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GOVERNANCE MODEL FOR THE WEB THEME

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ABSTRACT

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Knowledge management and a knowledge management system are important guidelines for the company today if it is wanted to make the company successful. A fact-based company that openly shares information within an organization cannot fail in its operations. However, this approach can always be enhanced. This was also the aim of this thesis.

To begin with, to create a greater understanding, there will be a deeper initiative in knowledge management. To be able to understand how it should be built up and what can be helped before the update of Web theme.

The research on similar web library solutions found a structure that is recurring in many other similar web libraries and features. To then it was studied what is the Web theme's current state and based on that can see what can enhance the current status of the site. Some features, that are missing and can be developed into the Web theme for the better usage, such as different search capabilities, organization, responsiveness and change of content. An in-depth study of these functions was made to create a perception of its constituent for improvement.

This survey also includes a plan in the form of a governance model for the construction and maintenance for the future use, with a build from a base using this model.

The key factor to the Action Plan is that editing rights are given to everyone. Next, the important changes consist of two different search functions. This will make Web Theme more efficient. However, completing them requires a little more time as well as financial investment, consequently those are at the plan level. However, clear steps will help prioritize, the things toned to be done in the future.

Keywords:
Knowledge Management, Knowledge Management System, Governance model, User experience (UX), Web library

FOREWORDS

This thesis was written for an organization's Healthcare department in Oulu in Finland between June and November year 2021. As this thesis was written, we have been in a pandemic that started in 2020. It has been challenging but not impossible and has given a new impetus to development.

I would like to thank my manager Lazo Eric for trusting me in this subject and assignment that I have now immersed myself in. This is an area that is relatively new to me. I want to dedicate a big thank to my supervisor Tuomo Kalajanniska for the guidance and all the help through this long journey.

I would also like to thank my teacher from OAMK Lasse Haverinen, who has guided me and always given support through the school years and this thesis. He has also given a great motivation for my path as a developer.

My friends from school, work and outside have also been a great support through this journey and years that I have put in.

Since I come from Sweden and do this thesis in Finland it has been extra big for me but also challenging. My family has then been a great support and believed in me. For this I am eternally grateful.

However, none of this would have been possible without my wife Kati Blide and I cannot thank her enough. She has always been a support and security for me in good and bad times. In addition, my daughter Astrid Blide has brought me extra light into life as well as given me a reason why I could never give up. Pappa älskar dig otroligt mycket.

Raahe 24.11.2021

Oscar Blide

CONTENTS

1   INTRODUCTION

Without effective information management, it can be said that a company cannot succeed. The flood of modern information and the speed of development will minimize the chances of success for a company without a sensible and systematic approach. Knowledge management was introduced years ago and especially the Web theme now. However, it is not possible to just maintain that Web theme because the UX changes whenever eras change. In this case, the form of information must change with the ages. A good example of this is the good search functions nowadays.

The web theme is a web library, which contains information about already made web-components. It is as an internal intra or a web library but its purpose is to produce information and share it with others that the work is always easier and effortless. The web theme is made directly for web developers.

Currently, the web theme is in use, but there is a desire to improve usability in order to the popularity will start to grow even more. Nevertheless, the task is to create a new governance model for the web theme and just explore what needs to be improved in the library. In addition, it is also important to create a new process for the web theme, how to update and maintain it or which department belongs the web theme ownership.

This thesis is aided by research questions that steer the thesis in the right direction and bring out the Company's ideas.

The research questions are the following:
1. What is a good content management model for the Web theme?
    1.1 What is the good UX for the Web theme?
    1.2 How the maintenance will be done for the Web theme?
2. What is the best technical implementation for the Web theme?
    2.1 How to easily edit content in the Web theme?

The organization wanted to know if the current model is the best for the web library. This is guided by the first question: "What is a good content management model for the Web theme?" Improving usability is guided by the sub-question 1.1 "What is the good UX for the Web theme?" the sub-

question 1.2 aims at practical part and its process. In addition, the question should answer the maintenance schedule and who would do it and to whom the ownership would belong.

The second question answers the issue of whether the technical implementation is the best possible and whether it could be updated to this day. The sub-question c diverts the question away from the UX side, which was already thought in the question. With the question 2.1 "How to easily add content to a Web theme?" the aim is to find a suitable and effortless solution for editing. With the help of this thesis structure, research questions and the survey, a conclusion can be reached to find a governance model that best serves all stakeholders.

Although the thesis addresses Web theme's challenges, development is still taking place and The Web theme is in the demo phase. The system is therefore not faulty but requires some fine-tuning. Such fine-tuning is done in the company all the time and it aims to update the tools to this day and for better help.

2 THEORY OF KNOWLEDGE MANAGEMENT

Knowledge management creates a better working environment in a multidisciplinary method, where the aim is to take organized knowledge as part of achieving the organization's goals. Because of the goal, the order of the information is important. The quote below is one of the most famous definitions of knowledge management. The definition unequivocally explains what knowledge management is. (17)

"Knowledge Management is therefore a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance" (15).

The purpose of the company is precisely as stated in this quote. The web theme strives to avoid having to reinvent things and the famous "steal the best" is realized most effectively. Probably every company strives for this state like quoting, but the problem often becomes the best available technology such as BAT. Therefore, delving into the best theories of knowledge management is certainly not a disadvantage. As can be seen from Figure 1, the example tasks with Knowledge Management functions and operations are diverse and their connection cannot be disputed.
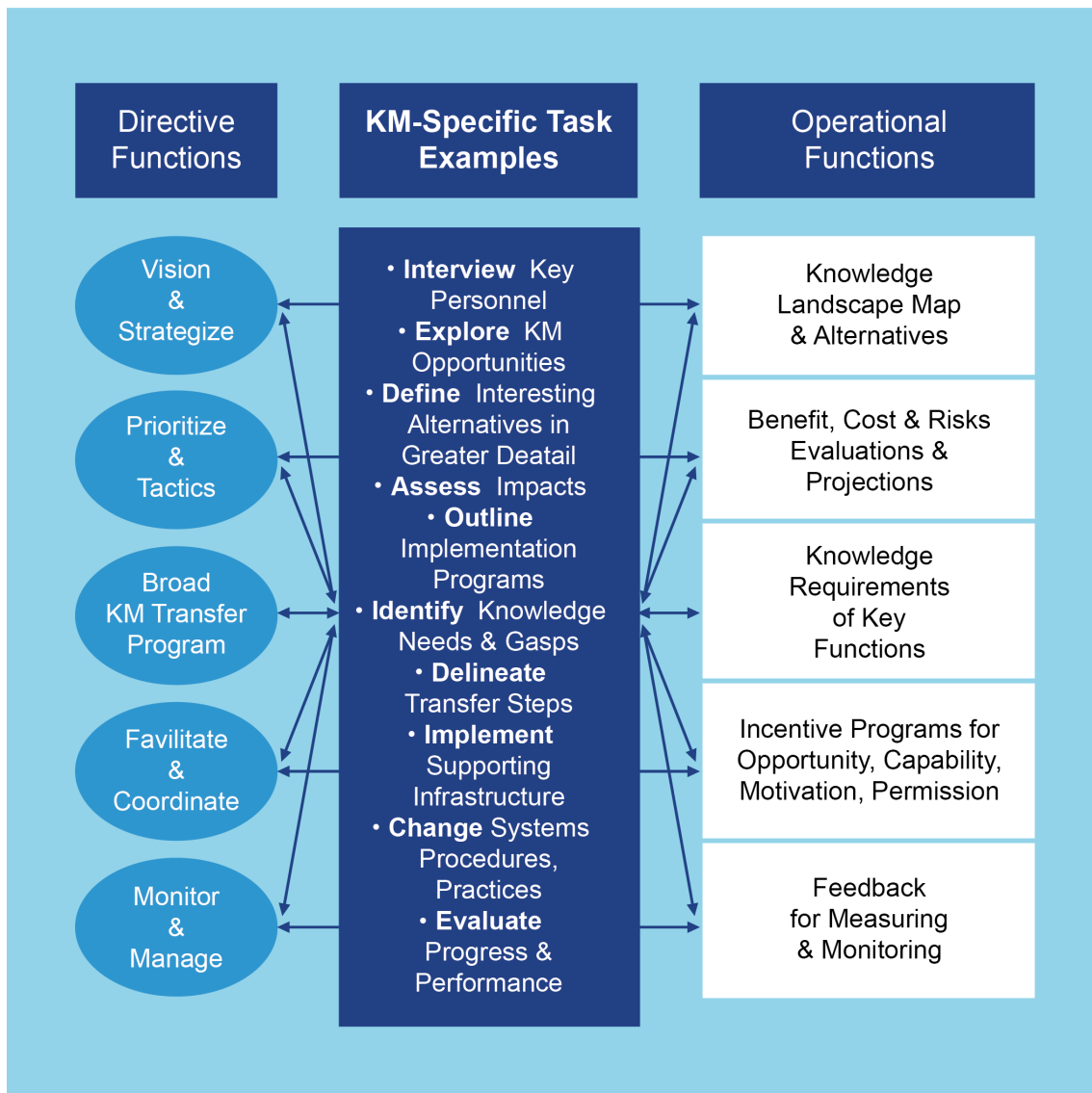
Directive Functions	KM-Specific Task Examples	Operational Functions
Vision & Strategize	• **Interview** Key Personnel • **Explore** KM Opportunities • **Define** Interesting Alternatives in Greater Deatail • **Assess** Impacts • **Outline** Implementation Programs • **Identify** Knowledge Needs & Gasps • **Delineate** Transfer Steps • **Implement** Supporting Infrastructure • **Change** Systems Procedures, Practices • **Evaluate** Progress & Performance	Knowledge Landscape Map & Alternatives
Prioritize & Tactics		Benefit, Cost & Risks Evaluations & Projections
Broad KM Transfer Program		Knowledge Requirements of Key Functions
Favilitate & Coordinate		Incentive Programs for Opportunity, Capability, Motivation, Permission
Monitor & Manage		Feedback for Measuring & Monitoring

FIGURE 1. The directive and operational functions with examples of KM-specific tasks. (9, p.3-4)

2.1 Advantages of Knowledge Management

Knowledge management has numerous benefits, but eight subsections are presented in this sub-section. One of the absolute benefits is that the purpose of Knowledge Management is to improve organizational agility. Knowledge management enhances agility by having information processed and organized in a place where everyone knows it is. In this case, there is no unnecessary waste in the performance of work tasks. Hence it can be said that knowledge management is a LEAN tool. (14; 7)

When it comes to the agility provided by knowledge management, one cannot fail to mention that it also improves communication. Because the information can be found in a specific place and is available to everyone, it can be said that communication is improved even when it is done offline.

By using a common data sharing location, the expertise of specialists can be easily brought to the fore. In this case, for example, certain recordings or even certain difficult solutions help those at the junior level to develop without the specialists always having to be in the role of a teacher. In addition, information can be large and can be used multiple times without having to disturb the same person several times. Organized information can be used to share information gathered over the years from professionals, even if they have already retired or changed companies, their skills will still be preserved. (16)

When there is a lot of good information available, it makes better and faster decision making possible. Even more helpful is when the information is handled well, i.e., divided into the right blocks. In that case, the decisions may be even better and faster. This definitely leads to easier and faster problem solving. Every company strives for this. Unfortunately, often time is money in many companies, where, for example, production must stay running or software must not be down. (9;10)

This also makes it easy to train employees at no extra charge. In many cases, better and more accurate training can be obtained, which would be obtained if there were a list of information drawn up through by an external trainer. Of course, even in this case, thanks to knowledge management, these could be stored in a data bank and knowledge can be shared with everyone. (14)

Considering the previous paragraphs, improved business processes will certainly be achieved. Once a good business process is achieved, it is easy to innovate. In addition, when knowledge is accessible to all, there is an excellent platform for innovation. For example, ready-made components are easy to combine and bring out new solutions through them. It is clear that knowledge management is an absolute part of companies today and therefore more companies are able to make big leaps in development. (9)

2.2 Issues of Knowledge Management

While knowledge management is undeniably a good method to make a company work well, it also has its challenges. According to this Miranda Case's "11 Knowledge Management Challenges Managers Face." there are at least 11 of them. (4)

In order to the information to remain up-to-date, employees should remain motivated to update it. It takes energy to get people initially motivated to update things at the same time and in addition, motivation should stay from week to week to keep the information up to date. Of course, in this situation, rewarding active users could be the solution, but that too can be a challenge on how to implement. (4)

There is also, another challenge to this is that the information should remain correct and accurate as, of course, curative. It is not just about motivating people; it is also about knowing and finding new knowledge in addition to collect it. Although the information could be correct and accurate, nowadays an equally important thing is the Relevance of the information. The challenge can be deciding whether an entity belongs to a data bank or whether it is information that everyone "knows". It can be considered how to measure the importance of information, how to monitor how it has contributed to the use of knowledge. (4)

The challenge may be to keep up with ever-changing and evolving technology. This can be noticed with updating the content, of course, but also with the user interface. Will the maintenance of such a databank become more inconvenient or beneficial if the technology is constantly changing and the databank needs to be updated all the time? Hardly not, but a good thing to consider, of course, what is the point of writing and prioritizing with the new technology that the relevant new technology can be introduced immediately. As well as the challenge is what can best interpret the data. Writing and presentation are important for everyone to understand. Consistency and standardization are important. (4)

Cyber security is one of the most challenging issues right now. Cyber-attacks are these days common and can be done in many ways without getting caught as well as infinitely many times. Hence, security is certainly one of the big challenges in such inside databanks. Although we are talking about cyber security, we can also talk about the security risk posed by people. Certainly, there are always risks, but these things are worth thinking carefully with the databank. Losing data can cause big losses. (4)

Regarding updating the data in the data bank, the data updates and administrators must be selected. The challenge can be motivation, but also the staff turnover. On the other hand, while the turnover is a challenge, it is also a benefit because it guarantees the permanence of the information. In this case, it is precisely the continuity that is obtained. One option could be overcoming a shared leadership, which will certainly work if, in addition, everyone has clear roles. (4)

3   THEORY OF KNOWLEDGE MANAGEMENT SYSTEM

The aim of the information system is to improve the flow and storage of information and to produce a better cooperation throughout the company. In addition, information systems can act as process controllers to improve process automation or to facilitate the operator's day-to-day work. There are a wide variety of knowledge management systems for different applications. They can be team-specific or company-wide, e.g. intranets. Nowadays, there is also a desire to share a common system with the customer, which creates a better supplier relationship and facilitates the work of both. It can be said that before the data storage played a major role with knowledge management systems, today the goal is to automate and share information easily by reducing human work. (11)

If we look at the topic more specifically, then there are three types of information management systems: company-wide information management systems, information work systems, and intelligent technologies. A company-wide information management system literally works company-wide and serves the company's employees in the role of an intranet, for example. In a knowledge management work system, people or machines implement processes and functions utilizing information resources to deliver products or services to customers. Intelligent technologies often refer to these example types as Artificial Intelligence, learning theory, data warehousing, data mining and knowledge discovery. (13)

Going deeper into the nature of information management, one can distinguish its four best components. They are people, process, content / IT and strategy. This can be easily stated without defining industry, size, or information needs. Information management will always need people to manage, publish and certify information sharing. In addition, well-explained processes are needed for managing, measuring, and later analysing data flows. (6)

3.1   Advantages of Knowledge Management System

By organizing information management, it is possible to achieve a lot of efficiency as well as improve the productivity of the personnel, because things are easy to find. In addition, personnel do not always have to come up with new ways to deal with difficult situations, in some cases employees can follow the instructions. This can also improve profitability. Of course, profitability can also

be improved with the help of knowing more about the product, and then, for example, reduced waste can be achieved through quality work. (6)

The system can be used to create better products and services. There is a lot more information behind the products and their order and data are in a better order, not to mention the services. This, of course, is facilitated by the fact that strategies are developed better when the system helps to understand the situation of the company. (6)

A storage allows existing skills and expertise to be reused. This, of course, creates much more capacity. In addition, this frees up a lot of space in people's memory when it can be trusted that difficult and rarely needed information can be found when retrieved from the system. In this case, the entire collective intellectual capital is utilized. (6)

Certain company systems can also be used to support simulation and forecasting. This identifies market trends in a timely manner and provides a potential benefit for oneself. In addition, an advantage over competitors can be gained. Surely, with the proviso that they do not use the system as an aid. (6)

3.2   Common challenges of Knowledge Management System and how to overcome them

One needs to be aware of the limitations of an information management system in order to make the most of the system. The challenge is to find the right and high-performance methods to collect and document know-how. In addition, the challenge is to find the information in the system itself. How to ensure that information is effectively available, and no time is spent searching for it. However, this is already being addressed by the system, hence it would be very peculiar if the system itself took more time. (8)

Certainly, at this point, the motivation of people mentioned above is also a challenge. How to get people to use the system efficaciously and of course produce information. In this context, the selection and implementation of a new system can be a problem. (3) In order for, the implementation to be successful as desired, it must be possible and seamless to integrate with existing systems and the production or IT processes of different companies. It is often complicated, but it should be possible.

Challenges can be overcome by promoting the definition, storage and sharing of clear processes. In addition, a culture of openness and information sharing in the company must be developed and created. The functionality of the internal intranet is an absolute must, not just for informing management, but just for common interaction. This is already well reflected in the company's internal intranet, for example. A clear strategy for deployment and a lot of time are needed. In addition, parallel systems or practices should be abandoned soon. Finally, a change management action plan needs to be created because today we are in a constant state of change, and it keeps on the company surface who adapts best. (4;5)

4   TECHNICAL BACKGROUND OF THE WEB LIBRARY

On the internet there are currently available websites and services which aim to share information and code that will be able to help the developers in their projects. These services act as a web library that provides components and features for reuse. This facilitates and time-optimizes the developers' work. These sites have a similar structure to make it easy to find what the user is currently in need of. What sets these websites apart is how they are presented to the user and how the make the best, effective way in searching for information and code.

The TypeScript-based free and open-source web application Angular offers itself a place where developers can find the basics of using Angular. From their page https://www.angular.io under the page Docs the user will find explanations and components that are ready for use. The structure of how the information and the code as well as the whole set-up being presented is something that is often recurring in similar web services, with a top bar that the user can navigate through different topics. In this top bar there is a search bar if the user has something they know they want to specifically search for. The left side of the whole page is a list that helps the user in a structured way to follow from the beginning but also someone who is a little more experienced can click directly on what they need to find. The information and code are displayed in the middle of the whole page which describes a component in more detail, as can be seen from Figure 2 below.
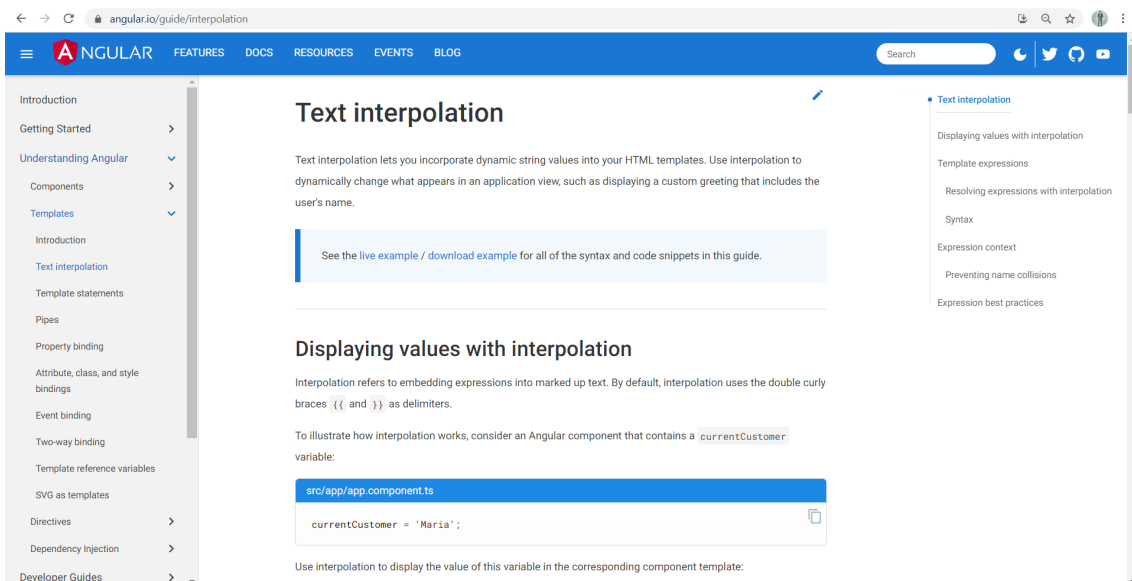
FIGURE 2. Website of Angular: Main View. (1)

W3schools (https://www.w3schools.com/) is an educational service with a focus on learning coding online, a W3school is commonly used programming languages.

It has an approachable look previously mentioned from www.angular.io and similar. It also has a top bar that gives the user a choice of programming language. If the user knows what is needed, there is also the option to search directly using the search bar that guides the user to the right place. Here, it has been chosen not to show the search bar all the time but to hide it under an icon. The default icon for searching the Internet is a magnifying glass found on the right side of the top bar that can be seen in Figure 3 below. With a mouse click on this icon, it animates the search bar to be displayed for the user who then can start their search. This feature provides more space for other elements on the web page. On the left side of page, there is a list that can contain various topics and components which could be used for their project. When a selection has been made, information and code with an example are visible in the middle section of the page. In the same way as in Angular Docs from https://www.angular.io.
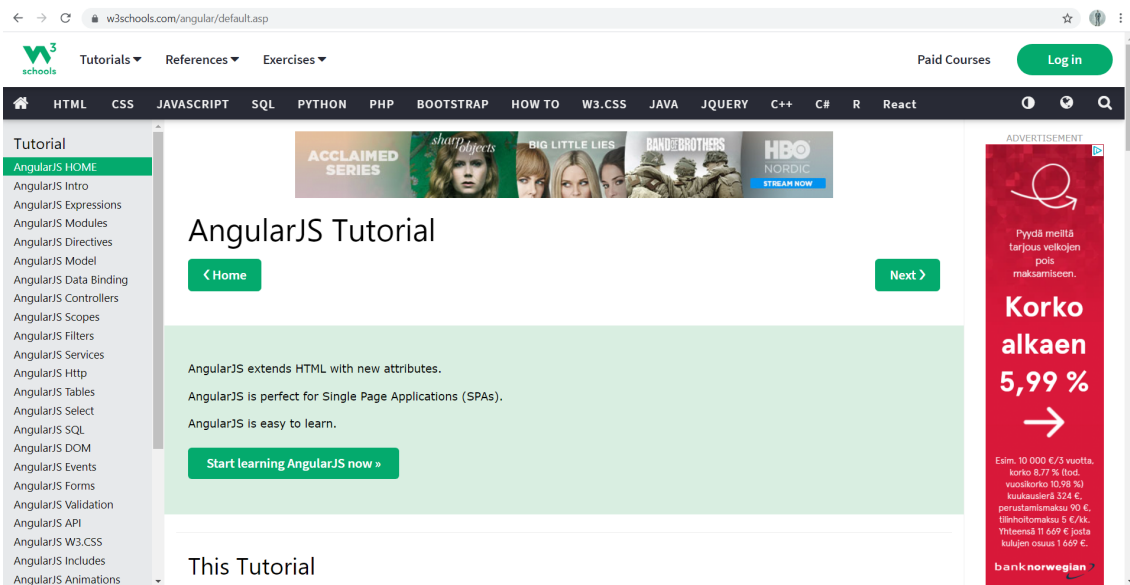
FIGURE 3. Website of W3schools: Main View of AngularJS Tutorial. (19)

The code can also be tested before, in the form of an isolated testing environment. To execute and test how the code works, the testing area can be reached by clicking the Try it Yourself button, as shown in Figure 4. The user is then linked to a separate page where W3schools has created its testing area.

Try it Yourself Examples in Every Chapter

In every chapter, you can edit the examples online, and click on a button to view the result.

AngularJS Example

```
<!DOCTYPE html>
<html lang="en-US">
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.6.9/angular.min.js"></script>
<body>

<div ng-app="">
  <p>Name : <input type="text" ng-model="name"></p>
  <h1>Hello {{name}}</h1>
</div>

</body>
</html>
```

Try it Yourself »

FIGURE 4. AngularJS code example. (1)

As seen in Figure 5 the isolated testing environment are consisting of a top bar with different functionalities and under it there are two box shaped fields next to each other. The left one shows the code that the user has selected before examining it. On the right side is the simulator that represents the site and the visual. To activate the code, all that is required is to run the code. In this way, the user can experience and see how the code would work. It is also possible to change and add to the code to achieve the desired result.
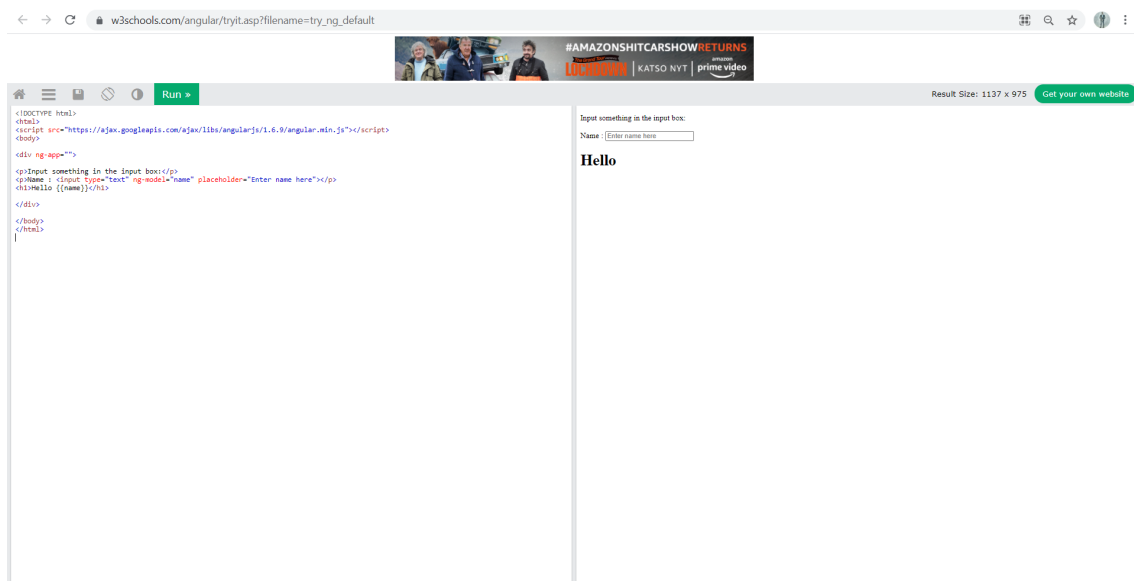
FIGURE 5. W3schools code testing. (19)

With a recurring structure, the website MDN Web Docs (Mozilla Developer Network) has created a document repository and learning resource for web developers. This contains a clarification of components and features that may be of interest to a web developer. It also has the layout of the main topics in a top bar and deeper categories in a list on the left side of the page. Information and code are displayed in the middle. Like previous services that have been mentioned, MDN Web Docs has

also an extra search function in the form of a search bar at the top right corner, to find what the developer needs much faster. There are similarities with W3schools.com service, such as being able to test the code directly on the website. What MDN Web Docs does that is different is that the code can be handled and tested directly on the same page, without being forced to another page. This gives the user lesser steps. Underneath where the code is displayed is the possibility to run the code. Figure 6 shows how the structure begins first information and then the code. The code can be executed when the user presses the Run button. Then the result from the code will be displayed in the box on the right side of the Run button. The user has also the option to restart the process through a reset button that is located under the Run button. It gives the developer the opportunity to learn and test their solution in just one spot.
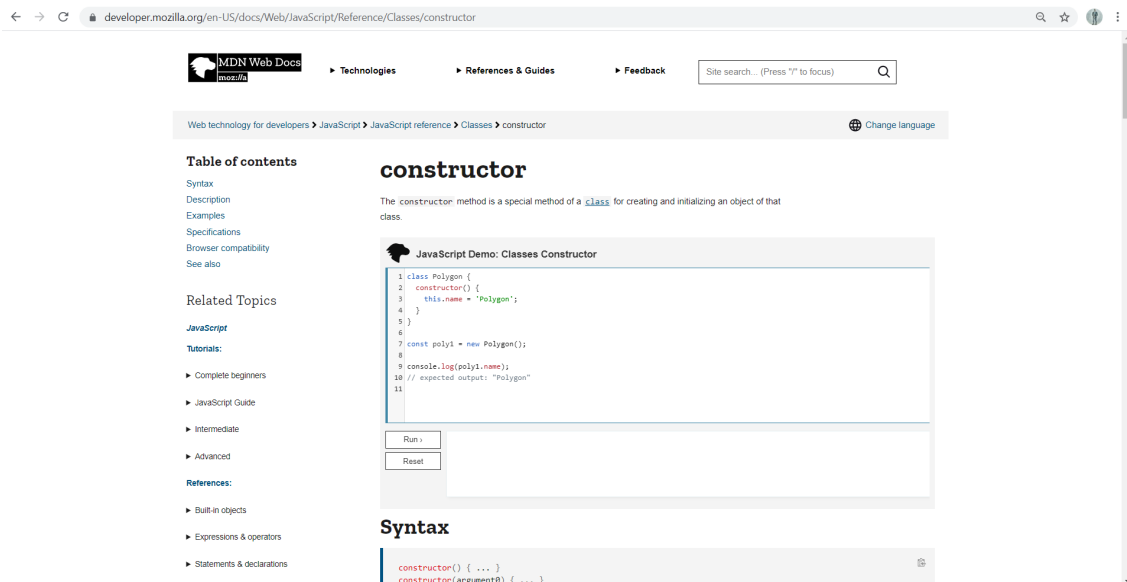
FIGURE 6. Website of MDN Web Docs: Constructor with code example and testing. (12)

4.1 Innovative solutions for development

An analysis of the websites from Angular, W3schools and MDN Web Docs can now give a good image of a reused layout among these websites. However, there are various smaller features that can guide the user for a more enjoyable experience towards the search goal. In this case, the user can find relevant information with the code that is ready made.

Maintaining can be difficult and time consuming. Angular itself takes the help of the developers themselves and offers a feature to Suggest Edits as seen in the Figure 7, for their components and

widgets. In this way, the quality can be maintained and something that may have been missed or a better solution could be offered.
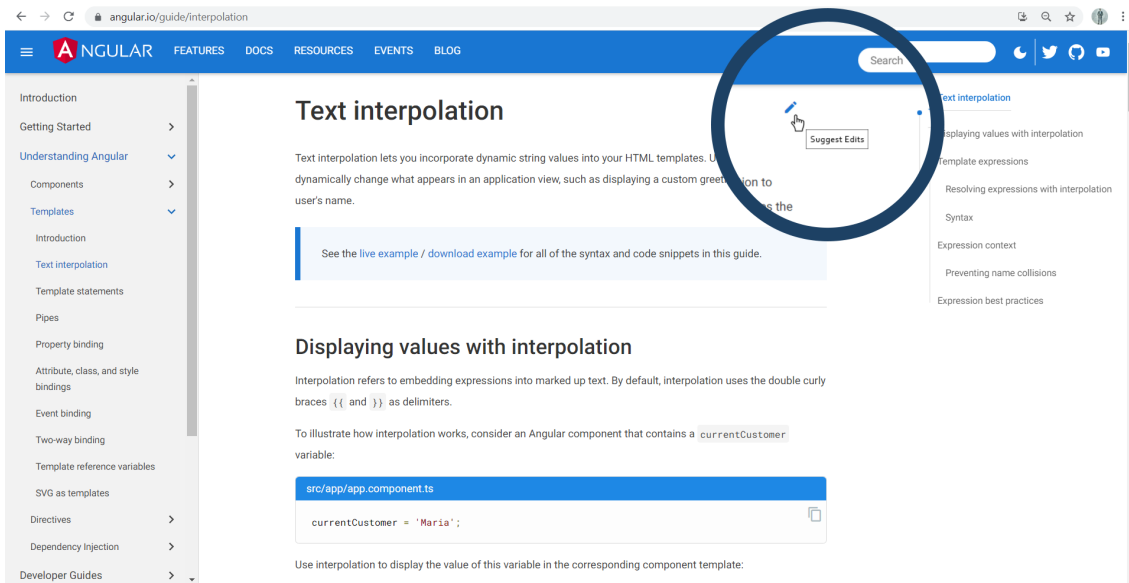
FIGURE 7. Website of Angular: Suggest edits. (1)

In a similar way, the online encyclopaedia Wikipedia has also solved it by taking assistance from the community, to add and update or correct current information. However, Wikipedia has a wider group of users and to avoid confusion among them there are instructions on how to use it. The risks increase in the larger group that can change information to something wrong. A more closed group or a community with the same goal can strengthen and keep the quality up. Figure 8.
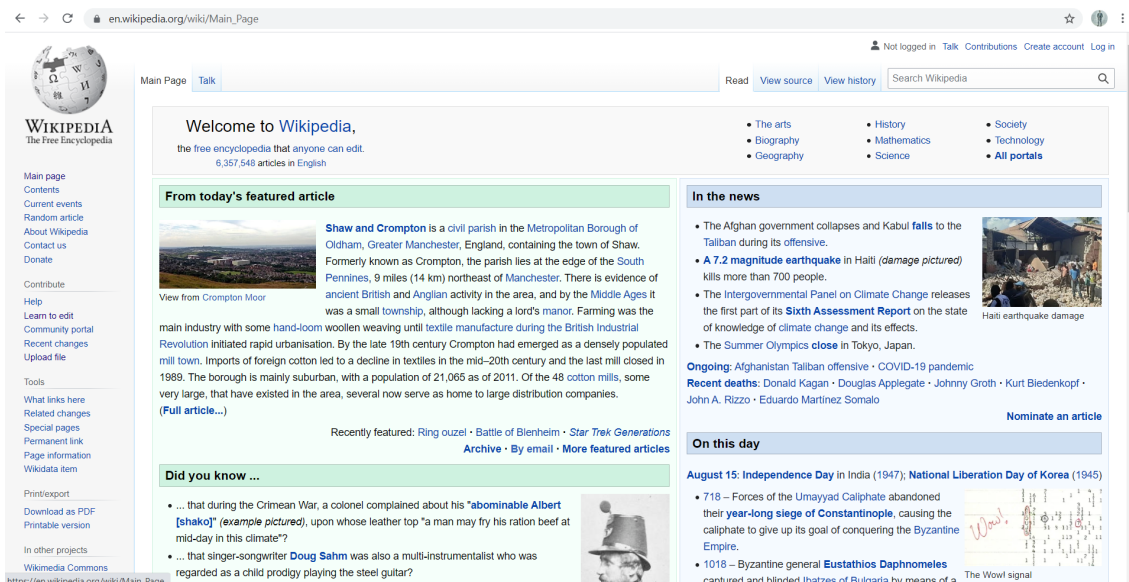
FIGURE 8. Website of the Wikipedia: Main View. (18)

Nowadays, websites have a lot of information, it is often difficult to even divide them into different sections. A search bar is usually provided as a solution to this issue. Which is easily accessible to be able to quickly navigate to what the user has in that moment of interest, in many cases a clarity and expectation for many. From the layout used by Angular, W3schools and MDN Web Docs, the search bar has been placed in the same area in the upper right corner which can be seen in Figure 9.
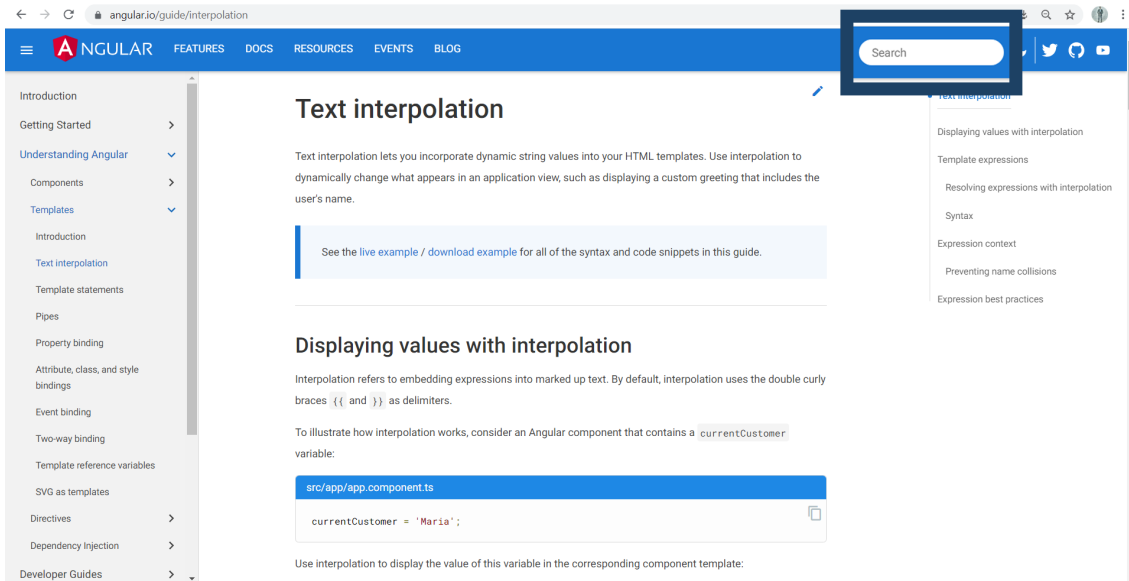
FIGURE 9. Website of Angular: Search bar. (1)

In addition, Angular has thought about this called "header searching bar". With an extra header navigation list that can be seen in Figure 10, on the right side. The navigation works by clicking on one of the headings in the list which then scrolls directly to the correct information under that topic. In this way, the user can already get an overview of what is available from the very beginning, by simply looking at the headings and getting directly to that information. This helps to organize the information therefore it becomes extra clear.
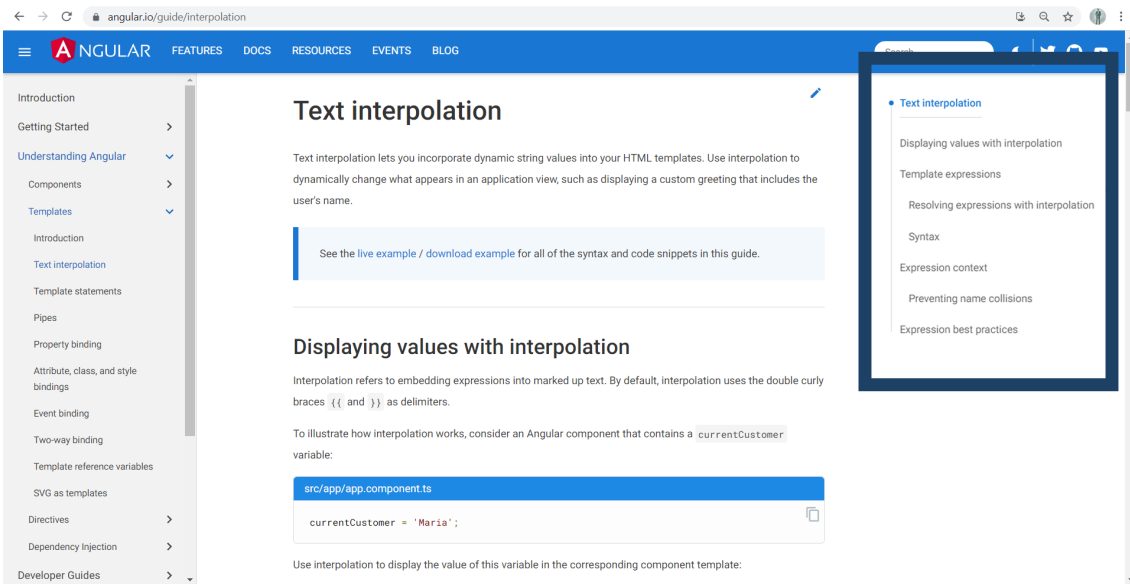
FIGURE 10. Website of Angular: Topic navigation list within the text interpolation section. (1)

A feature used by both MDN Web Docs and Angular is a button that directly copies the displayed code. On Angular's web page, this button is in the form of an icon in the right corner of the code box, which can be seen in Figure 11. This reduces the extra steps for copying the code to a simple button press. This also ensures that the developer gets all the code when it is copied to another location.
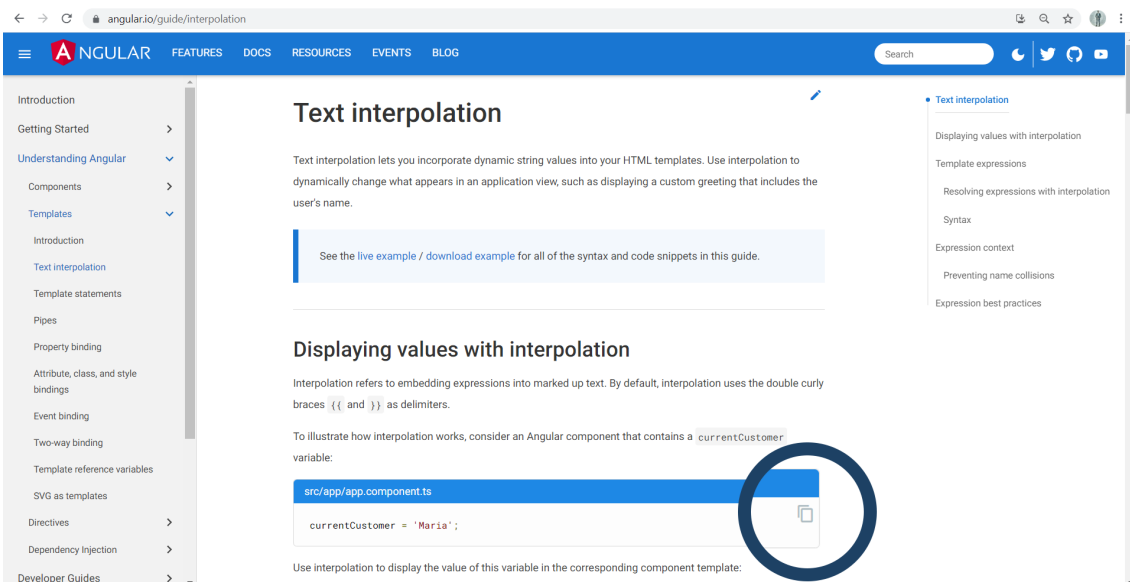

FIGURE 11. Website of Angular: Copy code with a button. (1)

Something that is also added in some web pages which are expected to be used when the user spends a longer time reading the information, is something called dark mode. This feature

changes the background to a darker colour and text to a lighter colour. Figure 12 shows how the entire page from angular.io changes. While W3schools in figure 13 has chosen that the dark mode should only affect the box with the code. The code makes it a little easier for some users to decipher with the dark mode. The function is more for the individual's own opinion and what is comfortable for the eyes when reading information. The function is in the form of an icon button located in the upper right corner in the top bar a similar way on both websites, angular.io and w3schools.com.
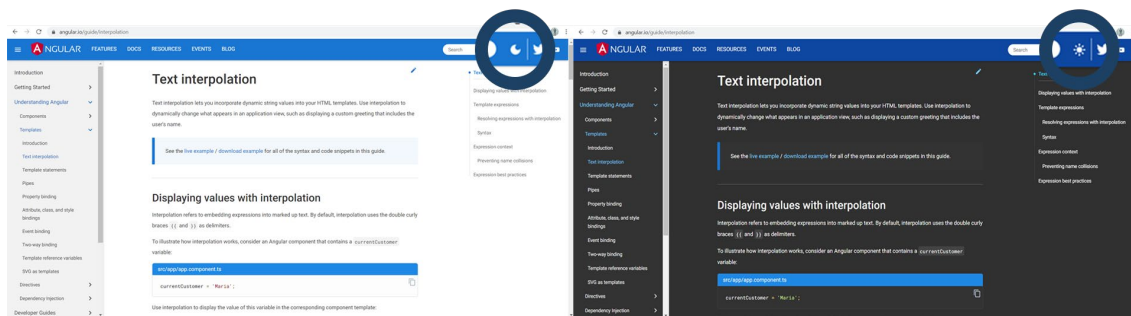
FIGURE 12. Website of Angular: Full dark mode. (1)
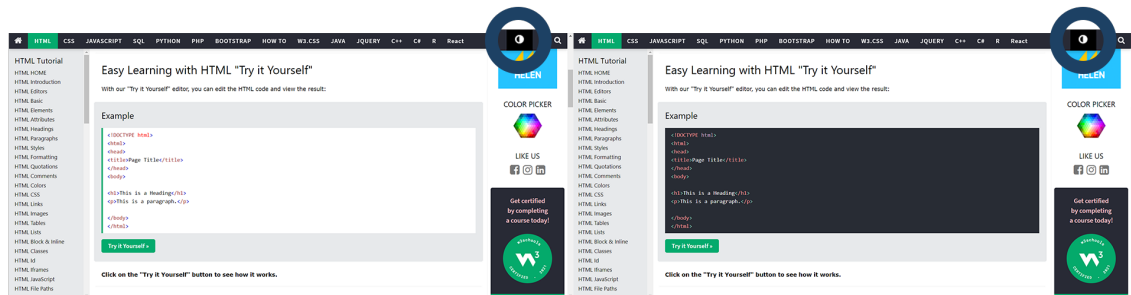
FIGURE 13. Website of W3schools: Dark mode. (19)

5 CURRENT STATUS OF THE WEB THEME

Software developers are using the Web theme, such as a knowledge management system. The Web theme includes guides and have the option of contribution for new components or widgets. In terms of appearance, the Web theme starts with a black navigation bar at the top, with topics that the Web theme can offer as in the Figure 14 at point 1. Within this top bar there is a button to change the style, it allows the user to see the older or newer version of style seen from point 2 in Figure 14. At the start of Web theme, the user will encounter an overview of documented information about new updates and changes under the topic Getting started viewed in Figure 14 at point 3.

FIGURE 14. The starting point of Web theme.

As seen in Figure 15 point 1, the information is displayed in the middle of the page which is the main part where all the information will be displayed in this service. On the left side of the page is a list of alternative categories from the main topic, which also includes a drop down of subcategories viewed in Figure 15 point 2. At this state the Web theme is not a fully responsive website. This means that it can have some issues scaling down if displayed on a smaller screen.
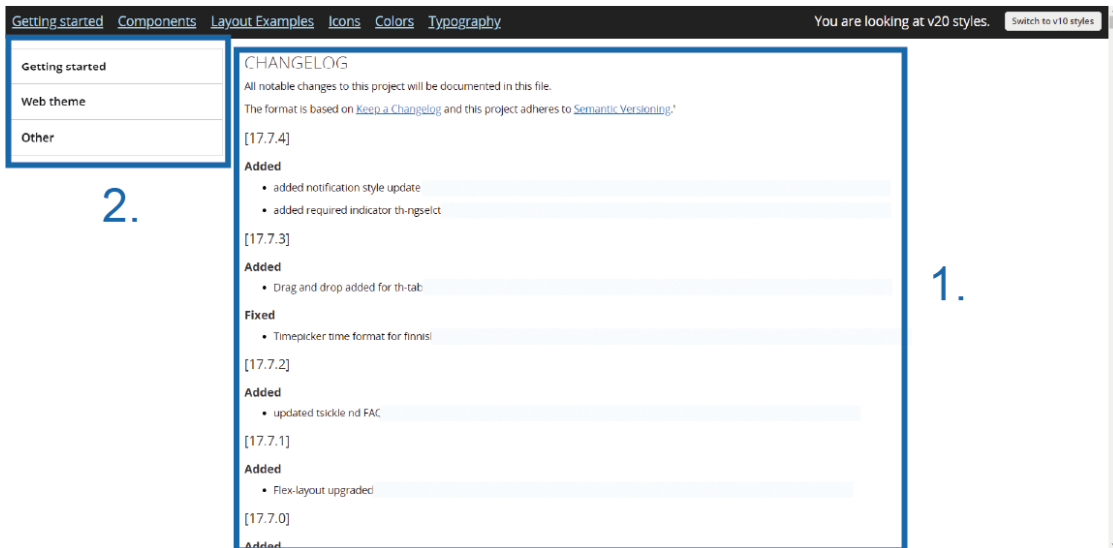
FIGURE 15. The structure layout of context and content list in Web theme.

In the list called Getting started there is a link to the company's wiki page with a concept overview of another service from the organization, it can be seen in Figure 16, which has the name Lifecare. This library's full name is Lifecare Web Theme and the Web theme is a support for the development of its services as the healthcare programs for doctors.

FIGURE 16. Concept overview of Lifecare in Web Theme.

Moving a step down in the list under the topic Web theme that is seen from Figure 17 point 1, the user can find the updates and changes log. Under the same category Web theme, there are Frequently Asked Questions (FAQ) with more detailed information about the service. A third subcategory under the Web theme in the list is the contribution. The user will have the opportunity to

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contribute with a new component or feature. This view displays information on how to start the process, Figure 17 point 2. It needs contacting the team responsible for the whole Web theme and the needed documentation before releasing a new component.
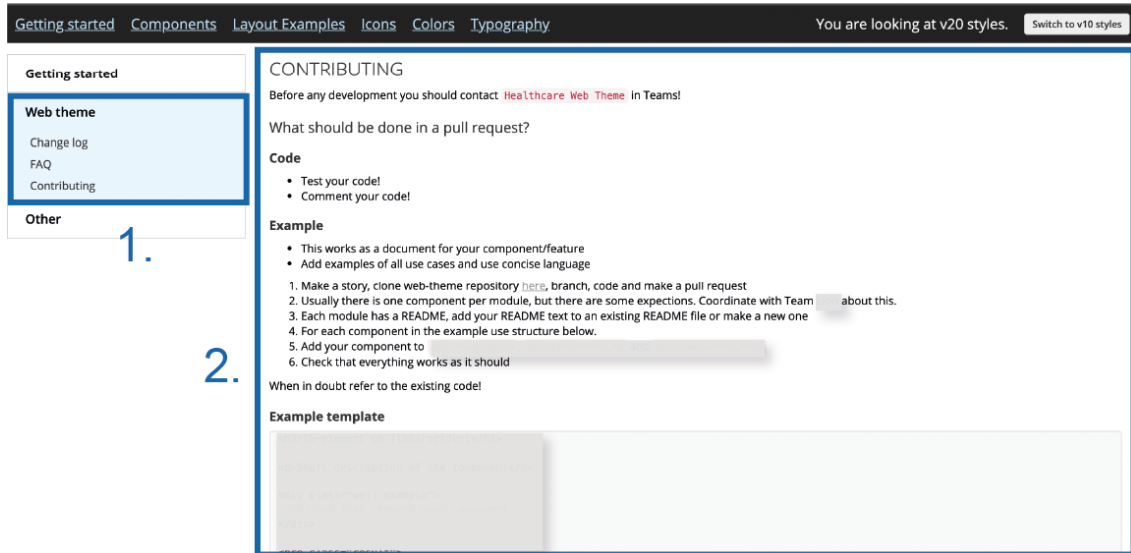
FIGURE 17. The contribution view in Web theme.

The last category in this side list is Other. Here the user can find the subcategory as Windows Presentation Foundation (WPF) that shows a link to Organization's wiki page with information about UI (User interface) components and UI controls, viewed in Figure 18.

FIGURE 18. The Windows Presentation Foundation (WPF) view in Web theme.

The last subcategory under Other is Sketch, viewed in Figure 19. It is a program that the UX team is using to produce graphic parts. If the user would like more information or look into the UI proto-typing, they need to contact the UX (User experience) team in the company for access. However, it is a link given to Sketch own homepage where the user can get a better understanding of this program.
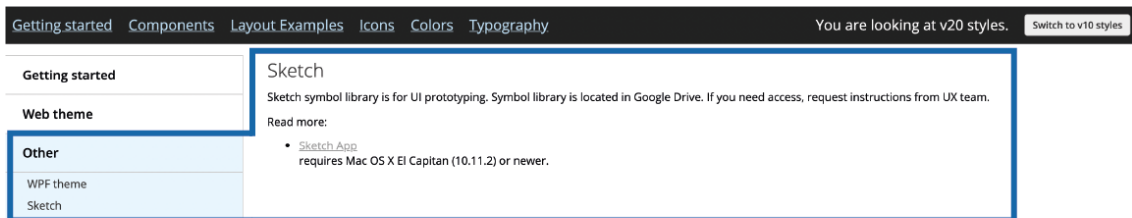
FIGURE 19. Sketch information in Web theme.

On the second topic in the navigation bar at the top, is the Components. It is one of the bigger parts of the whole Web theme. This is where the stored components, widgets, features are available for all developers to take part of. With the same layout there is a list on the left side of the page as seen in the Figure 20. In the list, various components can be found and then displayed in the middle of the page with a short description of the code. After that, there is an example of how visually it would look like and how the function should work, giving the user an option of testing the function-ality. Then the code of the component will appear below for the developer to use.
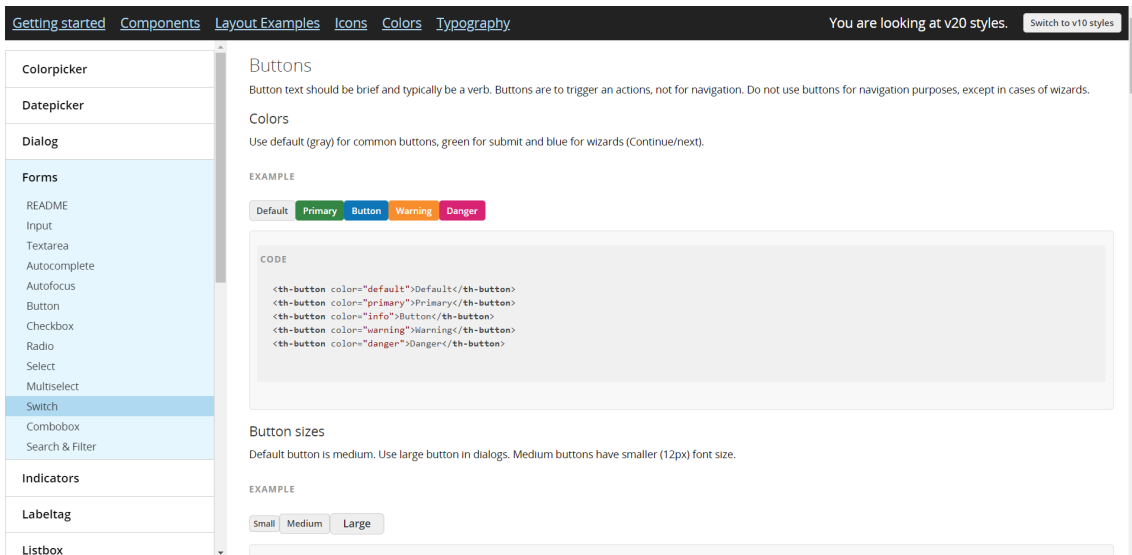
FIGURE 20. Components view in Web theme.

When navigating to layout examples as seen in Figure 21, the upper black bar brings the user to documented presentation examples of subcategory Masterdetail to show how the pattern can be implemented. A more focused explanation of a Masterdetail is an interaction pattern where data is presented in a formatted view and expanded when necessary, with the following instructions and sample code for the developers.
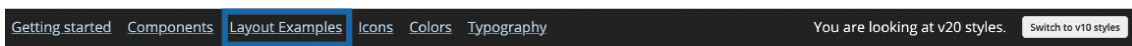

FIGURE 21. Navigation to layout example in Web theme.

In the next navigation topic which is viewed in Figure 22, there are the Icons where the user can take part of an icon sets for their work older and newer versions. There are instructions on how the user can get the right icon with an added code line that can be added to their ongoing project. The set of icons is displayed visually and exemplified for the user to see what the icons look like.
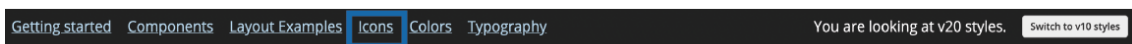

FIGURE 22. Navigation to icon sets in Web theme.

Colour is also something that can be found in the Web theme, in Figure 23. In the next topic colour there is information on how to use it to be able to maintain a unified look and colour code with examples on a colour gradient range of usage.

FIGURE 23. Navigation to colour codes for the Lifecare service.

In the last topic in the navigation bar at the top is Typography as seen in Figure 24. Here is thorough information on how the typography should be used. The heading size also affects whether it should be bold or light text. Also, text should be coloured according to the company's appearance rules or how paragraph should be used.

FIGURE 24. Navigation to the typography which is used in company's services and products.

5.1   Current difficulties with Web theme

With these different functionalities and layouts in the existing web site, there are also issues that can create difficulties for the users in their use of the current version of the Web theme, such as components that are no longer in use and still exist along with those newer ones, as viewed in Figure 25. There are no indications of which one to use and which is an older version. That can result in confusion for the user when choosing a component for the developer's project.
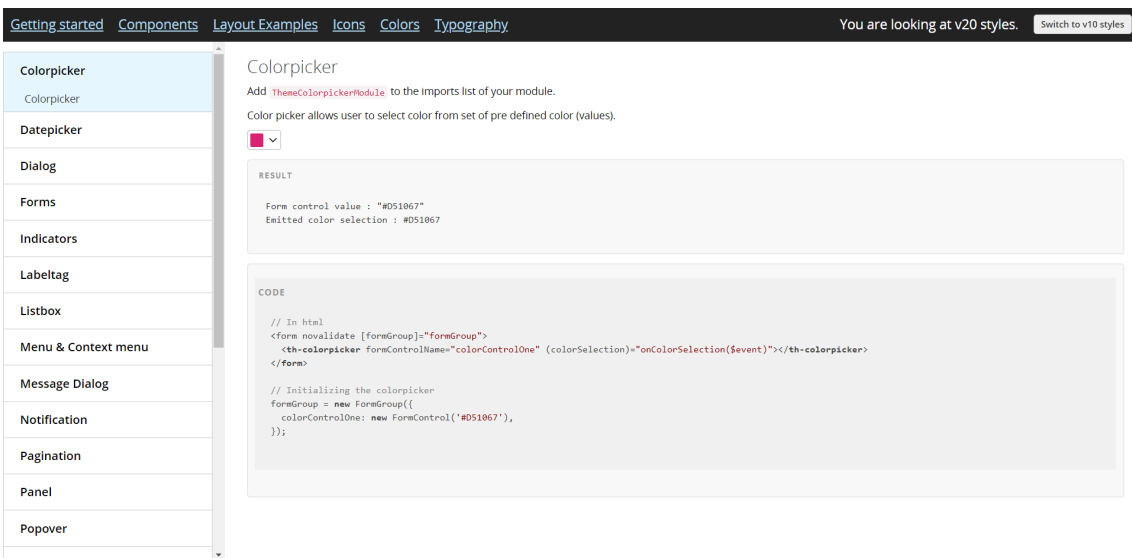

FIGURE 25. Components of Web theme.

There is a lot of information added to updates and changes that are then displayed under the changelog category. This is where the user first ends up when starting to use the Web theme. The

changelog is for the user to be able to get a greater overview of all changes that take place in the Web theme. Over time, much documented information has been gathered about the various updates. All changes are added to a long list that the user must scroll through if there is the will to read about the updates that have been made. The list only gets longer with time and shows all the information at once. Figure 26 gives a perspective of the current size and how long the list is to scroll. However, the user should be able to load the rest if they want to see the older documentation of updates instead of this long list. Therefore, the user can avoid an extra load of the displayed information.
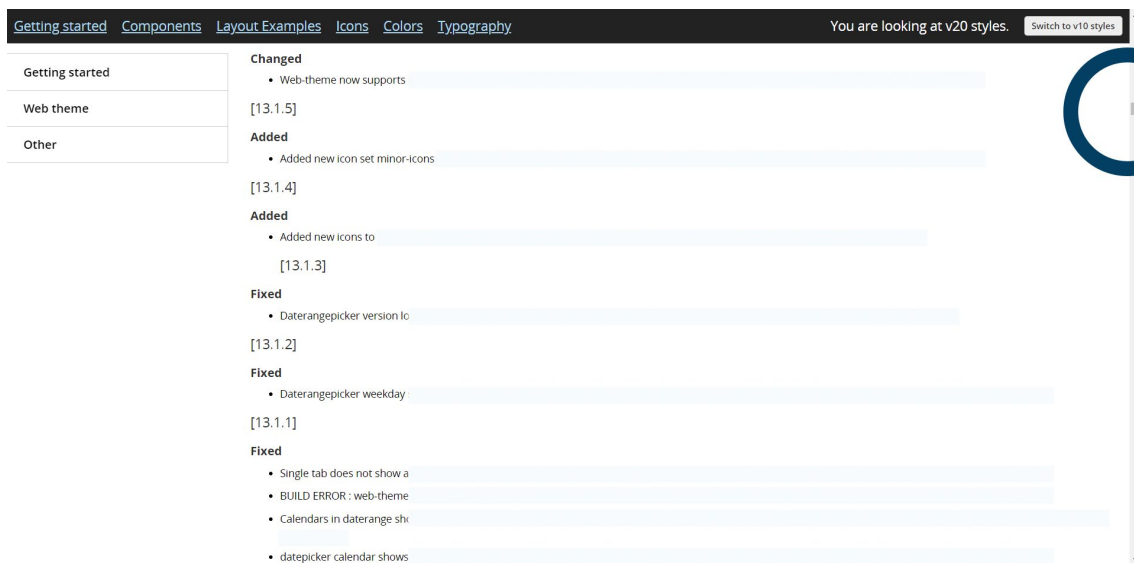
FIGURE 26. List scrolling in Web theme.

Search functionality does not exist and makes the user to manually navigate and search by them self though the content. At the beginning of Web theme when it was created, there were no major problem with this at that time. However, over time components are added as well as more information and changes. This forces the user to work more to scroll through lists of information and code to find what is being searched. There is a risk of missing components that could be used and this process is only slowing down the user. It indicates a need for search functionality for the current content and future components.

A visual issue for the user may arise in some cases when the text or example boxes are exactly in line with each other on the user's screen, Figure 27. There is no as-called white space between the elements, which facilitates the interpretation of text and examples.
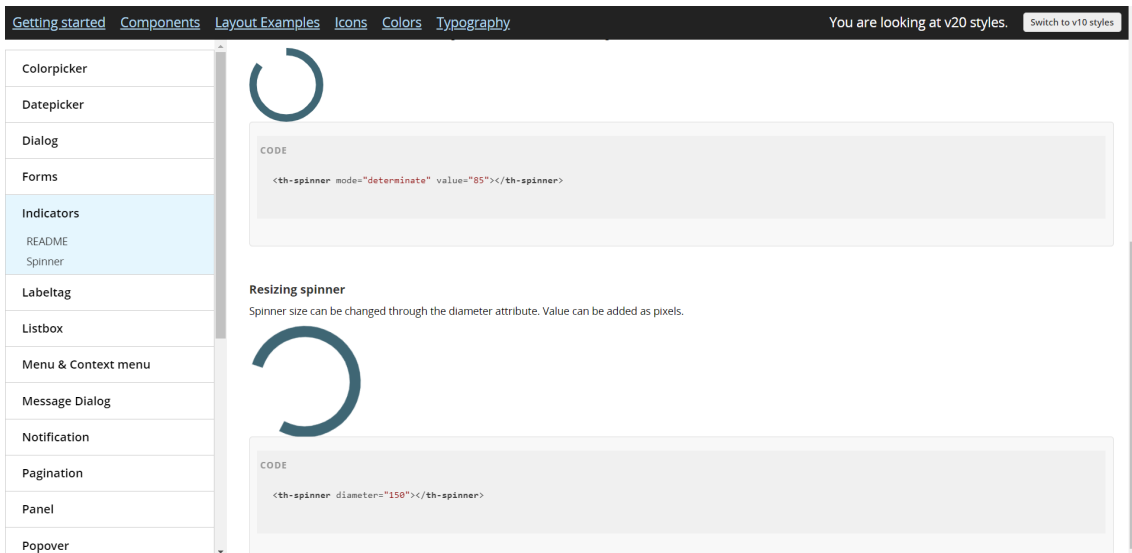
FIGURE 27. Limited areas in Web theme.

Something that emerges in the beginning for a new user may be the lack of search function. It has been requested in the company by the user's developers and from the UX team that this should be implemented. It has been a long-standing inconvenience for the users. The navigation in the top bar as well as the left side list also lacks an indication of where the user is in their search path. Instead of giving the user a quick indication and perception of where the person is, a confusion could then occur. Figure 28 demonstrates the missing indication and makes it difficult to tell where or what is selected. This can be solved by showing which is selected and active.
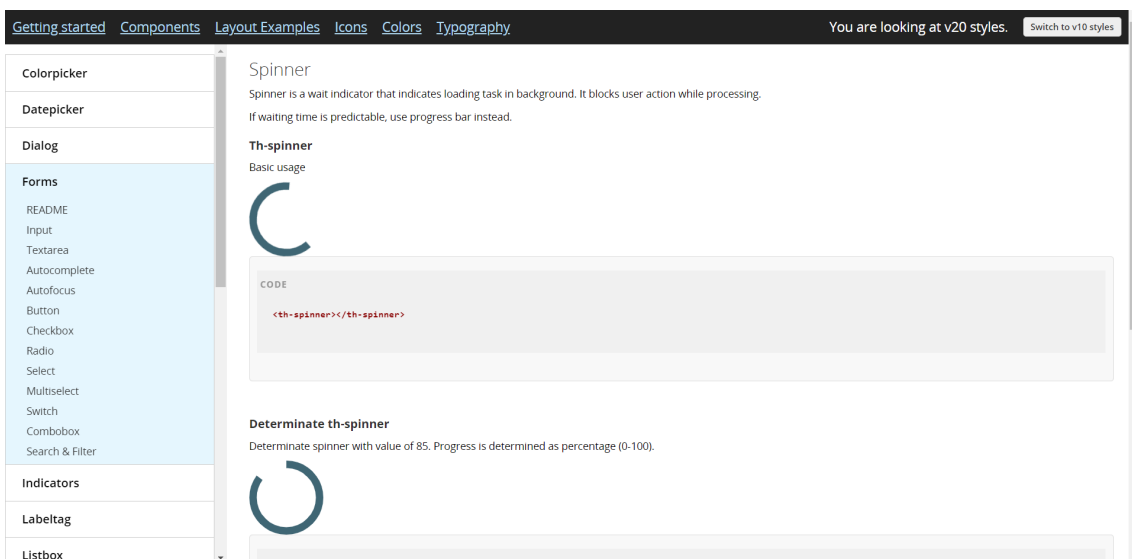

FIGURE 28. Missing indicators in Web theme.

It is possible to contribute to the Web theme. The structure of it is not an appreciated way to search for someone that could help from Microsoft Teams. It creates confusion and disorientation for the user and makes it less efficient. Only available at the start under Getting started is missing the interaction and flow that the user could have without leaving other areas where the user currently would be on. Even the opportunity to be able to edit the current component is missing. This is highly desired of an upgrade to be able to maintain the whole Web Theme in a better way. It is required by both teams and management that something needs to be changed. The user is instructed with information that guides the person from point by point telling what needs to be done to be able to share their code in a basic way into the Web theme. However, it needs to be displayed where the user is in the Web Theme and simplify it without having to login to another service such as Microsoft Teams before making changes. This instruction is in the same list and category as FAQ (Frequently Asked Questions) and can be found under the Web theme, Figure 29. Like the FAQ, this part is a bit hidden and may need to be encouraged to maintain the development and maintenance of the service. Lacks clarity and has a navigational confusion of the information to contribute.
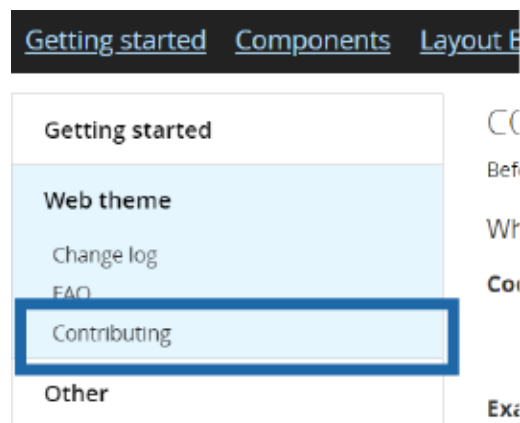

FIGURE 29. Contribution location in Web theme.

In case of problems with the Web theme or questions, its contact information is currently not completely existing. However, there are added FAQs (Frequently Asked Questions) under Getting Started in the navigation section in the top bar of Web theme. Then the FAQ under the category Web them in the left side list, as seen in Figure 30. When there is a lack of clarity, there is a risk of missing information, it confuses the company's employees and they need to find the right person who could help.
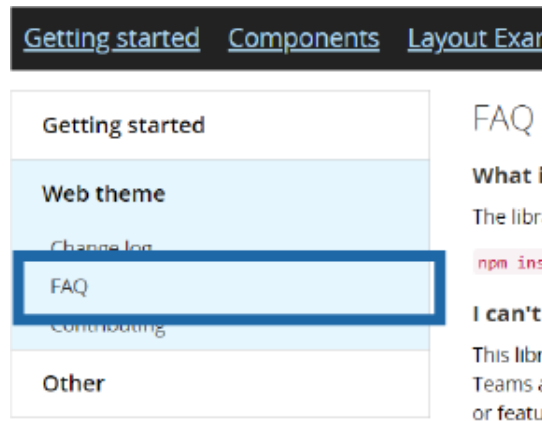
FIGURE 30. Frequently Asked Questions location in Web theme.

When there is a need to reduce the screen size for the Web theme, the content is affected, as the responsiveness of the web site is lacking. The information text in the middle ends up above the list on the left side. The navigation selections in the top bar move below each other and clump together. Figure 31 below gives a good example of when the Web theme reaches its maximum breaking point. Therefore, an update of a responsive solution for the content and composition of navigation in the form of an icon could be required.
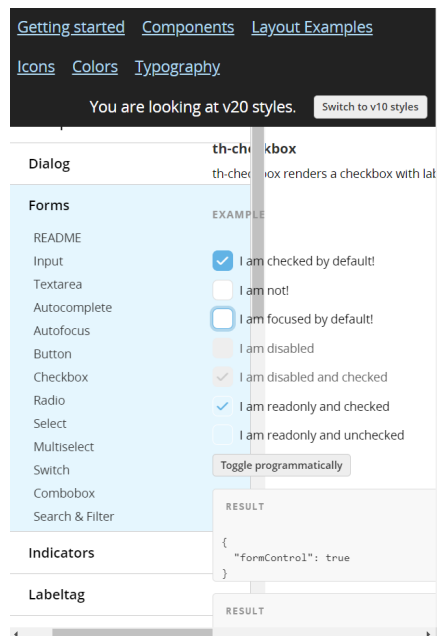

FIGURE 31. Unoptimized responsiveness of Web theme.

6   DESIGN SOLUTIONS

The entire Web theme is based on three main parts, the top bar, the page list and an information view, also called the main view, as viewed in Figure 32. The main view shows all information content to the users. This layout is used continuously throughout each view of the website as a basis. With this layout, information can be clearly displayed as well as navigation options for the best organization of the information by using the list on the left of the page. This provides an easier opportunity for a future expansion of the information and new components.

FIGURE 32. Web theme Wireframe: The three main parts.

A light and simple foundation that has previously been used by other web libraries, such as W3schools, MDN Web Docs or Angular's own, provides recognition for most users. Then it also facilitates the learning of new features. The Figure 33 below is showing the foundational layout of the Web theme. This gives the developers a better overview of the situation and they can concentrate on specific areas that will have features which could enhance the user of Web theme and the experience of its usage.
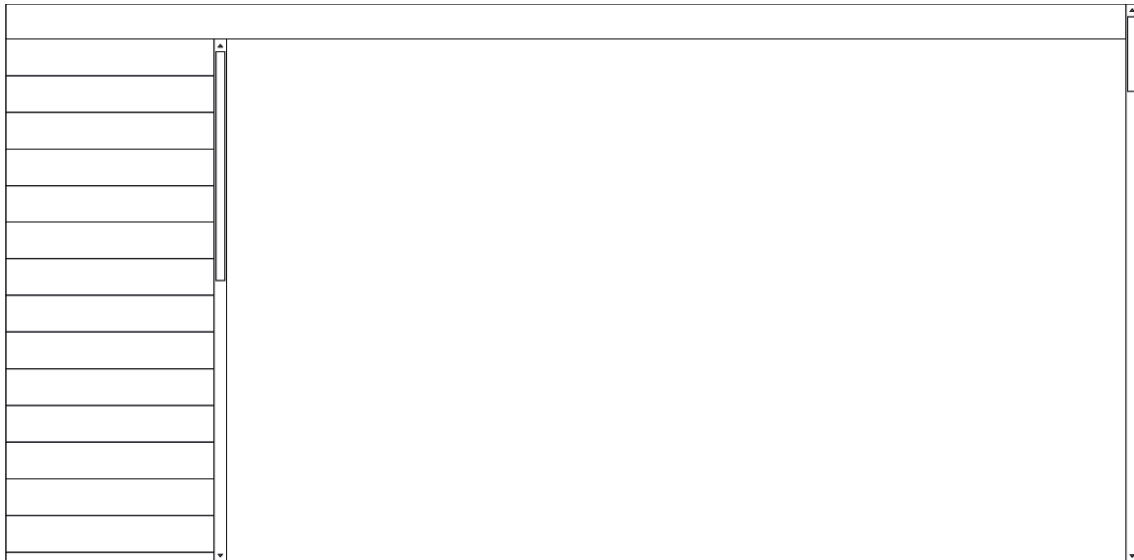
FIGURE 33. Web theme Wireframe: Foundational layout.

Initially, a wireframe framework for the Web theme was developed to see what the test version of the update looks like. This was made to get a better idea of how functions are added to the structure.

Keeping in mind that the structure is already followed and should not be changed to complicate developers and users. There will be small changes that can provide an extra functional enhancement. The opportunity to search has become a standard for services and applications that offer a lot of information and are then expected to exist. This is a recurring suggestion that most people bring up when discussing inside the teams. Practicalities, such as a search function, then have a good space and visibility in the top bar as shown in Figure 34. When the search bar is always available, the user is given a smaller step to take to find what they are looking for. The search bar does not extend over such a large part of the top bar as there may be more navigation options in the future.

Getting started Components Layout Examples Icons Colors Typography   Search   You are looking at v20 styles. Switch to v10 styles
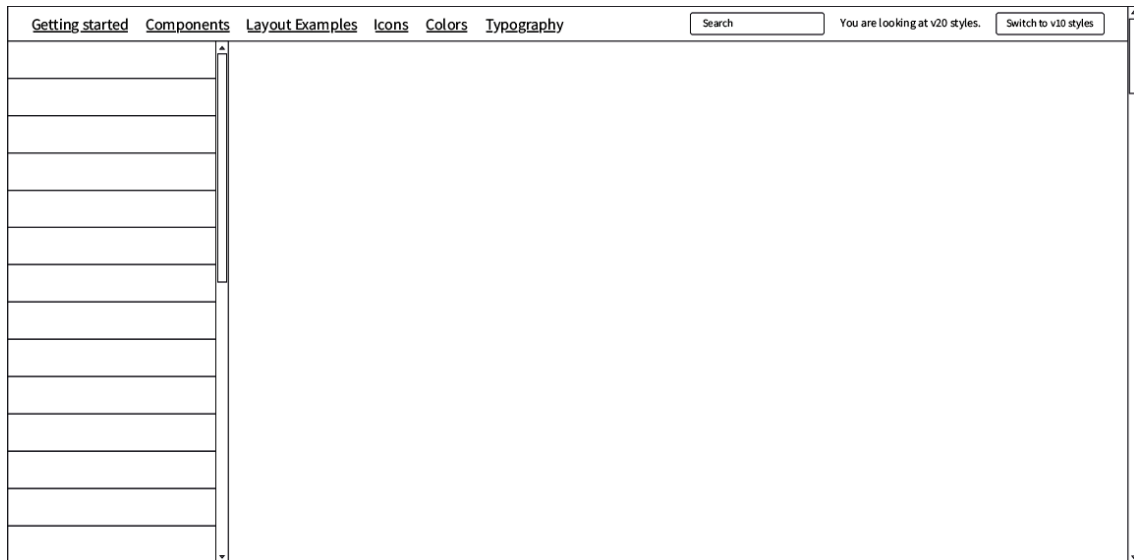
FIGURE 34. Web theme Wireframe: Adding a search bar.

An extension in the navigation areas at the top bar is contact, Figure 35. This is one of the simpler changes that are added when there is a need for support or questions that may be added when using the site. This was a change that came up when employees from other teams were using the Web theme. They had questions and had to spend a long-time for getting answers because the user had been guided from one person to another and it led to a dead end. They did not know who was responsible because the information was not clear enough and where the information could be found. A solution to this is to clarify the contact and information for the users to avoid confusion and being referred to the wrong person. At this moment, the contact option is a little more tucked away in a deeper way into the page. Therefore, by placing contact with visible avoids confusion and extra clicks for the user to reach the right information to the right people in charge. During contact, the user should be able to find the most frequently asked questions that may already have been answered. If that is not enough, it can also provide information on how and which team can be contacted. This avoids extra access routes to reach the right person who can help and thus saves time.
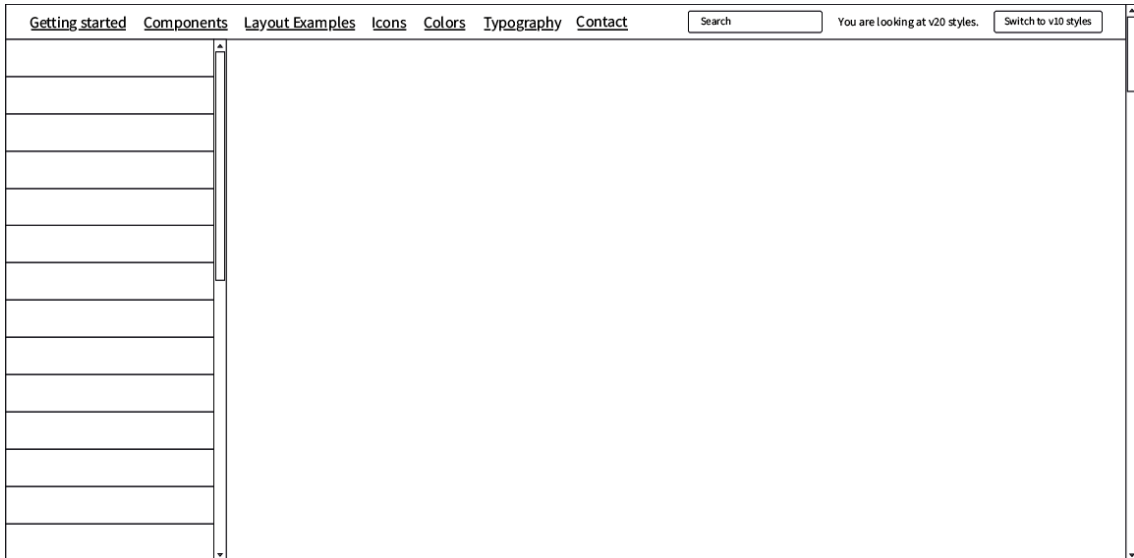
FIGURE 35. Web theme Wireframe: Adding contact at the top bar.

Adding indication of position can increase the user-friendliness of the web theme. In some cases, it is either missing or has not worked properly. The purpose of the change is to show the user where the user's cursor moves. It can be any underline, colour fill, or thicker typography and bold text, something that sets this point apart from other options. This is not a big change but it can bring additional clarity as well as create a professional image, an example in Figure 36. This way, additional questions can be avoided when the user is in a web theme. Because the page usually appears in team meetings when components are discussed, clarity is important so that everyone can follow.
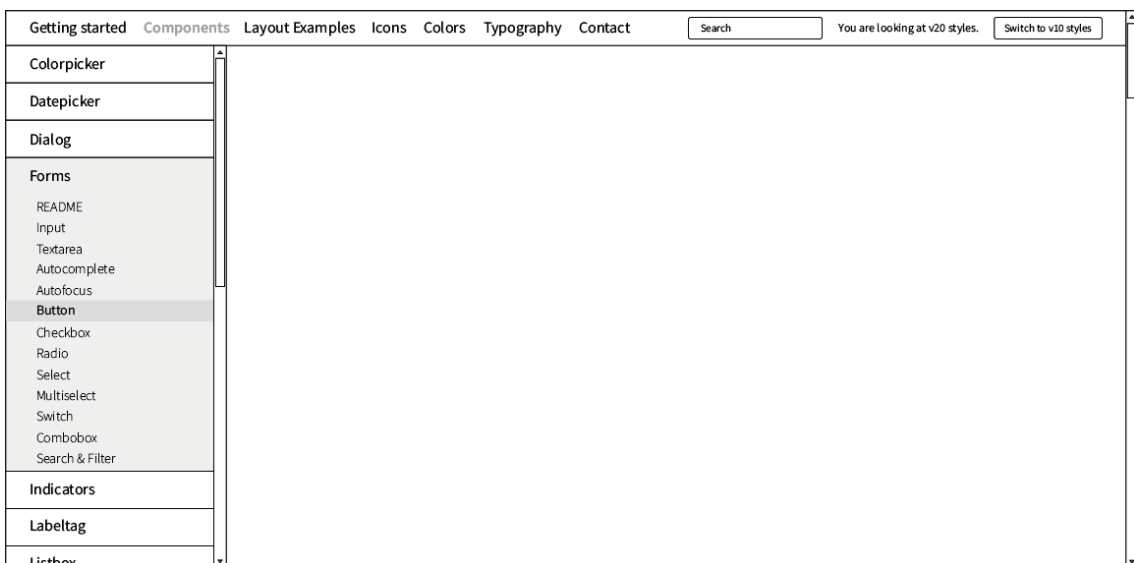

FIGURE 36. Web theme Wireframe: Indication improvement.

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The added contact link or contact section takes space in the Navigation bar and this is not a good UX-design. Therefore, something needs to be removed. The alternative is to shorten the information about which version the user is currently on, as demonstrated in Figure 37. It was asked why a whole sentence has been used to talk about what style version they are in as there is already clear information for the developers. This also gives a little more air space between navigation, search bar and the changing style version button.
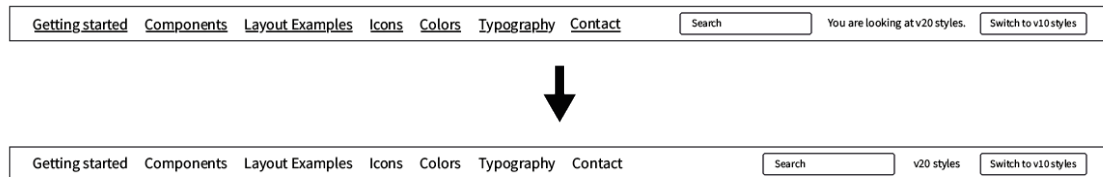

FIGURE 37. Web theme Wireframe: Removal of text.

This has been the major change that has been made in a minimal resource way for Web theme's top bar as already existing layouts. The rest of the web theme changes the information because screens have more space in the form of white space. Giving white space gives air between text and objects, Figure 38. This makes it easier to read the information. The Web Theme is created to maintain a consistent style of web for example in terms of colours. In addition, it is also founded to keep the web code consistent. Therefore, the Web Theme is created for developers who can return to the site multiple times if they wish. Which then requires a facilitation for service of code and information. Comments from the developers and UX team have been made about information, examples and code that have been close to each other and made it more difficult to decipher. The experience of organized and appearance of the information is not there right now according to the teams. As there are many who will use the Web theme, it will be necessary to adapt it for everyone, even for an internal web library such as the Web theme. Therefore, a clearer separation between objects and text will be needed to clarify the content for the user experience and streamline work.
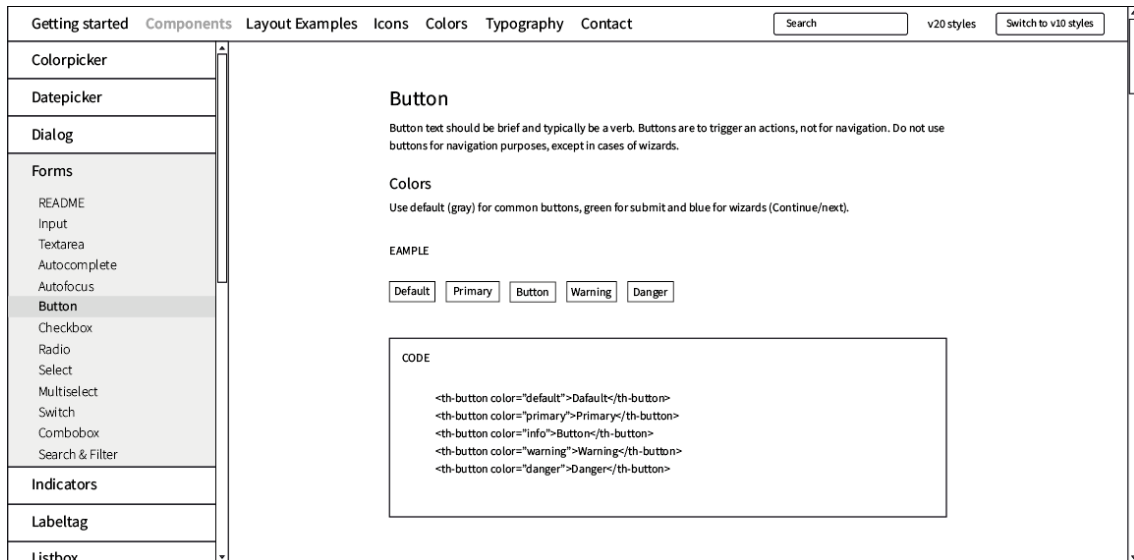
FIGURE 38. Web theme Wireframe: Spacing inform of Padding and margin.

With extra spacing, a new function can be added to the component side. Figure 39, show that a list of topics has been added on the right side. This is a feature inspired by Angular's own website (angular.io). With this list, the user should be able to navigate through long information in a faster way. Instead of scrolling up and down the page to find, the user gets an overview of the content with all the topics on that page. If the user already knows what to look for, a simple click allows them to go instantly to the title and access the topic of their choice directly without any additional measures. The option is always available to be able to scroll. However, this is another option for the user with an overview of the topics and quick navigation from a click of the computer mouse. It is a recurring inconvenience in services that have a lot of information to display and ends up with users having to scroll through to find. Over time, these lists of information can become long. The developers who are also users have mentioned if there is a solution to be able to navigate in a smoother way without having to scroll forward all the time. The UX team has then confirmed that this is a difficulty that often arises when developing information-demanding services.
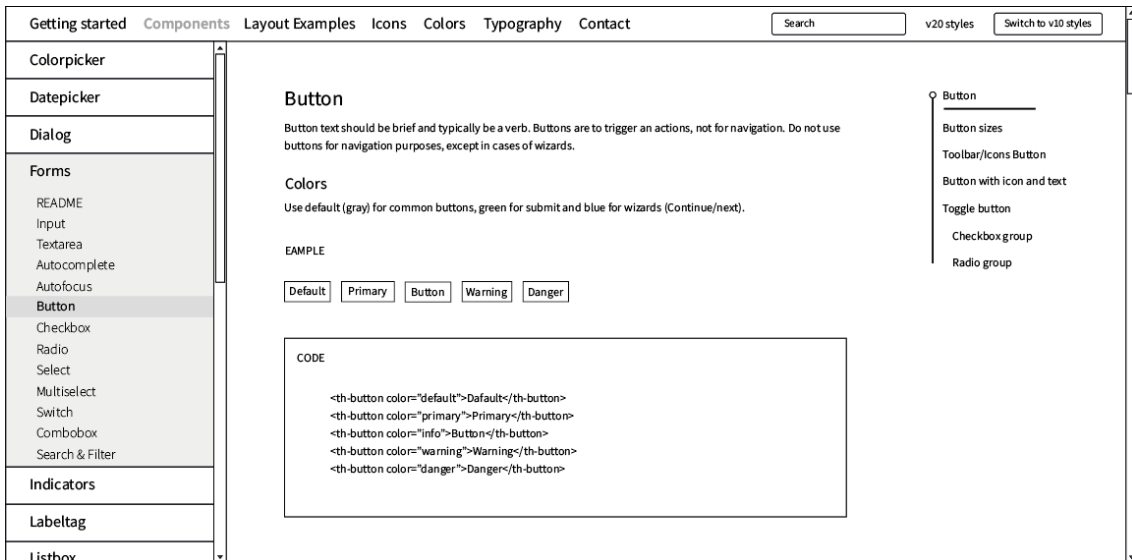
FIGURE 39. Web theme Wireframe: Adding of a topic list navigation.

The main meaning for the user is the code in most cases. Then the main users of Web theme are the developers. To ensure that all code is copied and to avoid extra clicks, this can be solved with a copy button. All code is displayed in a box which then shows the code that is ready to be used in the user's project. In the upper right corner of the box, shown in Figure 40 below, there is a button that copies all the code shown in the box. It is then ready to be pasted into projects with Ctrl + V for Windows users. In conversations with the developers themselves, such a function would be appreciated for a more efficient experience.
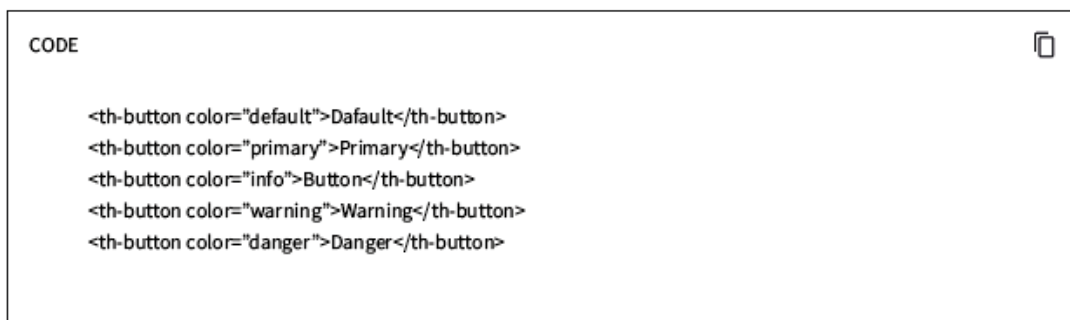

FIGURE 40. Web theme Wireframe: Copy code icon button.

One of those major newer features is Edit suggestion. It has been one of the more important parts for improving the maintenance of Web theme. It is also, something that is very much desired by the different teams in the company, as there has not been a well thought out maintenance work for Web theme before. This has created difficulties in maintenance and improvement in the

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development of Web Theme. In the upper right part of the information section for the selected component is an edit suggestion button for the component, Figure 41. It gives everyone the freedom to keep a higher quality of the component by having more eyes watching or if adding is desired. If something is missed or the component is faulty, a suggestion for change can be made. When a change is desired, forms are filled in with all parts from the component. The user then selects what needs to be changed, text or code and submits. To the left of the edit button is information about when the component has been updated and who performed it. In this way, the user gets a hint if the component is old or new.
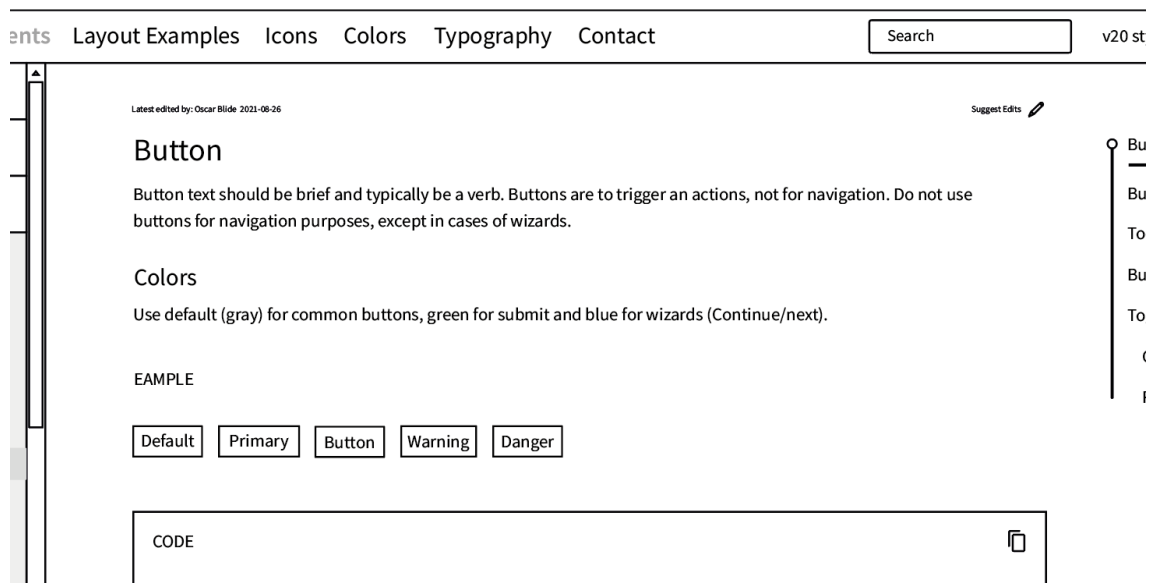

FIGURE 41. Web theme Wireframe: Suggest Edits button icon with update information.

Update information is also displayed in the change log. It shows information about the actual update and when and who did it. After a long time, the changelog will be long and maybe even demanding. To avoid this upcoming issue, the new information about the latest update may be most relevant. Because not all information needs to be displayed at the same time. However, it will require the information to be saved. A solution to this is then that only 5 ~ 10 of the latest updates will be displayed. If the user wants to go further back, it is possible to load more or use the search function, as seen in Figure 42. This is, something that has been discussed at meetings with the UX team and also with some developers. It drags down the long list that will be expanded over time as components and information are updated.
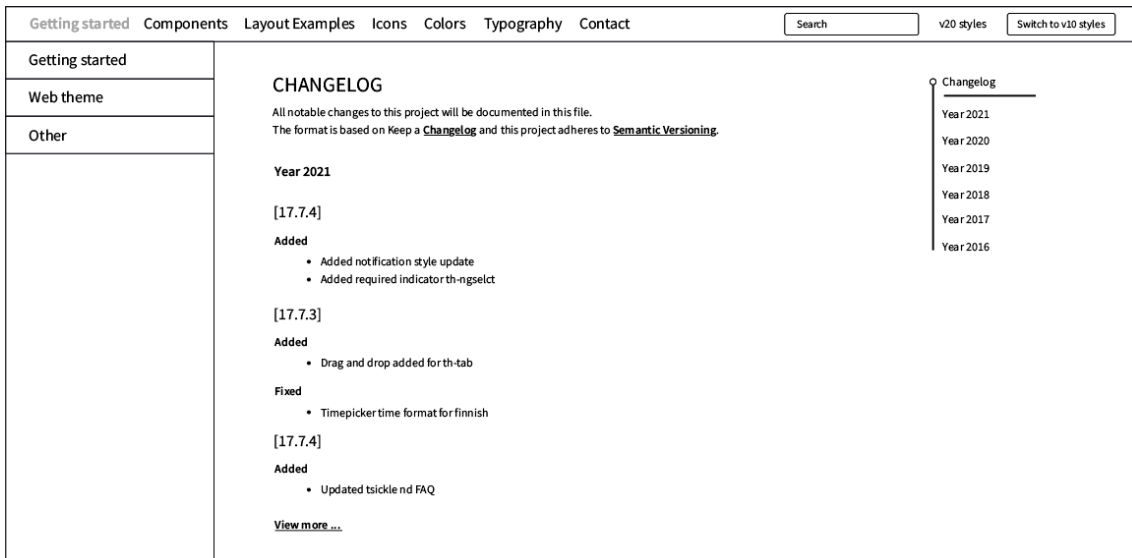
FIGURE 42. Web theme Wireframe: Organized changelog.

By summarizing these changes into a view as shown in Figure 43, these small changes can create an effective workspace while retaining the style of the older version. It gives the client a slower introduction to a newer environment. It makes so many of the users happy, both the groups of those who are for a newer development and those who like the current system, by using the step-by-step method to avoid confusion into this newer upgrade of the Web theme with some enhancements.
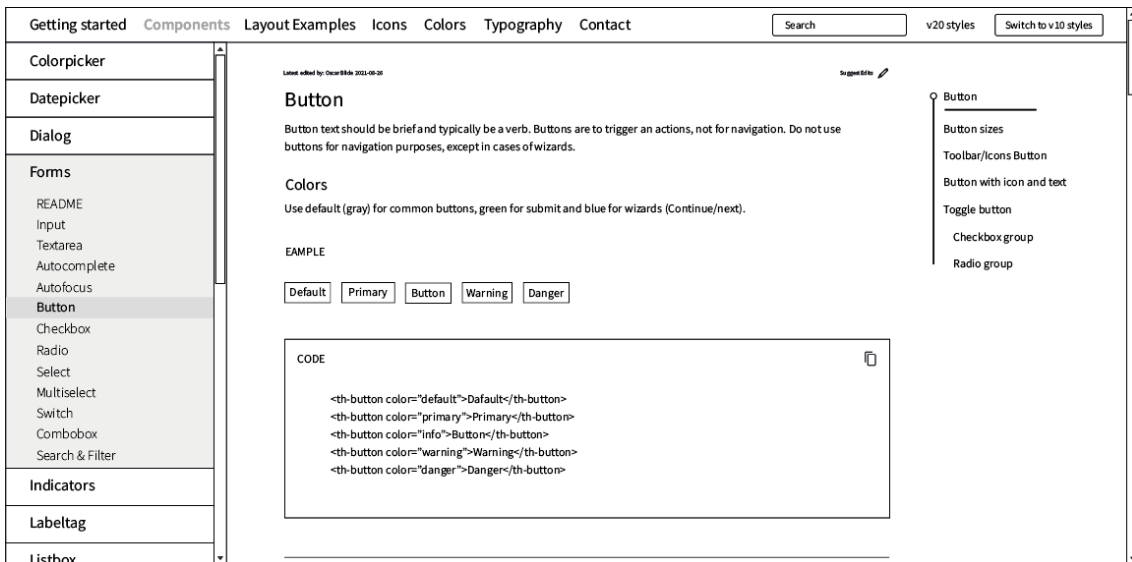

FIGURE 43. Web theme Wireframe: Summarizing of the features.

7 IMPROVEMENT ACTIONS

The outcome of the technical functionalities implementations and updates is shown in Figure 44. With a color indicator when navigating in the top bar between the various options, and with a contact as the last option for questions or in the search for contact with the responsible team. More to the right of the top bar is the search bar for even more direct word search and navigation to what the user is looking for. A little more to the right of the search bar is the style version with the button that can change the version from 10 to 20. The list of categories on the left side of the Web theme has also been given greater clarity when choosing from the list. The text indicates both color around and thickness, to show where and where the user is. The information that is then displayed has been allocated more space with new margin and padding directives. This provides more air and clarity. With this change, the new topic search feature was also added. It should help the user to get directly to the part that the user wants. Without having to scroll and search, the person gets an overview of what topics are available under this component. In the Figure 44 example, the component buttons are selected. When the user has found the right one and everything is correct, the code can now be copied quickly by pressing the button in all code boxes in the right corner of them. This gives the user a smoother use of Web theme.
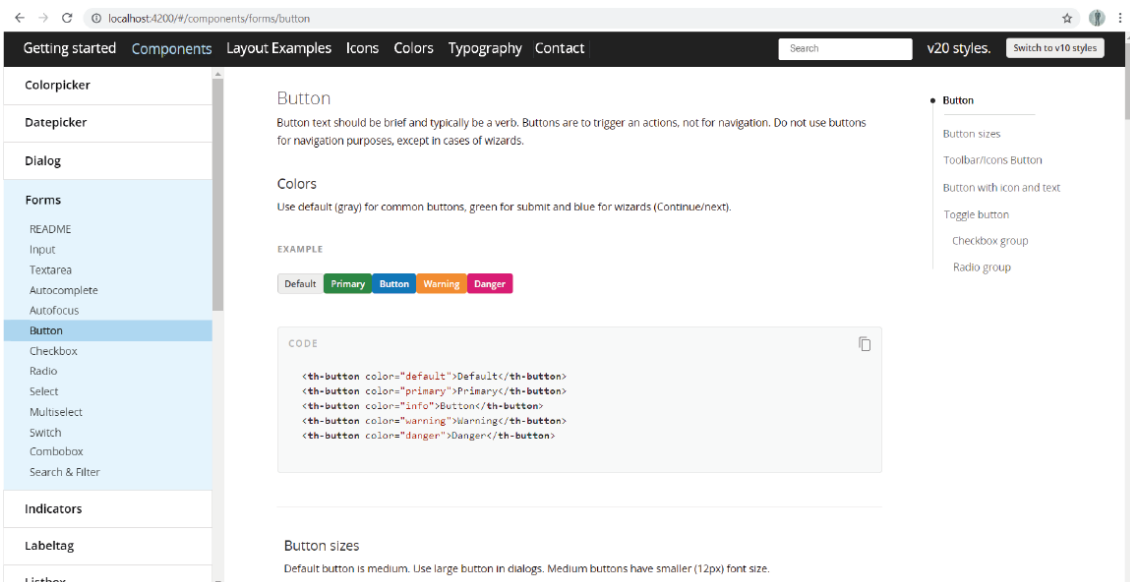

FIGURE 44. Web theme: Outcome.

When the space changes, a change is also required to what happens when the Web theme is reduced in size. The responsiveness has been upgraded to be able to view the information for the

user in a convenient way at all times. There are three stages that occur when the Web theme is reduced in size. As Figure 45 shows, the upper navigation part of the upper field is collected in an icon, which has three horizontal lines below each other. This icon is also called the hamburger menu. With a click, a list of the various navigation locations opens. This makes it easier to use in restricted space. This change is the first to occur when size is reduced.
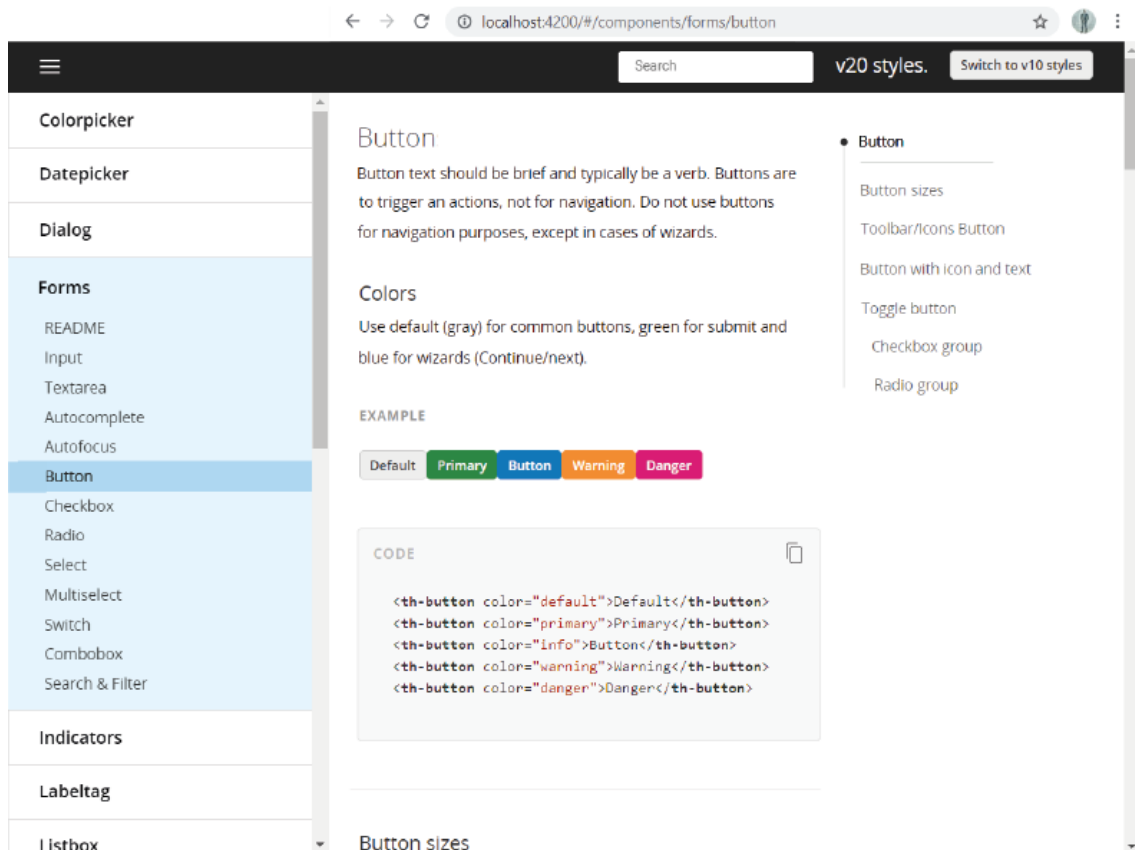

FIGURE 45. Web theme: Hamburger menu.

The second step, when the view is reduced is the left side list that can be seen in Figure 46 hidden from the view. The priority is the information that the user is displayed in front of. The list is now together with the navigation section collected under the icon with those vertical lines, also called burgers menu in the top bar left side. The list expands with choices that lead to multiple choices. This still gives the user a controlled environment when searching for a component or other infor-mation.
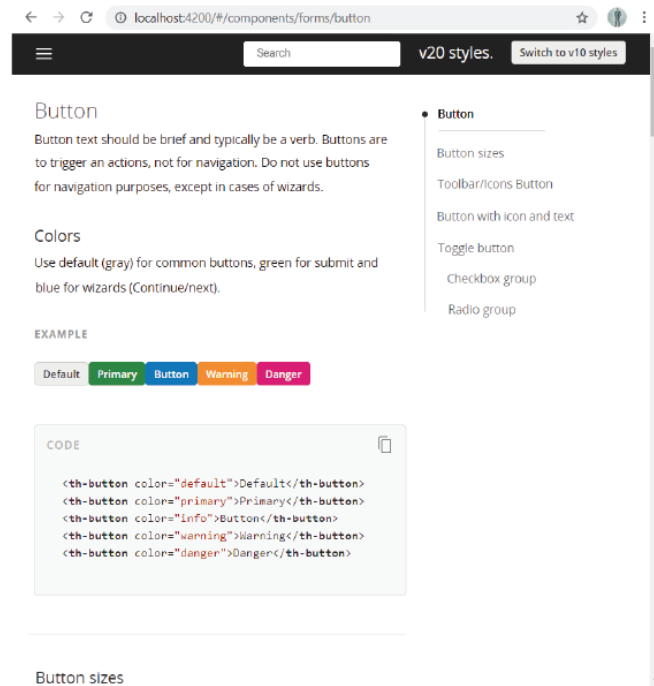
FIGURE 46. Web them: Second stage.

In the third and final step also seen in Figure 47 is the smallest option which is the smartphone screen size. In this view, the topic search list on the right side of the information view will be disabled. In this phase, the information will mainly be scrolled. Then the Web theme area of use is primarily via computer. If this function is desired at this size in the future, it is also possible to enter the list as a hidden list on the right side that can be pulled out if necessary. The style switch button next to the search box in the top bar has now been moved to the hamburger menu in the top bar.

These steps can now give the user a more comfortable experience and efficiency when used in any size. In that way, the user gets a better way to utilize what the Web theme is created for.
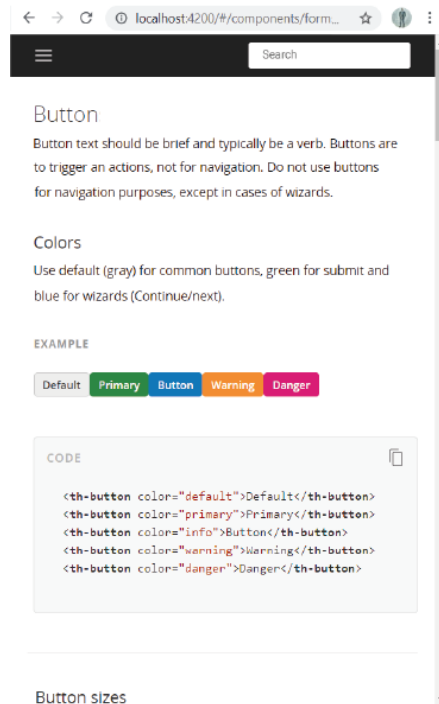
FIGURE 47. Web theme: mobile version.

One of the major extensions that can also facilitate the improvement of code and information is the ability to edit. It can facilitate with multiple eyes that can offer help and suggest edits, with an icon and text to clarify the purpose of this new function in the upper part of the information for the components. This leads the person to an edit mode that can later be submitted. The update is documented and displayed when and who did it with small text information on the left side of the edit suggestion that can be seen in Figure 48. This should make it easier to maintain a high quality of both code and appearance and give an opportunity for upgrades. In that case, the need for continuous maintenance may become a requirement as the technology also develops. At this moment it is not in functional use because of time requirement for the implementation.
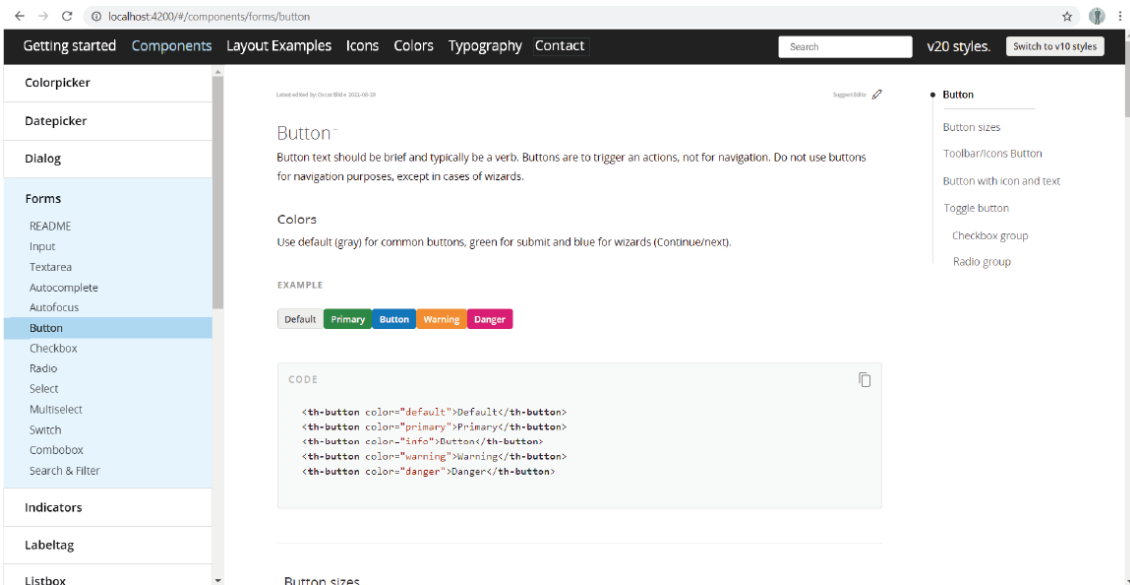
FIGURE 48. Web theme: Editing suggestions.

7.1   Governance model

Part of company's goal for the Thesis was to create a Governance model that clearly presents the responsible stakeholders. As can be seen from Figure 49, such a simple model has been created. This is to be developed in the future, but the basis for the future work has been laid.

The UX team is responsible for controlling and updating the entire Web Theme template according to the Governance model. This is because the page was created to disseminate the result of work done by the UX-Team, for example, icons or typography. However, this does not mean that all matters are the responsibility of the UX-Team. They are only responsible for things that are subject to their update and, of course, within the scope of their know-how. However, someone needs to be responsible for the usability of the whole page, hence naturally, in this case, it is within the scope of the UX-Team.

The customer base is easy to configure because it is in every section of SW Developer. In practice, this site has been created specifically for SW developers therefore they do not have to search for one Icon or query it from the UX team but now they can watch it directly from this Web theme. In addition, of course, the Web theme has ready-made components that SW developers have created to facilitate their own and others' work. Even then, that, the customer is another SW Developer.

The Owners section talks about precisely this know-how that is needed to own these departments. For this reason, SW developers own the components and layout examples sections. Most likely they have created these sections on the web theme, hence considered ownership close to understanding. The Owners section also requires the UX Team. They know best the rules of company icons, colours, and typography. In that case, it is best to keep the ownership in their possession. The look of the company should be consistent, it is a twinkling important part of the brand, therefore it does matter that the information is correct.

Maintenance is an important part of the Web theme, especially in the future, because the Web Theme editing aims at the Wikipedia model that "everyone" is free to update when needed. At the moment, it is seen for the maintenance that there is a need for a faster check interval for components. Other sections do not need to active maintaining.

As the update has not yet been released for everyone, experts have been selected for each category to update. In addition, even if the update is open to everyone, it is a good idea to have someone responsible for the updates. There is a danger that upgrades may be left out altogether if they are not the responsibility of anyone.

The communicating change is one of the most important issues, especially at the point in the future when editing rights are all the same. There are many good ways to do this, but especially in the context of these maintenance services, internal information could be used to inform users and owners about the changed things.

As has been said, this governance model does not answer all the questions, but it is a good guideline for starting an organized job. Clear responsibilities bring clarity to day-to-day work and are easy to schedule in the team's annual calendar. As the web theme itself aims to share information efficiently and reliably with everyone, consequently its governance model should be in line with this.
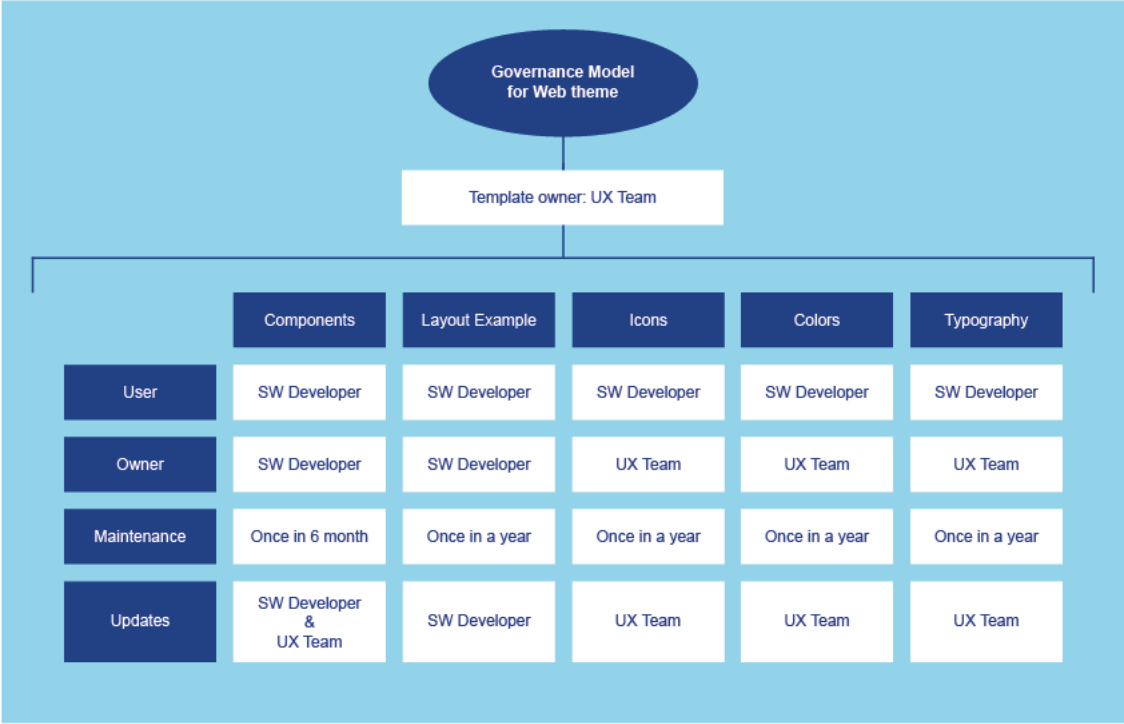
FIGURE 49. Governance model for Web theme.

8　ACTION PLAN AND CONCLUSION

The Thesis has reviewed the theory of knowledge management and knowledge management system and progressed to the technical implementation of Web libraries. Since then, the current state of Web Theme has gone through. Next, alternative design solutions were presented for the Web theme and improvement actions were considered. Finally, the Governance model was formulated. Then, it was supposed to consider the next steps after the Thesis and come up with a good action plan. Finally, the introductory research questions were answered.

8.1　Action plan

Following negotiations with the company, the need for an action plan clearly increased. The implementation as a whole cannot be completed at a time; hence some sort of priority order is good to make. The order below was one that is in urgent need and through these improvements the use of Web Theme will be faster and easier, and the rules will be clearer.

1. Editing rights for everyone
2. Search bar at the top of the website
3. Topic search

Editing rights for everyone help make updating more active and not burden only a few people at a time. In addition, small changes can be made quickly if it is noticed that an important point is missing or some point needs more clarification. Nowadays, the search function is actually used on every good user experience site. This supports rapid progress. The two Search functions would look for hits in the typed text. Again, this third point of topic search would then look for the title listing in the desired title.

These changes are not big for the user but will significantly change the user experience. Implementation requires a bit more work due to back-end solutions, but it is feasible. Therefore, the implementation takes place after this thesis.

8.2   Conclusion

The introduction identified important questions for the web theme that the thesis should answer. Those were the questions below.

Research questions:

1. What is a good content management model for the Web theme?
   a. What is the good UX for the Web theme?
   b. How the maintenance will be done for the Web theme?
2. What is the best technical implementation for the Web theme?
   c. How to easily add content to the Web theme?

In particular, the questions "What is a good content management model for the Web theme?", "What is the good UX for the Web theme?", "What is the best technical implementation for the Web theme?" and "How to easily edit content in the Web theme?" responses were received in the chapters "Technical implementation" and "Improvement actions". Based on these, a good input was obtained into the Action Plan, which was already presented earlier in this chapter. The governance model answers well the question "How the maintenance will be done for the Web theme?" that is, defining the maintenance timing half annually or annually.

The all over conclusion is that the Web theme is already working well, but small improvements will make it even better. The problem is not on the front-end side but rather the back-end side arrangements. In this case, reorganizing and, for example, the all-encompassing search function is a bit challenging to implement on a fast schedule. Part of the important job is to stick to the agreed responsibilities of the governance model. This creates a functional and all-in-one knowledge management system that can now be called as a Web theme.

The results of Web-Theme can definitely be used in other Web-based applications as well, of course, in other internal data management libraries as well. The company is big, hence this Governance model is really well suited for an application, for example, on the industrial side. However, if you think about UX design improvements, then they can easily be applied to company's products as well. The well-known products can always be improved and fine-tuned in a more user-friendly direction. In particular, one product would benefit from a number of solutions, as it is an in-house documentation system.

The thesis itself did not bring any particularly innovative results, but from the beginning it has been under consideration whether the web-Theme data repository could be utilized in the future in the construction of AI. This would save a lot of monotonous work and avoid the same mistakes. Of course, the amount of data should be increased, and resources should be clearly allocated to the project, but this would definitely bring an advantage to the company when it comes to long-term goals.

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