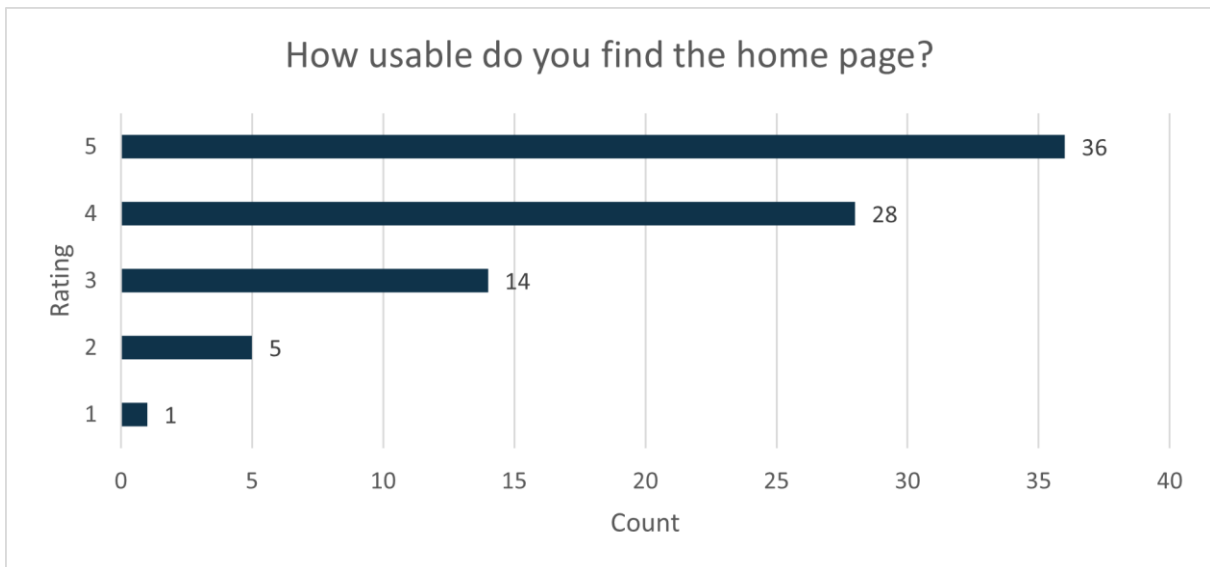


Figure 10 Answer distribution on survey question four "How usable do you find the home page?" (n=84).

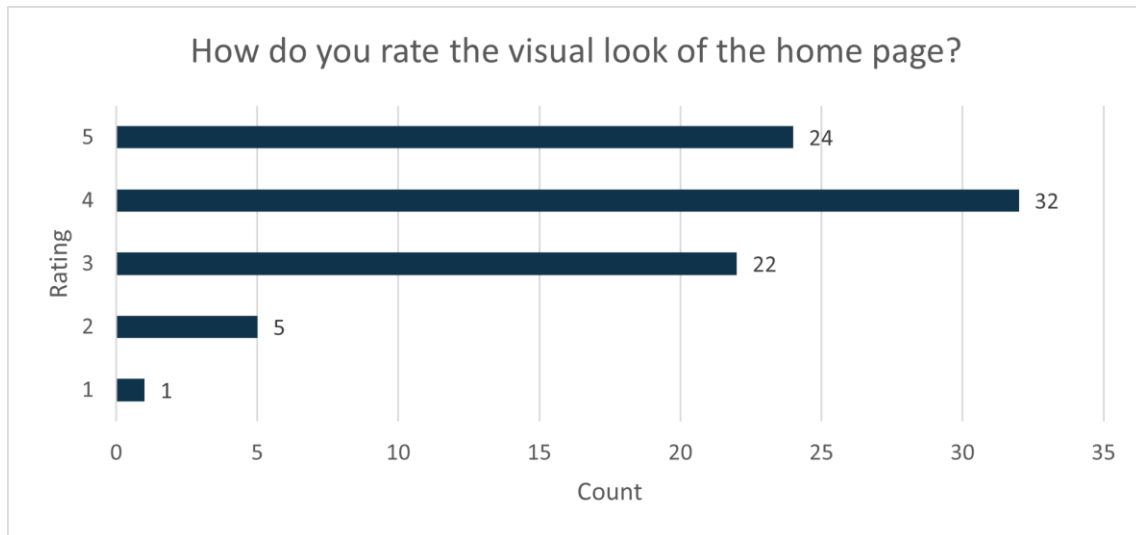


Figure 11 Answer distribution on survey question five “How do you rate the visual look of the home page?” (n=84).

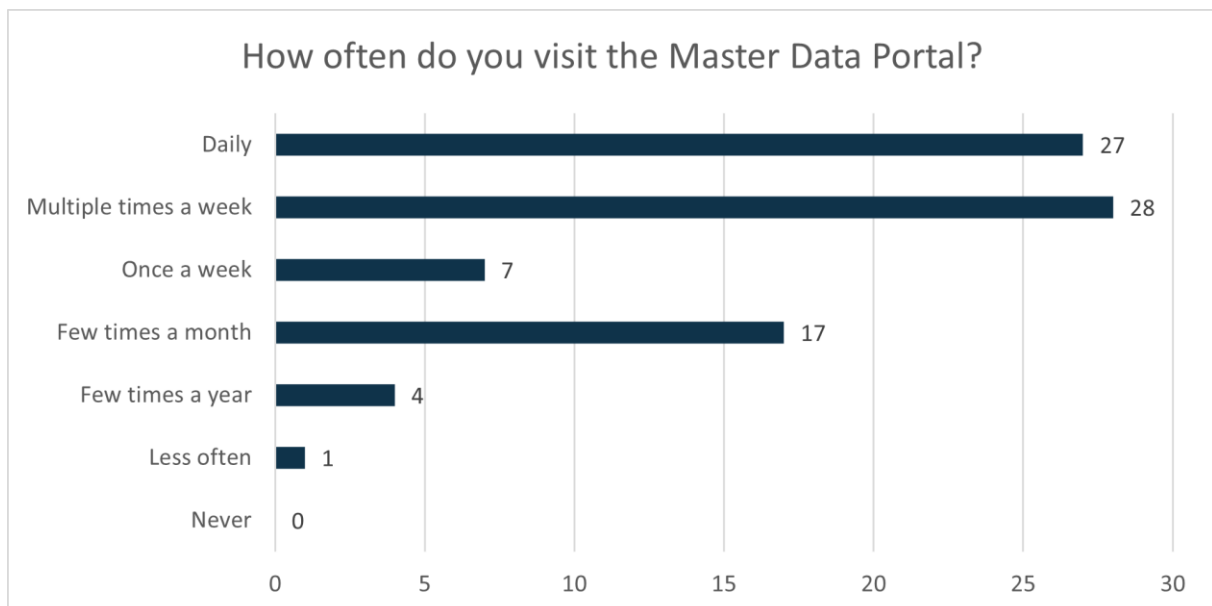


Figure 12 Distribution of answers in question six “How often do you visit the Master Data Portal?” (n=84).

In question seven, users would state their usage frequency of different portal features. It had same answer options as the visiting frequency question. Number of responses varies across different features. To identify the most relevant features, answers “Few times a year”, “Less often”, and “Never” are excluded in all respective categories. Figure 13 shows the usage distribution of different features. Three features stand out. At a total of 55 users, accessing a domain through navigation bar is the most used feature. It is expected, as it’s currently the only way to access all forms of the portal, used nearly every time a user must create a request in the portal. With only one less frequent user at 54, the second most used feature is viewing

the status one's open requests. The history segment of recently used forms is the third most used feature, named a frequently used feature by 44 respondents. Recently used forms is currently the only in-built option to access relevant forms for users that always use the same forms in their work operations.

Despite having ten frequent users less, accessing recently used forms ties accessing domains through navigation with the most daily users, both at 12. The navigation bar has the most "Multiple times a week" users at 18. Recently used forms has the most users in the two remaining categories, with nine users answering "Once a week" and 25 answering "Few times a month". A drop in the graph can be clearly identified, with accessing more resources through the links under more information (25 frequent users), accessing improvement ideas platform (16), and creating support request or bug reports (13) having far less frequent users than the top three mentioned.

Question eight was "What do you like about the current home page?", looking to gain insight into what the users would like to stay untouched on the existing home page. The question got a total of 72 responses. Mentioned in 36 answers (50.0%), the most prominent theme was the UI being simple, clear and easy to use. The comments included statements:

"It is quite convenient and easy to use"

"It's simple and clear"

"[It's] simple and not too busy and [it's] easy to read."

"Quite visible page, not too full of information"

Navigation of the portal was the next most mentioned topic. It was mentioned in 13 responses (18.1%):

"Accessing a domain through the navigation bar"

"Easy and straightforward navigation."

"Easy to navigate and no need to go through multiple pages to find relevant data."

Seven responses (9.7%) praised the fact the portal delivers to its purpose:

"It does what it is suppose[d] to do"

"It just works."

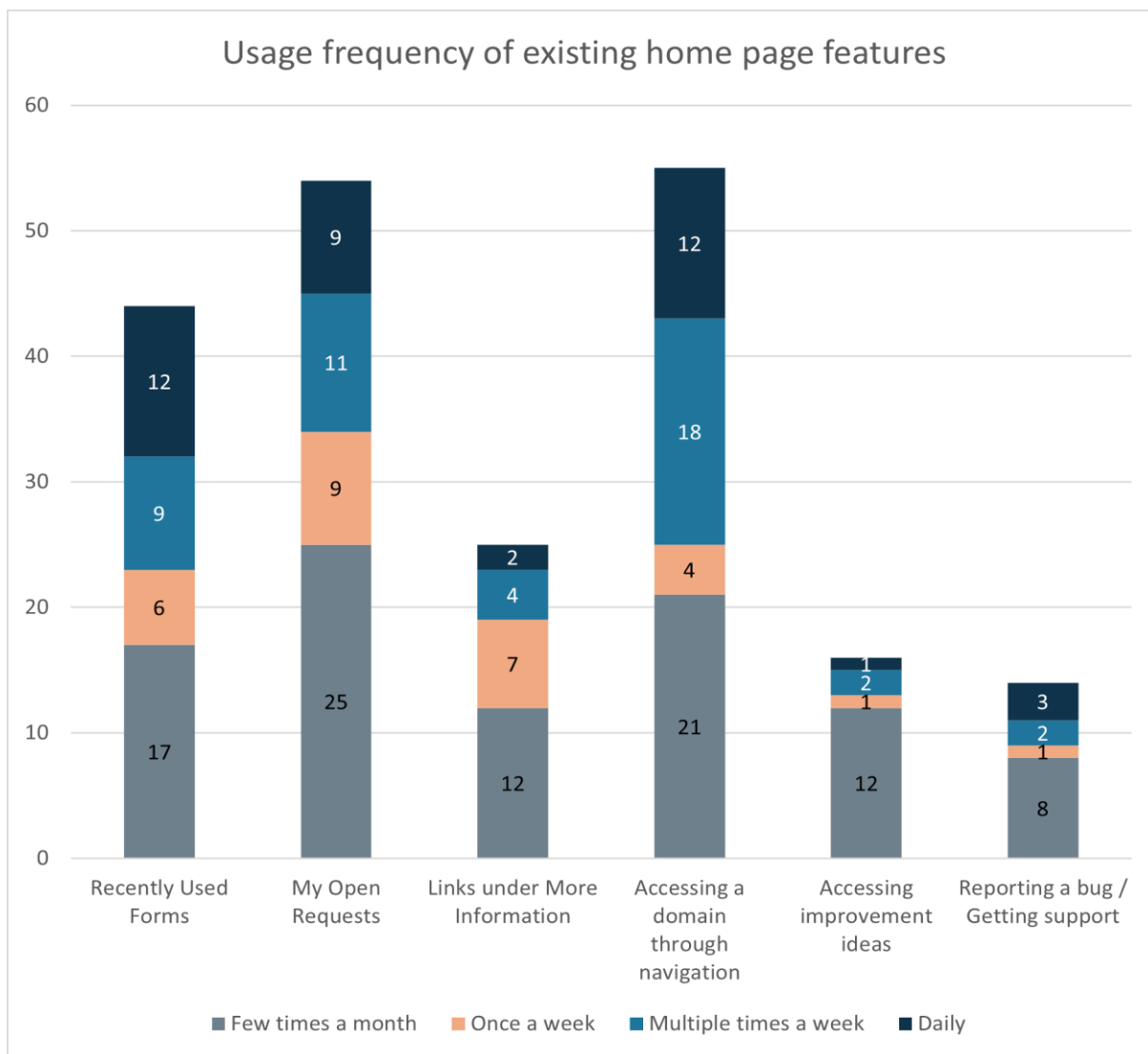


Figure 13 Distribution of answers in question seven “Usage frequency of existing home page features. Response frequency varies across categories.

These were the three most identifiable themes within the responses. Miscellaneous topics were also raised by some respondents. Centralized information access, specific page content and individual components, such as buttons, were among those mentioned.

Question nine was the opposite, reading “What do you dislike about the current home page?”. The question got 63 responses in total. 28 responses (44.4%) did not state any dislikes (e.g. “n/a”, “- “, “Nothing to dislike”, “Homepage is great”). Eight responses (12.7%) relate to issues with findability on the portal home page or the whole portal page:

“If you have not used a specific form/ Ticket it is extremely difficult to find it from the navigation”

“[Sometimes] it is bit tricky to find the correct place where to look.”

“Not always easy to find the right procedure to fill out the template”

Six respondents (9.5%) want to see improvements in the visuals and content of the home page:

“A bit cluttered and disorganised.”

“The [visual] appearance is quite static and plain. [...]”

“Visually boring. Despite that there's very little in there, there's even fewer things that I need.”

Five responses mentioned technical bugs and data-related issues, but they are out of scope of this thesis. Various individual topics were raised in the answers. They mentioned bad performance, duplicated features and insufficient instructions, to name a few.

After gaining insight on what users are fond and reluctant towards, question 10 gave respondents to present their wishes for the new home page, reading “What new features would you like to see on the home page?”. The question got 56 answers. At precisely half of them, 28 answers (50.0%) did not have any wishes for improvement in the answers (“N/A”, “...”, “I don’t know”). Eight answers (14.3%) were related to the business process of the forms themselves, which is out of scope for this thesis work. Equivalently to the dislikes of question nine, six respondents (10.7%) wanted to some general visual improvements to the UI. As more clear feature propositions, four respondents (7.1%) mentioned streamlining the workflow and customisation:

“More direct shortcuts into the features I use frequently”

“[Direct] link for procedure”

“Being able to customise the page somehow would maybe be a nice feature [...] I'd want to have my favourite forms pinned somehow in addition to the recently used tab.”

“[...] Maybe tickets related to each work position e.g. personalised for [job title] and so on”

There were individual mentions of adding more content. Examples were showing statistics or embedding a Viva Engage channel on the home page, as it offers up-to-date information on matters related to Wärsilä’s master data. Other distinct and relevant improvement ideas could not be identified from the answers.

Question 11 was for getting participants for user interviews at a later stage of the process “Would you like to participate in user testing? (20-30min remote meeting)”. Out of 83 answers, 27 respondents (32.5%) expressed their availability. Final question of the survey was question 12 “Anything else you would like to add?”, but it did not get any answers relevant for this research.

To summarise, the survey results offer valuable understanding into the user needs of the portal home page. The rating questions’ results came in relatively high, scoring 4.23, 4.11 and 3.87 in respective categories. Features mostly used in users’ workflows are accessing different domain pages, checking the status of open requests, and returning to recently used forms. The next section is about designing the new home page, supported by the information gained in sections 5.1 and 5.2. as well as the commercially popular interface elements discussed in Chapter 3.

5.3 New Design

The user survey results generally were much more positive than expected. In the discussions held at the beginning of the thesis project, it was estimated to get much more of a complete revision. The survey results shifted the direction of the new design from a full renewal to improving the existing design. Without the survey, the design work would have gone to a totally different direction, highly likely ending in a dissatisfying result for the users. This is one of the many examples on the importance of end user communication.

The design process takes place in Figma. Figma is one of the leading digital product design tools available (Kemp, 2025). It offers effective collaboration between product managers, designers, developers, and other relevant stakeholders. The leading use case of Figma is UI/UX design, making it the ideal tool for this segment of the thesis work.

Identifying the features to put in the new design is the first step of the process. Based on the survey, there are no features on the existing home page without frequent users. All functionalities can be carried over to the new design. As the two most used features, the navigation bar and status of open requests can stay relatively untouched. They are simple features that do not need any tweaks by default. The recently used forms -feature is something to carry over, but extending on that, an opportunity to add two new features can be identified.

As mentioned, it is the only built-in way to access frequent content for users. In the survey, a common wish was streamlining the process to access the forms. Additionally, users reported

having difficulties to locate the correct operation. An example of a form that is difficult to locate is “Update Running Hours”. It does not fall under a distinctive category based on its name alone, compared to, for instance, “Update Supplier”.

All three of these concepts can be combined by introducing a simple search functionality on the page. The search results are the numerous forms available in the portal. Users can access the homepage and search for a relevant form with an input. It is then possible to access a form directly from the homepage, without the need to go through the multiple tabs to locate it. Implementing a search feature is a great way to increase the familiarity of the page. A search input feature is often the first visible interaction element in the websites analysed in Section 3.4. Users can expect how the search input works and understand that it is a quick way to access resources on the whole page.

The second new feature is ability to pin one’s favourite forms on the home page. This was specifically mentioned by one user in the survey. It improves the experience for all users by allowing minor customisation of the page. Likewise with the search feature, it increases the possibilities to directly access the forms from the home page. The feature is especially handy to users that regularly use a modest number of forms that are all on separate tabs of the portal.

The links under “More information” suffer from not visually looking like links. As per another popular home page element, they can be implemented as card components. To the untrained eye, most of the links sound complicated and hard to distinguish the relevant content from them. Designing the links as cards not only improves their visual hinting of interactivity but also is a convenient way to add short descriptions about the contents of each resource.

The contact buttons (Get support and report a bug) do not have high usage according to survey. This is natural, as they are intended for situations where a user needs external support to continue their work. In the existing home page, they are paired with a descriptive text under the headline “What is the Master Data Portal?”. A button to access the improvement ideas platform is also in the same proximity. These can also be carried over without large changes. It is desirable to keep the familiar layout with them, so users can also locate them with ease in the new design, in case there is an urgent need for support.

The features consist of multiple simple functionalities that do not require a lot of room in the UI. A modular grid layout is the best way to showcase them. It offers the possibility to put

multiple features visible with clear distinguishable boundaries, contributing to feature discoverability. Additionally, new features can be added later, and the components order can be moved around effortlessly. Figure 14 shows trying out different layouts in the design process. After trying out several different layouts, a 3:2 grid layout proved to be the best solution for the new portal design. It offers subtle hierarchy, as the left column taking three fractions of available space can have more primary features, whereas the right column houses the features that can be considered more secondary. The difference in space taken is clear but not overpowering.

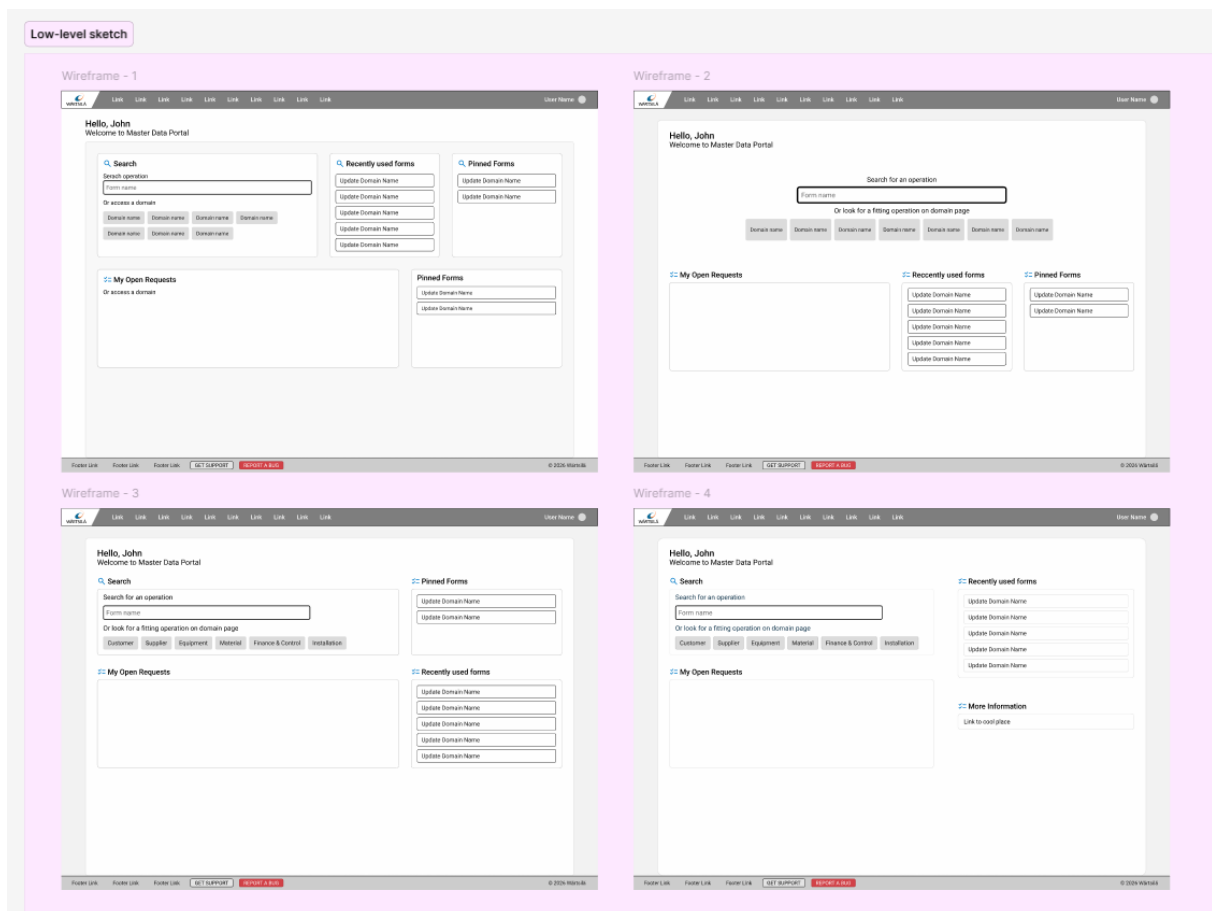


Figure 14 Experimenting with different page layouts.

Next is placing the elements in the columns. In the left column, the feature to search for forms is placed first. Instead of having its own feature, the history of recently used forms is placed the same component as the search input, having multiple access points to relevant forms. Beneath them is the component of the status of open requests. Final component of the left column is the section of links to external resources. The top of spot of the right column has the new pinned forms. It is followed by the short description of the portal and buttons to contact the team or access improvement ideas platform.

One survey respondent from the team working on this tool had proposed adding an embedded feed of Master Data team's Viva Engage Feed. Viva Engage is a social network platform Microsoft's organisational product family. It is the primary communication outlet for the team to share relevant information, such as new updates and demo session invites. As the right column takes much less space, the social feed is a convenient way to balance it out. Finally, a small footer is added to the bottom of the page. It is a consistent placement for the contact buttons, as their location of contact buttons varies on different pages. Additionally, relevant links can be placed in the footer based on need. The footer increases consistency by making the resources available at the same place in all different pages, equivalent to the navigation bar.

Once all features are in place in a balanced manner, the final part is making the design visually nice. Figure 15 shows the more high-fidelity design of the portal. The colour palette is mostly from an internal design system at Wärtsilä. It consists of mostly different shades of grey. Blue is used as an accent colour. The new search feature is subtly highlighted to guide users on the path. The red error button stands out well. Users can locate it whenever they face some issues. The link cards in "More Information" section wrap based on the available space. The uneven right edge on the list of cards is intended to make the cards easily distinguishable from one another, rather than making the cards equal in size. Another legibility detail is the "What Is Master Data Portal?" -section. The number of characters per line varies between 56-63 characters, which lands into the ideal line length range of 50-75 characters (Scott, 2022). Some precise design questions were left on the table for now, as the design and prototype does not need to be perfectly fine-tuned at this stage.

The new portal design was validated in a meeting with a small group of stakeholders, to confirm that the design work is going to the right direction. The stakeholders in question were satisfied with the design, with the new features getting additional praise. The design was accepted by the stakeholders without the need for changes. In the next section, an interactive prototype for user testing is created from the design.

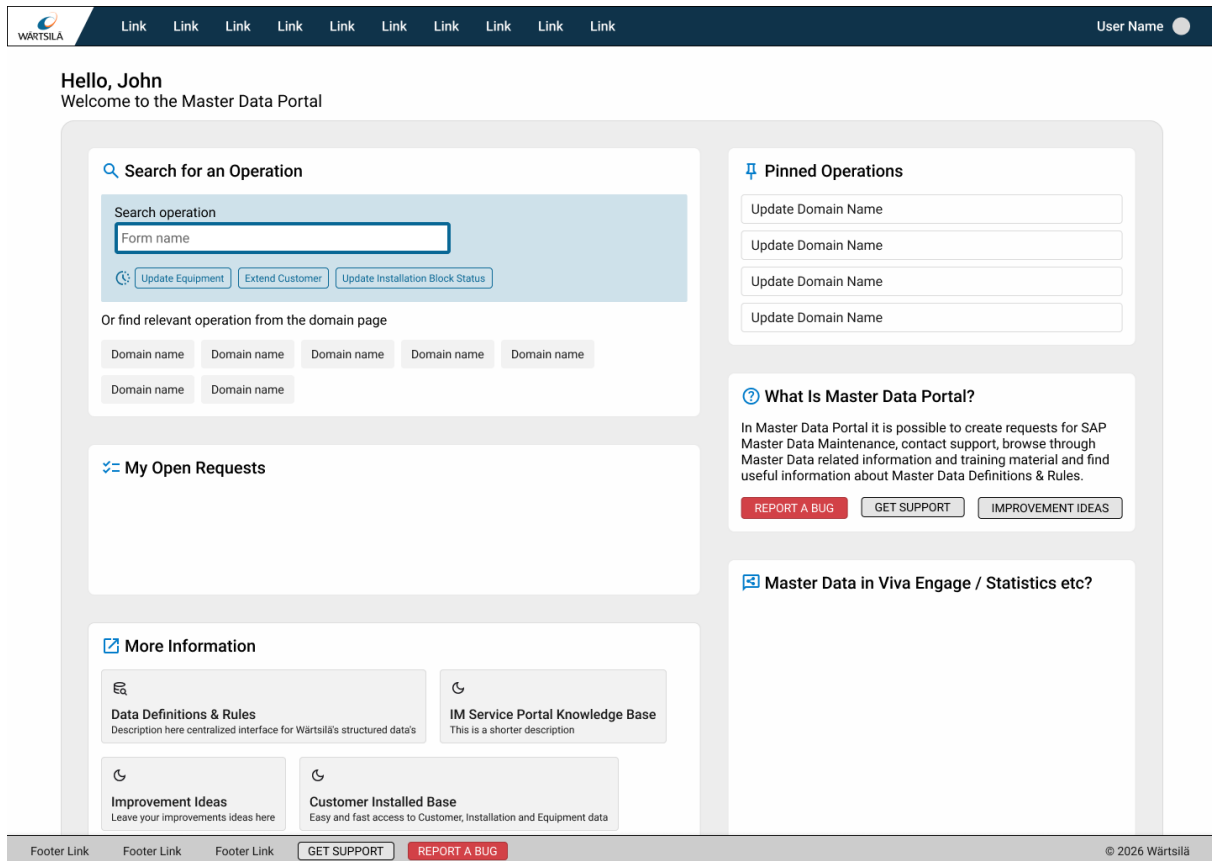


Figure 15 High-detail design of new Master Data Portal home page UI.

5.4 Prototype Creation

There were two paths to choose from with the prototype creation. Options were either creating a fully interactive version of the existing design with Figma or creating a new page into the portal web app behind a hidden website path. Creating a Figma prototype was the plan initially, especially since there now was an almost finished design to build the interactive flows around. Additionally, Figma offers more flexibility for doing big changes and testing different solutions compared to web development. However, two factors decided that we moved forward with the frontend coding option. Having the prototype in the portal makes users more comfortable in the upcoming testing sessions, as the portal is a familiar environment. With Figma, the experience would not have been nearly as immersive. Secondly, the speed of development. Personally, I am more skilled in frontend development than creating Figma prototypes. Despite it being a good learning opportunity, the time saving possibilities outweigh it. In addition, given that the prototype is successful, implementing it to be the home page of the existing portal will also be much quicker.

The frontend of the portal is a React and JavaScript web application. It uses Google’s Material UI library for the frontend components. As per modern software development practices, Anthropic’s Claude Opus 4.5 language model was used to support the development of the prototype. The model was accessed through a company internal generative AI solution. It was used to complete recurring tasks such as creating component structures as well as helping to debug logical and syntactical issues. The development process was straightforward. Eight React components and a parent component were created. The homepage was placed under a relative website path “/secrethomepageurl”, where it can be accessed in all different levels of environments of the portal: local/development, test, and production.

Figure 16 shows a full layout screenshot of the finished prototype. The finished layout has indistinct differences to the design presented in Section 5.3. After consideration, the new features, form search and pinned forms, both are coloured in the subtle light blue backgrounds to highlight them. The direct links to form operations are coloured in more tinted version of light blue. Contrary to the new design frames, the “Get Support” button kept its dark colouring, remaining more noticeable.

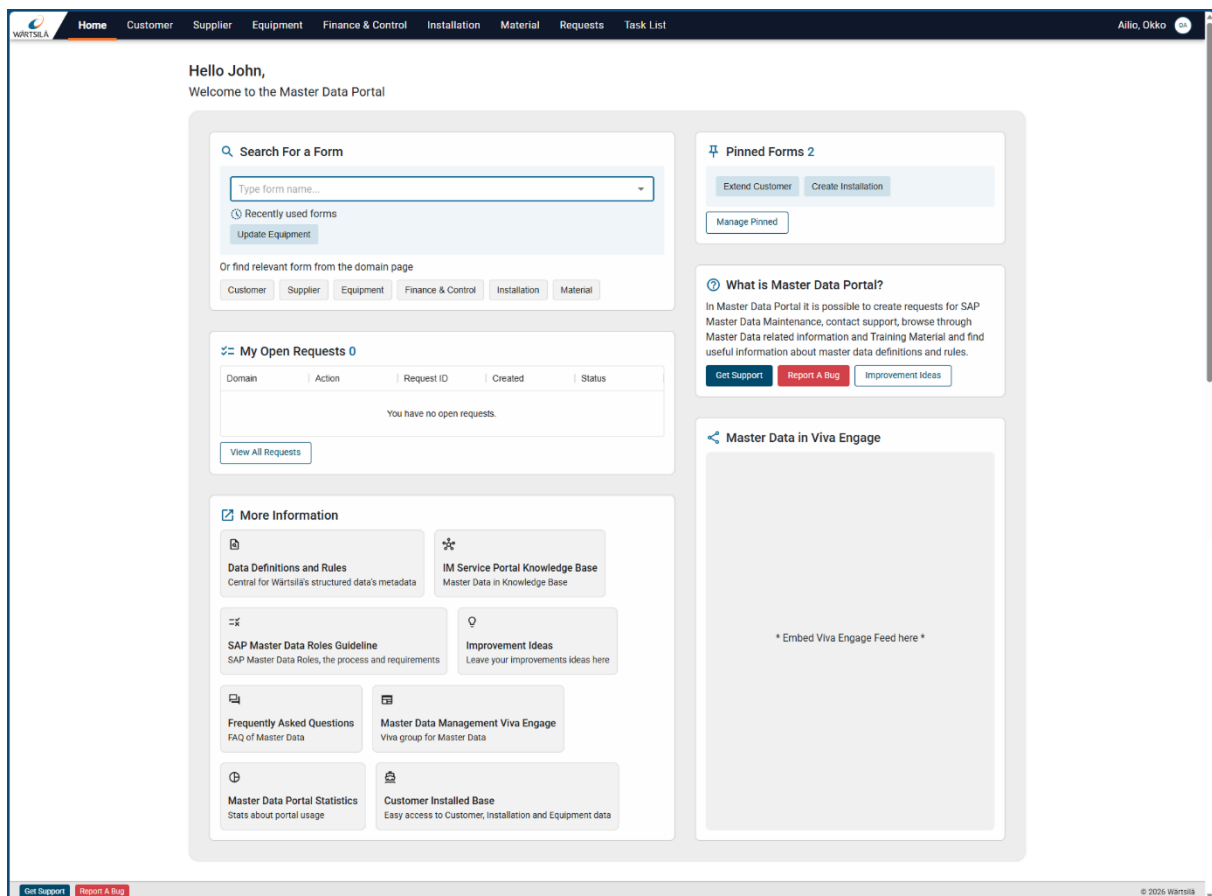


Figure 16 Screenshot of the full-height prototype.

The pinned forms are controlled by a pop-up modal (see Figure 17). The pop-up can be opened by clicking the “Manage Pinned” button in the section. Once opened, the background behind the modal is darkened. The modal has the exact same input component as the one for searching different forms. There are multiple points of exit. The modal can be closed by either saving or cancelling the changes, clicking the x-icon top right, or by simply clicking outside the content area. In general, there are patterns to control such favourites faster. Most users are likely to set their pinned forms only once and keep them for months or even years. It is reasonable to move forward with a simple way of managing, rather than aim for miniscule time savings. For this same reason, one cannot delete a pinned form without opening the same modal.

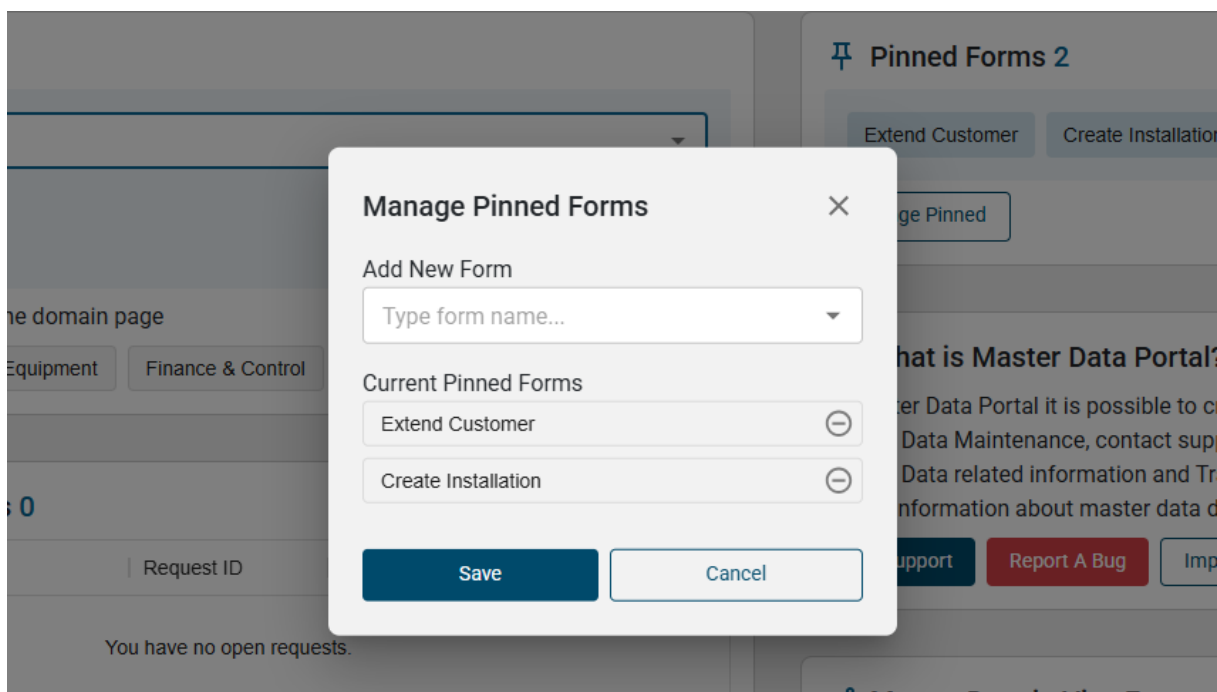


Figure 17 Pop-up modal to manage the pinned forms of the users.

To speed up the prototype creation process, some technical shortcuts were taken. The options for searching or pinning forms is hardcoded list of 12 items, which is roughly a fifth of the number of available forms in the portal. The recently used forms list takes up to four items at random on every refresh. Pinned forms are stored in a React state variable, emptying the list at every refresh of the browser. Embedding the Viva Engage feed caused technical difficulties, so it was omitted from the prototype. The navigation bar was left untouched as it is vital for the functionality of the portal. As pointed out in Section 5.1, it does not stick with scrolling. Now that the amount of content on the new home page has increased, it is necessary to keep all options available despite scrolling down on the page. Additionally, a mobile menu

ought to be introduced over the horizontally scrollable list of links it currently transforms into in smaller viewports. Regardless of these shortcomings, it fills the main requirement for the prototype: being something the users can test and play around with.

Figure 18 shows the responsiveness of the new home page on multiple different screen sizes. The content is cut off conveniently at the middle of some components. It hints the user there is more content available on the page if they scroll down further. On mobile viewports (width less than 768 pixels), the content arrangement changes from a two-column layout to a single column. The two columns become joint like a zipper, stacking alternately to create the single column. Search functionality section is again the first at the top, followed by the pinned forms, my open requests, and the other remaining sections.

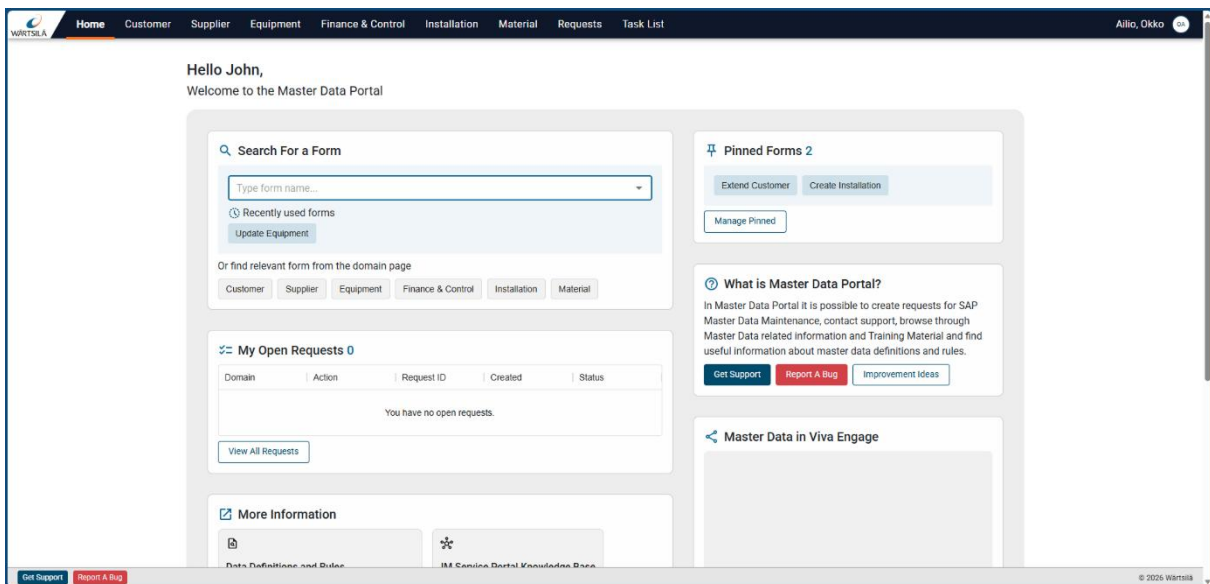


Figure 18 Visible section of the prototype in the browser on a 27-inch display.

The prototype is now finished. Next chapter describes the user testing methodologies with the prototype to gain insight on how successful the design work is.

6 User Testing Interviews

In this chapter, we will describe the means of user testing interviews of this paper. In the first section, we characterise the methodology and formulate five hypotheses for the research. Next section goes into detail about the structure of the interviews. Finally, the framework of the survey taken after the interviews is showcased.

6.1 Methodology and Hypotheses

As mentioned in the first survey results (see Section 5.2), 27 users expressed their availability to participate in user interviews. We agreed that a sample size of ten interviews is adequate to achieve valid results in the scope of the thesis. To reduce bias, the ten participants were randomised from the available users. As a point of contact, a meeting invite was sent out the participants.

The selected method was conducting a semi-structured format interview. All interviews were conducted using the same pre-set structure, available in Appendix C. The estimated length of the interview is 15-20 minutes. A time slot of 25 minutes was reserved for each interview session. All interviews took place remotely in Microsoft Teams. A test interview was conducted with a colleague to confirm the structure is reasonable and fits within the time frame.

Five hypotheses were formulated to support the user research:

- H1. Users will utilise the “Pinned Forms” feature to reduce the time spent navigating between different tabs of the portal.
- H2. Users can access relevant forms faster with the “Search for a Form” section.
- H3. Most users see themselves adopting the new home page UI as an integral part of their daily workflow.
- H4. Users will prefer the new UI over the existing one.
- H5. The home page changes will not have a noticeable effect on the workflows of users working in singular domains.

The hypotheses are based on assumptions that rose while creating the design. H1 and H2 are straightforward, leaning on the expected success of the new features. Based on them, H3

describes the assumption that the usage of the home page will rise due to the new features. H4 refers to users appreciating the new display of the interface that aligns the content better than before. H5 is the only hypothesis that is not clearly positive. It assumes people who have all the relevant resources available for their work is already on a domain page. Therefore, the new home page changes will not affect them as much. The user research conducted aims to validate these hypotheses. Next section describes the structure of interviews.

6.2 Interview Structure

At the start of the interview, users were asked for permission to record the session. They were asked to talk as much as possible, think out loud, to give as much information as possible on their decision making. It was emphasised that if something feels hard or odd, it is not the fault of the user but rather an issue in the prototype. The goal was to reduce the pressure of the participants to perform in a stressful situation. Once the interview was ready to formally start, users were given the link to the new prototype. The link pointed to the new prototype in the testing environment of the portal. Simultaneously, they were asked to share their screen.

When seeing the prototype for the first time, users were asked to share their initial impressions. They were asked to describe what they see and if something specific catches their attention. After the initial impressions, the interview was structured around three small tasks.

1. Accessing a form relevant to the user's work.
2. Adding the same form to the "Pinned Forms" -section.
3. Going to an external website from within the portal via a link in "More Information".

For task number one, users were asked to briefly describe what domains and operations they use in the portal. Based on their answer, they were asked to access a form that was available in the search result options of the prototype. If a user accessed the form the existing way through the navigation bar, they were then guided to try out the search input. After completion, participants were asked to share their opinion on the feature and if they would like to see something done differently.

In task number two, participants were trying out pinning forms to the home page. First part of the task was to pin the form that they had just accessed in task number one. Once the first part was completed, they were asked to delete that form and pin any other form. Finally, they were

asked to access the newly added form through the pin. By this task design, the whole functionality of the feature was showcased. Like in task number one, participants were asked to comment on their experience with this feature. They were also inquired if there was more customisation they would like to see on the home page.

Task number three was intended for introducing the new layout of the links to external resources, under “More Information” section. The task was to access Customer Installed Base from the home page. It is separate internal tool for reviewing up-to-date data about Wärtsilä’s customers installations, and equipment. After completion, users were asked if they were aware of these resources on the home page. Additionally, they were asked if the links are valuable and whether they feel some important resource is missing. Lastly, they were asked to compare the presentation of the links of to the one of existing home page design.

After the tasks were completed, users were asked to share their experience with the prototype. They also had the opportunity to share if they feel something should still be brought over to the new design. Before concluding the interview formally, the participants were given a link to a short post-interview survey. They were urged to fill the survey immediately after the meeting ends. Content of the survey is handled in more detail in the next section.

6.3 Post-Interview Survey Structure

A post-interview survey (see Appendix D) was conducted to receive quantitative data on the prototype that could be compared to the results of the first survey. First question of the survey is titled “How many different domains do you use the Master Data Portal in?”. The answering options are 1, 2, and “3 or more”. This question aims to point out the single domain users to receive context for the fifth hypothesis “H5. The homepage changes will not have a noticeable effect on people who work in singular domains.”, presented in Section 6.1. The answer enables observing the answers of singular domain users separate of all answers. Questions two, three, and four of the survey are comparable to the rating questions of the pre-design survey:

2. How useful would the new home page be for your work?
3. How usable do you find the new home page?
4. How do you rate the visual look of the new home page?

The options were again to rate between one to five stars. The numbers can be then compared to the related questions of the previous survey.

Question five is labelled “Please answer the following statements”. It features 12 statements created based on the hypotheses presented in Section 6.1. The answer options are a five-point Likert scale (Strongly disagree [-2] – Disagree [-1] – Neither agree nor disagree [0] – Agree [1] – Strongly agree [2]). To help the respondents, the question had a subtitle stating that they can assume the new prototype page they tested would now be the official home page. Table 3 shows the statements, hypotheses relevant to a statement, and the expected answer based on hypotheses. A distinct expected answer based on the hypothesis could not be provided for two statements. The responses to said statements are driven by subjective preference.

Finally, question six was a free text box, titled “Anything else you would like to add?”. Participants were encouraged to give feedback on the process, the prototype, the interview, or ideas, to name a few options. The results of this survey as well as overall insights from the user interviews are shared in the next chapter.

Table 3 Post-interview survey statements of question five.

Statement	Relevant Hypotheses	Expected Likert mean [-2, 2]
The new home page is beneficial for my work.	H3, H5	Agreement, ≥ 1.0
I find 'Pinned Forms' helpful for personalizing my workflow.	H1, H3, H5	Agreement, ≥ 1.0
I prefer the old home page design.	H4	Disagreement, ≤ -1.0
I prefer using browser bookmarks over the home page to access relevant content.	H1, H2, H5	No clear direction, $-1 < x < 1$
The "Search for a form" section speeds up my workflow.	H1, H3, H5	Agreement, ≥ 1.0
The content of the new home page is organized clearly.	H4	Agreement, ≥ 1.0
The home page changes are not relevant to my work.	H3, H5	No clear direction, $-1 < x < 1$
The new home page is aesthetically pleasing.	H4	Agreement, ≥ 1.0
I don't see myself using the 'Pinned Forms' feature.	H1, H5	Disagreement, ≤ -1.0
I prefer accessing forms from domain pages rather than the 'Search for a form' feature.	H2, H5	Disagreement, ≤ -1.0
The new home page layout is confusing.	H4	Disagreement, ≤ -1.0
The new home page is an improvement compared to the old design.	H4	Agreement, ≥ 1.0

7 User Interview Results

This chapter presents the results of the user testing interviews. First, we will look at the insights from the interview sessions and then analyse qualitative data from the post-interview survey. The chapter is concluded by addressing the hypotheses posed in Section 6.1. All interviews fit into the estimated 25-minute time frame. Four interviews were conducted in Finnish and the remaining six in English. We discussed whether doing all of them in English would be more equalised across all interviews but concluded that there is no valid reason to complicate the communication, if both the interviewer and interviewee spoke the same native language.

7.1 Interview Findings

Seven participants reported that their attention was initially caught in the region of the search input feature. Five participants specifically mentioned the search input, with two pointing out the recently used forms. Six users liked the new interface instantly. Two users were reluctant towards the UI at first, participant nine (P9) mentioning there being a great deal of content, with P8 pointing out the vast amount of text on page. Participants P4 and P5 began exploring the prototype immediately after opening the prototype. They recognised the newly added functionalities. They did not need to re-do the tasks as the goal of the tasks was to familiarise the users with them. Like the others, P4 and P5 were asked to provide feedback and improvement by answering the post-task questions.

The first task was to access a form relevant to the participant. The broader goal was to introduce the form search input feature. Four participants completed the task via the search input. Four participants completed the task the traditional route via the navigation bar and two participants utilised the domain buttons in the search input content frame. The group of six participants not using the search input were guided back to the prototype page and hinted to try out the search input.

After completion, feedback was asked from the participants. Eight participants gave a lot of praise to the search feature. Three participants were especially fond of the feature, as they voiced occasional difficulties in locating the correct form from the domain pages. Belonging to mentioned group of eight, participants P8 and P10 noted the helpful possibilities the feature provides but did not see a use case for themselves, P10 pointing out their preference to using

browser bookmarks. All users noted the recently used forms. P4 wished for the form to open into a new tab after clicking it. No other changes or wishes for improvements were presented.

P9 gave kudos on the form not being case-sensitive, which has been an issue for them in other work applications. P2 struggled with the search input initially, as they mistook the input field for submitting the name of the data to operate with. In the prototype, the search options were filtered based on the input. Spelling errors would cause all search results to be hidden. Given this feature is implemented on the new home page, the input options ought to show the best matches. As an example, a faulty user input “crate insallation” would show “Create installation” as the best match, rather than stating “No results”.

Having accessed a form, task number two was getting familiar with the pinned forms. Eight participants performed the task without any noticeable difficulties. P2 had difficulties understanding the task, likely due to a shallow language barrier. P1 accessed the form through the search input again and tried to find a button to add it from the form page. P1 described expecting the functionality to resemble adding a browser bookmark. Such functionality was not available in the prototype but was noted down to be added once the feature is implemented on the home page.

All ten participants gave great feedback on the feature. P1, P4, and P6 specifically mentioned the potential time save it offers for them. P1 was especially fond for it as they use three forms from three different domains. P10 liked the placement of the whole section. P9 proposed an improvement idea on the functionality. They mentioned the wish to organise the order of pinned forms, with drag and drop -style as an example.

In the third and final task, the assignment was to access an external resource from the portal home page. The task design was not as successful as with the first two tasks, but it did showcase the difference in ways users operate. Customer Installed Base was well-known among the participants. Many participants had quick access of their own, having it in their bookmarks or even had the page open in one of their current browser tabs. The purpose of these links is to be offered as relevant resources for users, not to act out as the quickest entry point to them. Half of the test participants were not aware of the links on the existing home page, likely due to the poor discoverability of the presentation. It caused further confusion but simultaneously was good onboarding for the participants. P4 and P5 stated that the links tend to be forgotten by them, as their current display does not signal interactivity by default.

Five participants explicitly stated they enjoyed the card style presentation. P1 disliked the card presentation, stating that it looks messy and unorganised. P10 agreed with them, liking the idea of the cards, but wanting to see them more organised by evenly spacing them out. P10 also stated that the heading text “More Information” was unappealing as “there are masses of information everywhere already”. P6 had a very high browser zoom, which caused the links to stack vertically. With their screen size, the layout was unsuccessful, with only four links cards concurrently visible at most.

Two improvement ideas were presented. The link cards had relevant MaterialUI icons as the visual elements in the prototype. P3 pointed out that the links should have the icons of the actual services to improve familiarity. Another idea from P7 was the opportunity to organise the external resource links on their own preference, but that would likely cause more confusion than improve the experience.

After the tasks were completed, participants were asked to give general feedback on their experience with the new home page. All participants praised the look of the new interface in the interview. Six participants gave more positive feedback on the new features as they allow users to access content more swiftly. Few interesting details were noted during the interviews. P1 and P7 tried to search for the link to Customer Installed Base from the form search input. It is interesting, whether it was a mistake or have they gotten used to accessing relevant content through search inputs on other websites. Using inputs for accessing all content has become more anticipable with the risen popularity chat interface AI tools. Three of such tools were presented in Section 3.3, with a clear emphasis on the input on the page.

As mentioned earlier, there were some issues with the layout on screens with high zoom that need to be reconsidered before the final version. Additionally, as the interviews took place in the testing environment, where P5 had 100 requests open. This caused the layout to shift down vastly. 100 is currently the limit of visible items in the section of open requests. Either this number needs to be lowered or some pagination introduced, for example 20 open requests per page.

P2 and P8 specifically mentioned that they do not want to see anymore content added to the page. Adding even more content could easily flood the page with information and hinder the experience. One of the users works as a gatekeeper for the Master Data requests. They wished for a small section to showcase the number of requests they need to review which would offer quick status update for them and other gatekeepers. Finally, with the modern trend of

implementing AI features, P7 would like to have an AI assistant on the page that would do their requests for them based on an input.

As stated in Section 6.2, the participants were given a post-interview survey before concluding the meeting. The results of the survey are analysed in the upcoming section.

7.2 Results of Post-Interview Survey

All ten interview participants answered the post-interview survey result, receiving a 100% response rate. Distribution of question one “How many different domains do you use the Master Data Portal in” is available in Figure 19. Only two interviewees use a single domain in the portal. It was expected that more singular domain users would be present in the interview participants. Three participants responded that they use two domains, with remaining five answering three or more domains.

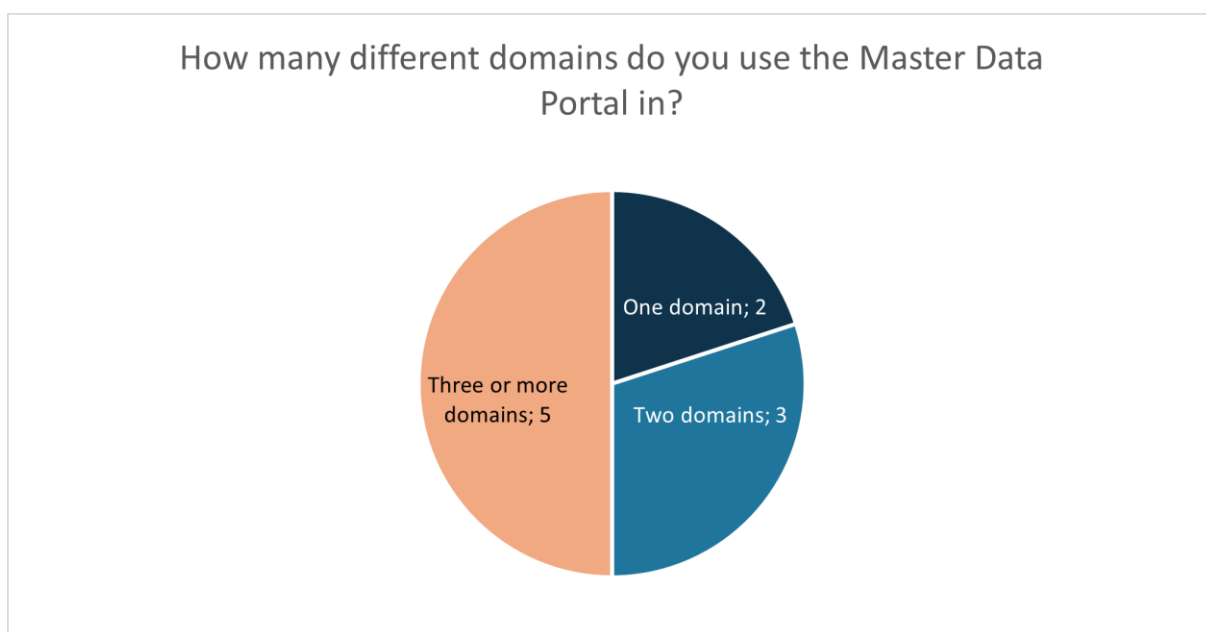


Figure 19 Pie chart of question one “How many different domains do you use the Master Data Portal in?” (n=10).

Questions two, three, and four mirrored the rating questions of the first survey. The general statistics of all respondents of the first survey was presented in Section 5.2. To compare the results of the post-interview survey more effectively, two subsets are taken from the original survey data. First, Table 4 shows the rating questions response metrics from the interview pool of 27 respondents in the first survey. The average of usefulness is 4.22, which is nearly identical with only a -0.01-difference compared to all survey respondents. There is a slightly greater difference in perceived usability average at 3.96, at a -0.15-deficit compared to all

respondents. Interview pool rated the visual look of the existing page at an average of 3.59, 0.28 less than the average of all respondents.

Table 4 Interview pool users' rating question results from the 1st survey, n=27

Question	Min. Value	Max. Value	Average	Median	St. dev.
Usefulness	2.00	5.00	4.22	4.00	0.83
Usability	2.00	5.00	3.96	4.00	0.88
Visual look	2.00	5.00	3.59	4.00	0.91

As mentioned in Section 6.1, the ten interview participants were randomised from the interview pool. Table 5 shows the rating question metrics of the ten interview participants to the first survey. The averages are near equivalent to the interview pool users. Usefulness is rated at 4.10, with a deficit of -0.12 to the interview pool. Usability is rated -0.06 less at 3.90. Visual look is also rated slightly below at 3.50, which is a difference of -0.09 in comparison to the interview pool.

Table 5 Interview participants' rating question results from the 1st survey, n=10

Question	Min. Value	Max. Value	Average	Median	St. dev.
Usefulness	3.00	5.00	4.10	4.00	0.70
Usability	2.00	5.00	3.90	4.00	0.94
Visual look	2.00	5.00	3.50	3.50	1.02

With the subsets presented, we can investigate the answers of the post-interview survey. The results (see Table 6) showcase evident increases across all three categories. The interview participants rated the usefulness of the new home page at 4.40, which is an increment of 0.30 in comparison to the first survey answers from the same participants. Perceived usability rose 0.50 in the post-interview survey, likewise to the usefulness rating at 4.40. Visual look was rated a substantial 0.80 higher at 4.30.

Table 6 post-interview rating question results, n=10

Question	Min. Value	Max. Value	Average	Median	St. dev.
2. Usefulness	3.00	5.00	4.40	4.50	0.66
3. Usability	4.00	5.00	4.40	4.00	0.49
4. Visual look	4.00	5.00	4.30	4.00	0.46

A distinct rise across all three categories can be identified (see Figure 20). The grey bar presenting the post-interview survey results is the tallest in each of the categories. The usefulness shows a minor improvement. It was rated 4.0% higher in the post-interview survey compared to all respondents and 7.3% higher within the interview participants. Perceived usability increased 7.0% in comparison to all respondents and got an increase of 12.8% between the two surveys taken by the interview participants. Visual look saw the greatest improvement. It got a substantial 22.9% increase across the two surveys within the interview participant group and an 11.1% increase compared to the average of all respondents.

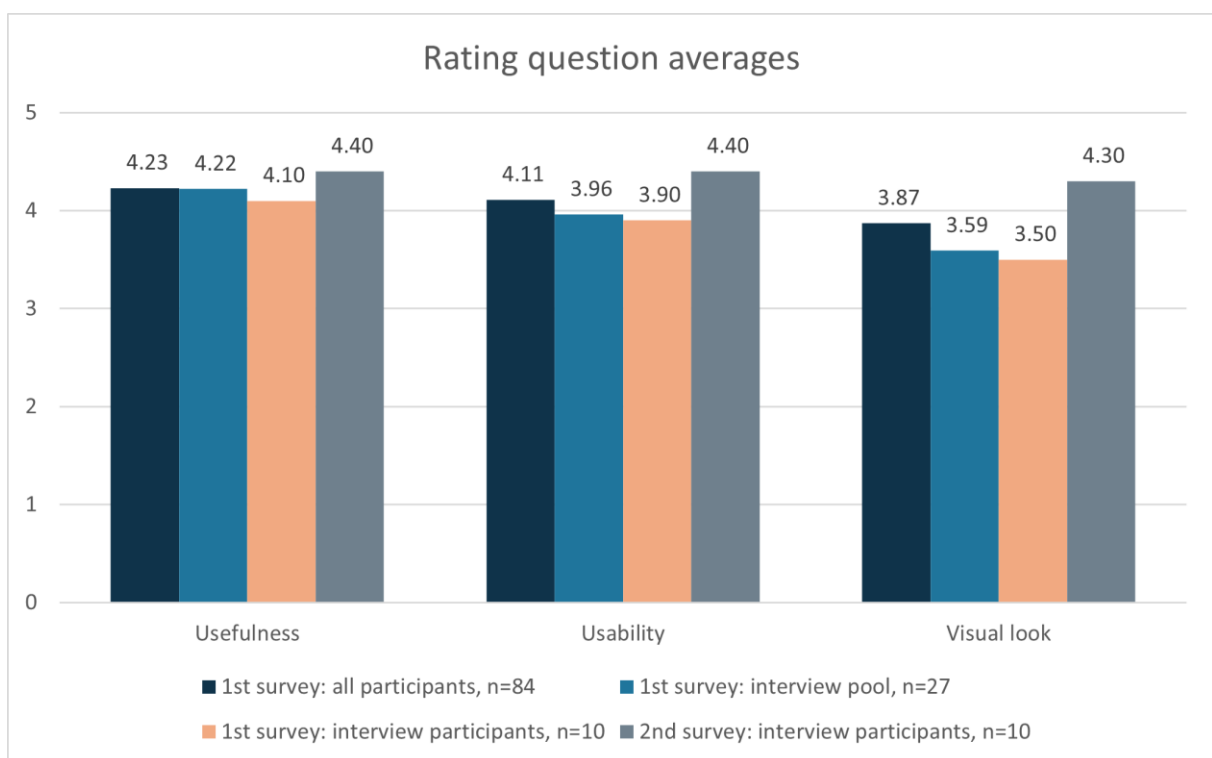


Figure 20 Rating question averages in different subsets across the two surveys conducted.

The relative improvement percentages from the first survey are not astounding on their own but are unequivocal increases when exploring the possible room for improvement, considering the high ratings to begin with. Comparing all respondents of the first survey and the post-interview survey, the increment in usefulness of 0.17 fills more than a fifth of the possible room for improvement of 0.77 at 22.1%. For usability, the increase of 0.29 out of 0.89 is nearly a third at 32.6%. Visual look filled nearly two fifths of the room for improvement. It increased 0.43 out of the possible 1.13, corresponding to 38.1%.

Question five had 12 statements regarding the prototype. Table 7 shows the Likert score means of the statements. The expected Likert score was correct on all statements. Statement two “I find 'Pinned Forms' helpful for personalizing my workflow.” was the most agreed upon statement at a Likert score mean of 1.7. On the contrary, statement 11 “The new home page layout is confusing.” was in unison the most disagreed statement, having a Likert score mean of -1.6. Statements four “I prefer using browser bookmarks over the home page to access relevant content.” and seven “The home page changes are not relevant to my work.” were estimated to not having a clear direction. It was expected that strong opinions cancel each other out. The Likert mean of statement four was nearly neutral at -0.2, but statement 7 leaned towards disagreement with a Likert mean of -0.8. The distribution of answers is available in Figure 21.

Question six was a free text box for anything the participant wanted to add. Four participants gave positive feedback on the interview process. Multiple participants reshared their improvement wishes and dislikes. Most of them were grasped earlier in this chapter. P4 stated that the button styles of the prototype were not visually pleasing, wanting to see improvements there. P6 and P10 wished for different colour themes, particularly the possibility for a dark mode, referring light-on-dark interface layout. Furthermore, P10 raised some spelling errors of the prototype and would like to see the page spellchecked before final implementation. With the gained insights, the successes of hypotheses created to support the user research are analysed in the following section.

Table 7 Statement question answer Likert averages

Statement	Relevant Hypotheses	Expected Likert mean [-2, 2]	Likert mean [-2, 2]
The new home page is beneficial for my work.	H3, H5	Agreement, ≥ 1.0	1.5
I find 'Pinned Forms' helpful for personalizing my workflow.	H1, H3, H5	Agreement, ≥ 1.0	1.7
I prefer the old home page design.	H4	Disagreement, ≤ -1.0	-1.0
I prefer using browser bookmarks over the home page to access relevant content.	H1, H2, H5	No clear direction, $-1 < x < 1$	-0.2
The "Search for a form" section speeds up my workflow.	H1, H3, H5	Agreement, ≥ 1.0	1.4
The content of the new home page is organized clearly.	H4	Agreement, ≥ 1.0	1.1
The home page changes are not relevant to my work.	H3, H5	No clear direction, $-1 < x < 1$	-0.8
The new home page is aesthetically pleasing.	H4	Agreement, ≥ 1.0	1.0
I don't see myself using the 'Pinned Forms' feature.	H1, H5	Disagreement, ≤ -1.0	-1.4
I prefer accessing forms from domain pages rather than the 'Search for a form' feature.	H2, H5	Disagreement, ≤ -1.0	-1.1
The new home page layout is confusing.	H4	Disagreement, ≤ -1.0	-1.6
The new home page is an improvement compared to the old design.	H4	Agreement, ≥ 1.0	1.3

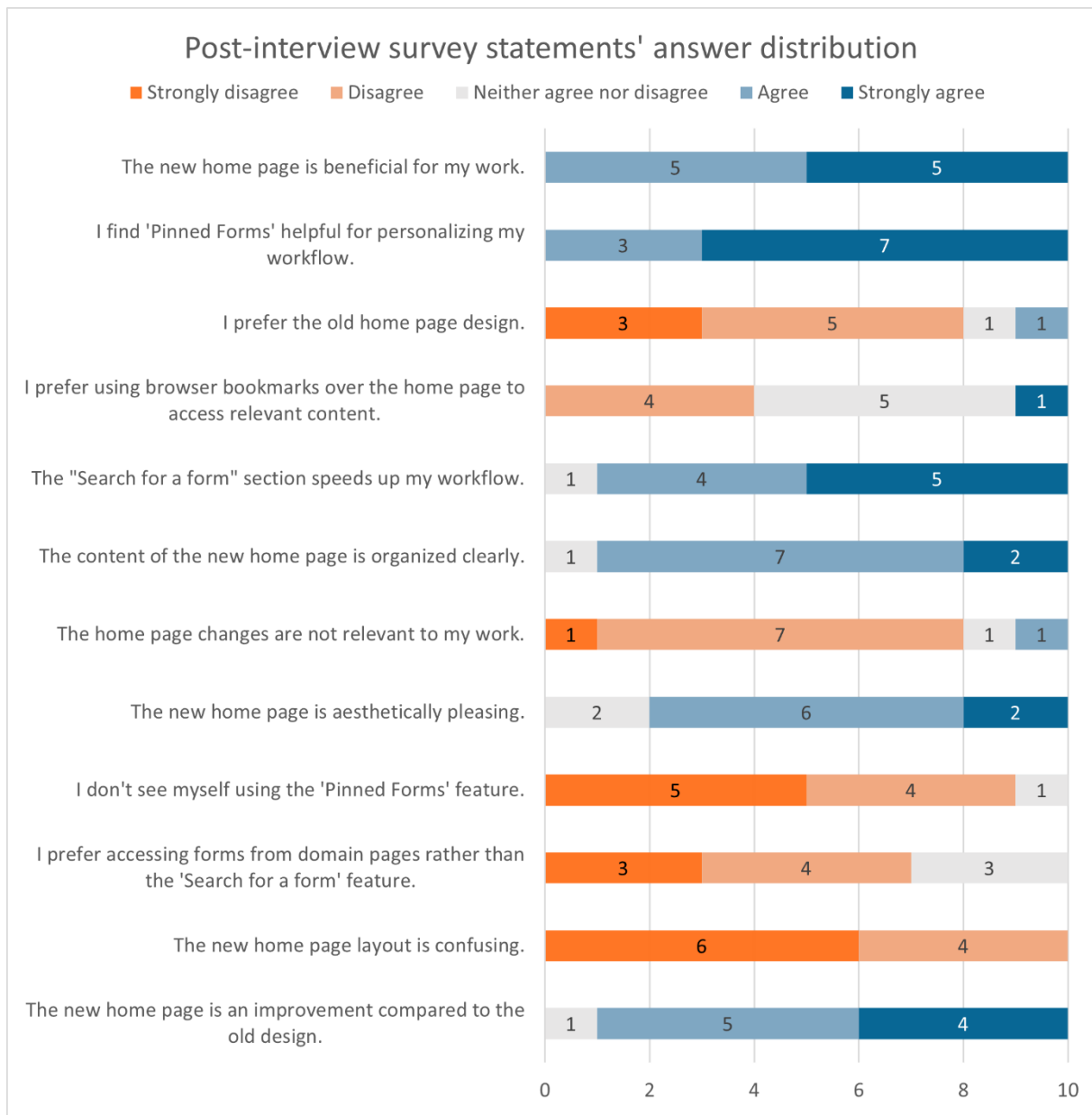


Figure 21 Post-interview question five statements' answer distribution (n=10).

7.3 Hypotheses

Hypothesis one was “H1. Users will utilise the “Pinned Forms” feature to reduce the time spent navigating between different tabs of the portal.” All the insight gained supports this hypothesis. All test participants gave positive feedback on the feature in the interviews. In the post-interview survey statements, all ten participants agreed or strongly agreed that the feature is helpful for personalising their workflow. The opposing statement nine “I don't see myself using the 'Pinned Forms' feature.” only got one neutral answer, the remaining nine participants disagreeing with the statement. The second hypothesis “H2. Users can access relevant forms faster with the “Search for a Form” section” is also vastly supported. Eight

participants praised the feature, three of which had raised concerns on having issues with locating the current form in the portal. Nine of the ten participants agreed with statement five that their workflow can be sped up with the search functionality.

The new features mentioned in H1 and H2 contribute heavily to the support of the third hypothesis “H3. Most users see themselves adopting the new home page UI as an integral part of their daily workflow.” The claim is additionally supported by the first statement “The new home page is beneficial for my work”. All the participants agree with it, half of them stating strong agreement. The fourth hypothesis was “H4. Users will prefer the new UI over the existing one.” It is also supported by the results. The UI got a variety of positive feedback in the interview sessions. Nine participants agreed with the sixth statement “The content of the new home page is organised clearly. Only one participant agreed with statement three, indicating that they prefer the old design over the new home page. No participants found the layout confusing (statement 11), nine of them stating that the new home page is an improvement compared to old design (statement 12).

Hypothesis five was “H5. The home page changes will not have a noticeable effect on the workflows of users working in singular domains.” The hypothesis is not backed by the information gained. Only participants P5 and P6 stated that they work in singular domains. As mentioned earlier, the number was surprisingly low, hindering the assessment of the hypothesis. The two participants also stated that the home page changes are relevant for their work (statement 7) and gave good feedback on the new home page features both in the interviews and the statements.

In conclusion, four of the five hypotheses were supported by the gained results and insights from the user testing interviews. The fifth hypothesis received little data to analyse, it also being opposed of the original hypothesis. In the following chapter the insights from this chapter are discussed overall with the complete research of this thesis.

8 Discussion

This chapter examines the obtained information of this study. First, the research questions behind this work are addressed. Limitations of this study are also discussed. Finally, we discuss what potential future research directions could be taken upon based on insight gained in this research.

8.1 Core Findings

The aim of the study was to answer the following research questions:

RQ1. What are the key aspects of a successful home page?

RQ2. How does replicating interface elements from widely used websites affect the usability of an internal tool home page?

Regarding RQ1, literature suggest that a successful home page communicates its purpose clearly and concisely. Its goal to is to create a pleasant first impression, influencing the visitor to stay. Essential content is visible immediately upon entry, without the requirement of scrolling. Given that the page encompasses more relevant content, the design must subtly hint users to observe further. A home page is often a hub for the users to enter designed paths available on the whole website. Therefore, available options ought to be distinctively displayed. The home page also acts as a familiar navigation point where the visitors can return to at any time. When the broader goal behind the website is to get visitors performing a specific action, such as buying a product or joining as a member, a method to perform the wanted action must be clearly placed.

The answer to RQ2 is formed from the results of user testing. New features mimicking design elements of widely used online tools got predominantly positive feedback in the test interviews. The ratings of usefulness, usability, and visual look all saw distinct increases across the two surveys. Combining the qualitative insight of the interviews and quantitative data of the post-interview survey suggest that the made changes had a positive effect on the overall usability of the portal. With the key findings presented, we will consider the limitations of this study in the next section.

8.2 Limitations of the Study

Despite achieving positive results, they ought to be viewed critically. Nearly all UI/UX design projects are unique. The user base, need, purpose, and constraints vary across projects in different fields. This result was successful for Wäertsilä, but it is infeasible to try creating conclusions based on these results that would apply everywhere. Another limitation is the single iteration of the design work in this paper. Design is iterative, sometimes going through multiple rounds to achieve the most satisfactory results for the users. This iteration happened to provide positive results, but based on this single iteration, it cannot be determined whether the best possible outcome was reached.

The positive interpretation of the results of this iteration may also be linked with the formulation of the five hypotheses of the user research. Four of the five hypotheses were stated in a positive tone, making it easier to showcase improvements provided by the new design. This imbalance poses a limitation that might have affected the interview structure and interpretation of the results, skewing the results into optimism rather than neutrality. Furthermore, the sample size of ten participants is relatively small. Despite the survey results showcasing distinct increases in the ratings of this the UIs, making generalised assumptions based on the sample is impractical.

The answers in the first survey create possibilities for discussion. The 84 responses gave an acceptable representation of the user group. However, the respondents who made themselves available for the interview gave much lower scores compared to the complete response averages. The interview pool respondents might be more confident in their opinions and voiced them in the survey. They also might generally be more interested in participating in the design work. Additionally, users were not interviewed prior to the design work. Without interviewing users before designing, it cannot be verified if the respondents giving high ratings satisfied with the existing home page. They might be opposing change, due to fear of having to re-learn something or having adverse experiences with UI renewals in the past.

This paper leaned towards familiarity in measuring the success of a UI element. Design trends are constantly shifting, but there are always some popular solutions that are then implemented everywhere. An example of an emerging trend is chat-based interfaces, popularised by AI assistant applications. They have spread outside that field, which begs the question: Is it an exceptional design pattern or something the users are just forced into using because it is everywhere, rather it being good?

Based on observations whilst gathering material for this paper, the on-going research is heavily focused on the possibilities in AI-generated interfaces. Despite the possibilities to speed up design work and generalise the knowledge around the field, I would raise the concern for the vast number of poor UIs still being present after decades of research. Usability issues will not be solved with a general solution.

9 Conclusion

This paper researched the opportunities of improving Wärtsilä's Master Data Portal home page UI by replicating interface elements widely used on home pages of online tools. The goal was to update the functionality and outlook of the page to enhance the self-service aspects of the portal.

After presenting relevant theoretical background behind UI/UX and internal enterprise tools, we studied the anatomy of a successful home page. The home page provides the first impression of the website for the visitor. It must swiftly influence the visitor to stay on the page by clearly communicating the purpose of the page. If the goal is to perform a specific action, a CTA to conduct it must be highlighted. A successful home page showcases the different paths a visitor can take, simultaneously being a checkpoint they can return to any time. Next, home pages of different online tools were analysed on their use of specific interface elements. Placing a text input for searching content near the top was a frequent design choice. Site navigation was often a bar at the top of the page. Most home pages did not have highlighted primary buttons, but rather buttons to access different resources on the website. Cards were a relatively popular choice to display information, also supporting the responsiveness of the pages.

Next, the existing UI was evaluated. To gain further information on users' needs, a survey was sent out to 500 frequent users of the portal. The survey results revealed a surprisingly high level of satisfaction towards the existing portal home page, shifting the direction of the design work. This highlights the need for the communication with end users when conducting UI renewals. Without reaching out to users, the outcome would likely have been much different from the prototype of this thesis. It would have led to an expensive implementation, likely being dissatisfactory to the end users.

Data from the home page analysis, UI evaluation, and the user survey were all key drivers of the new design. The new design included two new features. The most explicit change was adding a text input field for searching forms, mirroring the ability to search for content on different online tools. An interactive prototype was created of the new design. Ten user interviews were conducted utilising the prototype. Overall, the participants were satisfied with the prototype. To gather quantitative data on top the interview insights, the participants

answered a second survey immediately after the interviews. The results suggest successful results in the case of Wärtsilä.

The new design accelerates the start phase of data modification operations, thus leading to increased productivity. The qualitative and quantitative data from user research validates the design for existing users. Additionally, the new design reduces the burden for first-time users, by offering familiar interface elements. The outcome of this paper gives a good starting point and momentum for enhancement of the next steps of the process: refining the UX of the variety of forms available in the Master Data Portal.

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Appendices

Appendix A – Links to Websites Under Analysis

Website	Link
Bing	https://www.bing.com
Britannica	https://www.britannica.com
Cambridge	https://dictionary.cambridge.org
ChatGPT	https://chatgpt.com/
CodeAcademy	https://www.codecademy.com
Copilot	https://copilot.microsoft.com
DeepL	https://www.deepl.com
DuckDuckGo	https://duckduckgo.com
Encyclopaedia.com	https://www.encyclopedia.com
GeeksForGeeks	https://www.geeksforgeeks.org
Gemini	https://gemini.google.com
Google	https://www.google.com
Google Translate	https://translate.google.com
Lara Translate	https://laratranslate.com/translate
Merriam-Webster	https://www.merriam-webster.com
Oxford	https://www.oed.com
Python	https://www.python.org
React	https://react.dev
TypeScript	https://www.typescriptlang.org
W3 schools	https://www.w3schools.com
Wikipedia	https://www.wikipedia.org

Appendix B – Pre-Design Survey of Existing Master Data Portal Home Page

Master Data Portal Home Page - User Survey

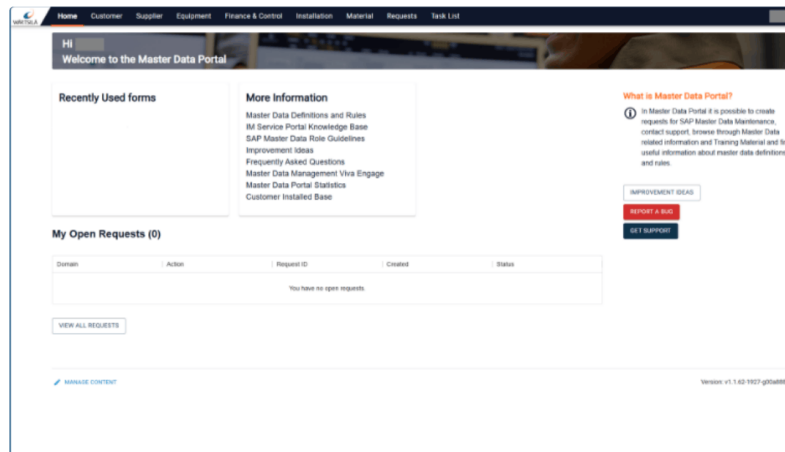
We're conducting this survey to get insights on the home page usage of Master Data portal [link redacted]. As many features are available on multiple pages of the portal, please limit your focus to the **home page** when answering this survey. Insights gained from this survey will drive a new design for the home page.

Answering this survey will take about **five minutes**.

All data gathered from this survey will only be used to develop Wärtsilä's internal services. Anonymized data will also be used while writing my master's thesis. By filling out the questionnaire you agree that your answers can be used in product and service development and evaluation.

* Required

* This form will record your name, please fill your name.



1

What's your job title? *

2

Why do you use the Master Data Portal?

3

How useful is the home page for your work? *



4

How usable do you find the home page? *



5

How do you rate the visual look of the home page? *



6

How often do you visit the Master Data Portal?

- Daily
- Multiple times a week
- Once a week
- Few times a month
- Few times a year
- Less often
- Never

7

How often do you use these features on the home page?

	Daily	Multiple times a week	Once a week	Few times a month	Few times a year	Less often	Never
Recently Used Forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checking the status / accessing your own requests ('My Open Requests')	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessing different information resources (links under 'More Information')	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessing a domain through the navigation bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessing the improvement ideas platform	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reporting a bug / Getting support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8

What do you like about the current home page?

9

What do you dislike about the current home page?

10

What new features would you like to see on the home page?

11

Would you like to participate in user testing? (20-30min remote meeting)

Yes

No

12

Anything else you would like to add?

Appendix C – User Interview Structure

Thesis interview structure

Introduction

Introduce myself, thank the participant for joining

Recording rights

Present this disclaimer:

This interview will be recorded to assist with notetaking. Any content used in my master's thesis will be fully anonymized, and all recordings will be deleted upon thesis submission at the latest. Is that okay with you?

Start recording once nodded

Beginning

In this interview you'll be testing a new prototype home page for the Master Data Portal. I will ask you perform a couple of simple tasks. The interview should take somewhere between 15-20 minutes.

Whilst using the prototype, please talk as much you can, sort of think out loud. The more talking the better, as it helps me understand your thinking process. There are no wrong answers or wrong paths to take. If something feels difficult, it's our problem, not yours.

Please open the link I will share you and share your screen.

Link to prototype

QA [link redacted]

PROD [link redacted]

Begin interview (participant sharing screen)

- What is your initial impression of this view?
- What do you see?
- What is your attention drawn to?

Task 1: Searching

Ask user what domain they work in

Let's imagine you need to access the following form for your work:

- Customer → Update customer
- Supplier → Update supplier
- Equipment → Update equipment
- FICO → Update G/L account
- Installation → Create installation
- Material → Extend Material

Try accessing it from directly from the home page.

-----**Wait for user to finish**

If the user goes through navigation → walkthrough for search box

-----**Wait for user to finish**

Questions post task

- How did it feel to use search box?
- Did you notice the recent forms there also
 - Random by prototype limitations
- Is there something you'd change here?

Task 2: Pinned forms

The new home page offers customization of the home page. Please add the same form just used to your pinned forms.

-----**Wait for user to finish**

Great, thank you. Now remove that form and add any other form than the one before.

-----**Wait for user to finish**

Finally, access the form you just added.

Questions post task

- What was it like to use this feature? What do you think about it?
- Is there some more customization you'd like to see here?

Task 3: Visit external link

Let's imagine you're working with a specific Wärtsilä installation. You need more information on that specific installation, so you go to Wärtsilä's Customer Installed Base.

Your next task is to enter Customer Installed Base from the home page.

-----Wait for user to finish*Questions post task*

- Were you aware that the Master Data Portal offers entrance to these different resources?
- Are these links valuable to your work? Is there some link you'd like to see added here?
- How do you rate the presentation of the links compared to the existing design?

Questions post tasks

Again, there are no wrong answers and all opinions are welcome.

- How was it like to use the new home page?
- How would you compare your feelings on it compared to the old/existing page design?
- Is there something missing from the existing design?

Ending

We are wrapping up here: Now that's it's fresh in your mind, please take the time to fill this short survey immediately. It consists of couple rating questions and some statements.

Survey link

[link redacted]

Final note

This is the final part of your time. Any questions still?

Thank you so so much for your contribution.

If you have any questions, do not hesitate to contact me afterwards.

Have a nice!

Appendix D – Post-Interview User Survey

Post-Interview User Survey - Master Data Portal Home Page

Thank you for participating in user testing of the new Master Data Portal home page prototype. Please fill this survey sharing your opinions on the new home page prototype. As a reminder, the prototype is available at [link redacted].

Answering this survey will take about **five minutes**.

All data gathered from this survey will only be used to develop Wärtsilä's internal services. Anonymized data will also be used while writing my master's thesis. By filling out the questionnaire you agree that your answers can be used in product and service development and evaluation.

* Required

* This form will record your name, please fill your name.

1. How many different domains do you use the Master Data Portal in? *

Domains: Customer, Supplier, Equipment, Finance & Control, Installation, Material

- 1
- 2
- 3 or more

2. How useful would the new home page be for your work? *



3. How usable do you find the new home page? *



4. How do you rate the visual look of the new home page? *



5. Please answer the following statements *

You can assume the new prototype [link redacted] is now live as the official home page of Master Data Portal

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The new home page is beneficial for my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find 'Pinned Forms' helpful for personalizing my workflow.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer the old home page design.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer using browser bookmarks over the home page to access relevant content.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The "Search for a form" section speeds up my workflow.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The content of the new home page is organized clearly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The home page changes are not relevant to my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The new home page is aesthetically pleasing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't see myself using the 'Pinned Forms' feature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer accessing forms from domain pages rather than the 'Search for a form' feature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The new home page layout is confusing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The new home page is an improvement compared to the old design.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Anything else you would like to add?

Feedback on the process, the interview, the prototype, ideas...