Maki

Facilitating beginning sewers in making the clothes that truly fit them.

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Maki

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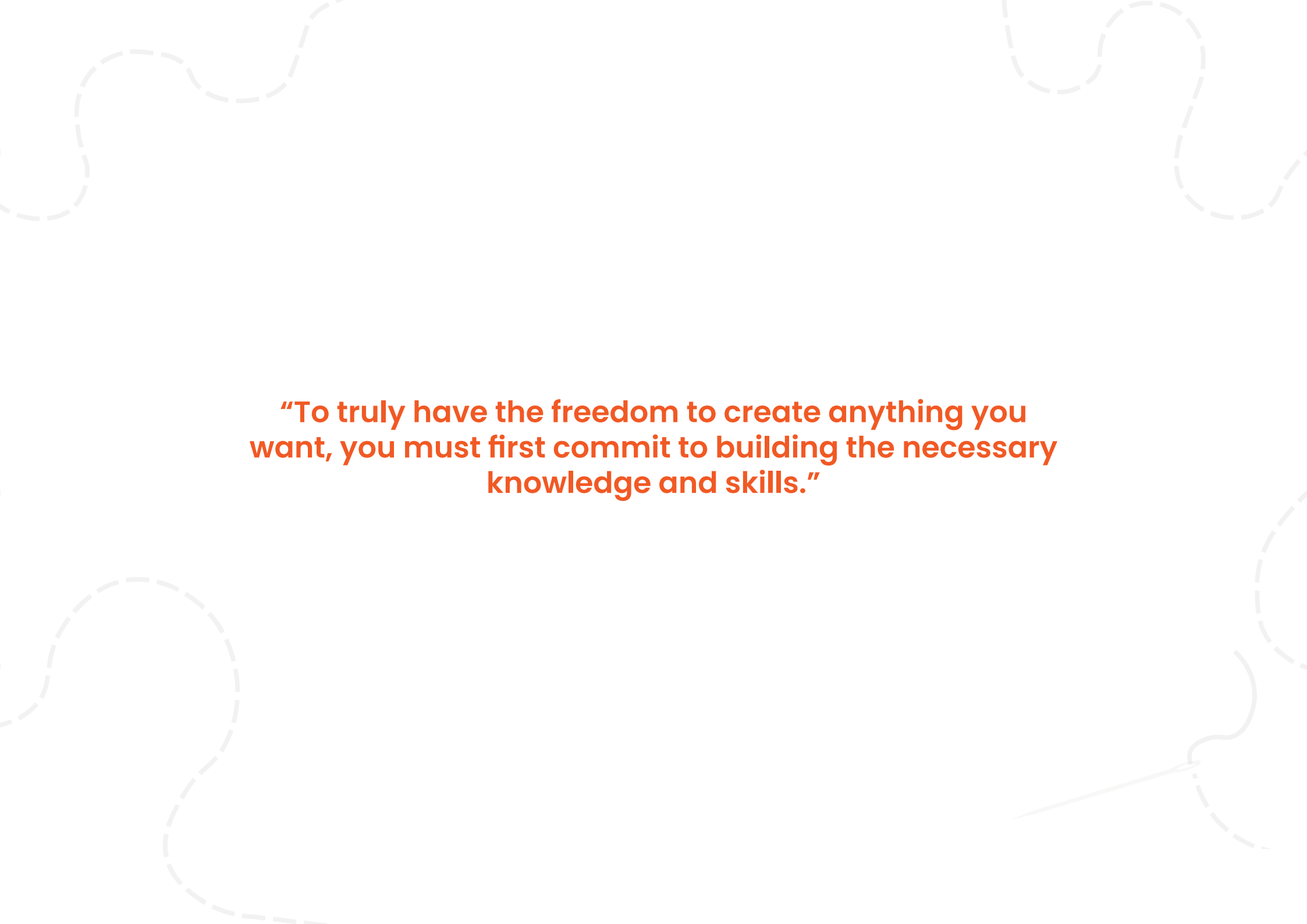Faculty of Industrial Design Engineering

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"To truly have the freedom to create anything you want, you must first commit to building the necessary knowledge and skills."

Acknowledgements

Summary

This IPD master thesis describes the process of developing the product-service of Maki. Maki is a startup founded by my partner Roos van 't Klooser and me. Maki has the focus of making the life of a beginning sewer a bit easier. Currently, beginning sewers have a learning journey full of struggles.

A beginning sewer wants to make clothing that truly fits their style and their size, and so they learn how to sew. They often lean on commercial sewing patterns, online tutorials, or sewing classes. They, like other makers in a rising Maker Movement, desire a level of creative freedom that is greater than these interventions allow them in their learning process.

To obtain this true creative freedom, one must first build the necessary knowledge and skills. Maki intends to facilitate the user in this process and create a fun, creative environment where users learn hands-on.

In this project, a design process is described that attempts to design an online learning platform for these beginning sewers. Through extensive user research, prototyping and exploring the field of sewing, the final concept was presented.

Maki is a platform that provides sew-alongs where the user learns hands-on through making garments. Every sew-along facilitates the user in making a specific garment, such as a summer dress or a halter top. The user first gets to design how they want the garment to be through varying modular elements, like sleeves, or collars.

After this the sew-along guides them through a process where they learn to draw the pattern and sew it together. This is done with steps in text, illustration and video, so the beginning sewer is fully supported.

Since Maki's users have the desire to learn how to make and design the clothing that truly fit them, the sew-along teaches them how to draw their own patterns. This is done with the help of a set of printable rulers. The rulers and sew–alongs will help them build a skill-set that can serve as a stepping stone in making anything they want later in their sewing journey.

On the platform some collaboration with other users can take place. Users get the chance to inspire others with their work through sharing pictures of end-results. The sew-along also allows users to comment, so they can help each other out and a community of beginning sewers can grow.

During the sew-along the user gets to creatively explore and make decisions on how the result should be. This makes Maki different from other sewing interventions. The user is facilitated in a creative process rather than following literal instructions from a copy-paste sewing pattern.

In the upcoming years, Maki should keep exploring how to facilitate its users best on their sewing journey. Maki could grow with the users in complexity and skills so that one day the user can enjoy the creative freedom of making anything they want.

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Introduction

1 Introduction

Why am I doing this project?

This project is my graduation Thesis for the Integrated Product Design master at the TU Delft. The project came about after my friend and partner; Roos van 't Klooster and I launched the start-up Maki to teach young people the valuable skill of sewing your clothing. Since it is my ambition to pursue Maki in the future, I decided I wanted to graduate in the subject. The project aims to develop Maki's product service. In this chapter, the background of this project is discussed. This is followed by the problems a beginning sewer faces. From this, a design goal is stated, and the scope for the project is defined. The chapter explains how the project will be set up to design Maki's product-service for facilitating beginning sewers in making the clothing that truly fits them.

1.1 Background

During the Covid-pandemic in 2020, I decided I wanted to make clothes that really fit me, both in size and style. I bought a sewing machine and started my sewing journey. Unfortunately, this was not always an easy process, and I ended up cussing at my sewing machine, ripping out many seams, and making many ill-fitting pants.

Together with my partner Roos van t' Klooster, an enthusiastic home sewer and strategic designer, we wanted to create a start-up that would focus on helping others learn how to sew. We were convinced more

people struggled to find the right tools and support in their sewing journey, so we created our start-up, Maki (fig. 1). We would inspire and support people in their sewing journeys.

We learned that there is indeed a rise of young people (typically between 20-30 years old) with the desire to learn how to sew. This can be due to the desire to learn a new skill, live more sustainably, enjoy making, express a personal style, fight boredom in a global pandemic, or create items that truly fit your body. Sewing can be a valuable skill in many aspects.

In the beginning phases of Maki, we observed that learning to sew is often done using commercially available sewing patterns. A sewing pattern is a garment template that can be traced to cut the correct shapes from the fabric. They come with instructions on how to sew the pieces together. Sewing patterns come with a whole array of problems for a beginning sewer, so Maki started with a focus on making these more user-friendly. We developed sewing patterns with more extensive online instructions in text, video, and illustration and tested these with multiple beginning sewers (fig. 2 & 3).

However, even though Maki had already gained quite some traction, we believed there might be a better way to support our customers on their sewing journey. We wanted to further understand our customers and their struggles. We learned that sewing patterns are only one of the many problems beginning sewers face. If we genuinely want to support these beginning sewers, we need to zoom out and look at
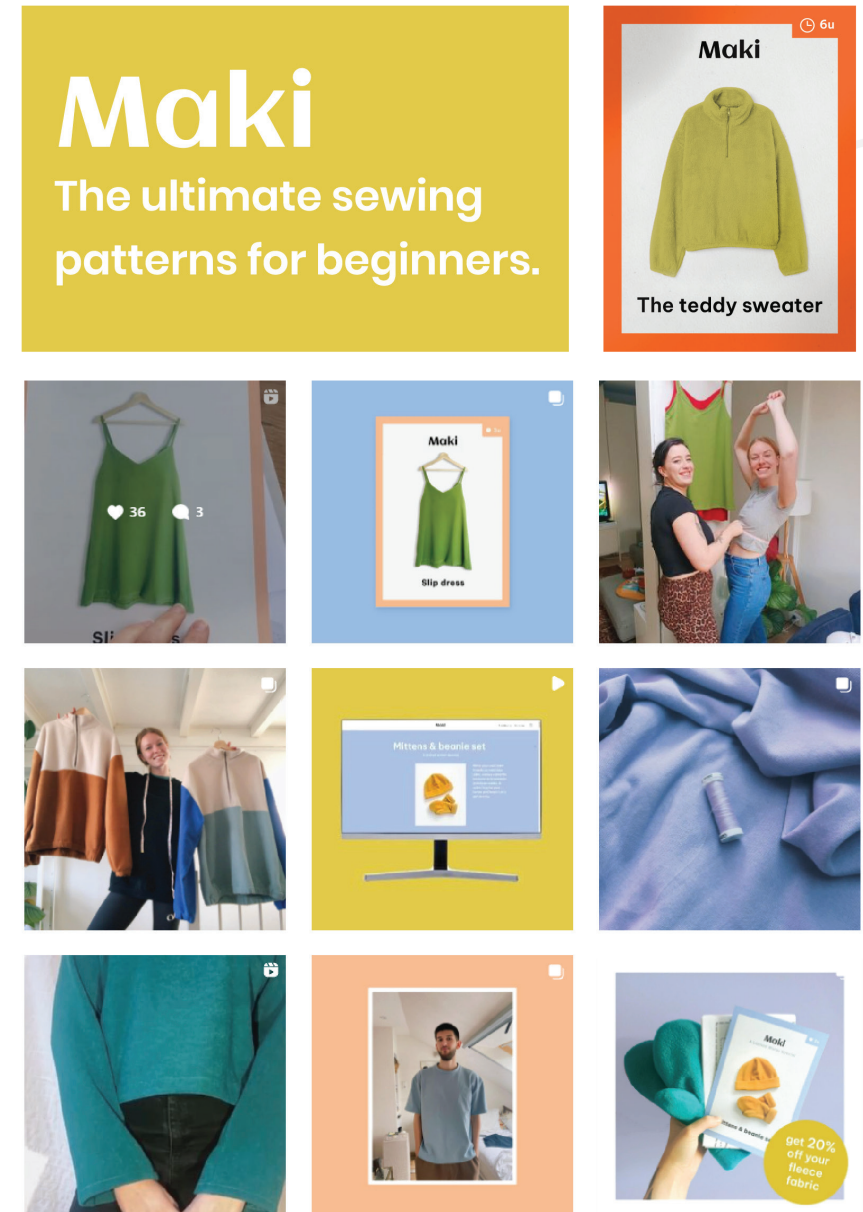
Fig 1. Maki .

Maki

The ultimate sewing patterns for beginners.

Fig. 2 Maki's ultimate beginner sewing patterns.

With online instructions using text, video, and illustrations!

their entire journey, what motivates these sewers, and what their goals are. With this knowledge, we can facilitate their learning process.

Maki wishes to take the beginning sewers by the hand and create a fun and safe environment to learn and experience the joy of making. As the Integrated product designer in our startup, I intend to explore further the possibility of Maki's product service having a facilitative role in the life of a beginning sewer. Therefore, I want to dedicate this graduation project to developing Maki's product-service.

1.2 Problem definition

Maki wishes to facilitate users in their journey of learning to sew, to achieve this there needs to be an understanding of what the struggles and frustrations for a beginning sewer are. In the first stage of Maki, we interviewed 20 young sewers (fig. 4). When absolute beginners embark upon the challenge of picking up sewing, they come across multiple problems. The problems described now were the most common:

Fig. 4 Interviewing beginning sewers.

Fig 3. T-shirts made with Maki's beginner sewing patterns.

Sewing classes

Taking sewing classes can get quite technical and serious as they focus on the intricate skill of sewing and traditional practices, where some interviewees just wanted to make something to wear without it being technically perfect. Other interviewees said sewing classes are too much of a commitment for them, and they would like to sew whenever they have some spare time. Next to this, these classes are often expensive and require the participants to walk through a standard program that does not allow them to make what they want.

Sewing patterns

beginning sewers often lean on widely available commercial sewing patterns (fig. 6). Although learning to use and understand these patterns is a valuable aspect of sewing, as they are the basis of all garments, they have numerous downsides. Sewing pattern sheets from magazines often look overwhelming and too detailed for a beginner; this is something that scares them off (fig. 7). Next to this, people often start sewing because convection sizes in store-bought clothing are too limiting. However, commercial sewing patterns usually also come in these convection

sizes, and altering them is considered too technical for a beginner. Another problem is that these patterns often assume that users have prior sewing knowledge. A beginner will constantly have to look up missing information. Finally, these patterns often require a lot of paper. A digital PDF sewing pattern can easily take up to fifty A4 pages that need to be glued together, a tedious task (fig. 8)

Online tutorials

Beginners often gravitate toward online tutorials to learn the skill (fig. 5). They aim at making specific items and leave little room for creativity and alteration. The sewer usually has an idea of what they want to make, and finding a fitting tutorial can be a struggle. Next to this, they only support one size or body shape.

These struggles can disrupt the joy of making and do not give the users the right handles to learn. A beginner usually ends up in a frustrating trial-and-error process of creating, failing, and learning. Failing and making mistakes are important and inevitable aspects in a learning process and so this cycle will eventually result in a skilled sewer. However, this project aims to design an intervention that makes

Fig 6. commercially available sewing patterns.
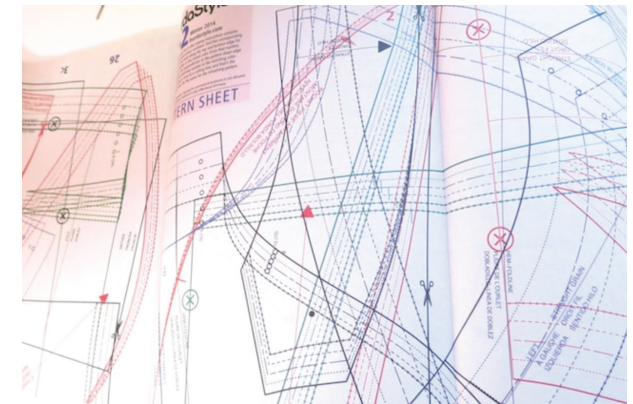
Fig 7. A pattern sheet in a sewing magazine.

Fig 8. Gluing together a digital sewing pattern.

Fig. 5 Sewing Tutorials on YouTube.

this process more smooth and enjoyable, through facilitating the user in their process of learning to sew. In this sense, the word facilitating has the definition of; making a process easier and more enjoyable.

1.3 Design goal & scope

The problem space is now presented; with the current tools available, users experience a learning process that is strugglesome and frustrating. Maki wants to facilitate this process. From this, a design goal can be distracted.

Design goal

With the problem space presented, the assignment for this project is to design a product-service system for Maki that empowers young people (20-30 years) interested in making clothing by facilitating the process of learning to sew. This product-service has to take a beginning sewer by the hand and create a safe and fun environment where they can grow in confidence and skill while they are making. This results in the following design goal:

"Facilitating the learning process of beginning sewers in making clothes."

Scope

The design goal can be met in many ways. There are, however, some factors that limit the solution space.

Maki aims to be a profitable and sustainable business; the final design has to fit Maki's business strategy to be viable. As of right now, Maki is an online platform that intends to stay online until it grows further. All designed solutions need to be online in the shape of an online platform (fig. 9).

In the past months, we gained some insights on how to best instruct beginning sewers in making a garment. We learned that detailed online instructions using text, video, and illustration are great for learning a new skill. It would be a waste not to use this valuable knowledge and so it can serve as a starting point for the design.

1.4 Set-up

A design goal was stated; facilitating beginning sewers in making clothes. In this section, the approach that was taken to meet this goal is discussed. Figure 10, presents an overview of this process. The different components of this overview will be discussed now.
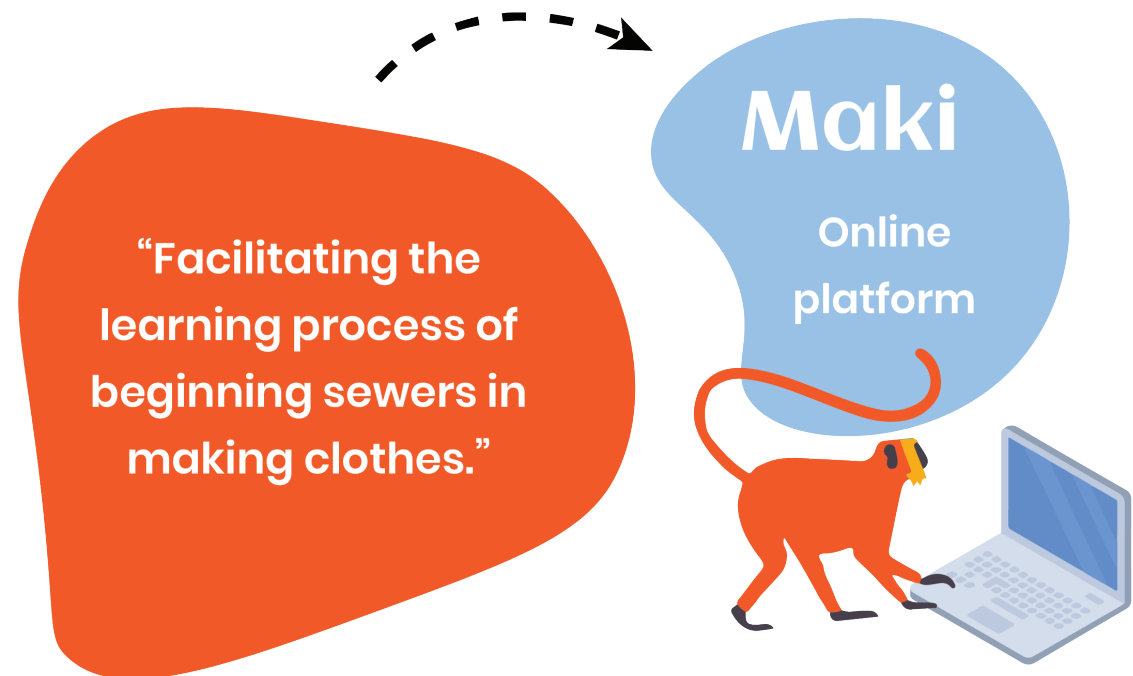
Fig. 9 The design goals and scope.
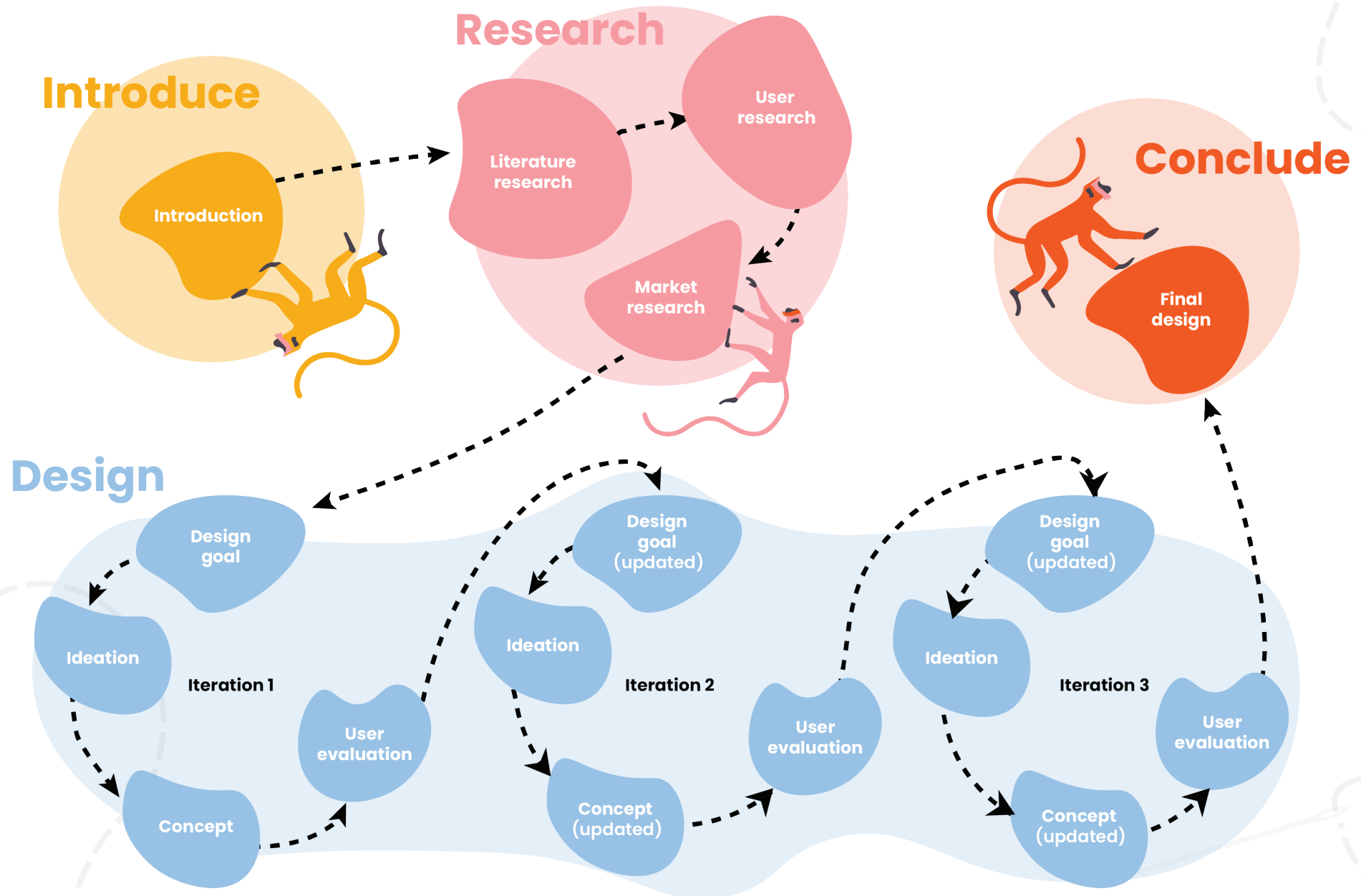
Fig. 10 Overview of the project approach.

Maki has done initial user research in the first phases, so there was already some understanding of a beginning sewer's struggles. However, we had not taken the time to go in-depth in understanding the root of these struggles and the underlying motivations and goals of the beginning sewer. Understanding why they sew and what they need is integral in designing a product service that serves the user's needs. For this reason, the project starts with a research phase (fig. 11)

Literature research

Through literature on relevant topics, an attempt can be made to understand why people want to sew, how they learn through doing, and what defines the attitude of a maker in the upcoming Maker Movement. As this movement is one of the reasons for this rise in young sewers, it is critical to understand where it comes from and what drives its partakers.

Research

Literature research
Why do they sew? How do they learn? What are the attitudes towards making in the maker movement?

User research
Who is the beginning sewer really? Where do they struggle? What drives them and what do they want?

Field research
What tools are already available for the beginning sewer and how can they inspire this design process?

User research

After the literature research, there will be theoretical image of the user. But is this really who the customer of Maki is? User research is conducted to get to know the beginning sewer and understand their journey and goals in sewing. What drives these young beginning sewers, what do they really want to get out of sewing, and does this correspond with what was learned in the literature research? The journey mapping method is used to visualize their journey and end goals and pinpoint the root of their struggles. The user research ends with an extensive user profile that portrays the wants and needs of the user. This can be leading in the design process.

Field research

Finally, the research phase concludes with field research on tools and research already available to the beginning sewer. Wonderful interventions exist that can be taken inspiration from for this project. With the insights from the literature and user research, we can determine how these interventions can be of use to this design process and where the existing solutions fail to meet the needs of Maki's user.

Iteration loops

With theoretical knowledge, a user profile, and interventions to take inspiration from, there is a clear understanding of the beginning sewer's needs. This can be guiding in an iterative design process. For this project, there was already a clear direction formed in the scope (Chapter 1.3; goal & scope); an online platform that facilitates the process of learning to make clothes. This is different from a design project that is more open-ended. With there already being a starting point, the design process can be structured using three iteration loops. Figure 12, shows an overview of such a loop.

Design

Insights gained

Design goal

Ideation

Iteration cycle

User evaluation

Concept
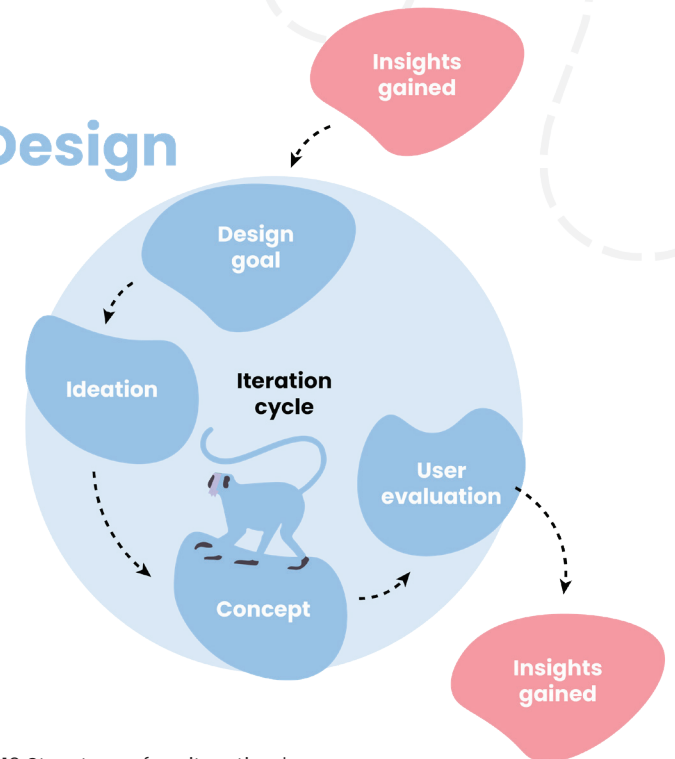
Insights gained

Fig. 12 Structure of an iteration loop.

A design process is a fluid process and dependent on new findings, inspiration and ideas. This means that for every iteration cycle, the design goal will be updated with the new insights that are gained.

After this, a session that generates ideas on how to reach the design goal of that iteration loop, is done. With these ideas, a concept will be formed (or improved upon) that will then be evaluated with users. This evaluation will decide the direction of the next iteration cycle. This ensures that the user input forms the foundation the design. In this way, the iteration cycles will build upon each other until a well-rounded concept is formed.

Research
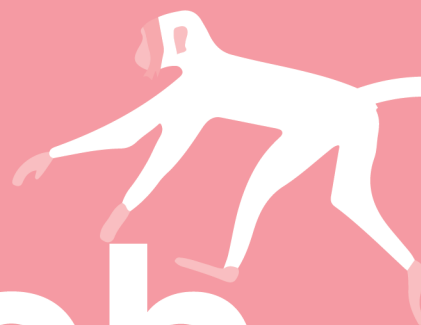
2 Literature research

Discovering the needs and motivations of a sewer.

This chapter presents literature research to form a theoretical understanding of a beginning sewer's needs. This research aims to understand their attitude toward making and sewing, understand how they learn, and in what environment they thrive. Four relevant topics are discussed. The rise of young sewers can be explained with the upcoming Maker Movement. This chapter starts by looking into this movement and finding the motivations of these makers (in this case sewers) that partake in it. Since the design goal is to facilitate the learning process of sewing and this is often learned through doing, relevant research on learning by doing is reviewed. Finally, the topic of makerspaces is presented to see in what environment a beginning sewer can thrive.

The chapter will end with an overview of the mindset, motivations and needs of a maker composed by literature. This can inspire the design process and form a base for the user research. Finally, the most important insights for the project are summarized in an overview.

2.1 Research question

The literature research aims to understand the needs of a beginning sewer, the main research question was posed:

What does a beginning home sewer need to learn how to sew?

To answer this question, it is necessary to create an understanding of whom these sewers are, what motivates them, and how they learn. To achieve this, four topics are reviewed: The Maker Movement, motivations for sewing, learning by doing, and maker spaces. Four sub-research questions are stated:

1. Who is the "maker" in the Maker Movement?

2. What are the motivations for a maker to sew?

3. How to best facilitate this maker in the process of learning by doing?

4. What is necessary to build an "online maker space"?

By answering all these question, we will be able to answer the main research question.

2.2 The Maker Movement

This section will answer the first sub-research question: Who is the maker in the Maker Movement? To achieve this, the section starts with explaining what the Maker Movement is about.

What is the Maker Movement?

The Maker Movement dates back to 2005 when the "Make Magazine" first appeared and used the word "maker". In the past years, the Maker Movement has grown immensely due to the rise of social media (Halverson & Sheridan, 2014). It is starting to integrate into most school systems for learning complex 21-st century skills.

Lee (2005) described The Maker Movement as a community of hobbyists, tinkerers, engineers, hackers, and artists. It builds on the ability of an individual to create or make things (Papavlasopoulou et al., 2017). Wyld and Dierking (2013) emphasize that the goal is the personal pleasure of figuring out how things work.

The Maker Movement focuses on STEM subjects (science, technology, engineering, and math) in most literature research. However, the more traditional practices such as sewing, cooking, or calligraphy fall under the movement as well and gain popularity for various reasons.

Through the development of digital fabrication tools and online platforms, the Maker Movement could take off. These platforms made sharing ideas, knowledge, designs, and feedback more effortless than ever. This collaborative approach where makers build upon the work of others is at the foundation of the Maker movement (Lee, 2015).

One of the many reasons the Maker Movement is gaining popularity is its use in complex skill learning such as coding and building electrical circuits. Learning through making is an excellent way to learn a new skill. Dougherty (2011) states that the "most important thing about DIY [or making] is that it portrays the idea that you can learn to do anything."

In the research done by Susmitha et al. (2018), principles of the Maker Movement were introduced to a classroom. The study showed that when a student is presented with a challenge to make or design something, rather than learning from a book, their perceived self-efficacy is higher. Next to this, they have a broader understanding that there are multiple ways to solve a problem.

This gained self-efficacy results in more confidence, enjoyment, and interest in a topic (Katterfeld et al., 2015). The Maker Movement creates a beautiful space for learning and is therefore starting to be widely integrated into our educational systems.

The Maker Mindset

But who are these people in the Maker Movement, and what drives them to join? Kalil (2013) describes these makers as "people who design and make things in their own time because they find it intrinsically rewarding to make, tinker, problem-solve, discover, and share what they have learned."

According to Lee (2015), there are shared values, beliefs, and dispositions in the maker community. Dougherty (2013) described this mindset that is characteristic of a maker. He assigned the mind of the maker four attributes:

Playful

Dougherty tells us that even though the technological advances in digital fabrication play a part in the movement's rise, the heart of the movement is still the need for experimental play. Gerschenfeld (2005) noticed that the students who showed up for his workshop "How to make anything?" did not have any professional goals but showed up for their pleasure within the freedom to creatively experiment. The research underlines that fun, playful activities create intrinsic motivation (Vansteenkiste, et al., 2004).
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Asses and growth-oriented

Dougherty (2013) describes the maker mindset as a "growth mindset that encourages students to believe they can learn to do anything. This ties in with the research of Susmitha, et al. (2018), where after students were exposed to the movement, they felt there were multiple ways to solve a problem, and they felt capable of doing so.

This growth mindset is when students see intelligence as something that can be trained and grow. Intelligence is then not a fixed constraint. Failure simply means more effort is needed to succeed and is not a reason to disengage (Lee, 2015).

Failure is positive

In the mind of the maker, failure is celebrated. Unlike beliefs in traditional school systems, failure seems to be a need to reach the goal of being successful. "Failure is always an option" is a famous phrase in the community (Lee, 2015).

According to Petrich et al. (2013), becoming stuck and then unstuck is at the heart of tinkering. Their research found that these moments were the moments the tinkerers remembered best and were critical factors in finding the solution.

Collaborative

At the core of the Maker Movement is a strong sense of collaboration. The Maker Movement can be described as a "knowledge building community" where each individual builds upon the work of others (Scardamalia & Bereiter, 2006). This is different from the traditional classroom environment, where a sense of competition and replication is present. The Maker Movement allows people to feel a strong sense of community and feedback.

Conclusion

To conclude this section, the sub-research question will be answered:

Who is the "maker" in the Maker Movement?

A maker is a person who finds it intrinsically rewarding to create. The maker has a maker mindset that influences the maker's actions. They thrive when there is room to play and experiment. They understand that failure is necessary to grow and have a sense of self-reliance; "I can learn how to do anything." Collaboration and sharing are essential to the makers in the community; they use it as tools to learn.

This gives us an excellent overview (fig. 13) of what is going on inside the maker's mind:
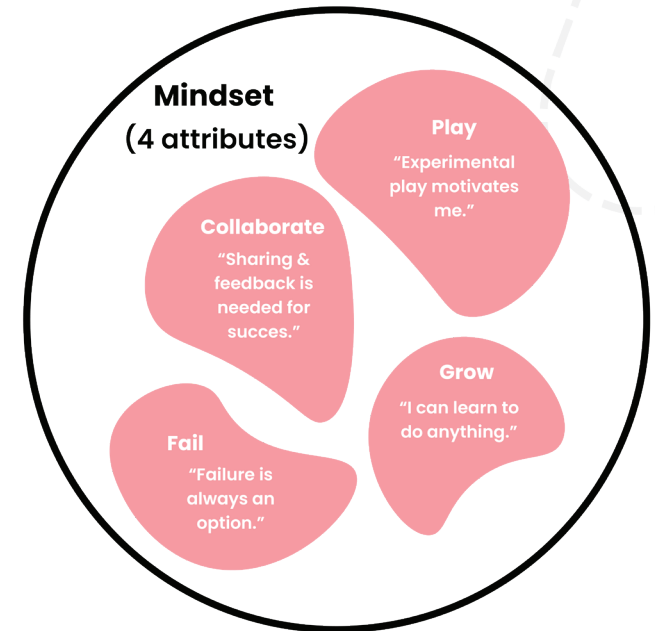
Fig. 13 The characteristics of the maker mindset.

2.3 Motivations for sewing

This section will attempt to answer the second research question: What are the motivations for a maker to sew?

Understanding why they sew

The research of Martindale and Mckinney (2017) focuses on understanding the reasons to sew your garments in a consumer culture dominated by fast fashion. Why is home-sewing gaining popularity again?

She interviewed women between the age of 20-and 40 who were found in Facebook sewing groups and asked them about; their reasons for sewing, feelings attached to the skill, reactions of others, and their sewing-related consumption.

The number one reason these women sew was simply personal fulfillment that they did not experience in other aspects of their lives. Sewing gives them creative satisfaction, stress relief, and a sense of accomplishment (Martindale & Mckinney, 2017). Kalil (2013) describes makers as "people who design and make things in their own time because they find it intrinsically rewarding to make," which ties in with this sense of personal fulfillment. However, besides personal fulfillment, she found three other returning themes that drive motivation: investment, control, and empowerment.

This information led to developing a model that captures the motivations for sewing when making a new garment. At the core is personal fulfillment. However, through making the garment, the user goes through different stages with different motivational drivers (fig. 14):

Investment phase: *The sewer invests in learning a new skill. The women invested money, cognitive effort, and time in making their clothes, which shows their devotion to the skill. The research showed that the more they invested, the more they became committed to the craft. This investment then starts to work as a motivational driver.*

Control phase: *Within making the garment, the women perceived a sense of control in making what they wanted to wear. They were able to reflect higher levels of self-expression through creating their garments. They have decided to sew the garment instead of buying it. According to the interviews, the factors that contribute to the decision to sew the garment are; time, selection, quality, fit, and price.*

Empowerment phase: *After the control phase, the sewers go to the empowerment phase. They pride themselves on the ability to sew and the feeling that developed from the amount of control they have over their appearance. This empowerment results from confidence in the skill, appearance, positive feedback from others, and a sense of belonging to a community of sewers.*

This model explains why people keep making their clothing. However, the following question remains; Why did they want to learn how to sew in the first place? The answers were varied, resulting in multiple answers to this question, among which:

-Needing a hobby to prevent boredom or fill excessive leisure time.

-Encouragement of others.

-The observation of others that were sewing in real life or online.

-They grew up sewing and were inspired by family members.

-Access to the internet (mostly YouTube and Google are used in learning to sew).

-Classes inspired them to sew at home.

-The access to sewing patterns (primarily print-at-home PDF patterns with clear explanations).

Conclusion

With this information, the sub-research question can now be answered: What are the motivations for a maker to sew?

The motivation for a maker to sew is multifaceted, but the answer revolved around three themes: investment, empowerment, and control.

However, the overarching reason to sew is personal fulfillment. Sewing gives a sense of accomplishment, is beneficial for stress relief, and is a creative outlet. The motivations are presented in the model below (fig. 15):
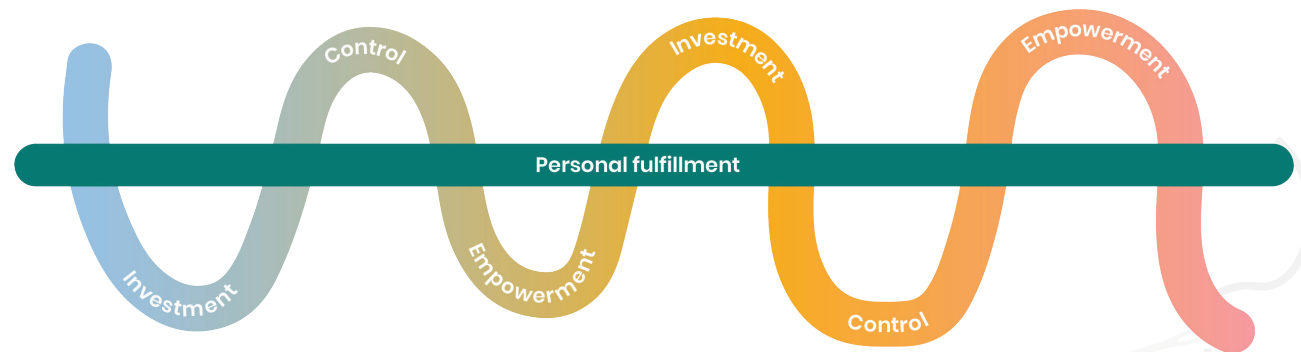

Fig. 14 Model: Motivation for sewing (Martindale & Mckinney, 2017).
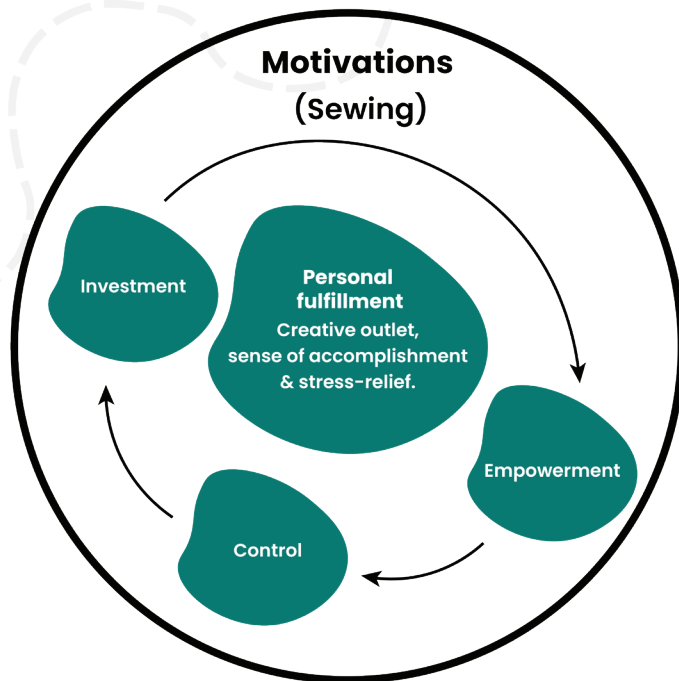
Fig. 15 Motivations in sewing.

2.4 Learning by doing

Now, an understanding is formed on how the maker thinks, why it makes, or more specifically why it sews. However, to best facilitate a maker in learning a new skill, it is important to understand the mechanisms behind their way of learning; learning by doing. In this section, the third research question will be answered: how to best facilitate this maker in the process of learning by doing?

The theory of learning by doing

Learning by doing, or experiential learning, is the process of learning through reflecting on experiences. It is the most practical way of learning a hands-on skill such as playing an instrument, or in this case, sewing. But before it can be understood how to facilitate this, the underlying theories need to be clear. The theories at the root of learning by doing are Papert's Constructionism and Kolb's experiential learning.

In Kolb's article, Experiential Learning: Experience as the Source of Learning and Development (1984), he describes learning by doing as a continual process. He captures the process into a cycle of experiencing, reflecting, understanding, and repetition (fig. 16).

The cycle starts with a person having a concrete experience in the real world. They then reflect on this experience. After this reflection, the person begins to draw conclusions and experiments with solutions in their head in the Abstract conceptualization stage. In the last step, the solutions are tested through Active experimentation, where the person tries out the answer in the real world, leading to a new concrete experience.

To facilitate this process, Kolb describes four learning styles. According to Kolb, every person has a preferred learning style. Two variables result in the learning style someone prefers. The first is how someone approaches a task (Processing Continuum), and the second is how someone responds emotionally (Perception Continuum). As stated by Kolb, thinking and feeling cannot happen simultaneously, so our learning style results from these two variables. Placing these variables on two

Fig. 16 Kolb's learning cycle (Kolb, 1984).

Fig. 17 Learning style matrix (McLeod, 2017).

axes results in a matrix that shows us four learning types (McLeod, 2017) (fig. 17):

With the information learned in Chapter 2.2; The Maker Movement; makers are "accommodating learners". The accommodating learning style is hands-on. These people heavily rely on their intuition instead of logic. They prefer using an already made analysis and thrive by taking an experimental approach. They need new experiences and challenges.

Furthermore, they learn through feeling and doing. They have a strong sense of intuition and find solutions through experimentation. Kolb claims that to assist the accommodating learning style in a leaning process, it is important to allow room for creative conceptualization and experimentation. Instead of just handing over the problem's solution, a learning platform should aim to have the student think of creative solutions and build the scaffolding to facilitate this process. The student is allowed to learn what works and gets to follow their intuition in a process of trial and error. This experimental approach can help with a sense of self-reliance in future challenges.

Constructionism

The theory of Constructionist learning, described by Papert in 1980, tells us that learning is most effective when tangible objects are made in the real world (Papert, 1980). This theory underlines the need for an experimental approach. His view mentions the necessity of replacing the traditional role of the teacher as a lecturer with being a facilitator of this creative experimentation (Papert & Harel, 1991).

Conclusion

With this information, the third research question can be answered: How to best facilitate this maker in the process of learning by doing?

Looking at the theories above, Kolb teaches us that the maker, with his accommodation learning style, needs to have the space to creatively experiment in finding his solutions and that a learning platform could focus on building the scaffolding to facilitate this process.

Learning (Accommodating)

Build the scaffolding for a creative process.

Do not lecture users but facilitate them.

Room for creative experimentation & discovery are important.

Fig. 18 Needs for learning.

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Papert tells us that this process of learning by doing should have a learning platform facilitating this creative process instead of lecturing solutions.This information is summarized in the overview in figure 18.

2.5 Environments for making

The rise of digital fabrication tools led to so-called "Makerspaces" or "Digital fabrication labs." They are places where people are allowed to explore and discover. In these spaces, makers have access to digital fabrication tools and work simultaneously on varying projects. These spaces give individuals an incredible toolbox with materials, different fabrication methods, social interaction, and expertise from multiple backgrounds, creating a vibrant community (Leben, 2015).

Since Maki is an online platform, the final design should also be online. It is interesting to discover what aspects of makerspaces could be translated to an online environment. The last sub-research question is answered in this section: What is necessary to build an "online maker space"?

Experiential learning

In a makerspace, makers learn from experiential learning. This is often done by mimicking someone else and learning through doing the activity. In makerspaces, people often help each other by sharing skills. Online this can be done with multimedia learning. With the rise of faster interne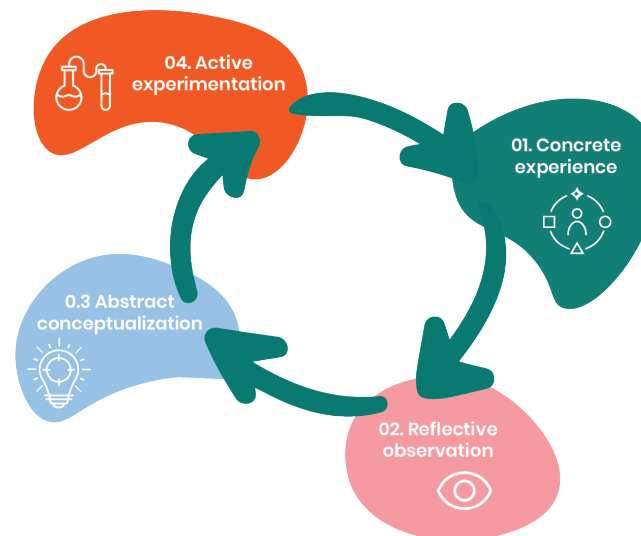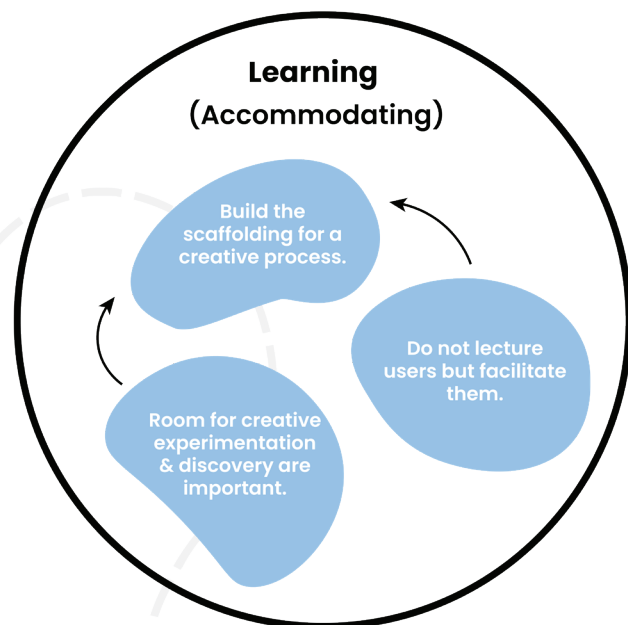t and compressible digital media, learning platforms can now use audible, visual, and real-time interactions for the user that enrich the learning experience (Gümüs & Okur, 2009). In the research of Zhang et al. (2006), it is stated that the use of interactive video in an online environment achieved better learning performances than in any other setting. Learning platforms that use instructional videos to teach, such as Skill share, underline this. This also explains why the first sewing patterns from Maki with steps in video, illustrations and text, were appreciated by users.

Collaborative knowledge sharing

Fields et al. (2015) emphasize that collaboration supports learning through the exchange of ideas and mentoring and eventually leads to deeper levels of engagement. In this regard, platforms such as StackOverflow are considered the holy grail for programmers. The platform enables them to ask questions, share pieces of code and build on the work of others. In this way, a community flourished that actively helped each other with their projects. This open-source sharing of knowledge from different expertise levels, is essential in building an online maker space.

The simultaneous working on projects

An important aspect that is different from real-life maker spaces is social interaction. Researchers have focused on achieving this sense of social presence in online learning environments. Social presence in online learning leads to students experiencing greater satisfaction and perceived learning. Next to this, it fuels motivation to participate (Mazzolini & Maddison, 2007), strengthens persistence (Berger & Milem, 1999), and boasts a student's performance (Hughes et al., 2008).

There are multiple ways this social presence can be increased in online environments. Kear et al. (2014) found that when learners have personal profiles with pictures, it strengthens a sense of connection among learners. Andel et al. (2020) researched the effects of being able to comment with text and emojis during an online educational video and learned that this strengthens the sense of social presence. This is in line with the findings of Swan (2005), who argues that online discussions on a discussion board can also strengthen this.

Biasutti (2011) interviews students after having an online course on music education. He found that collaborating, comparing ideas, and sharing knowledge and skills to support each other, are all related to satisfaction in the student's mind.

When building an online makerspace, building this sense of social presence is essential. This can be done by making personal profiles, giving the ability to comment, and showing the work of the makers to inspire others.

Creative exploration

In a makerspace, the freedom to explore creatively is significant. This fuels the intrinsic motivation of the maker (Vansteenkiste, et al.,2004). There are no instructions on how to do things in a makerspace; there is just learning through discovery. Platforms such as Thingiverse allow users to share their digital fabrication files. The platform inspires creative exploration by giving people the ability to comment on how they used the files for their projects and how to optimize them. Further exploration of the material is stimulated. In this way, Thingiverse provides a place where mashups and derivatives of projects can grow.

Conclusion

With this information, the sub-research question can now be answered: What is necessary to build an "online maker space"?

There are four aspects that are driving the success for the makerspaces. These are the room for experimental learning, collaborative knowledge sharing, simultaneous working on projects and creative exploration. For each aspect, it is explained what is necessary to obtain the benefits in an online environment.

Stimulating experiential play can be done by using multimedia learning and real-time interactions. Video is a great tool to explain.

Stimulating collaborative knowledge sharing can be done by letting users share what they have made and the insights they had during the process.

Social presence can be stimulated through making personal profiles, the ability to comment, interact with each other, and showing the work of other makers to inspire.

Finally, **creative exploration can be stimulated** by letting users make their own decisions in how and what they make, and acting as a facilitator in a creative process, instead of lecturing a particular set of instructions.

This leads to the following overview (fig. 19):

Environment
(Online makerspace)

Experiential learning

Using multimedia and real time interactions.

Collaborative knowledge sharing

Sharing work, insights and results.

Social presence

build personal profiles, Interact & comment.

Creative exploration

Facilitate the creative decisions of the maker.
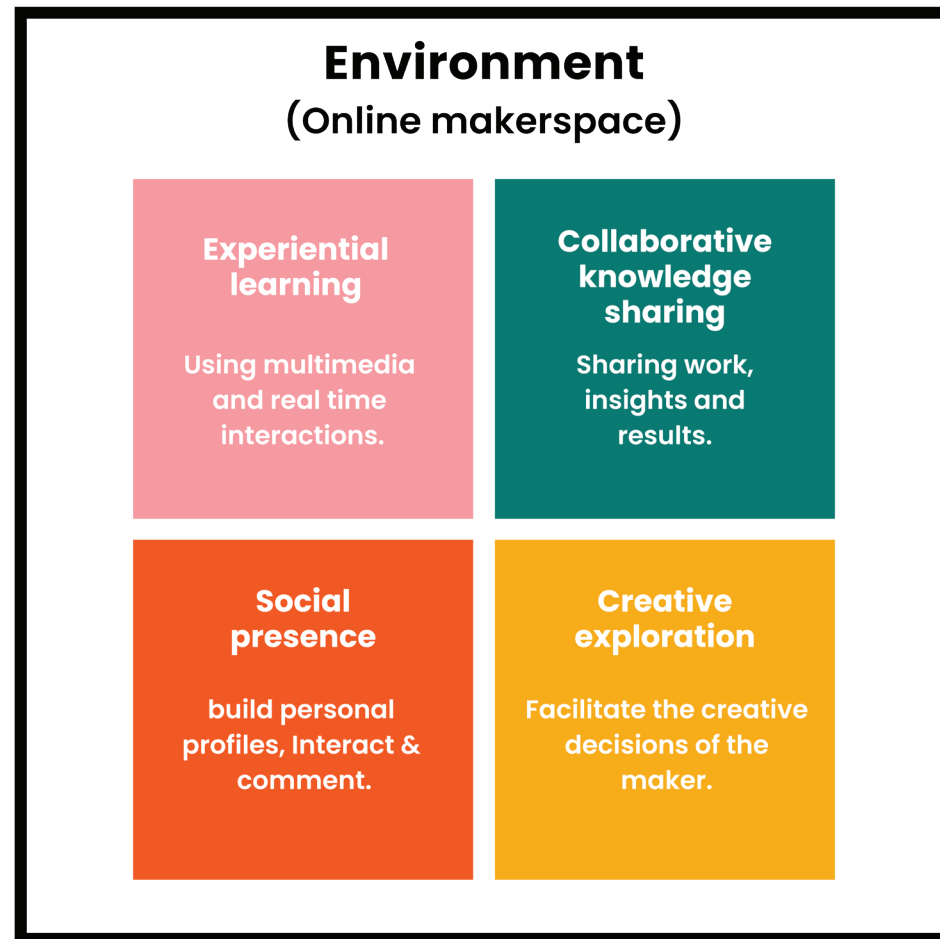
Fig. 19 Requirements for an online makerspace.

2.6 Conclusion: An overview of the maker

After diving into the topics discussed above, the literature research can be concluded by answering the main question: What does a beginning home sewer need to learn how to sew?

To answer this question an overview is made of the needs, mindset, motivations and preferred environment of the sewing maker. This can be found in figure 21. The components will be discussed and explained in further detail now.

Valuable insights about the sewing maker were obtained. A maker is motivated through experimental play. They believe they can learn to do anything, that failure is an option, and that collaboration is needed for success (Dougherty, 2013).

A maker finds it intrinsically rewarding to make (Kalil,2013), and they end up with a sense of joyful discovery. The maker is motivated to learn how to sew for various reasons, such as inspiration from others or simple boredom. However, the maker keeps motivated due to three themes; investment, control, and empowerment. The overarching motivation is simply finding personal fulfillment that they do not get from other aspects of their life. Sewing offers a stress-relief, is a creative outlet, and gives a sense of accomplishment (Martindale & Mckinney, 2017).

The maker's mindset fits an accommodating learning style described by Kolb (1984). Makers have a strong sense of intuition and learn through experimental play and having the creative freedom to find their own solutions. Papert (1980) tells us that learning platforms should facilitate this creative exploration for an optimal learning experience.

To create a learning platform that shares the success of a makerspace, four aspects that determine the success of these environments are outlined:

experiential learning, the collaborative sharing of knowledge, the simultaneous working on projects, and room for creative exploration (Leben, 2015).

In the literature research, some valuable insights for this project were gained. To learn, makers need to be facilitated in a creative process. The scaffolding for such a process should be offered to the maker. Furthermore, knowledge was gained about the maker mindset and how it thrives in a makerspace where experiential learning, collaboration, and creative exploration are the drivers in success. These aspects should be implemented in an online platform to resemble the benefits of a makerspace. All the insights valuable to the project are summarized in the overview in figure 20.
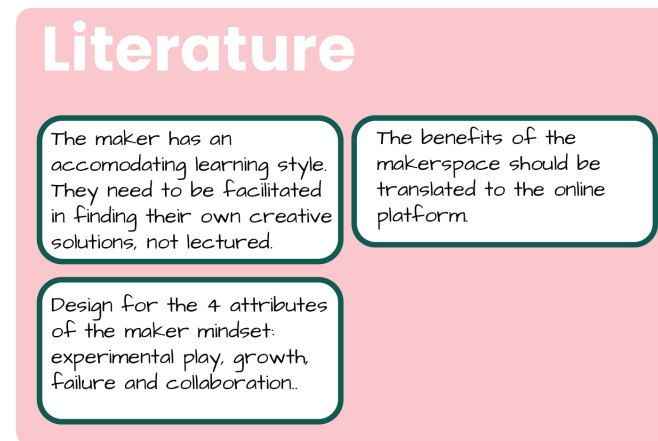
Figure 20 Takeaways from the literature research.

Learning
(Accommodating)

Build the scaffolding for a creative process.

Do not lecture users but facilitate them.

Room for creative experimentation & discovery are important.

Motivations
(Sewing)

Investment

Personal fulfillment
Creative outlet, sense of accomplishment & stress-relief.

Empowerment

Control

Environment
(makerspace)

Experiential learning
Using multimedia and real time interactions.

Collaborative knowledge sharing
Sharing work, insights and results.

Social presence
build personal profiles, Interact & comment.

Creative exploration
Facilitate the creative decisions of the maker.

Mindset
(4 attributes)

Play
"Experimental play motivates me."

Collaborate
"Sharing & feedback is needed for succes"

Grow
"I can learn to do anything"

Fail
"Failure is always an option"

The (theoretical) sewing maker

Fig. 21 Overview of the mindset, motivations, needs and preferred environment of a theoretical sewing maker.

3 User research

Getting to know the beginning sewer and their journey.

In the last chapter, literature stated what motivates a maker, what they need to learn, and what environment benefits them; a maker needs to be facilitated in a creative learning process of independent learning and has a maker mindset that thrives in makerspaces. However, user research is the best way to get to know a beginning sewer and to find out if the insights from the literature research can be confirmed.

In this chapter, more will be discovered about the journey of the user, their goals, and struggles in sewing. The chapter will start with a questionnaire used to get some first insights. After this, a few participants are selected to do more thorough follow-up interviews where the method of journey mapping is used to explore their sewing journey so far. To conclude the user research, a user profile is drawn up with the gained insights.

3.1 Questionnaire: Why do they sew?
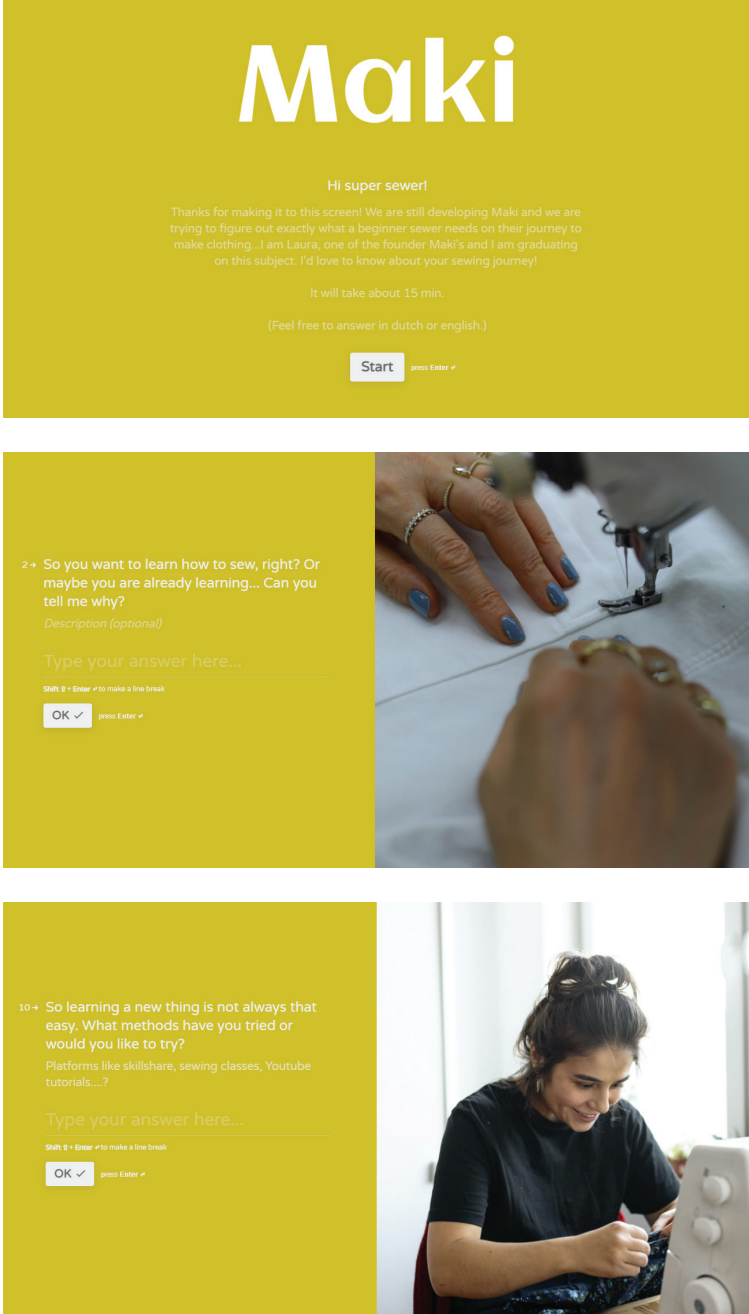
A questionnaire was conducted to start the user research (fig. 22). It was decided to start with a questionnaire because it is an efficient way to get some first data. Next to this, the questionnaire could help in screening participants for further follow-up interviews. With Maki having quite some traction on social-media, 19 subscribers of Maki (also referred to as Maki's) had signed up through Instagram to fill in the questionnaire.

These Maki's are young beginning sewers. The questionnaire was meant to get first data on why they wanted to learn how to sew, what they had tried so far, and what their goals are. All the questions were open-ended to really allow the participants to explain their motivations and reasoning. The questions of the questionnaire can be found in Appendix A.

Analyzing

The answers to each question were analyzed by looking for similarities and forming categories. The categories were color-coded and counted. For example, the reasons for sewing that had to do with sustainability were made green and the reasons that had to do with personal style were made red. The complete analysis and conclusion for each question can be found in Appendix A.

In figure 23, an overview of the results is shown. As the results were surprising in some aspects, they will be explained in further detail together with what they mean for the project.

Fig. 22 Questionnaire for user research.

Reasons for sewing
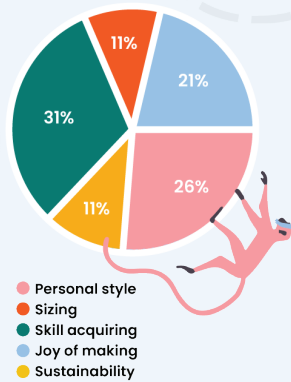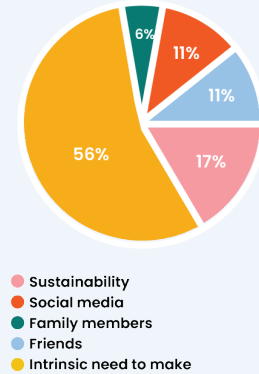
- Personal style
- Sizing
- Skill acquiring
- Joy of making
- Sustainability

(11%, 21%, 26%, 11%, 31%)

Sources of inspiration

- Sustainability
- Social media
- Family members
- Friends
- Intrinsic need to make

(6%, 11%, 11%, 17%, 56%)

Need for creativity

- Copy / paste
- Alterations
- Own design

(26%, 16%, 58%)

Methods of learning

- Online tutorials
- Instructions sewing patterns
- Asking an expert

(76%, 6%, 18%)

Goals and expectations

- Basics
- Fitting items
- Tailored items

(70%, 10%, 20%)

Ideal way of learning

- Class/ workshop
- Combination
- Alone

(32%, 26%, 42%)

Fig. 23 Results questionnaire
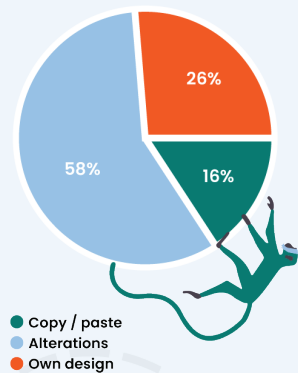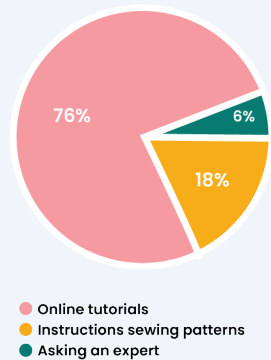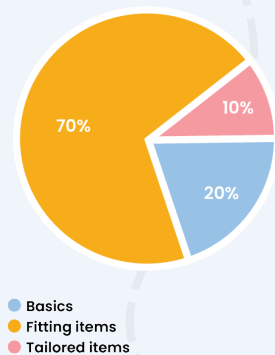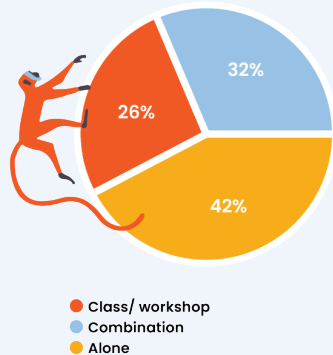
The questionnaire revealed there are multiple reasons for a user to start sewing such as; wanting to make clothing in a personal style, having sizing issues with convection sized clothing, wanting to be more environmentally friendly and simply the joy of making. When looking at the research of Martindale and Mckinney (2017) as presented in Chapter 2.3; Motivations for sewing, these reasons indeed revolve around personal fulfillment, investment, control and empowerment. E.g empowerment is found in making clothes in your style, control is found in making clothes that truly fit your body, and personal fulfillment can be found in the joy of making.

The source of inspiration in sewing was often a family member. However, seeing other people sew online was also a form of inspiration. This is seen in makerspaces as well, seeing others make is inspiring.

Considering the goals and expectations of the beginning sewers, they mainly wanted to make clothing that truly fit them. Most beginners had the goal of making simple garments and not highly tailored items. The goal of making fitting clothing is different from the goal Maki initially believed users would have; learning how to sew. This is interesting as it could change the purpose of the platform. They wanted to make items they could wear in everyday life, an important insight as this can determine what the users will make with Maki and what it is exactly that Maki should facilitate.

Surprisingly, when asked how much creativity users would want, multiple users said they want to learn how to draft their own patterns, so they could make their own designs. In earlier stages of Maki, we always assumed users did not want this as this would be too technical. Answers from this interview did show they were intimidated by the process of pattern drawing; "I'd love to design, but pattern making is a whole other level". To make it simpler, they expressed the need to alter existing sewing patterns

instead. They wish to have control over what they make and how it looks. Users realize that pattern drawing gives this freedom, and therefore it becomes a desired skill to have.

This insight reminded me of a personal anecdote that can help understand the situation. Something my mentor used to say to me during an internship at an electrical engineering department was: "to truly have the freedom to create anything you want, you must first commit to building the necessary knowledge and skills". He told me how he first had to learn a lot of boring, technical, engineering skills and knowledge before he could start to get creative within electrical engineering and that is where it became fun. He was happy he made that investment, as he could now create almost anything. He told me that the trick was to make the process of learning as enjoyable as possible.

For pattern drawing this might work the same. Only through learning to pattern draw and understand the basics of this craft e.g how a 2D shape translates to a 3D garment and how technicalities as seam allowances and darts are added, will you be able to make any type of garment and truly have creative freedom. Since Maki is there to facilitate the user in making their own clothing, Maki could aim to facilitate this process and make learning these technicalities easier and more fun, so they will be able to make anything they want in the future.

When asked about how they have been learning to sew, most users mentioned getting help from family members before resorting to online tutorials or books. This seems to confirm the accommodating learning style that makers prefer, as discussed in Chapter 2.4; Learning by doing. They like to try things themselves, and get help when they are stuck. Family members can give them personal

advice and therefore facilitate their learning process better than an online tutorial or sewing books. When asked how users wanted to learn, this also came forward. Most preferred learning independently, but desire getting personalized help when necessary.

Some interviewees also mentioned to want some level of collaboration. These aspects seem to meet some requirements of the makerspace. Working independently, but having the ability to collaborate and share knowledge. This collaborative aspect will be interesting to explore for Maki.

The data from the questionnaire confirmed some takeaways of the literature research, and gave some valuable insights for Maki. It will be interesting to get to know the beginning sewer even further. What is the journey they have had so far?

3.2 Journey mapping: What is the journey of a beginning sewer?

Now we have learned more about why beginning sewers start, what they want to make and inspires them, we can dive into the journey they have had so far. For this, 10 participants were selected that had filled in the questionnaire, based on their answers. It was decided to focus on users that gave surprising answers, such as the desire to learn pattern drawing, as it would be important to understand this better.

For these interviews, the method of journey mapping was used. A journey map is often used in design to understand a user's process. It is a visual representation of a process on a timeline that leads to accomplishing a particular goal.

For this journey map, the focus was for users to explain the process of creating an item they had made in the past. This journey map can help them remember specific actions and struggles they otherwise would not have brought up. Next to this, it served as an ideal structure for a conversation. The journey map had the goal of answering the

following questions:

Why did they start sewing?

What did they make?

What tools have they used?

Where did they find enjoyment or frustration?

When did they feel confident?

Can the maker mindset be found?

What are their goals in sewing?

A template was designed that walks through all of these questions while the user is filling in the journey map. The interviews were online and so the template was shared on the screen of the user. Together with the interviewee, the template was filled in. The template and how it was built up, is dicussed in Appendix B. An overview is given in figure 24. The resuts will be discussed now.

Analyzing

The template used during the interview proved to be a helpful tool in getting as much information out of the participants as possible. The templates had the role of a facilitator during the conversations more than something that "had" to be filled incorrectly. Each participant had their interpretation of what a step is or what confidence means to them. The most important thing was that the template got them to think deeper about their reasoning and actions, resulting in interesting quotes. The filled-in templates can be found in Appendix B.

The templates were analyzed using the questions asked in the beginning. Relevant quotes and data that served as answers to the questions were taken from the templates. These were then divided into categories of similar answers, and conclusions were drawn for each question. This analysis can be found in Appendix B.

Fig. 24 Filled in Journey maps.

Results

The results will be presented as answers to the questions posed above.

Why did they start sewing?

The are multiple reasons for Maki's to start sewing. The 6 reasons below were mentioned most often (fig. 25). Users gave similar answers as in the questionnaire. The reasons for sewing are divided but revolve around personal fulfillment, control and empowerment.

Reasons to sew

Family & friends inspire me

"My mom inspired me to start sewing."

Sustainability

"Sewing things yourself is more sustainable."

Need for a particular item

"I wanted to make my entire wardrobe so I could make things I really like."

Making is nice

"Making something is just really cool "

The value of home made

"Stuff that I have made has more value."

Fig. 25 Reasons to start sewing.

What do they make?

All make their own ideas

A pattern is seen as a base for their own ideas.

Start with non-wearables

They often start with pillows & pencil cases.

Loose fitting items to start

Often skirts & dresses.

Fig. 26 Items made by Maki's.

What did they make?

Interestingly, none of them made a ready-to-make pattern without any alterations. Most had a vision for something they wanted to make and searched for a pattern that could serve as a base for this. This confirms the data in the questionnaire. Users are not looking to copy/paste as Maki had initially believed. They have their own ideas and need this creative freedom to make what they want.

In the early beginning of sewing, participants often opted for non-wearables such as pillows and pencil cases. Very tight-fitting or tailored clothing still intimidates them. When they did start making wearables, they began with loose-fitting items, such as skirts and dresses (fig. 26).

How do they learn?

Most of the participants learned the basics of sewing from others, such as their parents or grandparents. Some of them also followed live sewing classes for a while. After this, they resort to a trial and error process and use YouTube tutorials and books with sewing techniques as supportive tools (fig. 27). This again shows the need to learn independently and to find their own solutions first. Maki can make sure this process of independent learning is not disturbed, but facilitative by offering a scaffolded learning environment.

How do they learn?

They learn from others

They often had live sewing classes or family teach them.

Trial and error

They embark on a trial and error journey and learn through doing.

Tutorials and book

Tutorials and books are used as supportive tools.

Fig. 27 Supportive tools used.

Where did they find enjoyment or frustration?

There were multiple aspects of the sewing process that were enjoyed (fig. 28). Most of them enjoyed the anticipation before a project. Thinking about what they are going to make and what it will look like gives them a sense of joy. This again ties in with users wanting to have as much control over what they are making as possible. The creative process of figuring out what to make is enjoyed.

Most participants mentioned they enjoyed gaining new skills. They felt prouder when they were successful in activities they had not done before, which made them more fun to do. This shows some a first sign of this "growth attribute" of the maker mind as discussed in Chapter 2.2; The Maker Movement.

Most of the other activities described as fun were the ones that were strongly result-focused. Finishing a seam or sewing two main pieces together that led to really seeing the garment form.

Aspects that led to a lot of frustration in the process were the more technical skills that require strict rules to be followed to be successful (fig. 28). These were the skills that are hard to figure out with just trial and error, such as inserting zippers and making buttonholes. Participants mentioned they had to be patient in figuring out how this worked. They were perceived as so technical that there was no more fun in doing it. However, when they completed such a task, they did feel more confident afterward. Maki could focus on facilitating these technical tasks so that unnecessary frustration is taken out of the process but the feeling of achievement remains.

What do they enjoy?

The anticipation

They enjoy thinking of creative ideas and how the project will look like.

The sewing

Sewing was mentioned to be peacefull and mindfull. They can get in a flow.

Technincal skills

The more technical stuff (buttonholes, inserting zippers) is not considered fun.

Discovering new things

Learning new things was enjoyed. They felt more proud when they did something new.

Mistakes

All of them made a mistake at some point. This frustrated them but did not surprise them.

Creating results

It was often mentioned that tasks that lead to a clear result are enjoyed more.

Fig. 28 Enjoyment and frustrations.

When did they feel confident?

Overall the participants were confident that they could figure out anything they came across. The "growth" attribute of the maker mindset as discussed in Chapter 2.2; The Maker Movement, is confirmed here; the user feels they can learn to do anything. They all challenged themselves to do something they did not know precisely how to do yet, but they had a sense that by just trying it, it would be okay. They all made mistakes while making a garment, but most accepted it as part of the project. This confirms the acceptance of failure that is found in the maker mindset. Whenever the insecurity got too high, they would make a mock-up (test run, usually out of cheap fabric), to feel more confident when doing the actual step (fig. 29).

What are their goals?

Creative freedom

Most want the skills to make their own designs and the creative freedom to do so.

Making their own clothes

Making clothes is more important than the sewing itself.

Pattern drafting

Most want to learn to alter or draft simple patterns. It should not get too technical.

Fig. 30 Goals in sewing.

Quite confident

Overall participants were quite confident. They challengened themselves with every project but felt they could figure it out.

How confident are you?

Fig. 29 Confidence during the sewing process.
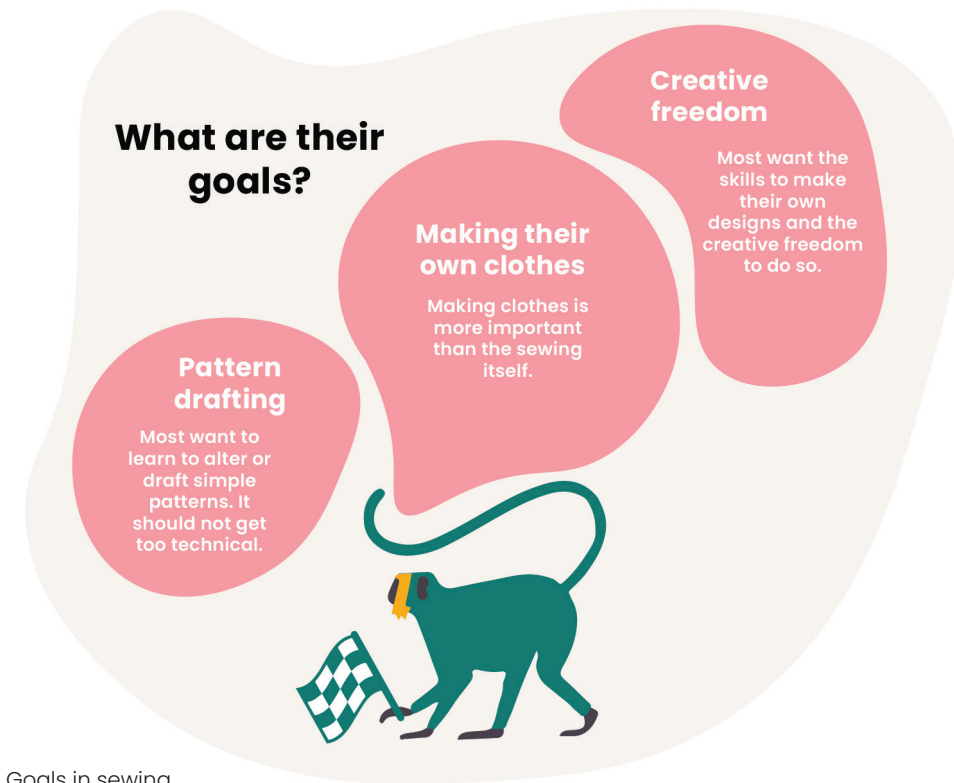
What are their goals in sewing?

Just like in the questionnaire, the participants want to learn how to make their own fitting clothing. Not necessarily how to sew. This is an important distinction, as one is focused on learning a technical skill where the other is result focused. Important to them is that these clothes fit well. They do not just want to copy/paste a commercial pattern. They have their visions and ideas about what they wish to make. When asking about this creative freedom during the interviews, it was mentioned that users do want some sort of baseline to start with. A complete white canvas might be too much creative freedom. This means Maki should provide some sort of base that the user could work from.

In the interviews, many participants again mentioned they wanted to learn how to alter patterns to their needs or draft simple patterns themselves (fig. 30). This can help them in creating the creative freedom they desire and making the pattern fit well. Maki should explore facilitating this.

Can the maker mindset be found?

There were multiple signs of the maker mindset. Not all the participants showed strong maker traits, but most did describe a level of need for experimental play, desire for growth, collaboration, and the acceptance of failure. Some maker mindset quotes are collected and found below (fig. 31):

The Maker mindset

Failure accepting

"I expected that it would go wrong at some point, it's just part of the process."

"I thougt well, it had to go wrong at some point."

"I gave myself a lot of time for if I where to fail."

"There are two types of mistakes, the ones you can fix , and the once you can't. Those are much worse."

Growth oriented

"Mistakes do matter, but I practised so it will be okay."

"I dont know what the fuck I am doing, but let me just try this."

"I would not throw myself into challenging projects without the right supportive tools."

"I had never done it. I did not look it up, I just started. It would be okay."

Experimental play

"Figuring out how it works was fun."

"I have a vision, I don't know how to do it, let me just discover it."

"I enjoy it better when it is not that serious, when the demands are not as high."

"It's nicer to experiment than just to follow an ordinary pattern."

Collaborative

"I'd rather ask my mum for help then google something, personal contact is nicer."

"For the hard parts, I just go to my mum."

"Me and my mum can figure most things out togheter."

"It would be nice to have something where you can check in online and work simulaniously."

Fig. 31 Maker mindset; quotes from interviews.

With users portraying characteristics of the maker mindset, we can use the literature research to inspire aspects of the design. e.g. we know that makers thrive in makerspaces and in Chapter 2.5; Environments for making, it is discussed how benefits of this makerspaces could be used in an online platform.

3.3 Conclusion: Creating a user profile

The user research led to many interesting insights and takeaways for the design. To conclude the research, a user profile is created and presented in figure 33. A user profile is a method in design that gives an overview of what the user wants, needs and motivates. The overview will be explained in further detail now.

The interviews concluded that users start sewing because of multiple reasons. However, they revolve around personal fulfillment, investment, empowerment and control. The main goal of the user is to make simple, fitting clothes, in their style, that they can wear in their everyday lives. This means they do not necessarily want to learn the technical skill of sewing. Maki should mainly be focused on how to facilitate the process of making clothes and make this as simple and enjoyable as possible, rather than teaching users technical and professional skills in sewing.

The interviews showed that users have their own visions and ideas on what they want to make. Users do not want to just copy and paste a pattern. Not a single user had made a commercial sewing pattern without altering it. Participants mentioned the desire to learn how to draw patterns to gain creative freedom over what they make. Maki could facilitate the user in this process and give the user a basic skill set in pattern drawing. In this way, the user can grow towards their goal of having the creative freedom to make their own designs.

The interviewees showed characteristics of the maker mindset. The participants showed the need for an independent learning process where they challenge themselves, make mistakes, get help from others when necessary, and most importantly, creatively explore.

However, users did mention that they wanted to have some sort of base to work from in this creative exploration. Maki should provide projects that present this base, instead of offering a complete white canvas.

Some interviewees mentioned to want some level of collaboration. They were inspired by seeing other makers sew and have the desire to share knowledge between them. This is often seen in makerspaces as well. Maki should explore this collaboration in the design so the benefits of the makerspace can be translated to the design.

We have gained valuable insights of the user and formed takeaways for what this means for Maki. They are captured in a list in figure 32. In the next chapter, it will be discussed what is already out there to help the user meet their goal.

User research

Maki should facilitate the user in their goal; making simple fitting clothes.

Maki shoud teach the user how to pattern draw so they will build the skill-set to create anything they want.

Maki shoud provide the user with some projects that form a base so they do not start with a complete white canvas.

Maki should facilitate the user in a creative process where users learn indepentenlty.

Maki should explore collaboration in the design to have users experience the benefits of a makerspace.

Fig. 32 Takeaways for Maki from the user research.

Needs

I need to be facilitated in my own creative process.

I need space to learn independently and get help when I am stuck.

Motivation

There are multiple reasons why I sew.

They revolve around personal fulfillment, investment, control and empowerment.

Maker mindset

Collaboration
Others inspire me and I am open to collaborating and knowledge sharing.

Growth
I am growth oriented, I challenge myself with every project. I will be okay.

Failure
I know failure is part of the process, it is frustrating but I accept it.

Play
I enjoy figuring out how things work and how things should look.

Wants

I want to make my own ideas and visions. I do not just want to copy/paste a pattern.

I want to learn how to draw patterns so I can have this freedom later.

Goals

My goal is to create simple fitting garments that fit me well.

This is more important to me than learning how to sew well.

…I want to learn how to make my own clothing.
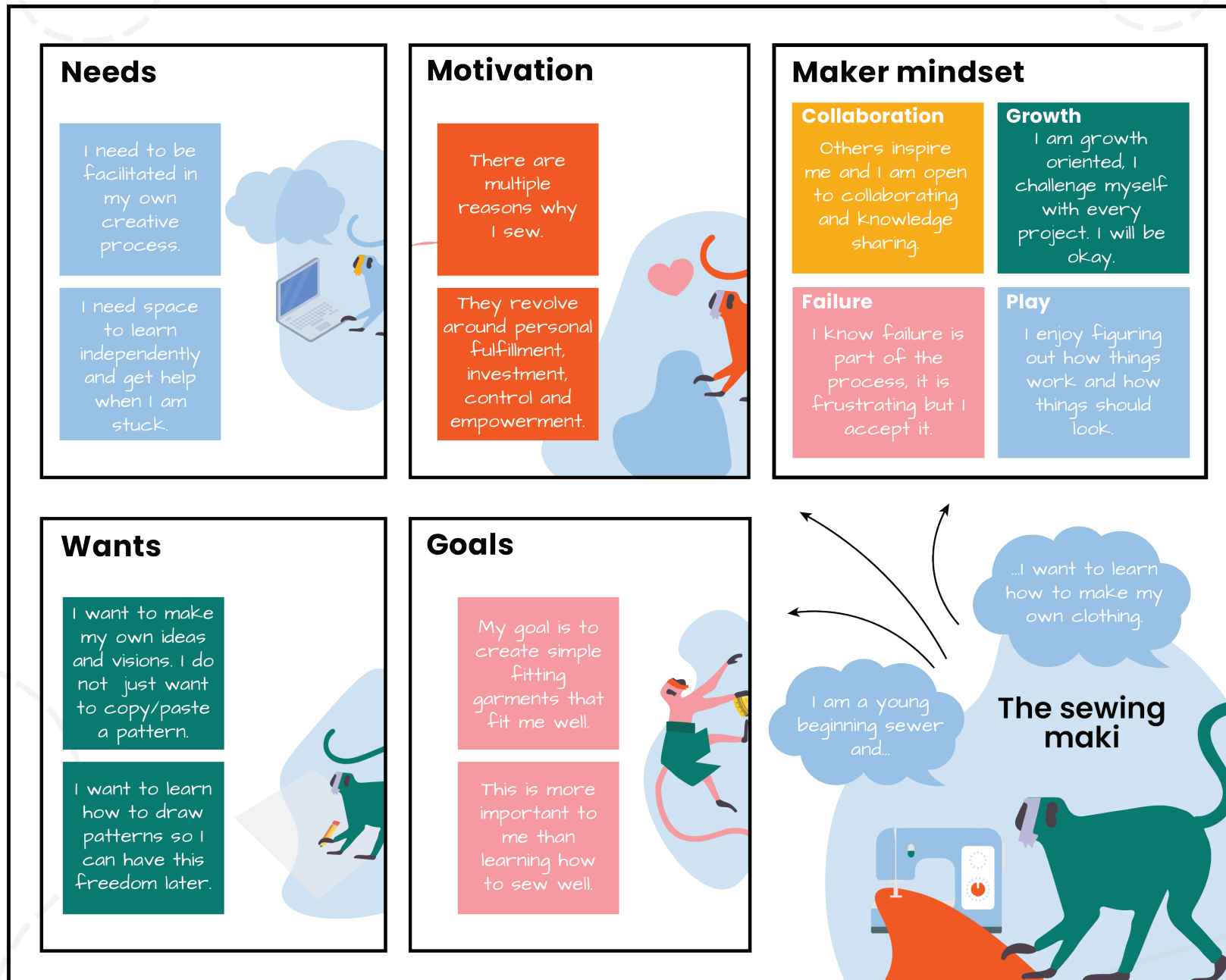
I am a young beginning sewer and…

The sewing maki

Fig. 33 User profile.

4 Field research
Inspiring interventions.

In the last chapter we learned what the user wants and needs; learning to make their own fitting clothing in their style. They wish to learn how to do this in a process where they can creatively explore. Next to this, they want to learn how to draw simple patterns, so they can obtain the freedom to make their own designs in the future. Drawing patterns to obtain creative freedom is a complete new direction for Maki. The focus shifted from using commercial patterns that dictate what the user should make and teaching them how to sew it together, to opening this up and facilitating a creative learning process where garments are made from scratch and in this process users are taught how to draw patterns.

For this reason, field research is done to find inspiring interventions to learn about facilitating the user in this process. The chapter starts with introducing interventions that open up the creative process of making clothing and how this can inspire Maki. After this, I will explore methods to let users draw patterns in simple ways and find where inspiration can be found in how Maki can have users do this as well.

To conclude the chapter, a list of takeaways for Maki will be given.

4.1 Creativity in making clothing

To start the field research, interventions focused on giving users creativity in making clothing are discussed. Currently, Maki offers sewing patterns with extensive instructions, these do not offer the user much creative freedom. There are a few interventions out there that do implement this creativity. They are discussed in this section.

Tailornova

Tailornova is an online pattern software that helps design a pattern with modular segments. This means you can choose your neckline, sleeve, collar, etc. The platform gives you an enormous amount of base options that you can endlessly combine. This makes the user able to create almost any type of garment. In the user research we learned that users do want some sort of base to start from; the feeling of a complete white canvas was too intimidating. A platform like Tailornova offers a base with supplying pre-determined modular parts that can be combined.

After the user has designed their pattern, they can then fill in their measurements. The platform will then output a fitting pattern that you can print (fig 33).

Tailornova gives a lot of creative freedom and allows you to design a garment that will fit you well. This seems to connect with the goal of the beginning sewer.

However, the sewing pattern will not come with instructions on sewing it together, which is a definite must for a beginner. The user is not facilitated in a learning process. The platform is focused on professionals in the fashion industry that do not need this support. Tailornova shows a part of the creative freedom the user is looking for but lacks support in learning; even though the garment will be their design and fit right, the user does not understand how their measurements translate to the pattern. And so, they will never be able to design something without the help of Tailornova. This is the true creative freedom the user is looking for.

Tailornova can inspire Maki in how they can make use of modular bases that can endlessly be combined to create a lot of creative freedom. If the user would also be facilitated in a process of learning to draw the patterns next to this, Maki becomes the facilitator in getting the user where they want to go: being able to have the creative freedom to make anything they want and make clothing that truly fit them in the learning process.
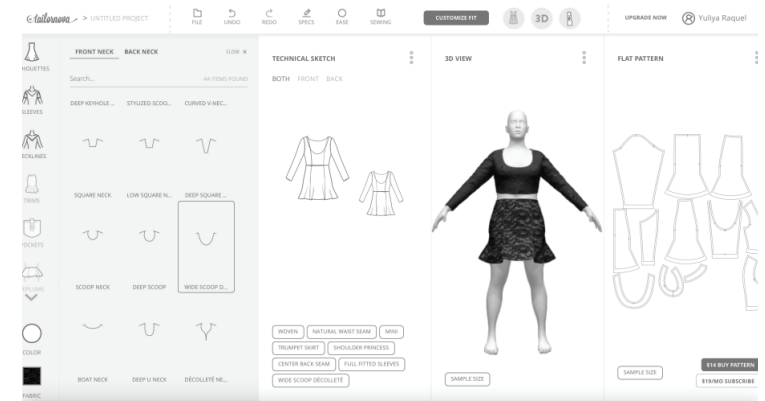
Fig. 33 Tailor nova's pattern design module.

Puff and Pencil

Puff and Pencil is a pattern selling business that uses the same concept as Tailornova; a modular system to design your sewing pattern. On their website, they offer the option to create a dress by changing the base, collar, and sleeves (fig. 35). They have much fewer options than Tailornova but support the user with beginner-friendly instructions in both text and video. For this reason, this intervention is mentioned, as it offers the user some support in learning to sew the garment together with giving creative options. Just like Tailornova, Puff and Pencil can inspire Maki with their modular patterns.

THAT IS HOW IT WORKS

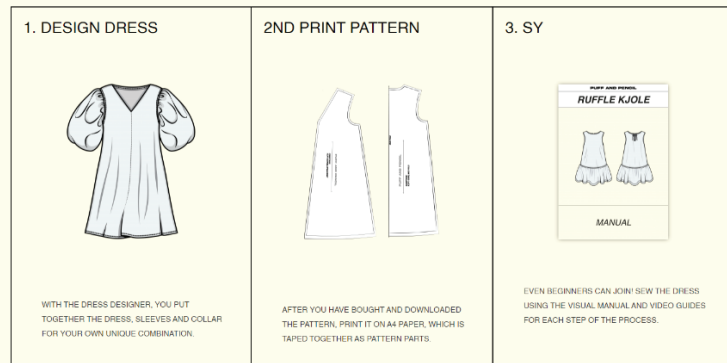| 1. DESIGN DRESS	2ND PRINT PATTERN	3. SY
WITH THE DRESS DESIGNER, YOU PUT TOGETHER THE DRESS, SLEEVES AND COLLAR FOR YOUR OWN UNIQUE COMBINATION.	AFTER YOU HAVE BOUGHT AND DOWNLOADED THE PATTERN, PRINT IT ON A4 PAPER, WHICH IS TAPED TOGETHER AS PATTERN PARTS.	EVEN BEGINNERS CAN JOIN! SEW THE DRESS USING THE VISUAL MANUAL AND VIDEO GUIDES FOR EACH STEP OF THE PROCESS.

Fig. 34 Instructions on Puff and Pencil's website.

Fig. 35 Dresses from Puff and Pencil.

Make/Use; Flat to form

A project that rethinks garment making in a revolutionary way is Make/Use (McQuillan et al., 2018). In this research "user modifiable zero waste fashion" is explored. The project has a focus on sustainable garment making through outputting zero waste garments that add value for the user through having the ability to be personalized.

Zero waste patterns are a way of pattern making where no fabric is left unused. Usually, this starts with a rectangular piece of cloth is that is manipulated according to a pattern with cuts and seams to form a garment (fig. 36).

Make/Use explores creativity in making zero-waste garments your own and facilitating the process of understanding how garments are formed through transforming 2D shapes into
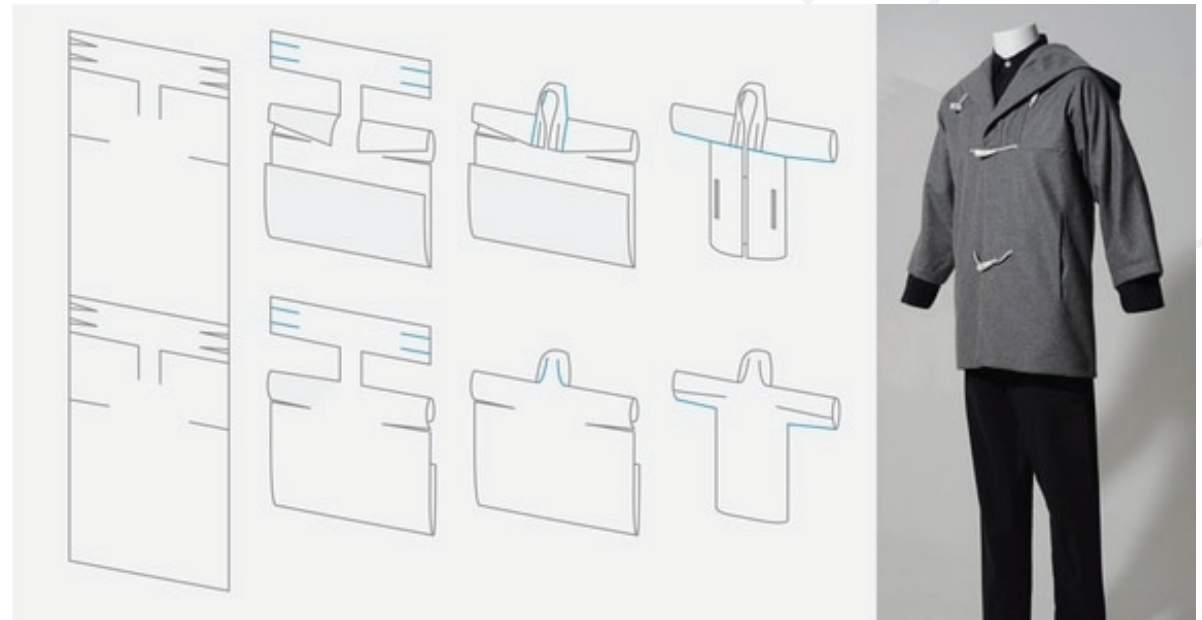

Fig. 36 Example of a zero-waste sewing pattern.

3D clothing. The concept of this project will be explained now.

Make/Use transforms a set of instructions on making a zero-waste garment to an "embedded wayshowing system" that is integrated in the garment. The wayshowing system is a set of intuitive patterns, lines, and shapes that are printed directly onto a cloth (fig. 37). These form cues on how the garment could be assembled. The cues are supposed to guide the user through the process of making the garment. e.g the lines of blocks on the side could mean to hem that part of the garment. This transforms the process of making a garment from literal instruction following, to a process where the users find its way through possibilities. This opens room for creative exploration in not only the outcome, but also in the process. Make/Use can be inspirational for Maki. The creativity is not only considered to be found in the first stage of the process, where users think of an idea and create it with the skill-set they have, but is a clear result of the process of exploration itself.

Besides this, the exploration of cues printed on the fabric, does not only lead to creative options, but also allows for an understanding of how garments are formed.

Maki could also try to focus on embedding creativity during the process of making a garment, and using it as a supported tool in learning.

Fig. 37 Make/Use crop top print. Figure taken from McQuillan et al., (2018)

translates to the body (fig. 38).

In developing the Make/Use system, they found that this grid became a new way of understanding and teaching zero waste patterns. This grid can show how to transform a rectangular cloth into a zero-waste pattern for a specific garment (fig. 39). The horizontal and vertical lines form guidelines for drawing the design features of the garment. These guidelines are based on the user's measurements and fabric width. In this way, the user starts with drawing a simple structure of lines to create the pattern. This simple parametric structure as a starting point can be inspirational for Maki. It makes pattern drawing simpler, yet it still shows relations between distances and body parts.

We learned that the users of Maki want to have creative freedom in designing the pattern to realize their own ideas and visions. With the zero-waste Make/Use system the user is supported through a creative process of making a more environmentally friendly garment, but the user is limited in making anything they want.

4.2 Pattern drawing made simpler

To give users of Maki the creative freedom they desire they will need to go through learning the technicalities of pattern drawing. As I learned during my internship: "To truly have the freedom to create anything you want, you must first commit to building the necessary knowledge and skills". Maki can facilitate this process for pattern drawing in making it more smooth and fun. There might be ways where a basis of pattern drawing can be taught through using supportive tools. In this section, some other interventions are explored that allow the user to draw a pattern in a more accessible way for beginners.

Make/Use; Zero waste matrix

The Make/Use project (McQuillan et al., 2018) where "embedded wayshowing" is used to facilitate the user in exploring and making a garment, was further developed into a system that allows users to draw zero-waste pattern themselves.

The "wayshowing" of the Make/Use project was supported with a grid that gives the user more information on how the pattern
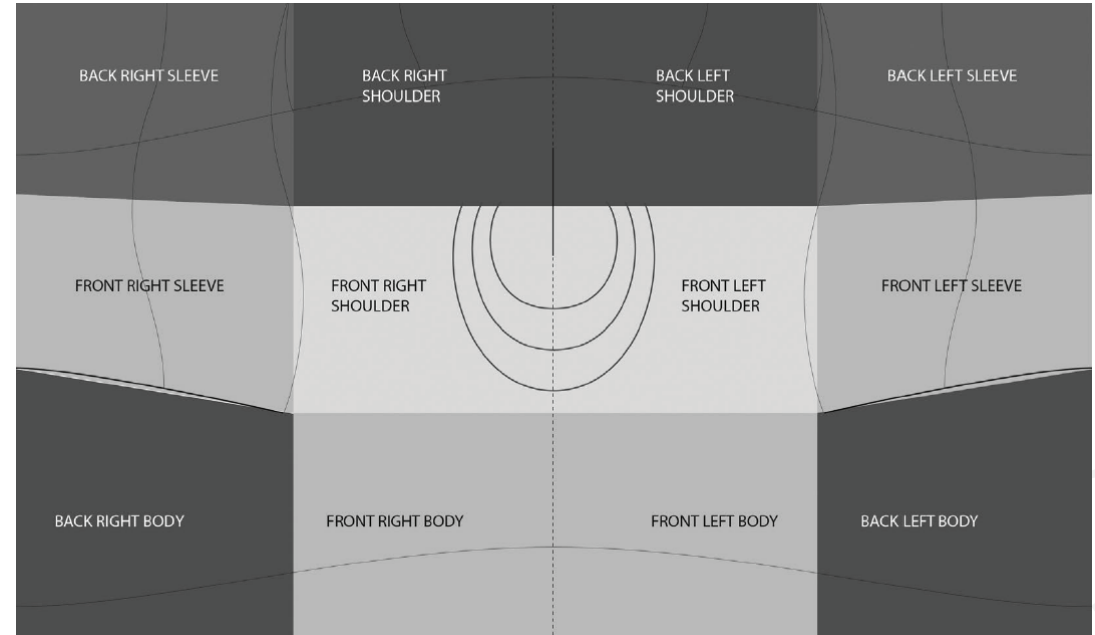

Fig. 38 Make/Use Grid for understanding relations to the body. Figure taken from McQuillan et al., 2018.
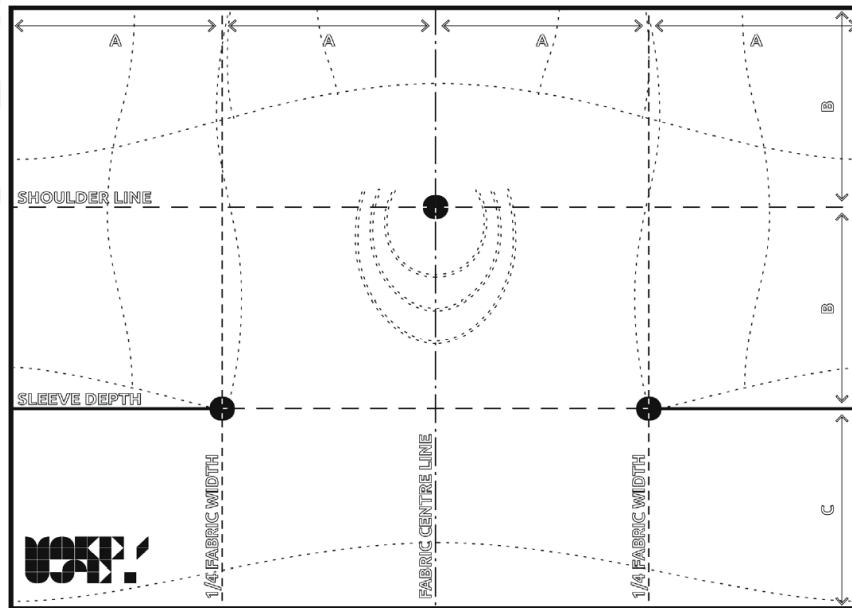
Fig. 39 Make/Use Grid for making crop top. Figure taken from McQuillan et al., 2018.

To achieve this, Maki should facilitate the user in learning a basis of more traditional pattern drawing, so they will be able to create anything in the future. The simple parametric structure Make/Use implements to facilitate the user in drawing the pattern could help with forming a base to facilitate learning more traditional pattern drawing techniques.

No pattern needed

Similar to the Make/Use project, the book 'No pattern needed' by Rosie Martin (2016) tried to re-think the system of sewing patterns. This book explains how to make a garment from complete scratch. Martin used a system that lets users draw simple shapes like a rectangle or circle and tells them how to draw a pattern for a specific garment from there (fig. 40 & 41).

In this way, the user learns how to draw a design completely to their size and builds an understanding of how to do this in the future as relations to the body are made clear. This is similar to the structure used in the Make/Use patterns.

The book offers a clever solution to introduce beginners to pattern drawing. They also provide some amount of creative freedom. For each sewing

pattern, some variations are presented. However, with being tied to using certain shapes, options do become limiting at some point. The user cannot make anything they want. Making a blouse with separate sleeves already becomes impossible. We know the user of Maki wants to be taught more traditional pattern drawing skills, so they can truly make anything in the future.

Just like the Make/Use project, This simple parametric structure as a starting point can be inspirational for Maki.

Fig. 40 No pattern needed by Rosie Martin shows how to draw a pattern from scratch.
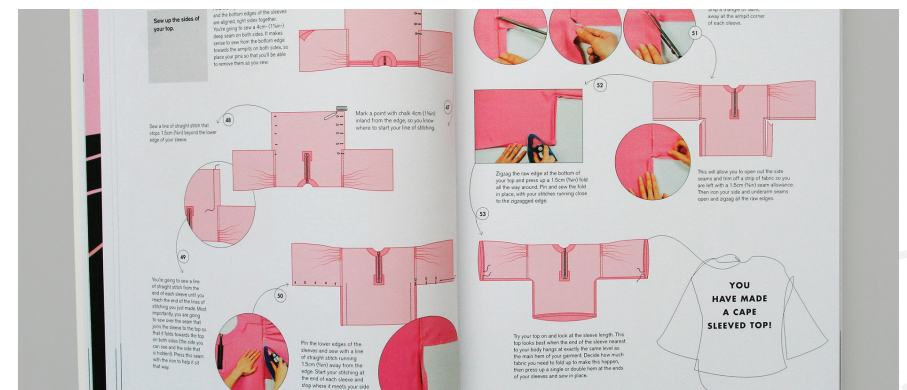

Fig. 41 No pattern needed by Rosie Martin shows how to draw a pattern from scratch.

Decode; zero waste pattern master

Decode is a complete zero-waste design system that focuses on solving environmental problems withing the fashion industry (DECODE, n.d). Besides developing zero waste patterns and rethinking the fashion industry, DECODE also focuses on education.

To teach people to make zero waste patterns, Danielle Elsener, the founder of DECODE, developed the Pattern Master tools. These are rulers or shapes that support drawing zero-waste patterns (fig. 42). They have plastic versions of these rulers, but the user can also print them on a few sheets of paper. They are used to transform a rectangular piece of fabric into a garment by allowing users to trace curves and distances with the ruler. A set of instructions with dimensions is given with the rulers on how to place and trace them. This leaves the user with a zero-waste pattern. Each ruler is intended to make a specific type of clothing. e.g a ruler for trousers or a ruler for robes.

The rulers are a great way to support users in drawing a pattern, however right now, each ruler allows you to make one specific type of zero-waste garments. Of course creativity within this zero-waste garment can be found, but this remains limited. The ruler cannot support you in making anything you want, the thing the user of Maki desires.

However, Maki can take inspiration in how such a ruler forms a supportive tool in pattern drawing and how DECODE takes elements of a pattern in terms of curves and distances, and translate these to a tool that uses a minimal amount of paper to translate a sewing pattern onto the fabric. Next to this, such a way of pattern drawing can help to create an understanding of relations to the body and dimensions as the user has to draw the pattern from complete scratch.

A. HANGING NOTCH
B. CHALK GUIDE
C. ORIENTATION ARROW
D. CHALK NOTCH
E. 3MM ACRYLIC
F. 1 CM GRID
G. VISUAL GUIDE
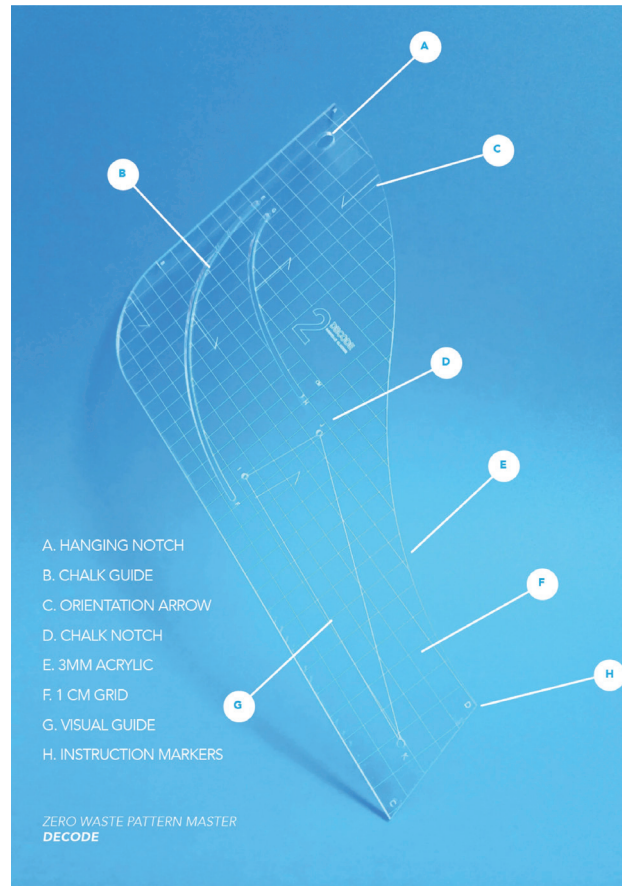H. INSTRUCTION MARKERS

ZERO WASTE PATTERN MASTER
DECODE

Fig. 42 Decode's pattern master tool. Figure taken from DECODE's website.

4.3 Conclusion

Users of Maki had the goal of making clothes that truly fit their size and style. To learn how to do this, users want to go through a learning process where creativity and exploration are central. Next to this, the user wants to learn how to draw simple patterns to gain the freedom to make anything they want in the future. Maki intends to facilitate this creative learning process and teach users a basic skill set in pattern drawing along the way. All the interventions discussed hold aspects that can be inspiring in obtaining this goal. Combining these inspiring aspects might lead to a design where the goal of the user is met.

Platform such as Tailornova and Puff and Pencil give the user creative freedom in making their own garments. The platforms allow the user to combine modular parts into a design of their own. The user of Maki mentioned wanting to make their own idea's and visions but needing some sort of base to start from to avoid being intimidated by a white canvas. The modular parts from these platforms create such a base whilst allowing room to make it your own. Starting with such a base and building on to these with creative options, can be inspirational for Maki.

Make/Use takes the user on an explorative journey in making zero waste garments. Through assembling the garment with an "embedded waymaking system", the user is facilitated in understanding how a garment is formed whilst exploring creatively.

Maki can take inspiration from not only having creativity at the start of the garment making, where the user decides what to make, but also throughout the process.

Make/Use is further developed with a zero-waste matrix. This is a simple, parametric, structure the user can draw, existing of horizontal and vertical lines. After this structure is drawn up, the user can draw the remaining design features of the garment.

A similar approach to make pattern drawing simpler is taken by Rosie Martin in her book No patterns needed. Here she lets users start with a simple shape like a rectangle or circle and explains to them how to draw a pattern from there. Both the zero-waste matrizand starting with simple shapes can serve as inspiration for Maki. They can support the user in learning more traditional pattern drawing skills, so ultimately the user can create whatever they have in mind.

DECODE developed the Pattern Master tools that support the user in making zero-waste patterns, they can be a great inspiration for developing supportive tools in teaching pattern drawing.

These aspects that can be taken inspiration from, are translated to a list of takeaways for the design in figure 43.

Field research

Maki could embed creativity throughout the entire process of making a garment, not only at the start.

Maki could supply the user with a base to work from that allows for a lot of creative manipulation.

Maki could use a simple structure or grid as a supportive tool in learning to draw sewing patterns.

Maki could use supportive tools such a rulers as a supportive tool in learning to draw sewing patterns.

Fig. 43 Questionnaire for user research.

Design

5 Iteration 1

From research to the first concept: Maki makerspace.

With the research from the first chapters, a lot of knowledge was gained. With this as a starting point, it is time to start the first iteration cycle and design the first concept (fig. 44). In this chapter, it is explained how this was approached. The chapter will walk through all the steps that were taken to form the first concept; Maki Makerspace. The blue design Maki is introduced to help understand the methods used and design decisions taken. Next to this, this design Maki serves as a reflective tool to help me put my thoughts on paper. This blue design Maki will appear throughout the chapter.
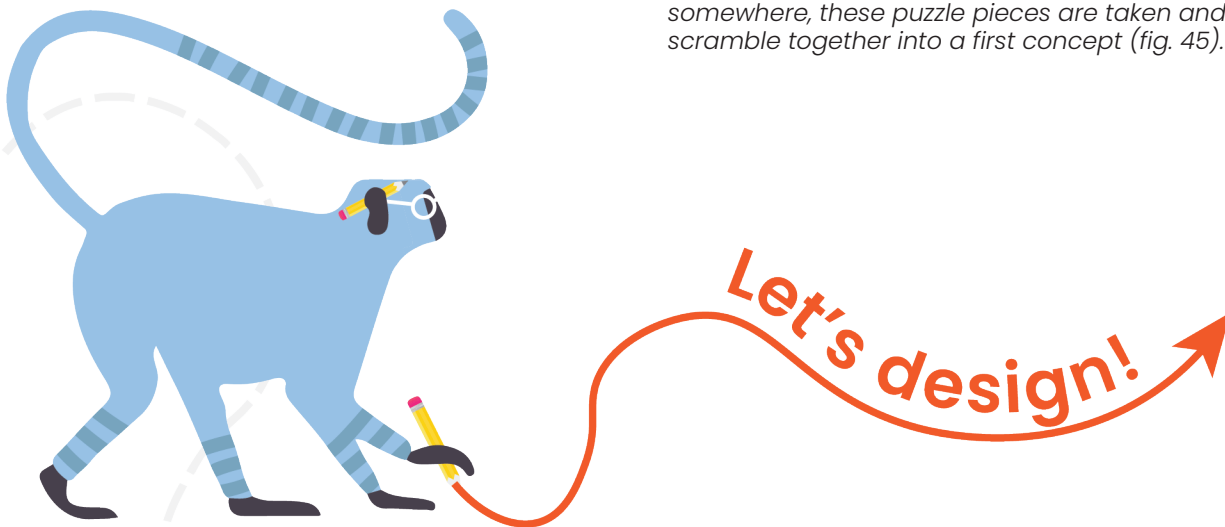
5.1 Method

After the research phase, it was time to start designing and enter the first iteration cycle. The purpose of the first iteration cycle is to create a first blunt concept inspired by the insights from the research. The metaphor of solving a puzzle can be used to explain this iteration cycle. The insights from the research can be regarded as puzzle pieces that will ultimately form a fitting puzzle; the concept that fits the user's needs. However, right now, it is unclear how to put these pieces together. Because one needs to start somewhere, these puzzle pieces are taken and scramble together into a first concept (fig. 45).

Fig. 45 Merging all insights into a concept.

As discusses in chapter 1.4; Set-up, there will be two more iteration cycles. This means this first concept does not have to be perfect yet. The main goal is to evaluate with users quickly and find out what does and does not work in facilitating their learning process in making garments. This evaluation will result in insights on which puzzle pieces fit and which do not, and steer the design into a substantiated direction for a new iteration cycle that can help complete the puzzle. This chapter will explain how this process is approached.

The overview of the process is shown here (fig. 46) and discussed in detail next.

Fig. 44 Let's design.
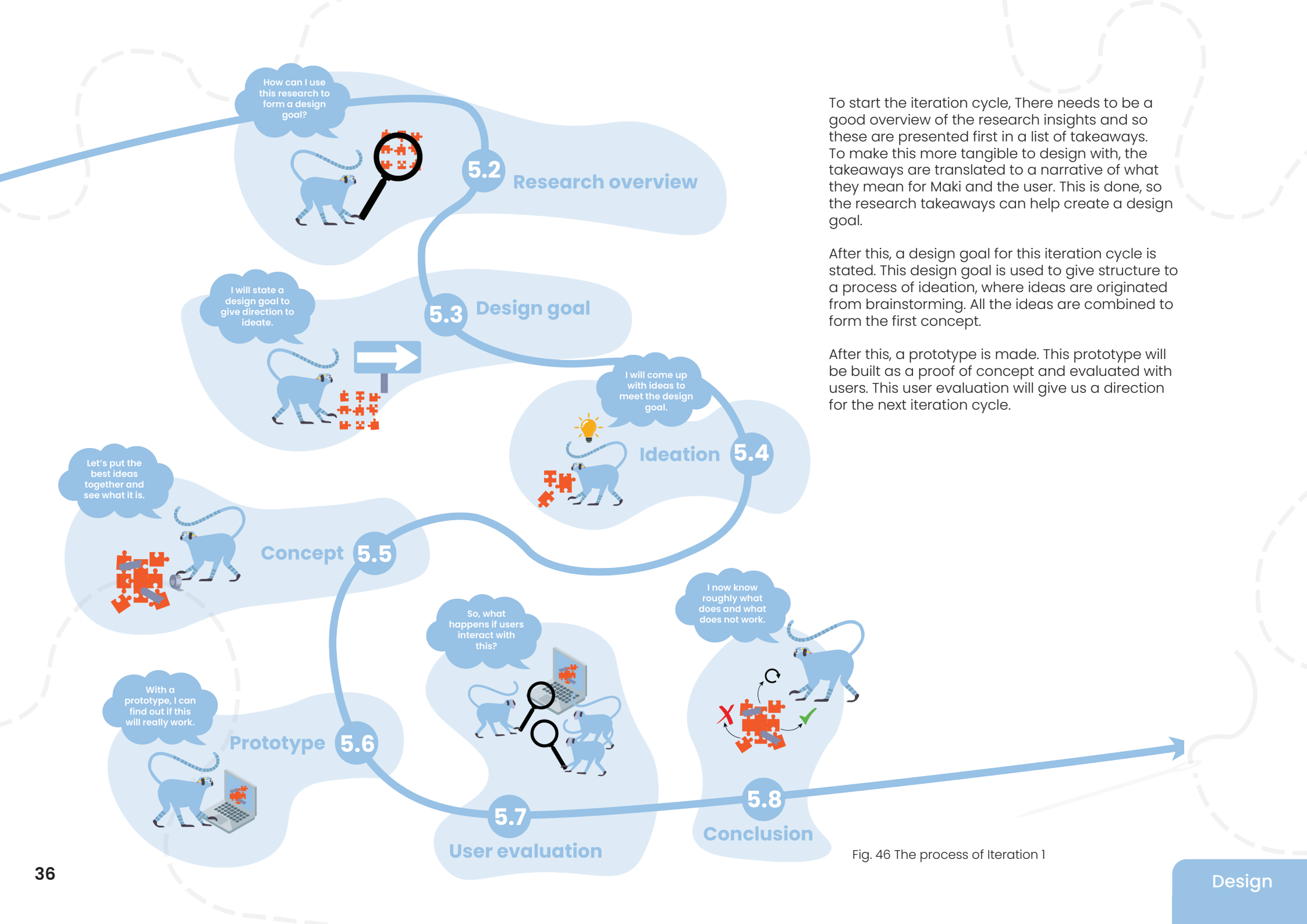
To start the iteration cycle, There needs to be a good overview of the research insights and so these are presented first in a list of takeaways. To make this more tangible to design with, the takeaways are translated to a narrative of what they mean for Maki and the user. This is done, so the research takeaways can help create a design goal.

After this, a design goal for this iteration cycle is stated. This design goal is used to give structure to a process of ideation, where ideas are originated from brainstorming. All the ideas are combined to form the first concept.

After this, a prototype is made. This prototype will be built as a proof of concept and evaluated with users. This user evaluation will give us a direction for the next iteration cycle.

Fig. 46 The process of Iteration 1

5.2 Research overview

This iteration cycle starts with the insights from the research. Therefore, the research takeaways are summarized and presented in an overview. To find out how these takeaways can inspire the design goal, a narrative of what they mean for the relationship of Maki and the user is presented in this section.

The literature research taught us about how makers prefer to learn; independently in a creative process. The research stated that makers have a maker mindset with four attributes; the need for explorative play, an orientation towards growth, accepting failure, and the desire for collaboration. The environment a maker thrives in is a makerspace, where inspiration from others, and collaboration are beneficial for the growth of the maker.

The user research confirmed most of these insights from literature and taught us what the user wants and needs: learning to make their own fitting clothing in style and size. They wish to learn how to do this in a learning process where they can creatively explore and collaborate with others. They want creative freedom, but do want a base to start from to avoid intimidation of a white canvas. In this learning process, they want to learn how to draw simple patterns, so ultimately they can obtain the freedom to make their own designs in the future.

Finally, the field research gave inspiration on how to implement creativity in the process of making garments and facilitate the user in learning to pattern draw through supportive structures and tools.

These takeaways for Maki are presented in figure 47.

Literature

The maker has an accomodating learning style. They need to be facilitated in finding their own creative solutions, not lectured.

Design for the 4 attributes of the makes mindset; experimental play, growth, failure and collaboration..

The benefits of the makerspace should be translated to the online platform.

Those are a lot of takeaways, what do they mean for Maki and the user?

User research

Maki should facilitate the user in their goal; making simple fitting clothes.

Maki shoud teach the user how to pattern draw so they will build the skill-set to create anything they want.

Maki shoud provide the user with some projects that form a base so they do not start with a complete white canvas.

Maki should facilitate the user in a creative process where users learn indepentenlty.

Maki should explore collaboration in the design to have users experience the benefits of a makerspace.

Field research

Maki could embed creativity throughout the entire process of making a garment, not only at the start.

Maki could supply the user with a base to work from that allows for a lot of creative manipulation.

Maki could use a simple structure or grid as a supportive tool in learning to draw sewing patterns.

Maki could use supportive tools, such a rulers, as a supportive tool in learning to draw sewing patterns.

Fig. 47 Overview of research insights.

To make this overview more tangible to design with, the takeaways can be translated to what they mean for the relationship between Maki and the user using a narrative. This narrative can then be used to help understand the purpose of the design and form a design goal.

The narrative is presented in figure 48, and will be explained in further detail now.

The narrative shows the user at the beginning of their journey leading to their goal; being able to make anything they want so they can truly make the clothes that fit their size and style. Maki will facilitate this journey in learning to draw patterns and making garments.

Through projects in which users can learn hands-on, they already make garments that fit their style and size. These projects can supply the user with a base to work from with as much creative freedom that can be given in a learning space.

Through doing these projects the user will gain a more profound understanding of garment making and pattern drawing, so ultimately they will have the true creative freedom they want; they can make the garments that fit them in style and size, without the help of Maki.

The design to facilitate this, is still a black box. With the purpose of the black box being clear, a design goal can be created.

5.3 Design goal

With the narrative presented in figure x, the design goal can be updated for this iteration cycle. A design goal can help give direction and structure to the process of ideation. In this section, the process of how the design goal was formulated, is explained.

At the beginning of the project (Chapter 1.3: Design goal & scope) an initial design goal was stated:

"Facilitating the learning process of beginning sewers in making clothes."

However, through research many insights were gained that can sharpen the design goal. These insights led to understanding what the purpose of the design should be, as explained in the narrative in figure 54. This is translated into a new design goal (fig. 49):
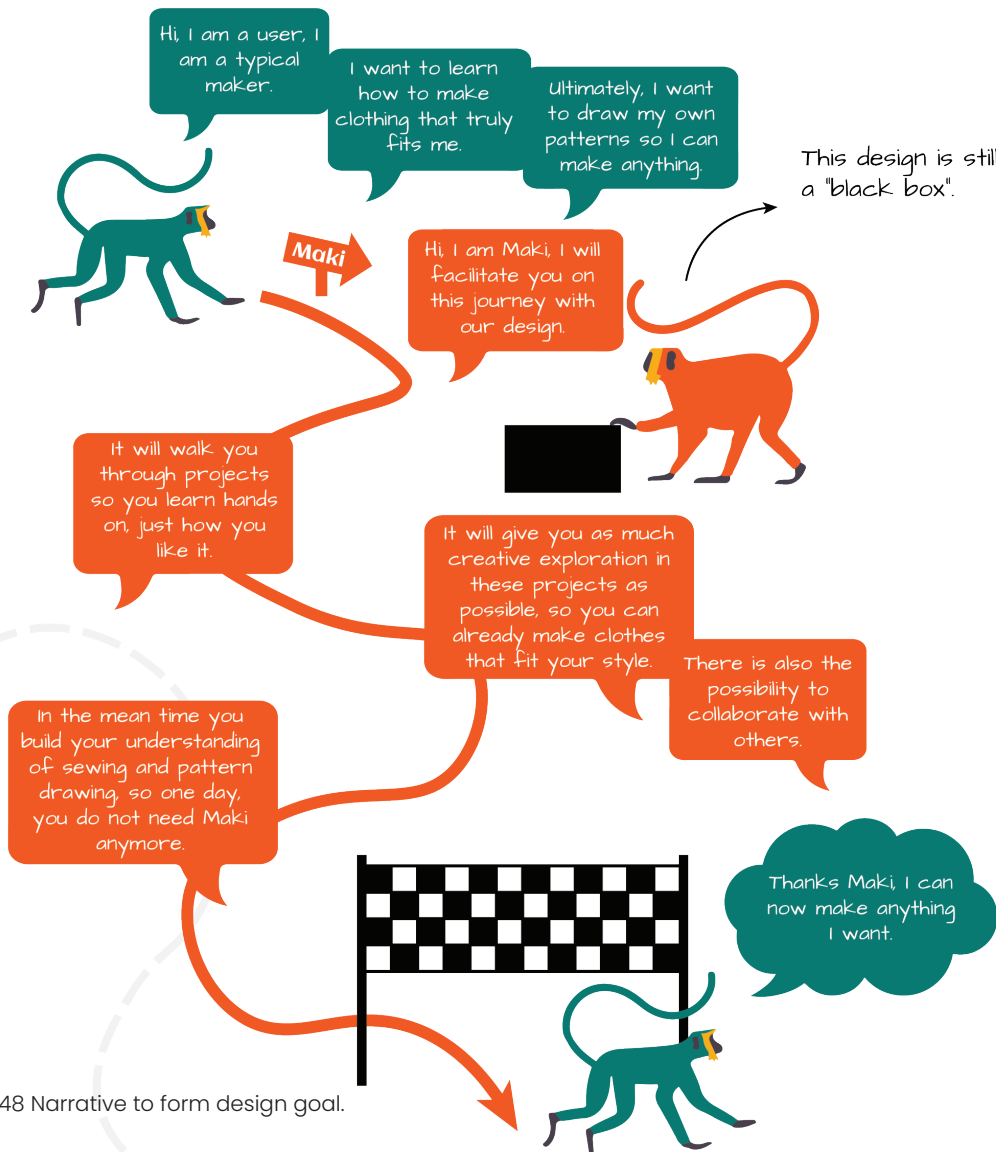

Fig. 48 Narrative to form design goal.

The highlighted part is the most important as this is what the user wants.

Literature research: Facilitate rather than lecture.

Literature research: Learn through doing, failure and growing.

Literature research: Creative exploration and collaboration to fit the maker mind.

User research: Making fitting clothes in style and size is what the user wants.

User research: From scratch so they need to learn to draw patterns.

Facilitating the user in a learning process with room for creative exploration and collaboration, that ultimately leads to the user being able to make fitting clothes from scratch.
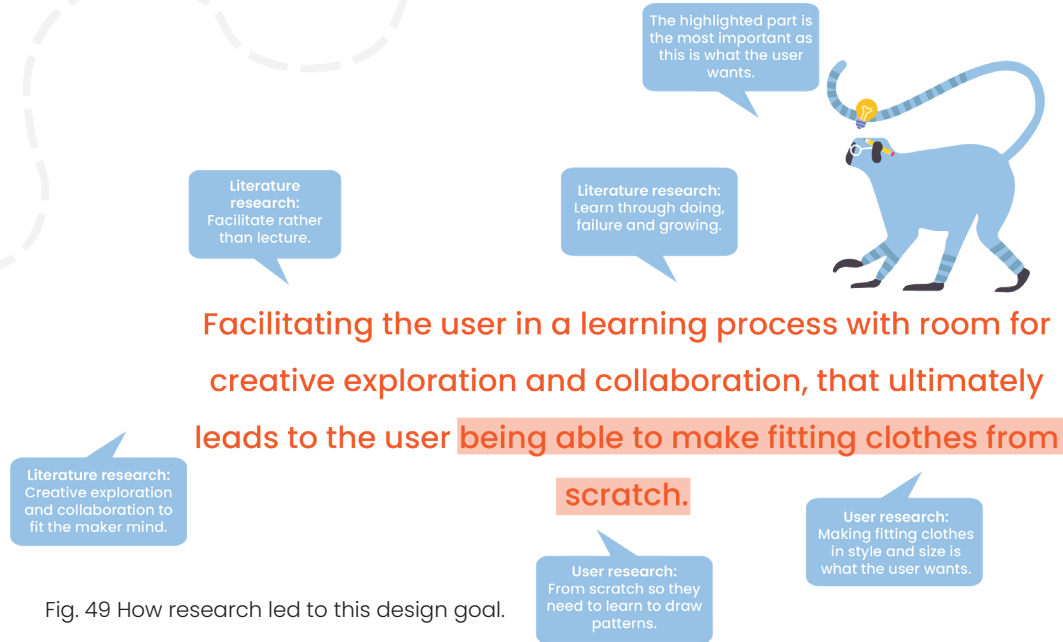
Fig. 49 How research led to this design goal.

The design goal is now a long sentence with numerous aspects. It was meant to give structure to the ideation process, but this becomes hard when it is elaborate. To make this easier, it can be dissected into three central themes: the learning process, creative exploration, and collaboration. These all revolve around the most crucial part, where the user wants to go; making fitting clothes from scratch in their style (fig. 50).

That is a bit long...let's dissect it.

Facilitating the user in a learning process with room for creative exploration and collaboration, that ultimately leads to the user being able to make fitting clothes from scratch.
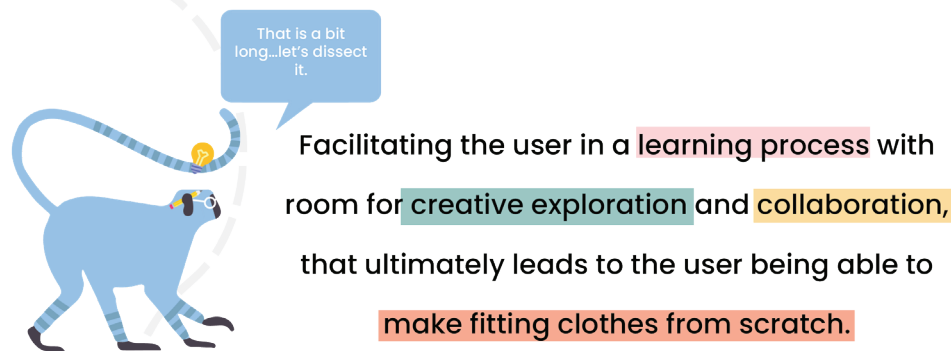
Fig. 50 Dissecting the design goal.

These central themes can be seen as the pillars of the design goal (fig. 51). They can be useful in thinking of different ideas for each pillar. In this way, the sum of ideas could meet what the user wants, and all aspects are considered.

Making fitting clothes from scratch

The learning process

Creative exploration

Collaboration

I can now ideate on how each pillar can serve what the user wants.
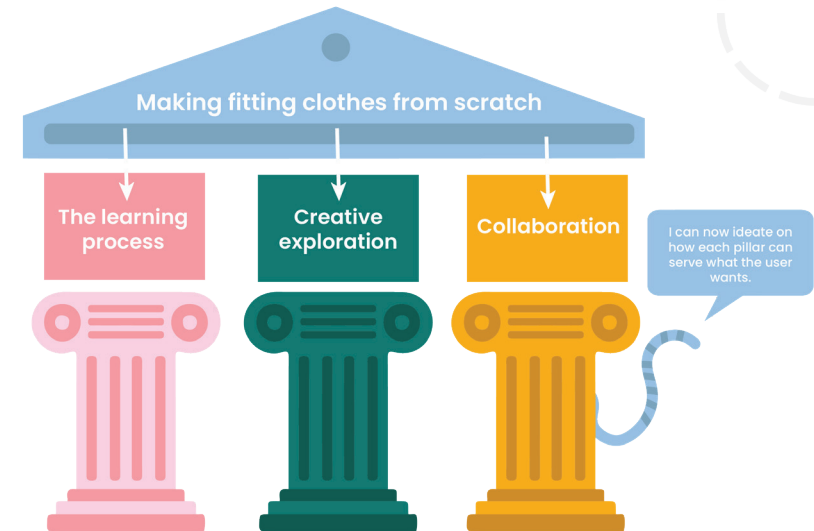
Fig. 51 The pillars of the design goal.

5.4 Ideation

In this section ideas are generated to form the first concept in a process of ideation. The ideation starts with explaining how the design goal and scope already steer the ideation process into a direction. After this ideation is done through simple brainstorming sessions. Finally, all ideas are combined to form a first concept.

With the design goal giving some structure in supplying three pillars to ideate with, a process of ideation can started. However, something is already guiding the ideation in a direction; in Chapter 1.3, design goal and scope, it was decided that the design should be an online platform since this is integral to the business model of Maki. It was also stated that the current Maki platform, with sewing patterns with online instructions in video, illustration, and text, could be a starting point. This way of explaining steps to the user seemed to work well. When this

is combined with the updated design goal, a first idea is born: making an "online makerspace where people learn how to make fitting clothes from scratch" (fig. 52).

Now, ideation on how this online makerspace should be given shape can occur. For this, the three pillars are used. For each pillar, a simple brainstorming session was done, where I explored multiple ideas and took inspiration from other interventions discussed in Chapter 4; Field research.

The brainstorming for each pillar was guided by the questions of how this pillar can serve what the user wants; creating fitting clothes from scratch. I started thinking of ideas that would lead to new questions and so, new ideas. I did this until I felt like I had enough ideas for each pillar to form a concept. As this iteration cycle was meant to create a first blunt concept, I went with some ideas based on intuition. For each pillar, this process is discussed.

Creative exploration

For the online makerspace, users should be given the option to explore creatively. Maki will supply the user with hands-on projects where they make garments and learn to draw the patterns for these, so ultimately they learn a basic skill of pattern drawing. In these projects users should have a lot of room to creatively explore. Letting the user draw the pattern themselves already gives options for creativity in the project, as the pattern is built from the ground up. How can Maki further facilitate creativity within these projects (fig. 53)?

I give the user a project where they make a garment.

Let's think of ideas on how implement creativity.
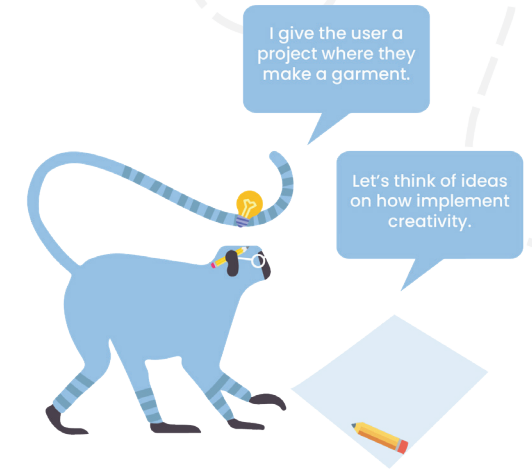
Fig. 53 How to facilitate creative options.

Maki

An online platform that provides sewing patterns with video, text, and illustration for commercial sewing patterns.

This already worked quite well.

Design goal

Facilitating the user in a learning process with room for creative exploration and collaboration, that ultimately leads to the user being able to make fitting clothes from scratch.

But this allows us to make it fit what the user wants.

The learning process

Creative exploration

Collaboration

Maki

An online makerspace where people learn to make their own fitting clothing from scratch.

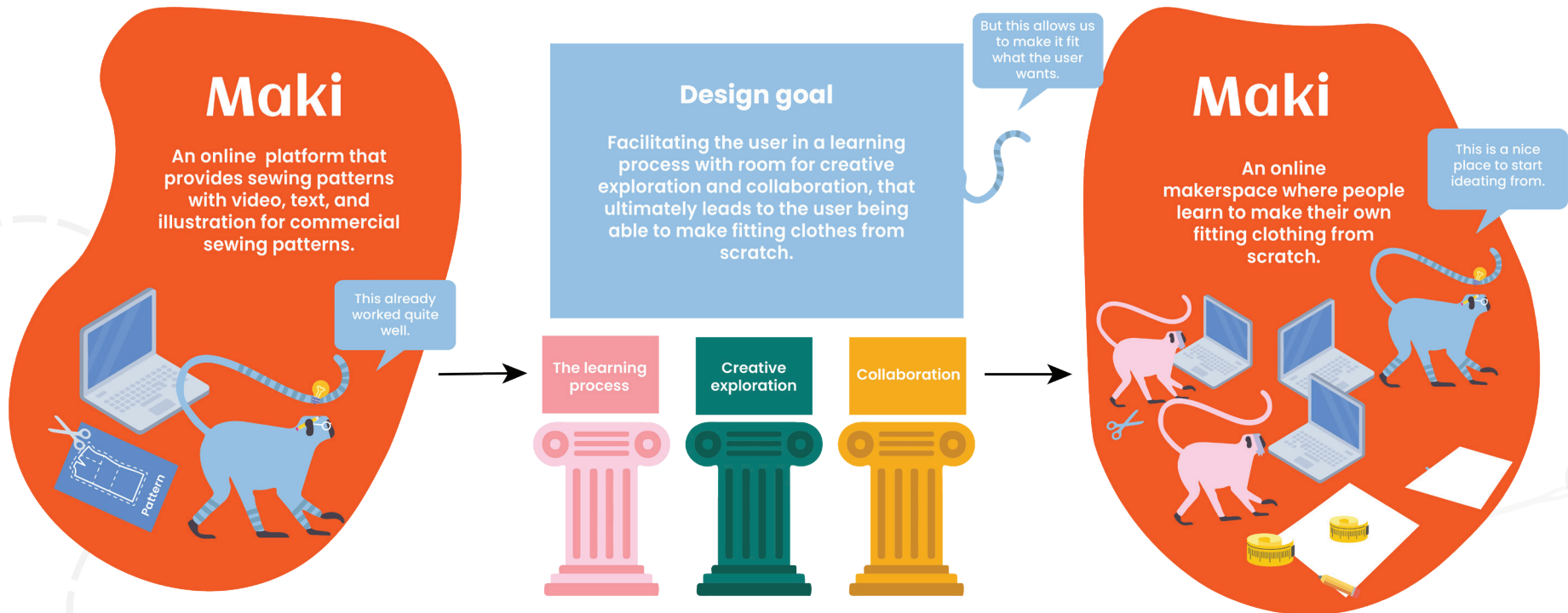This is a nice place to start ideating from.

Fig. 52 Overview of how the idea of an online makerspace is born.

Design

Starting from a specific garment.

The first question that comes to mind when thinking of creativity in a project is: how much creativity should be given? You could start from a completely white canvas and let the user draw up anything, but this would become difficult to facilitate. Next to this, the user mentioned they want a base to start from. There are multiple levels of creative freedom. You could start with a product category, like making a shirt or a pair of pants. However, this creative space might be too big for the users, as there are almost endless options. Instead, narrowing this down into a specific type of clothing can be beneficial; make a slip dress or make a fleece hoodie. This still leaves room for creativity and lets the platform facilitate the process better since it's more narrowed down (fig. 54).
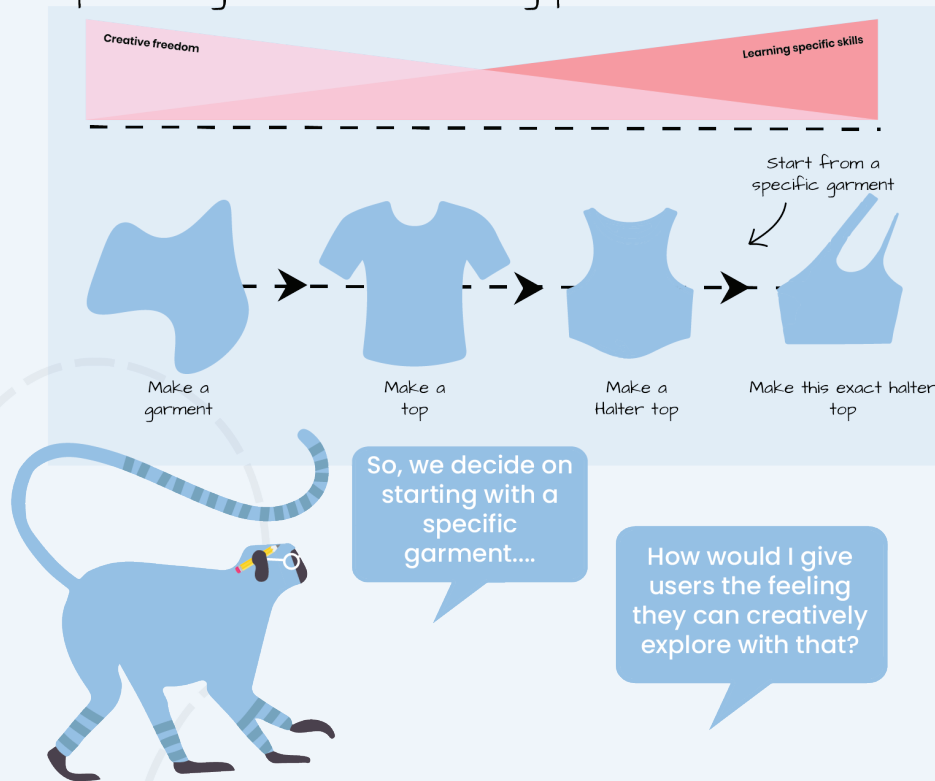
Specific garment as starting point

Creative freedom

Learning specific skills

Start from a specific garment

Make a garment

Make a top

Make a Halter top

Make this exact halter top

So, we decide on starting with a specific garment....

How would I give users the feeling they can creatively explore with that?

Fig. 54 A base for creative exploration.

White canvas

Do not show choices in fit, fabric, details etc.

Make a floral 50's Summer dress.

Maki
Make a summer dress

Create a white canvas

VERY EASY VOGUE®
V9311

Regular patterns already show the outcome.

This could make them feel like they have options....

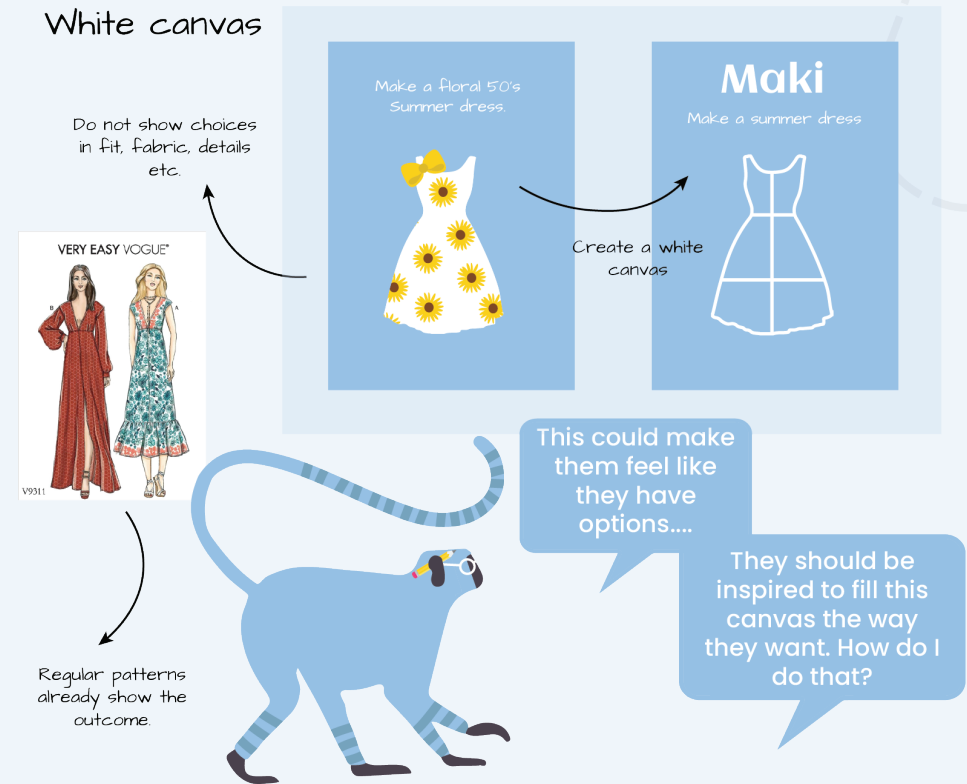They should be inspired to fill this canvas the way they want. How do I do that?

Fig. 55 A white canvas.

The base as a white canvas.

When it is decided to start with a specific garment, such as a halter top, to supply the user a base to work from, the user would need to know that they have some creative space within this. Patterns and courses often show the possible results in a specific fabric and fit. This can create a sense of: "what I am supposed to make is already decided for me." Instead, the base can be represented as more of a white canvas (fig. 55). This allows users to feel that they still need to design what they are going to make. This white canvas could just be the most basic version of the garment in white or gray color, unlike regular sewing patterns that show all variations in the eventual fabrics.

Inspiration wall

Creativity goes hand in hand with inspiration. Just leaving the user with a white canvas might throw them in the deep. Instead of telling them exactly what to make, I can inspire them with ideas and examples of filling in their white canvas. For this reason, a small inspiration wall can be built where users can see different styles of clothing, fabrics, graphics, and examples of the result (fig. 56), much like a mood board. This can inspire them to fill in their white canvas as they want.
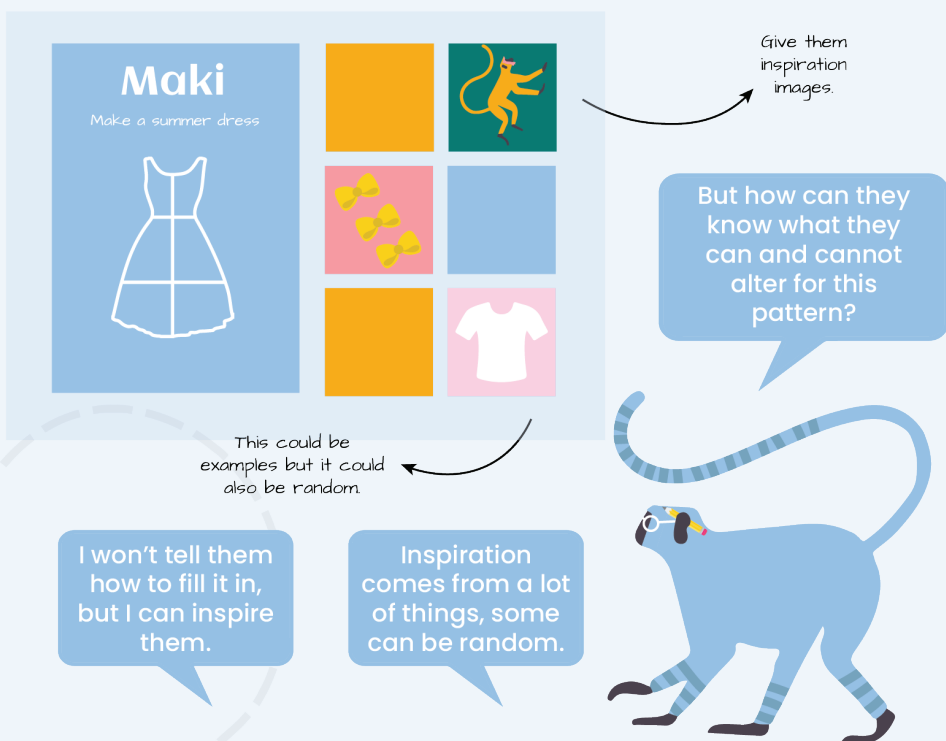
Variation options

It should be clear where creative options begin and end.

I can show what aspects exaclty can be varied.

Maki

Make a summer dress

Make it yours.

Alter neckline

Alter sleeves

Alter length

To know where creativity begins and ends we should show options.

There should be multiple options for each garment to make sure there is enough creative space.

Fig. 57 Show variation options.

Inspiration wall

Maki

Make a summer dress

Give them inspiration images.

But how can they know what they can and cannot alter for this pattern?

This could be examples but it could also be random.

I won't tell them how to fill it in, but I can inspire them.

Inspiration comes from a lot of things, some can be random.
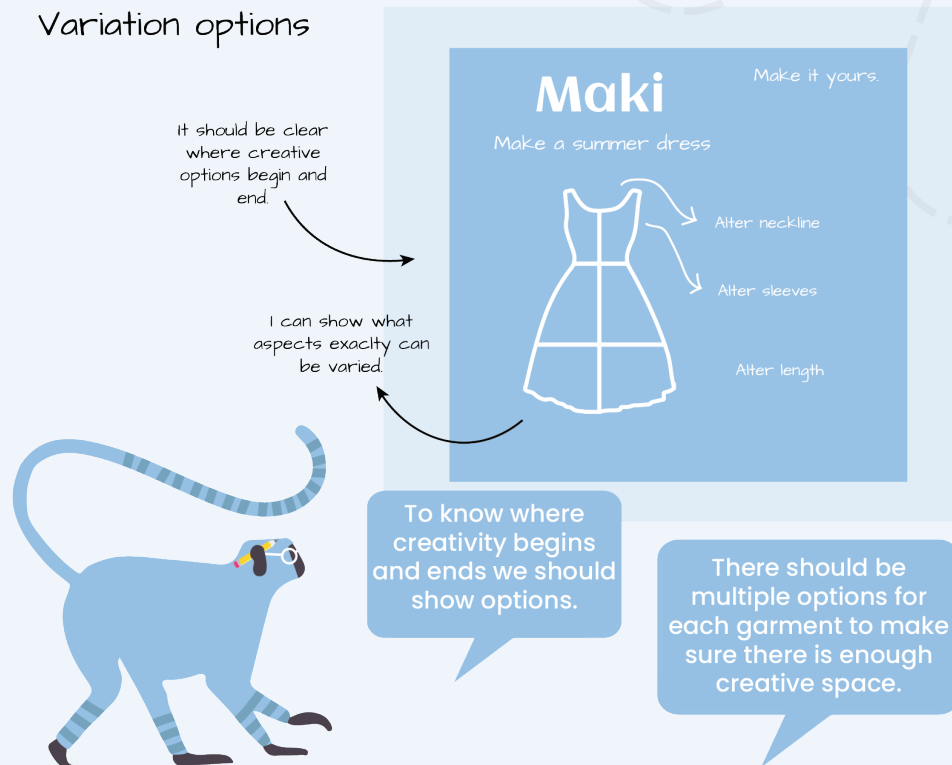
Fig. 56 Inspiration wall.

Variation options

Now, there is a base presented as a white canvas with inspiration; how would the user know what he can and cannot do with the canvas? There need to be some limits, so the user knows what he can design. Each project should have various options for variations (fig. 57). These variations should be shown beside the base garment. Instead of regular sewing patterns showing 1 or 2 variations in the shape of a result, the platform can inspire you to show your options and how you can vary these. e.g. create your own neckline or sleeves.

With these ideas, I started to feel what the creative space should entail for the first try. There are arguably a lot more options in providing this creativity. However, since the goal of this iteration cycle was to evaluate with users quickly, I decided to leave the ideation on creativity here (fig. 68).

Creative exploration

So we have an idea on how this creativity should be implemented.

What are the next steps? How do we teach the user to make the garment?
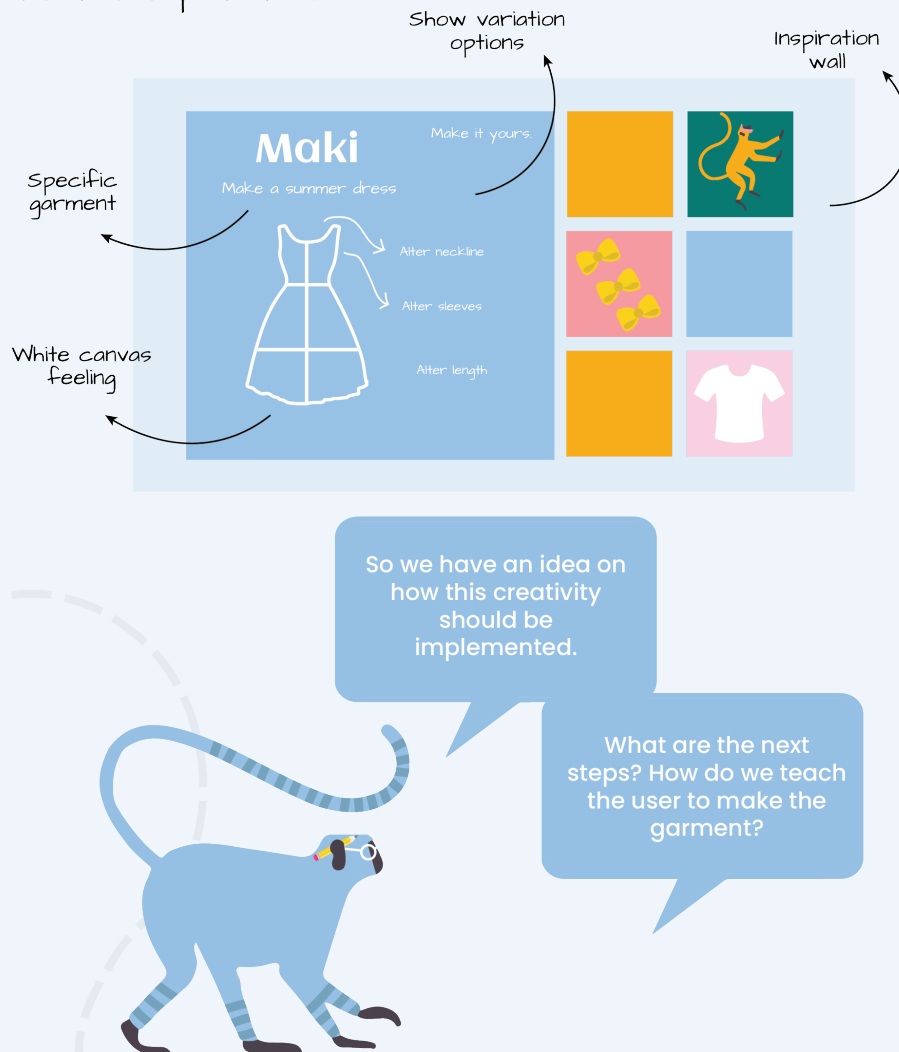
Fig. 58 All ideas on creative exploration.

The learning process

Users want to learn how to make garments and draw their own fitting patterns. The platform should support this learning process. Since the users are beginning sewers, they do not yet have a lot of experience in this. The book "No pattern needed" (R. Martin, 2016) and the Make/Use project (McQuillan, 2018), showed us a simple way for users to draw a pattern starting from a simple structure. Both of these can serve as an inspiration for this ideation, where I tried to find out how to facilitate the learning process (fig. 59).
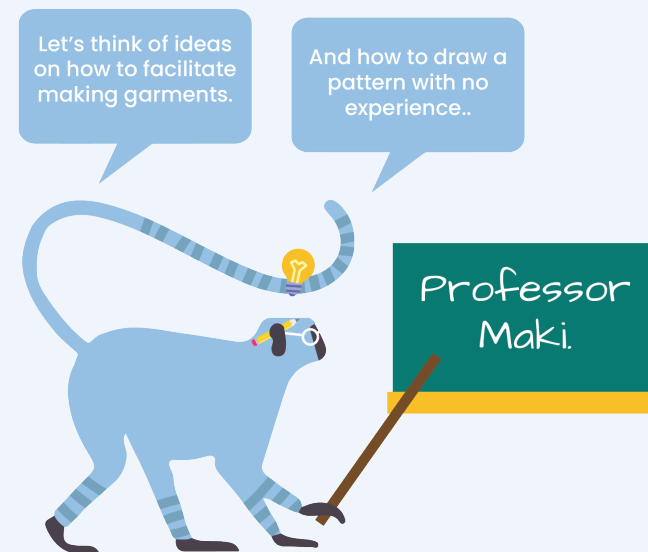

Let's think of ideas on how to facilitate making garments.

And how to draw a pattern with no experience..

Professor Maki.

Fig. 59 Ideating on the learning process.

From instructions to sew-along.

So, I want the user to learn how to make garments and draw patterns. The first question that arises is; in what form should the platform teach them? It was already stated that the user should be supplied with hands-on projects in which they learn, but what do these look like? Maki used commercial patterns and had online instructions for these in text, illustration, and video, and Maki learned that these work great for explaining something. This is a starting point. However, a sewing pattern is no longer the driving factor since users will draw it themselves and might alter and change some things. This means

the users are not just executing literal instructions anymore; the process is opened up with creativity. Literal instructions on making a specific thing becomes "facilitation" in making your own thing. Therefore, this new process can be described as a sew-along (fig. 60). This is a hands-on project where the users make a garment from scratch with help of the platform, "they sew along". Just like the existing instructions from Maki, the user can be pointed out all the steps to make a garment on a web page that offers detailed explanations in text, illustration, and video, but that also guides the user through decisions in making it their own.

Now that there is a rough idea of how such a sew-along would look like, the question becomes how to facilitate pattern drawing in this form. Pattern drawing is complicated and entirely new for even more experienced sewers. I decided to think of a way to tackle this.

Offer sew-alongs

The sew-along should show the steps but also offer room for decisions so it does not become "literal instructions".

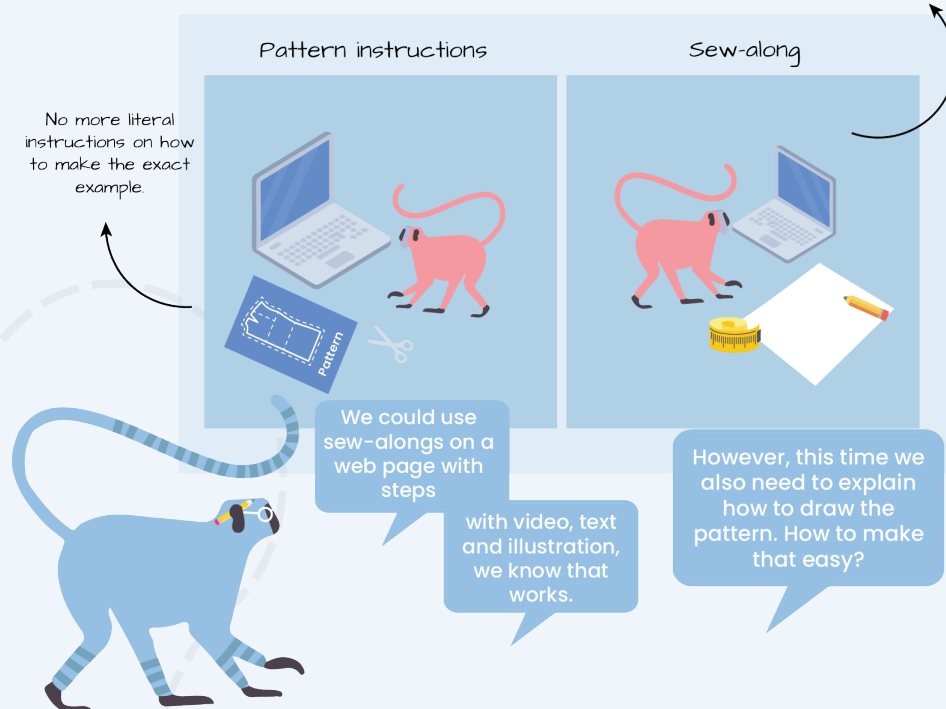A sew-along page that facilitates from pattern to garment..

No more literal instructions on how to make the exact example.

Pattern instructions

Sew-along

We could use sew-alongs on a web page with steps

with video, text and illustration, we know that works.

However, this time we also need to explain how to draw the pattern. How to make that easy?

Fig. 60 Sew-along.

Start with structure of lines.

We start with a simple structure of straight lines that is used to outline the pattern.

This structure could be made for your personal measurements.

Users should be explained how the lines correlate to the body so they start to understand how patterns work.

Let's see if a structure with straight lines will be simple enough.

However, how do we ensure that a pattern drawn like this will be correct? The math is quite complex.
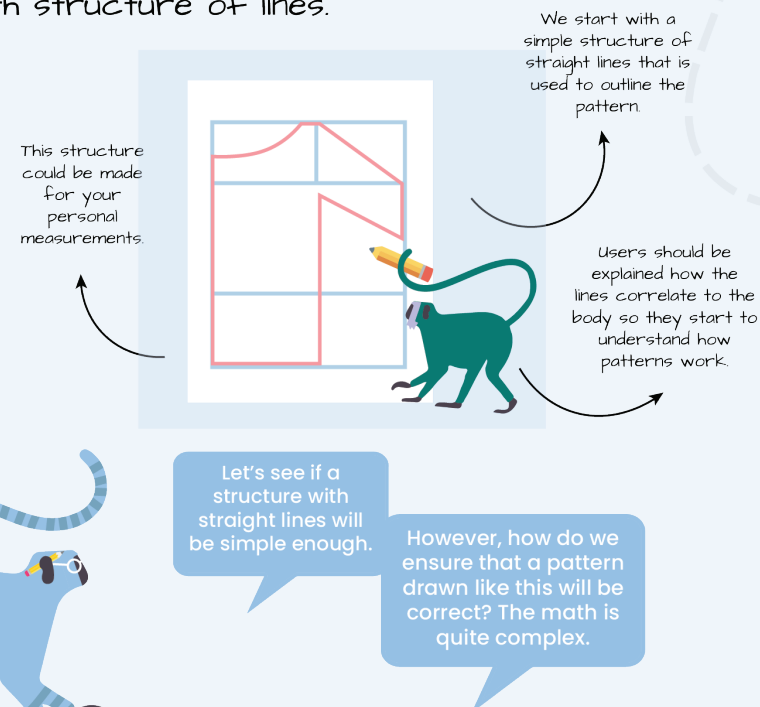
Fig. 61 Structure of simple lines.

Starting with a simple structure.

Inspired by the book: No pattern needed by Rosie Martin and the Make/Use project from McQuillan et al. (2018) as discussed in Chapter 4: Field research, the users could start with a simple structure. As I want to give the user as many creative options as possible, I decided to keep the structure simple. Next to this, I want the user to come close to experiencing traditional pattern drawing so that Maki becomes a stepping stone for learning the real thing. Like the Make/Use project, I would just use a structure of straight lines that can be used as an outline to draw the pattern. This structure will be parametric so that different size patterns can be made. Since this is a learning process, it will be essential to tell users how these lines correlate to points on the body. In this way, they might get a feel for how sewing patterns are built up (fig. 61).

Now that there is the idea of a structure, the question becomes: how can Maki let users make this in their size without all the math?
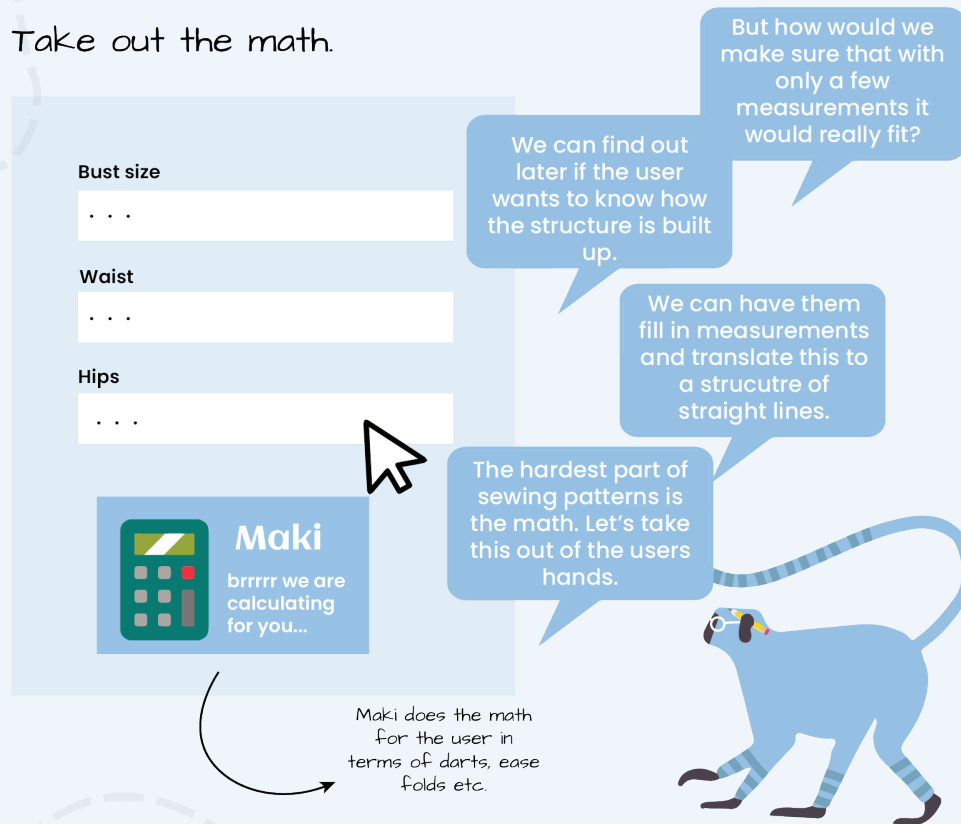
Take out the math.

Bust size

. . .

Waist

. . .

Hips

. . .

Maki

brrrrr we are calculating for you...

But how would we make sure that with only a few measurements it would really fit?

We can find out later if the user wants to know how the structure is built up.

We can have them fill in measurements and translate this to a strucutre of straight lines.

The hardest part of sewing patterns is the math. Let's take this out of the users hands.

Maki does the math for the user in terms of darts, ease folds etc.

Fig. 62 Option to fill in measurements.

Fill in measurements.

The hardest part about making sewing patterns is translating your measurements into a garment. Maki can enable the user to fill in their measurements before a project and output a fitting pattern to be drawn (fig. 68). This would take the complicated math out of the hands of the user. It will be interesting to see if the user indeed enjoys having this taken out of their hands or wants control over it.

With Maki doing the calculation for the users, more technical things such as ease (the extra room in the garment that makes it sit comfortably while moving) are taken out of the process, so the user can focus on learning the simple basics first.

The goal of the user was to learn how to draw patterns, so ultimately they would be able to create anything they want. For Maki to be a stepping stone in this, taking these technicalities out can be a problem. I should find out if the user has any desire in wanting to know where the calculations come from or are okay with keeping it simple at first. Maki could slowly start integrating the calculation when the skill-level of the user rises.

Fit checkpoints.

Even when professionals draw sewing patterns, they still need to go through fittings. Translating a pattern to a human body will likely almost need adjustments. In regular sewing patterns, the user follows the instructions and sews it together without any fittings. This often results in fit problems that are hard to fix. For this reason, I want to integrate fitting checkpoints (fig. 63) that allow the user to make alterations during the process to optimize the fit. This will ensure that it fits and teaches the user about how such alterations are made. An essential skill in pattern drawing. They will be facilitated through a process of fitting and altering to their own needs.
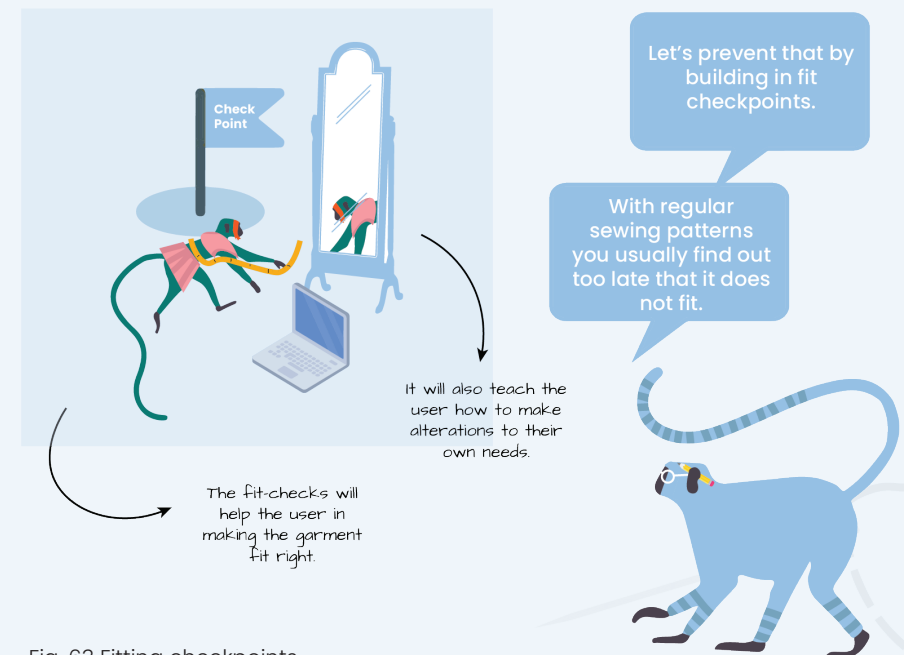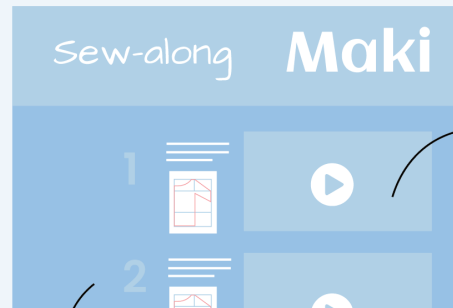
Fit checkpoints

Check Point

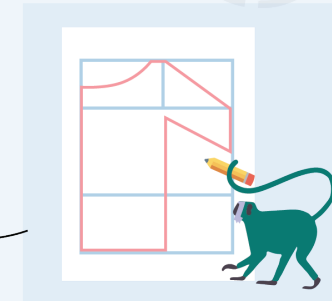Let's prevent that by building in fit checkpoints.

With regular sewing patterns you usually find out too late that it does not fit.

It will also teach the user how to make alterations to their own needs.

The fit-checks will help the user in making the garment fit right.

Fig. 63 Fitting checkpoints.

The learning process

A sew-along from scratch

A page that is called a sew-along with all the steps in text, illustration & video.

Sew-along **Maki**

1

2

There are fit-checks between the steps to make sure it fits. They facilitate the user in alterations.

In the process there are options and decisions so it does not become "lecturing".

Pattern drawing is done by starting with a simple structure in your measurements.

So, we have an idea on how we can facilitate pattern drawing and sewing....

Are there ways to make it a collaborative process?

Fig. 64 All ideas on facilitating the learning process.

With these ideas, I started to feel what the learning process is. Since the goal of this iteration cycle was to evaluate with users quickly, I decided to leave the ideation here and test this structure with fitting checkpoints first before adding more ideas (fig. 64). The question regarding the next pillar would be: how do I make this learning process collaborative?

Collaboration

an essential aspect of a makerspace, is collaboration. In the user research, some users mentioned the need for this collaboration. For this reason, I will explore the possibilities. Some decisions on facilitating creativity and learning have already been made, so a rough outline of the concept is starting to form. The concept will have a sew-along page and the project will be presented as a white canvas with an inspiration wall before the sew-along. I asked myself how collaboration could fit into this rough concept (fig. 65).
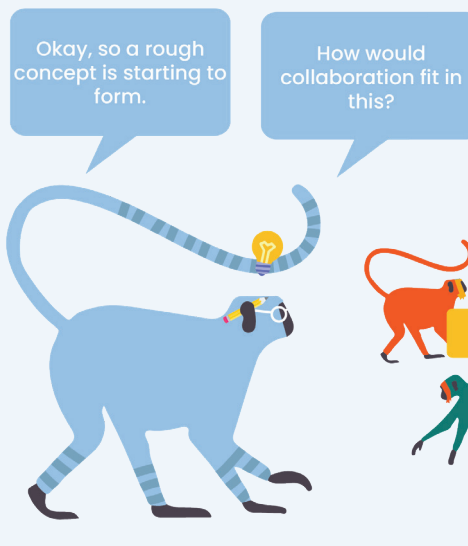
Okay, so a rough concept is starting to form.

How would collaboration fit in this?

Fig. 65 How to integrate collaboration?

Personal profile with everything you have made.

First things first, to collaborate, you need to exist on an online platform. For that reason, I decided each user should have a profile. The option of a profile opens up many possibilities and ideas. The profile can hold all your projects, the results, and practical stuff like your measurements. It could even showcase your skill level. However, the most important use is to create a personal space on the platform (fig. 66).

But now that there is a personal space for the user. What can they do with it?

Personal profile

Projects

Maki

Bust size
. . .

Waist
. . .

Hips
. . .

Skill
★★★★★

But now the user excists, what else can it do?

It could hold everything you have made so far.

It can hold all your information and skill-level.

A personal profile can be made for each maki.

To collaborate you first need to excist.

The profile could hold your measurements.

It could even show your skill-level in sewing and adjust these as you do more sew-alongs.

Fig. 66 Possible user profile layout.

Forum for help

★★★★★
. . .

★★★★★
. . .

Users can help others by giving solutions and tips.

If the user do get skill-levels assigned, this might encourage them to help others that are less skilled.

There could be a forum for each sew-along.

A forum could resemble the collaboration of a makerspace.

In this way they can help each other, but how can they also inspire each other?
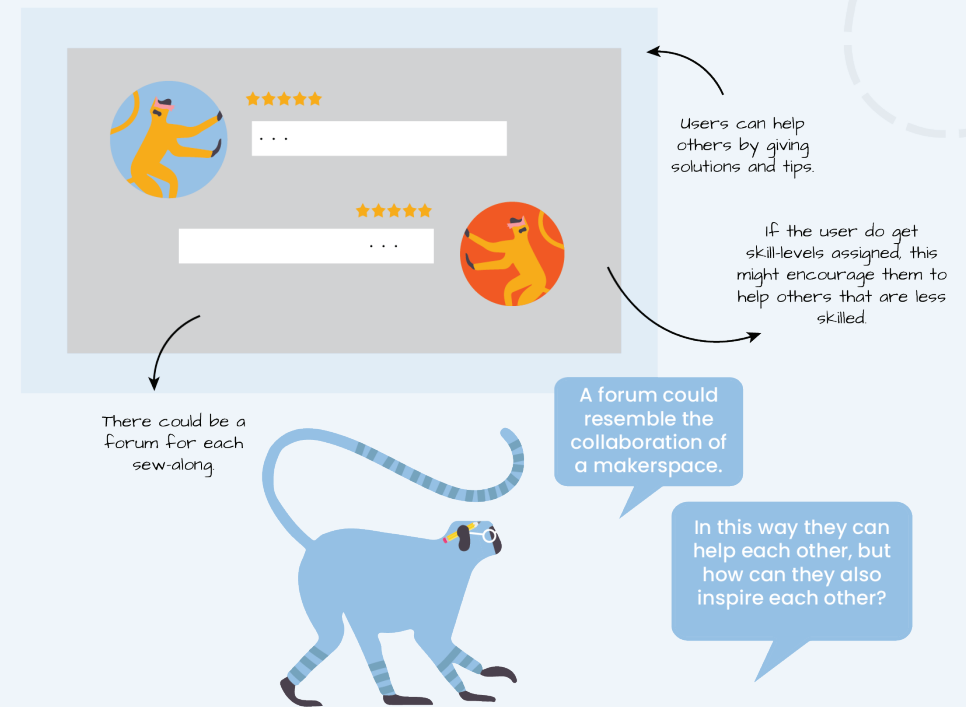
Fig. 67 Forum.

Forum for help

Sewing is a process with numerous struggles. I found that beginners often go to other people for help. As these people are not always available, it might be an idea to integrate a forum where users can seek help. Here, users can discuss, support, and inspire other sewers (fig. 67). Research of Andel et al. (2020) showed that commenting strengthens a sense of social presence. Research of Swan (2005) states that the use of a discussion board has the same effect. Hopefully, this forum will create this sense of social presence and allows the user to experience the benefits of collaboration like in a makerspace.

Share results

Now, the users can help each other when they get stuck. However, there can also be a more positive form of collaboration, something that is also present in makerspaces; inspiring others. The platform should make it easy to share results (fig. 68). In this way, makers can inspire each other in how they made the garment. Next to this, it can have a positive effect on users trusting the sew-along by seeing that it helped others obtain successful results. Other platforms such as Etsy use this as well.
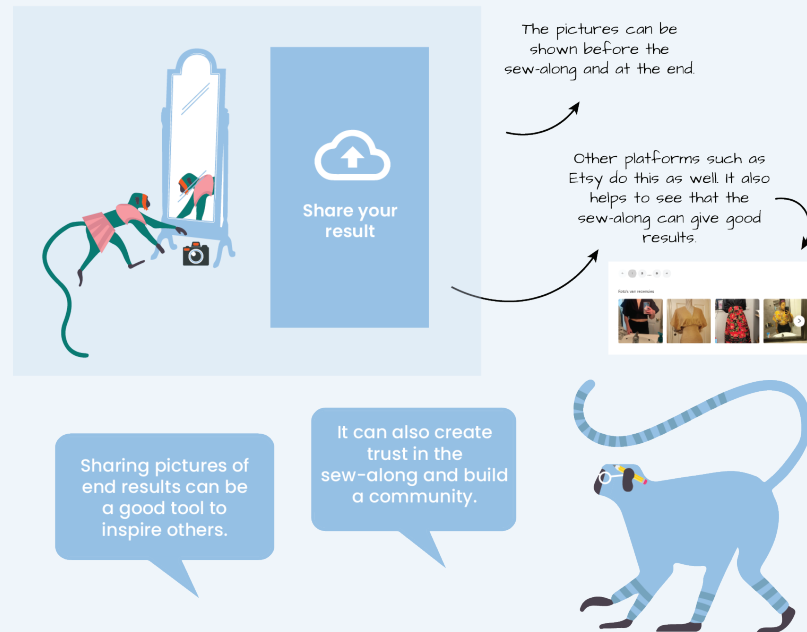
Design

Share results

The pictures can be shown before the sew-along and at the end.

Other platforms such as Etsy do this as well. It also helps to see that the sew-along can give good results.

Share your result

Sharing pictures of end results can be a good tool to inspire others.

It can also create trust in the sew-along and build a community.

Fig. 68 Possibility to share results.

With these ideas, I want to see if I am going in the right direction in making people collaborate. The profile, the forum, and the upload option are good starting points for building a community (fig. 69). It will be interesting to see if users indeed need this community.

Combining ideas

Now, that I have multiple ideas, they have to come together to form the first concept. Some ideas have already formed a rough outline of what the online makerspace should hold. There needs to be a sew-along page, there needs to be a page to show the white canvas with the inspiration wall before the sew-along, there has to be a personal profile, and a forum. Next to this, every platform has a home page. I made an overview of these pages and what functions they will fulfill to give me a starting point in designing the platform (fig. 70).
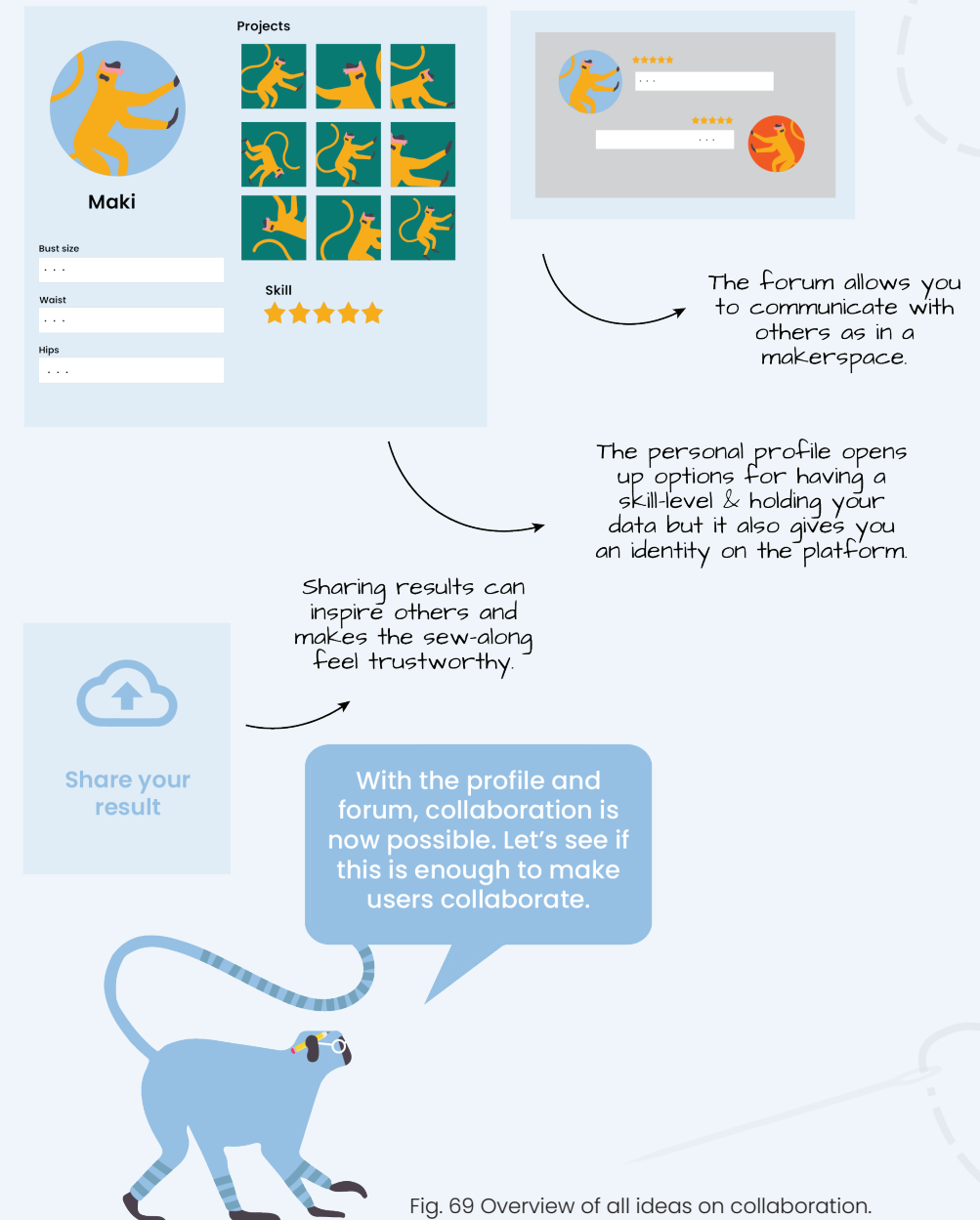
Collaboration

Projects

Maki

Bust size
. . .

Waist
. . .

Hips
. . .

Skill
★★★★★

The forum allows you to communicate with others as in a makerspace.

The personal profile opens up options for having a skill-level & holding your data but it also gives you an identity on the platform.

Sharing results can inspire others and makes the sew-along feel trustworthy.

Share your result

With the profile and forum, collaboration is now possible. Let's see if this is enough to make users collaborate.

Fig. 69 Overview of all ideas on collaboration.

Online makerspace

The product page is basically where you sell the "product", in this case the sew-along. It also holds the function to inspire users.

The sew-along could refer to the forum at every step so the user knows this option is available.

Pages user goes through

Home page → Profile page → Sew-along product page → Sew-along → Forum

sign up

Help

Functions

Explain concept	Fill in measurements	white canvas as product	Explain steps (video, text illustration)	Q & A for Maki's
Convince to sign up	Show all results	Inspiration wall	Refer to forum	
Introduce community	Hold personal data	Show variation options	Upload results	
	Show current skill-level	Results of other Maki's		

Since the concept of sew-alongs from scratch is new, we need a place to explain to users how this will work.

The results that are uploaded should directly appear on the product page.

Fig. 70 Overview of functions of all pages.

Home Page

Profile page

Fig. 71 Wireframes of updated pages.

The home page would have the function to explain the concept to the user. The profile page will hold all the personal information; measurements, results, skill level, etc. The sew-along needs to be promoted on the platform, this can be done on the product page. This is where the white canvas and inspiration wall can be shown to the user before they start the sew-along. Finally, there is the sew-along page that explains the user how to make the garments in steps with text, illustration and video. This sew-along page

is connected to a forum where users can interact. Now that I had an overview of what these pages would need, I proceeded to make wireframes of these pages (fig. 71). While creating the wireframes, some additional ideas came up. The wireframes and ideas can be found on a full scale in Appendix C.

With these wireframes, a concept is starting to form. An overview of this concept will be given in the next section.

5.5 Concept

With the wireframes made, the concept of an online makerspace with sew-alongs was formed; Maki makerspace. To explain the concept, there will be an overview of the users' journey when visiting the pages (fig. 72). The concept will be explained further in writing.

Home page

The home page first explains the concept of the sew-alongs.

A video shows the user how the platform works.

The product page also explains everything the user will need to start.

Then the user is explained in 3 steps how it works again.

The user is also introduced to the community with pictures of sewers.

product page

A garment is presented as a "white canvas".

An inspiration wall shows images to inspire the user. There are also pictures of end-results from others.

Fit-checks help the user in making it sit right.

The user can upload an image of their result when they are done.

Sew-along page

Every step is explained in text, video and, illustration.

Fig. 72 Concept overview Maki Makerspace.

Profile page

Maki

NAME

Name

Completed projects

REFILL REFILL REFILL REFILL

Skill level
Rising rookie

Measuremetns

Waist

Hips

Upper bust

Arm lenght

Full bust

Neck

Logo

Home About Contact

Each user has a personal profile that shows their skill-level and measurements.

I am actually a beginner in skill-level now, but I will grow!

So the profile page is where I fill in and store my measurements. Good to know!

Forum

Sew-along title

Forum

5 other makers are online

NEED HELP FROM AUTHOR

Ask other makers

General

NEW QUESTION

I cannot figure out how to?

Name

Name Input field

Can someone help me with?

Step 1

NEW QUESTION

I cannot figure out how to?

Name

Name Input field

Can someone help me with?

Step 2

NEW QUESTION

I cannot figure out how to?

Name

Name Input field

Logo

A forum is there to help the user when they get stuck or want to communicate with others.

The forum has Q & A's for every step.

I am starting to understand how this pattern drawing works.

I finished my first dress completely from scratch!

AAAAAH! I think I am stuck here...Maybe someone else can help me with how to fix this.

The concept op Maki Makerspace is a platform that provides sew-alongs to beginning sewers. In these sew-alongs, users make clothes from scratch. In the process they learn a basis of pattern drawing, so they can create anything they want in the future.

On the platform, the user will be shown a base garment like a "white canvas" combined with inspiring images and variation possibilities. In this way, the user can create their vision of what they want to make and is stimulated to explore creatively.

In the sew-alongs, **the user learns how to draft the pattern.** The user fills in their measurements, and a simple structure will be generated. With the use of instructions in video, illustration, and text, the user is shown how the pattern is drawn and how it should be sewn together. The fit-checks will help the user in making it fit well. Any fit alterations will be supported in the sew-along.

On the platform, **collaboration** is possible. Every user has a profile. When users get stuck or need help with a specific idea, they can go to the Maki forum, where other users can help. When users finish a garment, they can upload a picture. This will appear on the website to inspire others.

Unlike a sewing pattern with literal instruction or an online tutorial telling you how to make a specific dress, **Maki Makerspace facilitates the user in making a garment that is entirely their own.** The user is given creative decisions and options to alter whilst being provided a step-by-step overview of how to assemble the pieces. In this way, they learn through doing and are facilitated rather than given literal instructions. The outcome can be different for each user, unlike regular sewing patterns. Hopefully, this is a first stab of Maki becoming a stepping stone in teaching users how to draw patterns and create garments, **so one day, they can have the true creative freedom they desire, and make anything they want.**

5.6 Prototype

To see if this platform was feasible and to evaluate the concept with users, a prototype was built. For this prototype, there were two main aspects that need to be developed. First, a pattern had to be developed that users could draw and where they have some creative options. This pattern had to be parametric, so users could fill in their measurements. These would then have to be translated to a simple structure of lines. Furthermore, a set of instructions has to be created in text, illustrations and video on how to sew the item together.

The other aspect is building the platform. The wireframes have to be transferred to actual web pages. In this section, The process of building a prototype is described, starting with developing the pattern and instructions and ending with the development of the online platform.

Developing the sewing pattern system

A parametric sewing pattern was needed with a few simple measurements. To not overcomplicate things, it was decided to make a parametric pattern for a simple slip-dress (fig. 73).

The slip dress is an easy garment for beginners, and creating the pattern will not take a lot of time.
I started thinking about what measurements would be necessary to make it fit and how darts and ease should be added. For this, I took inspiration from commercial slip-dress patterns.

I taped my dress form with a few lines and made a mock-up of the pattern. This gave me some insights into which measurements were important. I translated this to a model in Excel (Appendix D) and played around with multiple values of ease and measurements. After drawing various patterns (fig. 80) and sewing multiple mock-ups, I developed a pattern system that can be drafted using eight measurements, that starts from a simple structure of straight lines.

Fig. 73 Slip-dress design.

The pattern system was tested using my measurements, the measurements of my dress form, and the measurements of someone with a different body type (fig. 74). A decent result was obtained in all three situations, so I felt confident enough to have beginning sewers play around with it.

Fig. 74 Prototyping.

I made multiple test versions of the pattern.

Lots of mock-ups were made to test the fit.
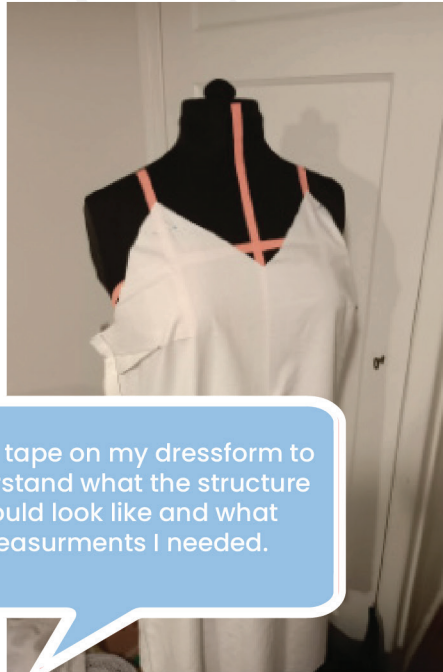
I used tape on my dressform to understand what the structure should look like and what measurments I needed.
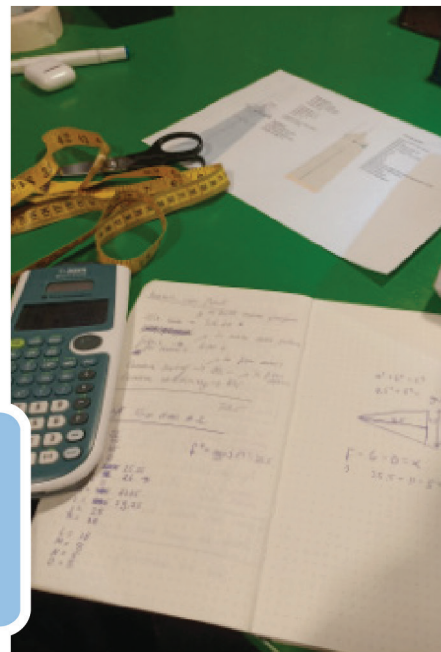
I used different people to test with.

Here, I experimented with the darts and the ease.

53

The user needs to draw the following structure (fig. 75). The distances are determined by their measurements. The calculations for this pattern can be found in the model in Appendix D. The lines within the structure represent different body measurements (fig. 76):
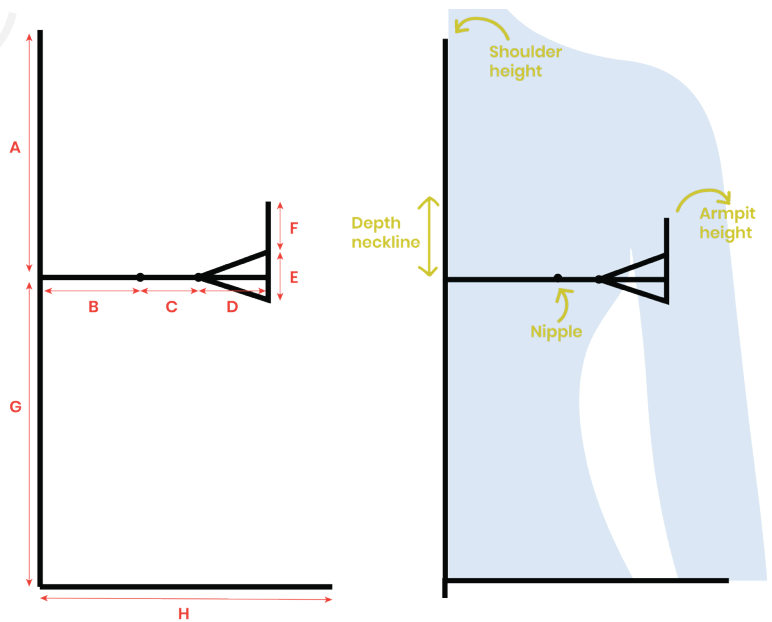
Fig. 75 Structure for pattern system.

Fig. 76 Relations of lines to the body.

Fig. 77 Front and back pattern.

When connecting these lines, the user will get the following pattern for the front part of the dress (fig. 77):

The back pattern is created by folding the front pattern along two lines(fig. 83). This prevents the user from having to draw something twice and wasting paper. This folding was a happy accident that I found worked well.

With this line structure as a base, the much-needed creative freedom becomes possible. The user can decide on the neckline, the width, and the length of the dress (fig. 78 & 79).

Straight   **Halter**   **V-neck**   **Round**
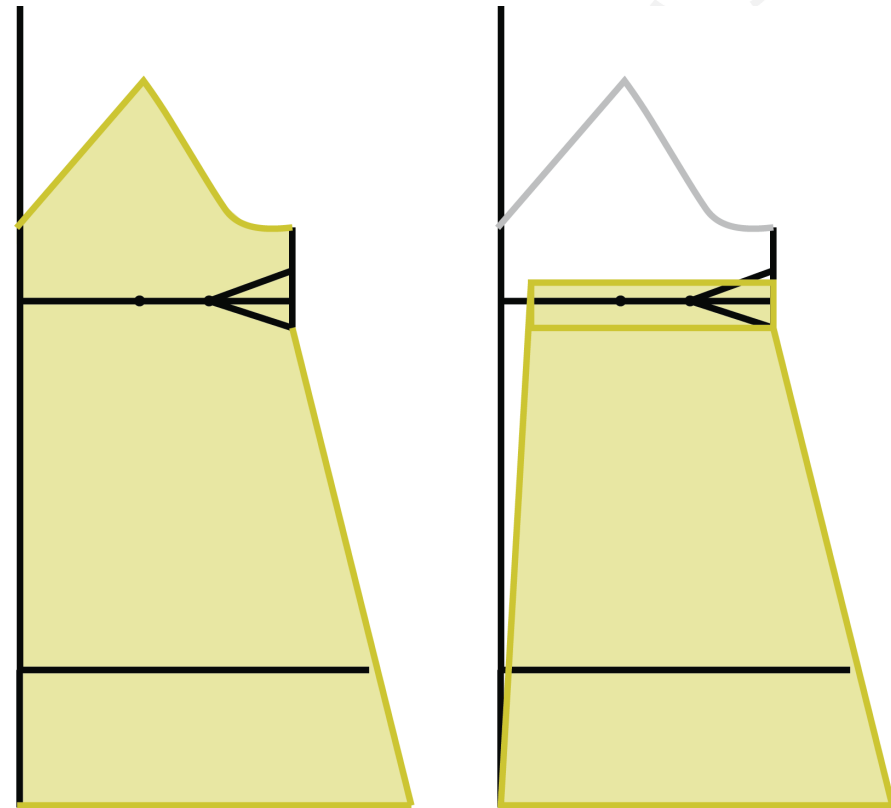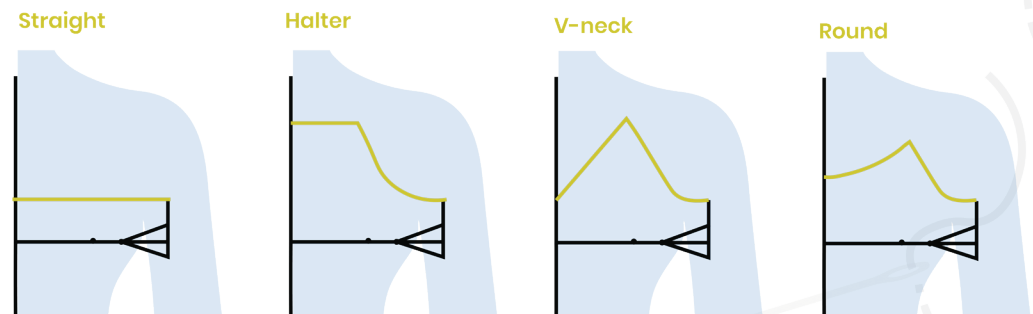
Fig. 78 Variation options.
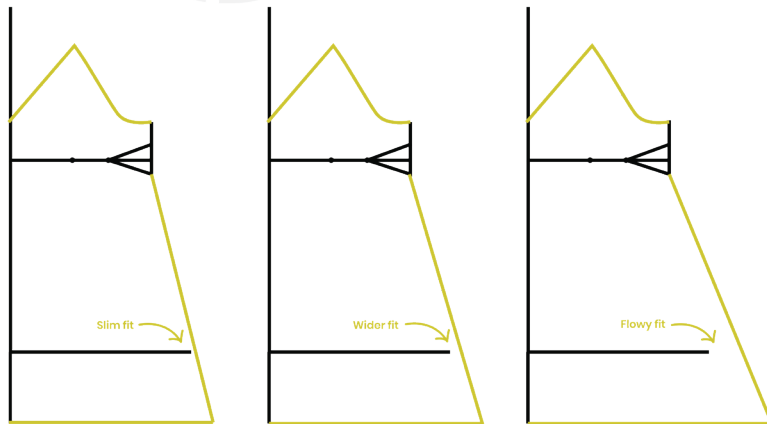
Fig. 79 Variation options.

The pattern was created to be on the large side. Even though the parametric system works well, I learned that adjustments are sometimes needed to account for measuring, cutting, and sewing errors. To make up for these errors, I decided to add a large seam allowance, so the user can make adjustments. This will be done in the fit-checks (as explained in Chapter 5.4; Ideation). Here, the user is taught how to make alterations to ensure that the dress fits. In this case, this is either taking the dress in or giving more space with the seam allowance.

This pattern and its fit-checks, were translated into a set of steps that included illustrations, text and video. I started to design what such a step would look like. Some examples can be found here (fig. 80). Since the objective of Maki was to be a stepping stone to teach users a basis in pattern drawing, it was important to include steps of this traditional practice. I.g. letting users add seam allowances (extra fabric behind the seams) and having users draw darts (folds in the fabric to create 3D shapes). These skills are at the basis of pattern drawing.

Fig. 80 Examples of steps Maki Makerspace

Taking measurements

While making this pattern, I regularly had to take measurements on myself. This was pretty hard to do. I realized I had not thought about how the user should take their measurements. For this reason, a system of using pins and a tight T-shirt was introduced. Users would place pins on specific points on the body and measure between these points. In this way, the measurements become more consistent and easier to understand for the user (fig. 81 & 82).

With illustrations (fig. 83) and video, it can be explained to the user how their measurements should be taken.
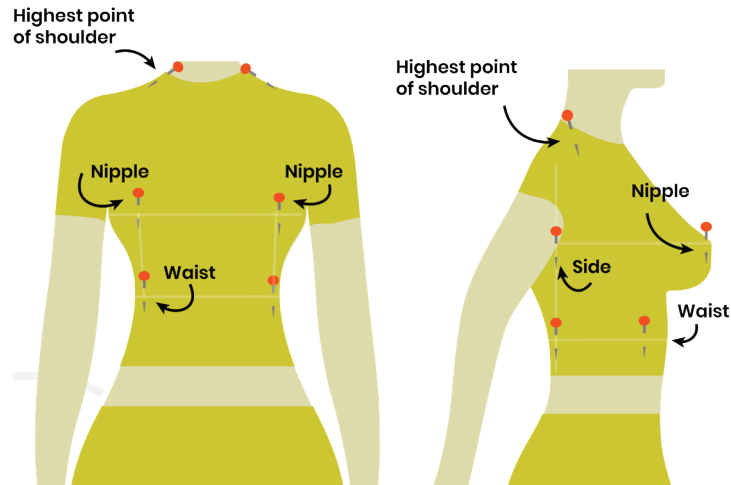

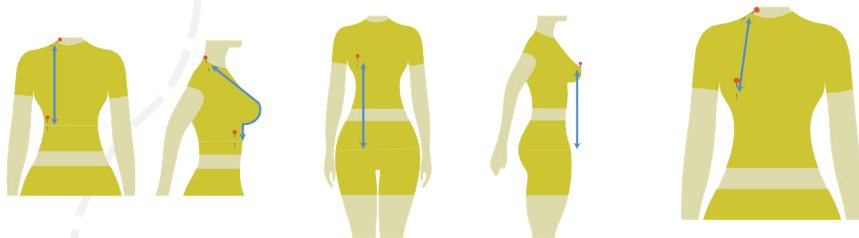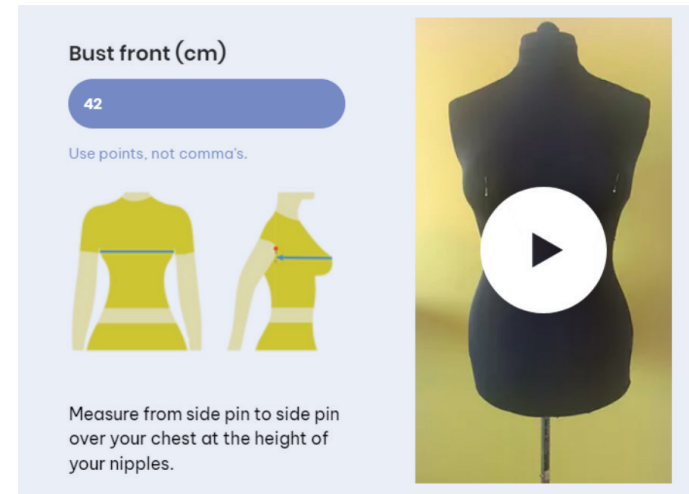Fig. 81 Points on the body where pins should be placed.

Fig. 82 measuring instructions

Fig. 83 measuring instructions.

Building the platform

To make this a functioning prototype, a web editor (Wix) was used to build all the pages of the platform. Some simple JavaScript functions allowed me to do calculations with user inputs (measurements). The platform was given a different name because Maki is selling other patterns. To not confuse subscribers, the prototype of the platform was called ZigZag.

In building every page, the wireframes that were shown before were used and copied. The steps that were created were placed on the sew-along page. Some minor adjustments had to be made in where things are placed on the page because of limitations in Wix. However, all the core functionalities are built into the prototype. Screenshots of the platform in full scale can be found in Appendix E. an overview is given here (fig. 84).
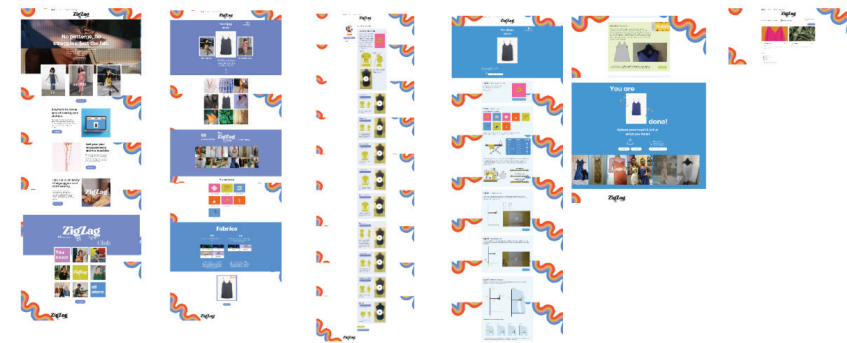

Fig. 84 Screenshots of prototype.

5.7 User evaluation

After the prototype was made, the concept was evaluated by users. The evaluation was focused on whether the design goal is met with the concept of Maki Makerspace and what still needs to change. Since this is the first concept, it is expected that numerous aspects still need improvement.

This section will discuss the process of evaluating Maki Makerspace with users. First, the approach of the evaluation is discussed. Then, a pilot is conducted, and the results are discussed. Furthermore, a questionnaire and interviews are done to conclude the pilot. The chapter section with an overview of insights that guide the concept into the second iteration cycle.

Approach

Leading in this evaluation is if the design goal is met with the concept of Maki Makerspace. The design goal revolved around what the users find the most important; making fitting clothes from scratch in their style. This was translated to a research question:

How does a beginning sewer experience making a dress from scratch in their style by using the platform of Maki Makerspace?

Furthermore, the design goal had three pillars; creative exploration, the learning process, and collaboration. These pillars will be used to make sure all the aspects of the concept are assessed (fig. 85).

To answer the research question, a pilot was used that had users make a slip-dress with the prototype. 25 participants were collected through a small Instagram campaign (fig. 86). Since the participants are all subscribers of Maki, they are all beginning sewers.
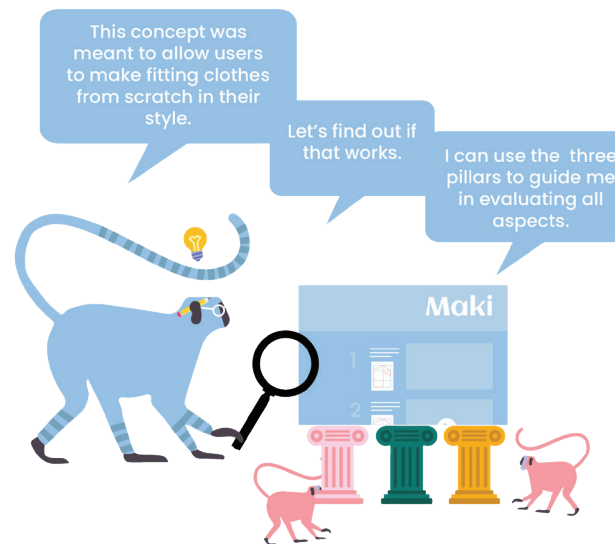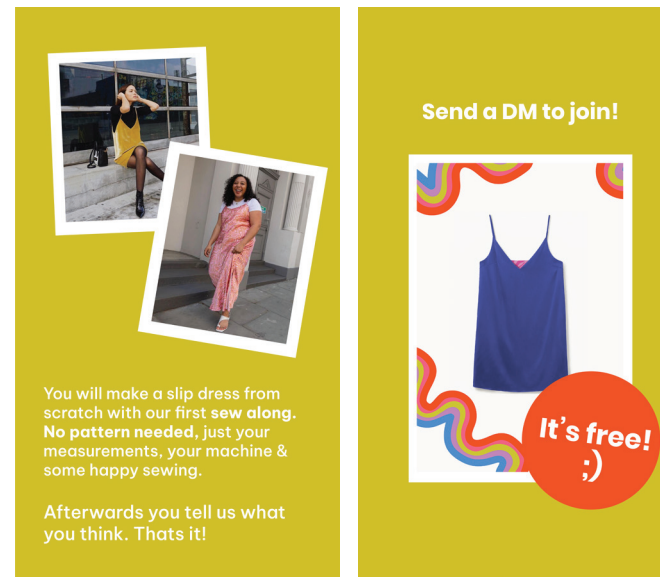

Fig. 85 User evaluation plan.

Fig. 86 Images shared on Instagram to obtain participants.

For the pilot to be realistic, the participants should come as close to the experience of Maki Makerspace as possible. For that reason, it was decided to allow them two weeks to finish a slip-dress with the platform's help. The participants would not be interfered with during these two weeks and are only asked for their feedback in a questionnaire and interviews when they are done. This would allow them the room to finish the pilot in their own time and space, as users expressed they wanted to learn independently. This is an advantage of an online platform that participants could experience in this pilot. However, there is a disadvantage to this method. It would be hard to see how the user responded to the platform. Therefore, it was decided to be present for one of the participants when they made the dress, so their response to the platform could be observed.

Pilot

The participants were given two weeks to finish the pilot. After this time, 21 made an account on the platform, 15 started the sew-along, and 11 finished on time. Even though these numbers were a bit disappointing, there was an explanation. The participants often had to buy fabric online and did not receive it on time to start. Next to this, the weather was nice and sunny, which led to people changing their plans.
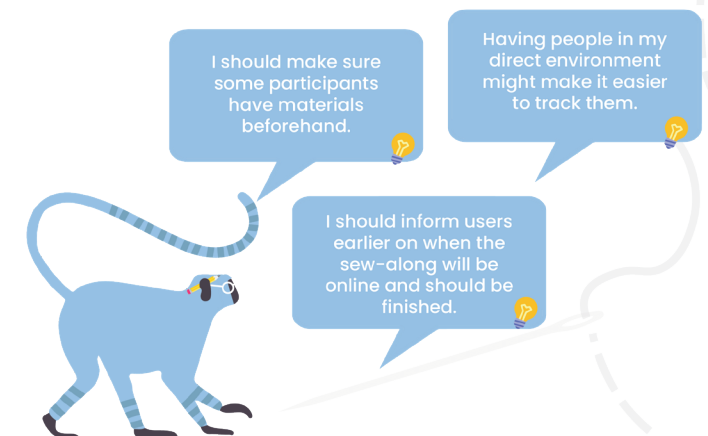

Fig. 87 Takeaways for the next pilot.

These things will be considered for the next pilot round (fig. 87). However, there was still enough data to draw conclusions with nine results. For one of the participants, I was present during the pilot. The insights from this observation and insights from the other online participants will be discussed now.

Observing a participant

One of the participants was observed during the pilot. This participant described herself as a "beginning sewer". She had never done any pattern drawing or made something fitting for her measurements.

During the process, notes were taken. An extensive overview of the observations and takeaways can be found in Appendix F. The user made a well-fitting dress with the platform's help. It surprised me that the process was relatively smooth, but of course, there were hurdles. Figure 89 shows observations and accompanying insights. This will be further explained now.

The user enjoyed the creative options the most. She said she had been looking to make her own dress for a party, but could not find the correct pattern. With this sew-along, she could make the dress have her envisioned neckline. However, she did mention that the options she had were not clear to her from the start. She only discovered during the sew-along that there were things that she could change. Maki will need to make sure the users understand that they are entering a creative process.

 Next to this, she needed more support in drawing curved lines. She had trouble visualizing how the lines she drew would eventually translate to the dress. Even though the dress ended up fitting, she would have liked the neckline to sit a bit higher. This could have been prevented If she had understood how the pattern would translate to the dress. It is important that Maki supports the user enough in drawing the pattern, maybe more supportive tools should be implemented.

Another thing worth mentioning was how she felt confident enough to differentiate from the sew-along. Sometimes she did things her way or had an inventive solution to a problem. The literature research showed

this sort of behavior is typical for a maker and should only be supported. The fact that she felt free enough to take a different approach, even with me in the room, told me that the sew-along did allow room for this exploration. However, sometimes she skipped steps that were important. If the sew-along had better explained why some things are done, this might lead to the user not skipping these steps.

Online participants

For the other participants, it was hard to keep track of what they were doing until they had uploaded their results and filled in the questionnaire. However, in the two weeks, the pilot ran, there were a few things that could be said. People filled in their measurements before starting the sew-along, which showed the intention to start. Upon hearing they were waiting for fabric, this started to make sense. During the sew-along, no one placed a message on the forum during the sew-along. They either do not need this function, or something was holding them back from using it.

Next to this, not every one that finished the sew-along uploaded a picture to the platform. It will be interesting to find out what held them back.

Multiple pictures of the results were uploaded to the website. I was relieved to find out that most had gotten through the sew-along and obtained a successful result. Some results can be found below, together with observations made when looking at the dresses. (fig. 90). They are explained now.

When looking at the dresses, participants used the various design options they were given and were not afraid to deviate from the example in the videos. Some participants even made alterations that were not explained in the sew-along (a slit or a more "body-con" fit using a more stretchy fabric). This shows the creative and explorative play that is so important to a maker as discussed in Chapter 2.2 The Maker Movement. Users might even want more options, It will be interesting to explore this creativity further.

All these insights are summed up into a list of takeaways (fig. 88). The takeaways are color-coded

according to which pillar they belong. This can help later in seeing what pillar still needs the most improvement.

Pilot

The sew-along should explain why the user is doing something so they will not skip steps.

All variation options should be supported throughout the entire sew-along.

There needs to be more support in drawing and visualizing curved lines.

People made creative decisions that were not facilitated. Offering more creative freedom should be explored.

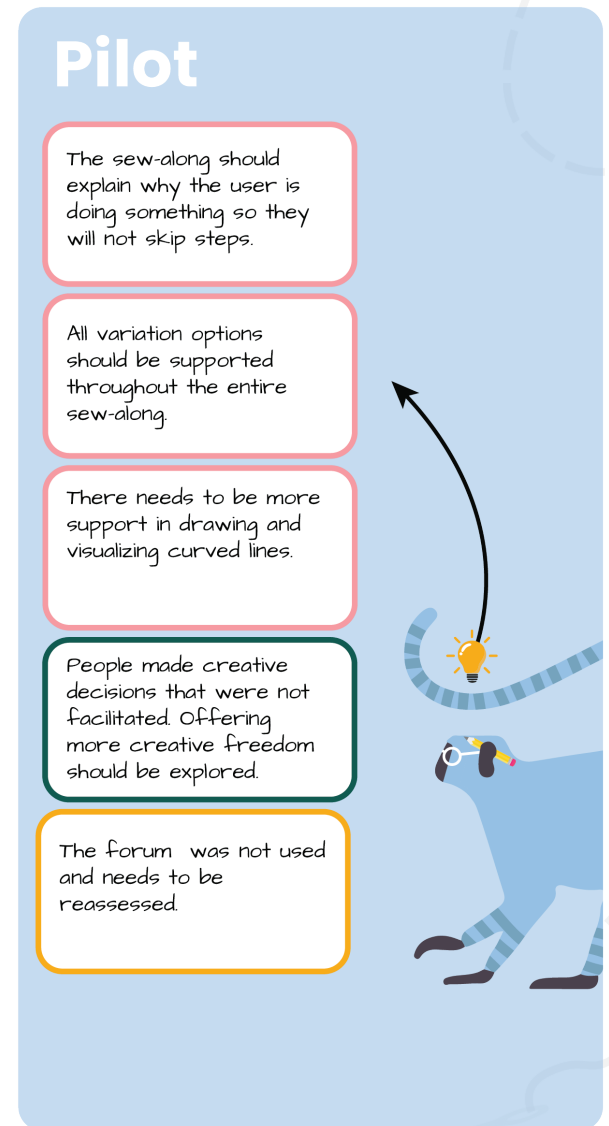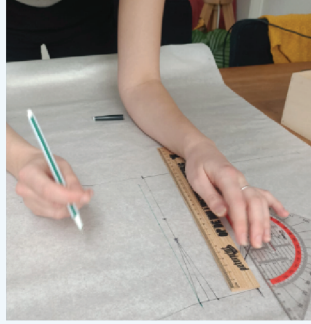The forum was not used and needs to be reassessed.

Fig. 88 Takeaways from the pilot.

👁 Measuring went without problems. Although sometimes she got sloppy.

💡 Explain why taking measurements correctly is very important.

👁 The user started drawing the pattern in the corner of the paper. This led to a problem.

💡 Explain where to start drawing on the paper and how much paper you need.

👁 The user taped extra paper to her pattern to fix the problem.

💡 Users will find their own inventive solutions to problems. Do not interrupt this process.

👁 The user enjoyed the creative decisions. She did not know there were so many options.
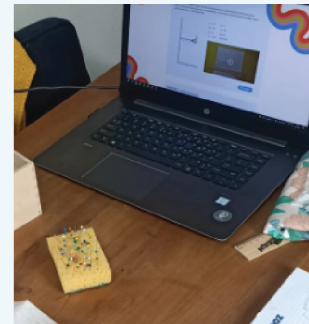
💡 Creative options got the user excited. They should be clear from the start and highlighted in the concept.

👁 The user marked her machine but said she did not understand why.

💡 Explain why the user is doing certain actions so they are more inclined to do it.

👁 The user wanted to cut everything at once, but the sew-along told her not to; she was confused.
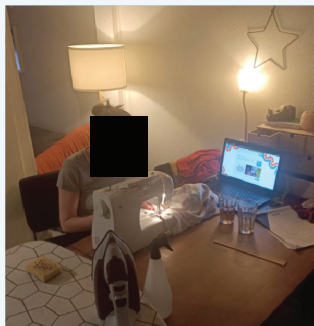
💡 Explain why a specific order is necessary to make the dress fit better.

👁 The user had never made darts and yet ignored the instructions to do it her way.

💡 Suggest ways of doing things instead of presenting it like there is only one way. Facilitate not lecture.

👁 The fit-check helped. The dress sat right. However, she was unsure about the lining.

💡 Explain how lining affects the fit and how having ease makes it more comfortable.

👁 In drawing the curves for the neckline, the user struggled.
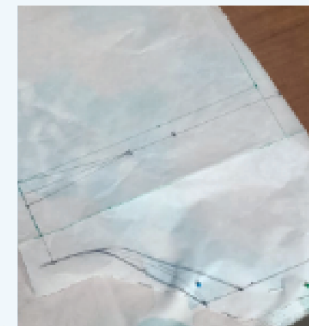
💡 Provide more support for curved lines and help visualize how it will look in the end.

👁 The user felt unsupported in her decision to sew a different neckline. She got stuck.

💡 Offer support for all variation options.

This user made a tighter dress from stretch fabric. She must have taken it in at the fit-checkpoint. It helped her alter it to her needs.

Users actually made different necklines, this shows that they are not afraid to make creative decisions.

This dress has a slit in the back (I was told). This was not supported in the sew-along.

All the dresses seem sewn togheter well. There are no clear signs of mistakes.

There is a lot of variety in the end results, we can confim user use the creative freedom they are given.

Maybe there is room for even more creative options?

Fig. 90 Slip-dress results.

Questionnaire

To understand what the online participants experienced during the pilot, they had to fill in a questionnaire (fig. 91).

It was decided to do both a questionnaire and interviews because at the start of the pilot 25 people had signed up. Since it would be too much to interview all of them, I wanted to use a questionnaire to learn what their experience was. However, with fewer participants than expected, only 11 participants filled in the questionnaire (not all of them finished the dress completely).
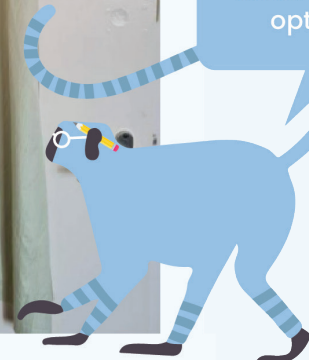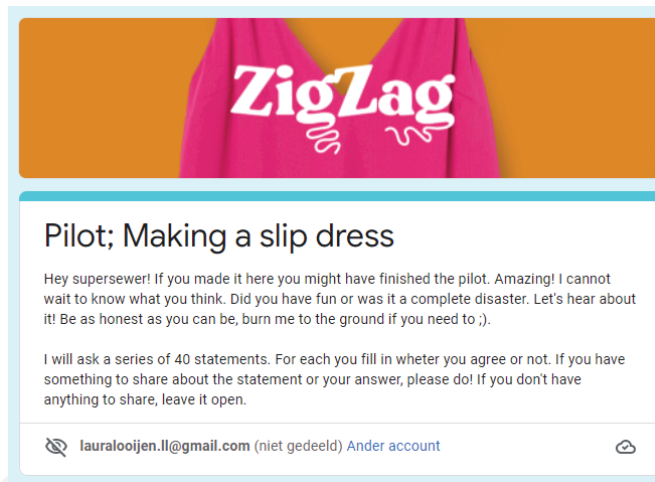
Fig. 91 Questionnaire.

Since the pilot already asked a lot of time from the user, the questionnaire was aimed to be efficient yet dive into all pillars. For this reason, Likert scales were used. You can fill these in quickly, yet they still show an intensity or strength towards a statement. 40 statements were made up and divided over the three pillars. The entire list of statements can be found in Appendix G. The user was given space to elaborate after every statement.

The results of the questionnaire can be found in Appendix G. Since there were fewer participants than initially expected, the statements were hard to draw conclusions from. The statements that were unanimously agreed or disagreed with, were used to draw conclusions. The statements ended up not really being insightful because they missed an explanation. For the other statements, quotes from the users were used. Since these were very insightful, the next questionnaire should simply aim to ask open questions. Next to this, I got the feedback that the questionnaire was still too long (fig. 92).
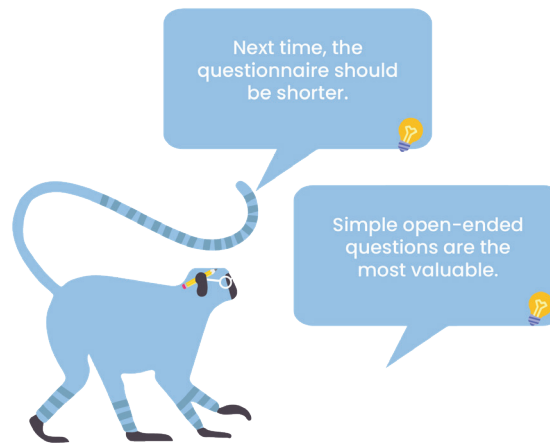
Fig. 92 Takeaways for the next questionnaire.

An overview is presented of the most important statements and interesting quotes in figure 93. The insights from the questionnaire will be further discussed now.

The users acknowledged that the sew-along was a different experience than making a commercial sewing pattern. Users appreciated the creative freedom that the concept offered and enjoyed the process of learning how to draw patterns. Users mentioned that the experience was more personal and that they started to have an understanding of measurements and drafting. They also mentioned that starting with a base was useful. Next to this, participants unanimously agreed that the fit-checks helped them in making the dress fit.

However, there were still some hurdles. The users still seemed to struggle with understanding how the pattern translated to a garment, and therefore they made some mistakes. One user mentioned that using the structure was not clear enough, and that drawing the curved neckline for the dress was too complex. Next to this one user stated that even though she gained an understanding of pattern drawing, she would have a hard time using this knowledge to make anything else. In saying this she confirmed that users indeed have the goal to draw their own designs one day. However, as of right now, Maki does not support the user good enough to get there. The pattern drawing needs more support in drawing curved lines and explaining the user how the pattern translates to the garment so the users builds a skill set.

The users were very enthusiastic about the creative freedom they were given. Users even asked for more creative space within the sew-along and said that his was the most enjoyable part of the concept. However, it was not clear to them, that they had this creative freedom in the start. In hindsight, this makes sense, the base that was supposed to be shown as a white canvas, was just a greyed out picture of the dress. This was not enough to show users they had options. Maki should explore this creative freedom in the concept further.

Surprisingly, users were not that enthusiastic about collaborating during the sew-along. One user mentioned that it is not something they actually want, as it is their own little project. Another user mentioned not using the forum because they did not have any questions. It will be interesting to see what comes out of the interviews to better understand this.

These insights are translated to the final takeaways of the questionnaire (fig. 94). Just like the overview of the pilot, the takeaways are color coded according to which pillar they belong.

Statements

Fig. 93 Overview of questionnaire results.

✅ **Agreed**
It was easy to navigate through the website.

✅ **Agreed**
The concept of a sew-along was understood.

✅ **Agreed**
Measuring and filling in the measurements was easy.

❌ **Disagreed**
Measuring felt like too much of a hassle for this project.

✅ **Agreed**
I felt confident that the item would fit.

❌ **Disagreed**
The steps were too detailed.

❌ **Disagreed**
Drawing the pattern myself was complicated.

✅ **Agreed**
I enjoyed drawing the pattern.

❌ **Disagreed**
I would rather have the option to print the pattern.

✅ **Agreed**
The dress I made fit well and came out as expected.

✅ **Agreed**
The fit-checks have helped me to make the dress fit well.

✅ **Agreed**
I felt supported and confident during the sew-along.

✅ **Agreed**
I have learned something new.

✅ **Agreed**
The website has inspired me to make the dress in my style.

❌ **Disagreed**
I was afraid to let go of the example.

❌ **Disagreed**
I wish I had more creative freedom.

✅ **Agreed**
I would like to be part of a sewing community.

✅ **Agreed**
Seeing work of others has inspired me.

✅ **Agreed**
I used the text, video and illustrations to understand the steps.

✅ **Agreed**
The sewing page had a clear layout.

Quotes

"It was a very different experience than normal patterns, which leave you in the dark on so many aspects. This was really a learning space!"

Visualizing how the pattern will end up looking is still a problem.

"I learned about drafting and measurements but I have to think about this hard and deep to be able to make anything else with this knowledge"

It seems like the user starts to have an understanding but remains insecure. Should the pattern drawing be simpler?

"I made a mistake with the neck, I think…It looked different than I wanted."

The creative freedom is appreciated. The pattern drawing is seen as a tool to get there.
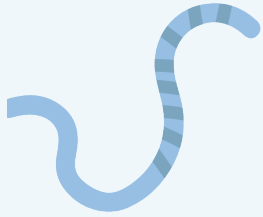
"Well for me it wasn't much about my measurements but more about the creative freedom! It was really cool to see how to draft. I had never done that before."

"As an impatient person I mostly used text and illustration. I only clicked on the video if it wasn't clear right away."

The user felt like the method supplied with the structure, was not clear enough. They even wished they had done it differently.

" I found it hard to draw the neckline and know how it would look on me. I think I would have better taken a existing halter top from my closet to decide this. "

Detailed steps work. This is confirmed again.

"There were many steps, but I kind of liked the ease of checking off many steps. Especially for beginners I think this to be great"

However, starting with a simple basic pattern was appreciated.

"It was really nice that you first drew a basic pattern and then you could design your own neckline."

"Really fun to draw the pattern. I have never done that before and it would be a cool skill to have. "

"I actually never checked the forum because I didn't have any questions. Maybe if I got a notification when someone asked something that I had helped."

Surprisingly, users were not that enthusiastic about collaboration. It appears it is not necessary for them. Maybe the forum was not integrated enough.

Again, the options the user had were not clear beforehand.

"I would have like to know beforehand what the options were."

"Collaboration is not something I actively want. It's MY own little project :) But maybe if I'd struggle much it would be nice to know if others are with me."

Here a users asks for more creative options. This seems to be the direction to go in.

"As a beginner, I also like to just go at my own pace."

The sew-along was experienced as personal.. This ties in with the idea of the sew-along being facilitative in your own process instead of making a standard pattern..

"I really enjoyed making your own pattern this way because I hadn't done that before. The different steps you made to decide what the dress would look like made it very personal"

"It would be nice, for a next step, to show more variation."

Questionnaire

The creative freedom was enjoyed. It could be extended and focused upon.

The user should know what creative options they have beforehand.

The user needs more support in freehanding curved lines.

The user needs more support in visualizing what the lines they draw will result in.

The user is not sure if it wants to collaborate. It would have to be low-effort and low-key.

Collaboration should be better integrated into the sew-along.

Fig. 94 Takeaways from the questionnaire.

Interviews

After the questionnaire, 3 participants were selected to do follow-up interviews online (Zoom). This was done to give some participants the chance to elaborate on the answers from the questionnaire and to allow for things to come up that were not mentioned in the questionnaire. In these interviews, the platform was screen shared.

The participants were asked to share whatever came to their minds when revisiting the pages. In addition to this, there were a few guiding questions to make sure the conversation would flow and that all the aspects of the platform are discussed. For each pillar, a few questions were stated. After the interviews, the answers were written down and translated. The list of questions and their answers can be found in Appendix H. Overall, this way of interviewing worked well and users had a lot to tell about the platform.

The interviews were analyzed and summarized. The results will be discussed now togheter with some first ideas on how to improve on the concept.

Results

The users mentioned that overall the concept was clear to them. One user did mention feeling intimidated by the pictures that were used on the platform. She thought they were looking to "perfect". She expressed a need for more "home-made" looking pictures. Maki could use pictures of other sewers and use images of results that are not perfect. The platform is a learning space after all, and the maker mind, as discussed in chapter 2.2 The Maker Movement, is known to accept failure.

In the interviews users again underlined that the creative freedom was the most enjoyed part. It appears to confirm the needs for creative exploration as seen in makers. However, it was not clear to the user beforehand that this creative freedom would be there. Maybe GIF's or animations can be used to show the variation options of the sew-along beforehand.

Next to this, the interviewees mentioned wanting more inspiration pictures. Maki should focus on emphasizing and explaining creativity in the concept. Maybe the user can be guided through a small design process first so they understand the creative space that the sew-along gives them.

The users mentioned that the amount of detail in the sew-along was good and that it gave them confidence if they could skip some things. Just like in the questionnaire it was mentioned that more support was needed in drawing the neckline. Users need to understand what they are drawing and need to be further facilitated in drawing curves. Some supportive tools such as the Pattern Masters (DECODE, n.d.) can be designed to help the user with this.

When asked about collaboration users mentioned that his was not necessary for them. One of the interviewees said that a forum is a bit too much for them. If it were right under their nose, they would most likely interact, but it would have to be very low-effort and low-key. This is an unexpected find, as other traits of the maker seem to be confirmed, a strong need for collaboration seems to be missing.

Of course, there are other explanations of why the forum was not used. One user mentioned they thought no one would respond, a reasonable belief as they knew this was a pilot. For this reason, Maki should potentially focus on integrating collaboration better or making it more low-key before turning it down completely. One interviewee mentioned integrating a comment section into the sew-along, so it would be less disconnected.

These insights are again summarized in a list (fig. 95).

Interviews

The user wants inspiration pictures with a more "home-made" feel to them.

The user enjoyed the creative freedom and desires more, if possible.

The users wants to know all creative options beforehand.

The users want more support in drawing and visualising freehanded lines.

The user wants to help but do not want to go out of their way. Collboration should be better integratd.

The user needs to feel like others would respond.

Fig. 95 Important takeaways from interviews.
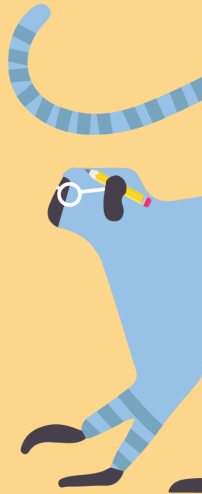
Conclusion

Overall, the user evaluation led to many insights. The way the evaluation was set up staring with observation, followed by a questionnaire and finally a more thorough interview, worked well. With each activity, I would go deeper into understanding where problems arose and why. To conclude the user evaluation, the research question can be answered.

How does a beginning sewer experience making a dress from scratch in their style by using the platform of Maki Makerspace?

All users showed some form of learning with the Maki Makerspace platform. The sew-along was considered a good way to learn how to draw a pattern and sew it together. The number of details in the steps, together with how they were presented (text, illustration and video) was sufficient and helpful. The fit-checks helped the users in making dresses that fit right.

The user experienced pattern drawing as a valuable aspect of making a garment. The user had no trouble drawing the outlining structure for the pattern. However, they would have liked more support when it came to free handing the neckline.

Next to this, they said they found it challenging to visualize how what they were drawing was reflected in the final garment. The user mentioned that even though they made a successful pattern, they would have liked to understand better what they were drawing with each line.

Overall, the creative freedom this concept allowed was seen as the most valuable part. The users talked about how drawing the pattern allowed for more options than they would have thought initially. All the users made their own version of the dress. Some users even added things that were not facilitated. This shows a need for creative exploration. This was mentioned by the users as well.

Another important thing users discussed, was that they would like to know what creative options they have beforehand. This was not clear to them in the current concept. They only figured out they could alter the pattern to their desires during the sew-along.

During the pilot, no collaboration occurred, even though the platform did allow this in the shape of a forum. Users mentioned that they did not need help during the sew-along, they did not believe anyone would respond, and they felt the forum was too disconnected from the sew-along. When asked about what they need regarding collaboration, they said they do not want to engage in a forum actively.Maki should look into integrating the collaborative part more into the sew-along and making it more low-key.

Summarizing, The user experienced the concept of Maki Makerspace as a personal learning experience. I would like to highlight the following statements to underline this:

"I really enjoyed making your own pattern this way because I hadn't done that before. The different steps you made to decide what the dress would look like made it very personal."

"It was a very different experience than normal patterns, which leave you in the dark on so many aspects. This was really a learning space! I love that, makes me feel capable."

With the decisions, the user had to make and the options they were given, they were able to make the dress from scratch in their style and draw the sewing pattern for it themselves. In this way, the concept took a shot at becoming a facilitator of their creative learning process in making clothes from scratch. The concept was a good first stab at meeting the design goal, however a few aspects still need to be improved.

Design

5.8 Conclusion

This iteration cycle had the purpose of creating a first blunt concept to quickly get insights from the user and find a substantiated direction to go in. The concept of Maki Makerspace, still has some sharp edges, but overall, it forms a solid foundation to start a next iteration cycle.

All the takeaways from the user evaluation are collected and placed in the overview presented on the next page (fig. 97). All the similar takeaways are merged. Some first ideas that came up during the evaluation are already presented. These will be further developed in the second iteration cycle.

This second iteration cycle will mostly focus on expanding the creative exploration, as this is where the user experienced the most fun. Maybe the user can be guided through a design process before starting the sew-along.

Next to this, the second iteration cycle will could focus on creating the space to design a supportive tool for the user, that helps them with drawing complex curves. Also, the user should be further explained how what they draw, relates to the garment. In this way Maki can become the facilitator in teaching the user a basis in pattern drawing, so they can learn to make anything they want in the future (fig. 96).

There should be minimal focus on collaboration, as the user did not want this as much as anticipated. However, there might still be some minor improvements that can be done, such as integrating it better into the sew-along, before taking it out of the concept completely.
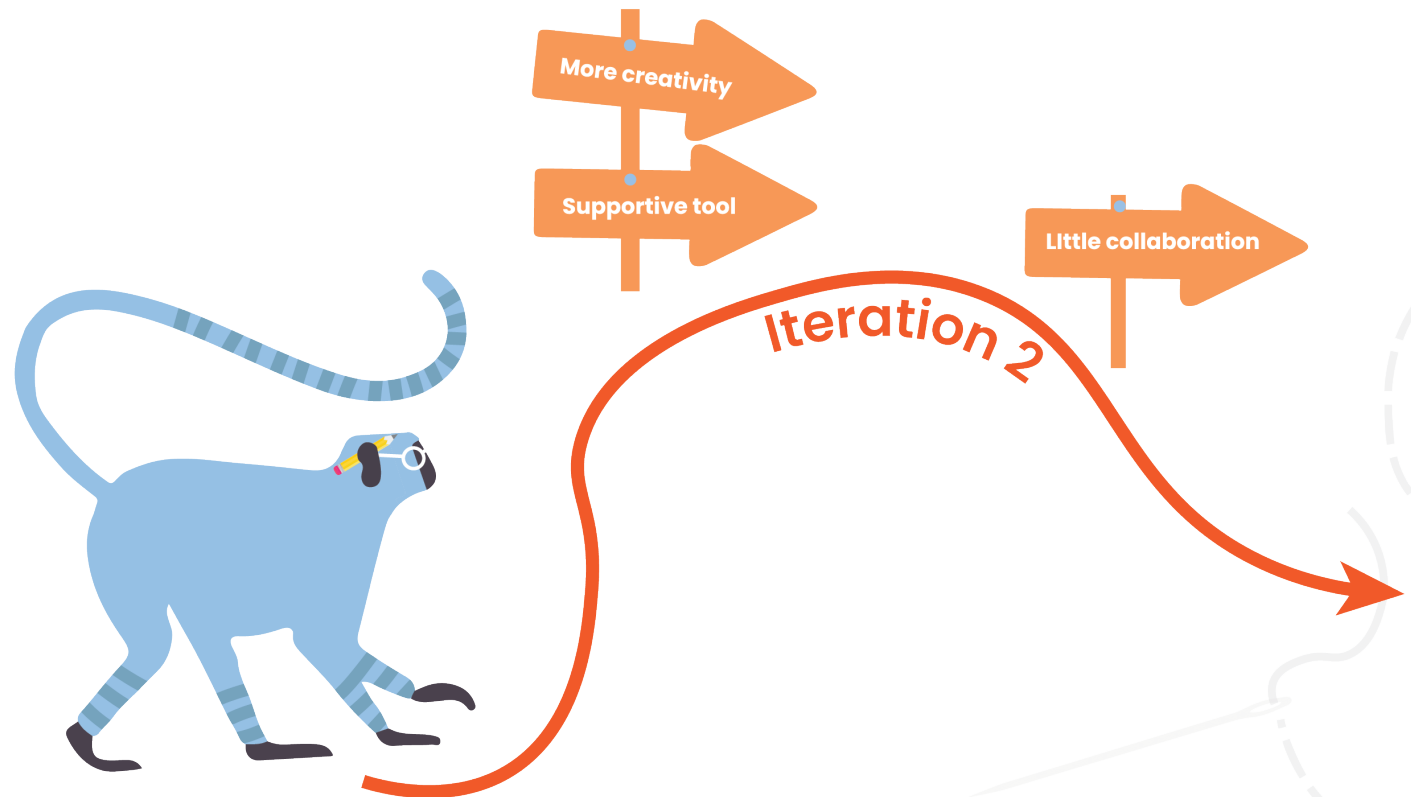
Fig. 96 The direction for iteration 2.

Design

Fig. 97 Takeaways from user evaluation; iteration 1.

Learning process

The user needs more support in freehanding curved lines.

The user needs more support in visualizing what the lines they draw will result in.

The sew-along should explain why the user is doing something so they will not skip steps.

All variation options should be supported throughout the entire sew-along.

I should think of ways to visualize an outcome. Maybe with GIFs or animation.

I could look into supporting tools for pattern drawing, like rulers.

In the next iteration cycle I need to support the users in drawing curves and visuzaling how the pattern will translate to a result. The user also desires to be supported in all decisions they make.

Creative exploration

The creative freedom was enjoyed. It could be extended and focused upon.

The user wants inspiration pictures with a more "home-made" feel to them.

The user should know what creative options they have beforehand.

The user could go through a little design process first so options are clear.

Creativity seemed to be the most enjoyed aspect. This should be highlighted and extended in the next cycle. It is important that the user knows beforehand what the creative space is.

Collaboration

The user wants to help but does not want to go out of their way. Collaboration should be better integratd.

The user needs to feel like others would respond.

Maybe it could just be a comment section.

The forum should not be on a different page but directly under the steps.

Collaboration seems less desired than expected. There seems to be some interest though. In the next cycle we can try to integrate it better and make the user feels like others would respond.

6 Iteration 2

Improving aspects of the first concept: Maki Creative Space.

Iteration round 1 created a substantiated direction to go in; there should be a focus on exploring creativity in the concept further, a supportive tool should be designed to further facilitate the user in pattern drawing, and the focus on collaboration can be minimized (fig. 98). The concept of Maki Makerspace already worked well on multiple aspects, although, inevitably, there is still room for improvement. With the overview presented in the conclusion of Chapter 5.8; Conclusion, it is clear where these improvements should take place. Supported by the blue design Maki, this chapter will walk through the process of Iteration 2 where these improvements are implemented.

6.1 method

The purpose of the second iteration cycle is to improve on aspects that were still problematic. The metaphor of solving a puzzle can be used to explain this iteration cycle. The insights from the research were regarded as puzzle pieces that will ultimately form a fitting puzzle; the concept that fits the user's needs. In the first concept, the puzzle pieces from the research were scrambled together. The evaluation of the first concept indicated which puzzle pieces do not fit right yet. This iteration cycle will focus on those pieces to make them fit (fig. 99).

> Let's see where there is room for improvement.
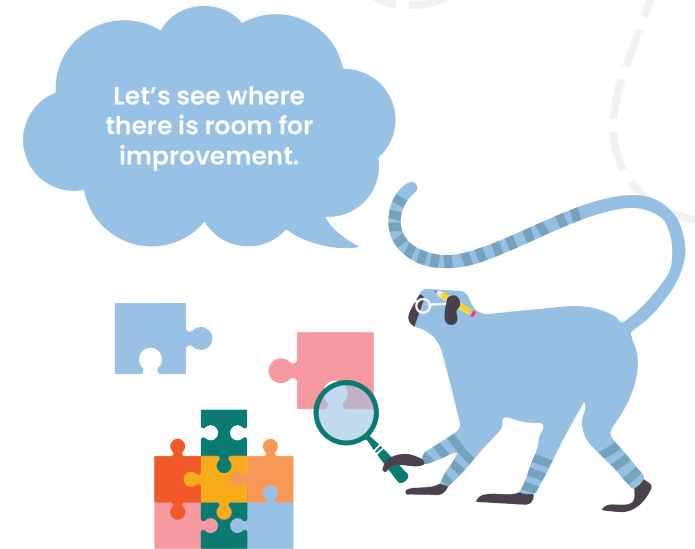
Fig. 99 Improving on certain aspects.

In the initial approach, as discussed in Chapter 1.4 Set-up, was that there would be three iteration cycles. With there being space for one more cycle after this one, there is room to experiment with some new ideas. The concept will again be evaluated with users; a pilot is done with a prototype that is followed by a questionnaire and interviews. In this way, the effect of the improved concept can be measured. This evaluation will steer the direction of the third iteration cycle. In this section, it will be explained how the process of improving the concept of Maki Makerspace is done.

The process of this cycle is shown in the overview (fig. 100) and discussed in detail next.

More creativity

Supportive tool

Little collaboration

Iteration 2
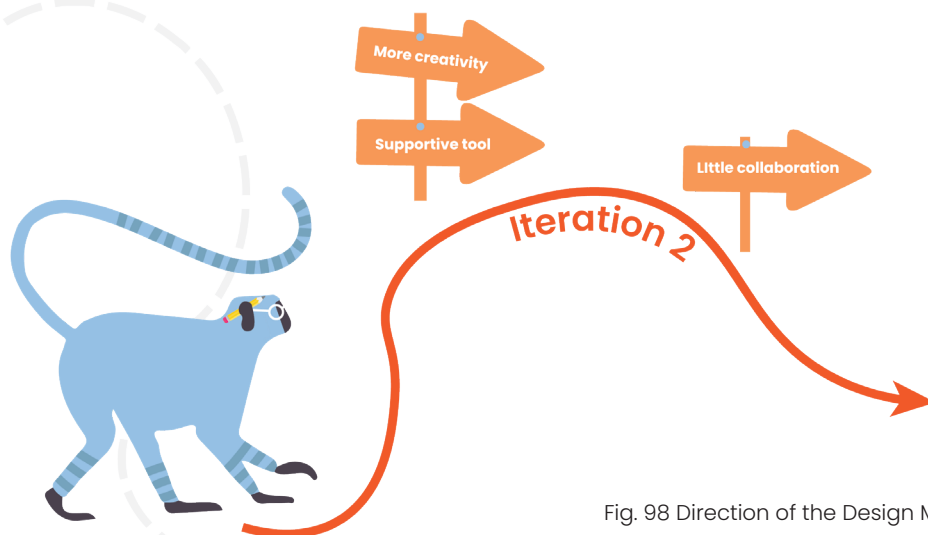
Fig. 98 Direction of the Design Maki.
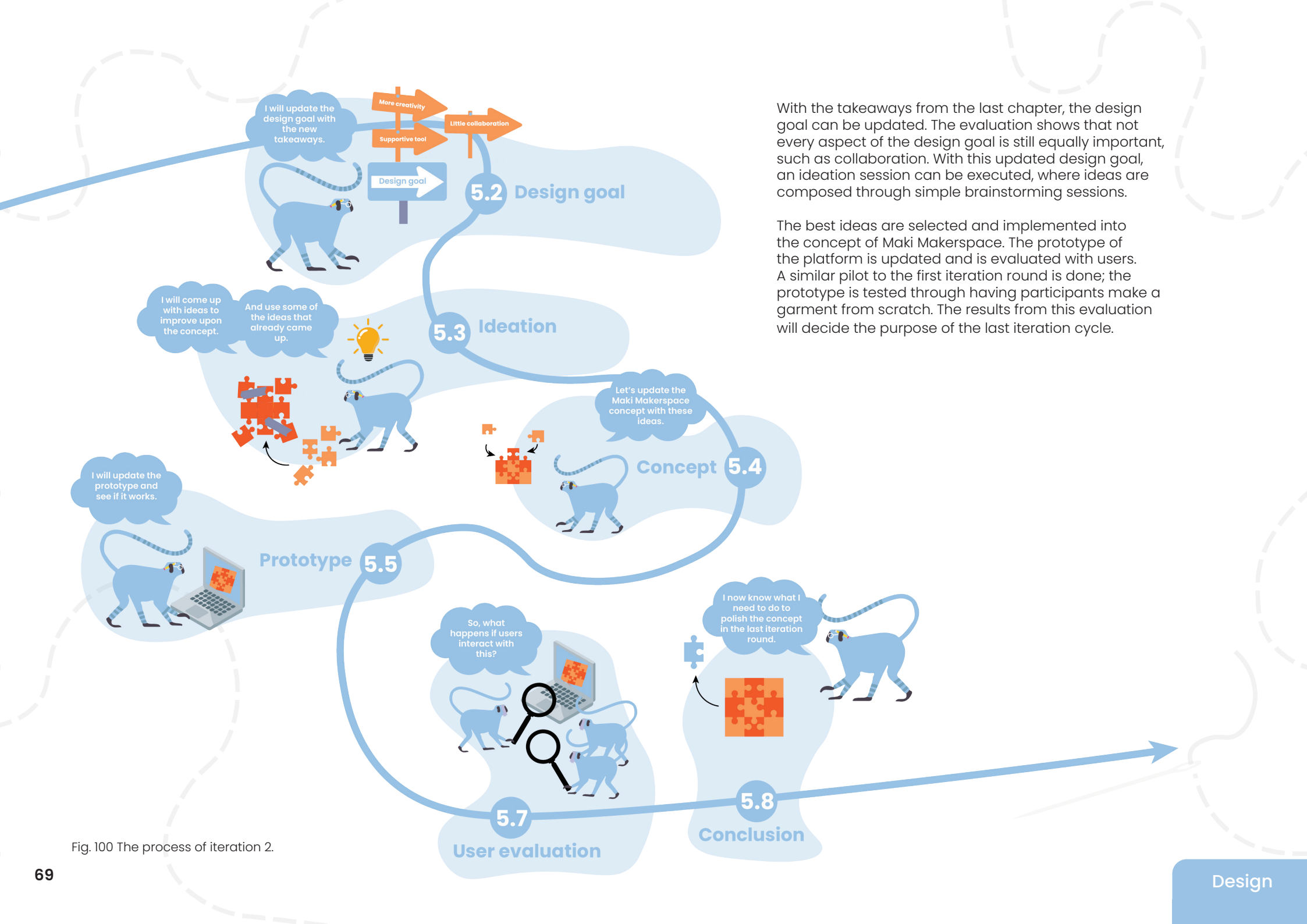
With the takeaways from the last chapter, the design goal can be updated. The evaluation shows that not every aspect of the design goal is still equally important, such as collaboration. With this updated design goal, an ideation session can be executed, where ideas are composed through simple brainstorming sessions.

The best ideas are selected and implemented into the concept of Maki Makerspace. The prototype of the platform is updated and is evaluated with users. A similar pilot to the first iteration round is done; the prototype is tested through having participants make a garment from scratch. The results from this evaluation will decide the purpose of the last iteration cycle.

Fig. 100 The process of iteration 2.

6.2 Design goal

With the takeaways from the user evaluation, the design goal can be updated for this iteration cycle. A design goal can help give direction and structure to the process of ideation. In this section, the process of how the design goal was formulated, is explained.

To start the iteration cycle, the design goal is updated with all the takeaways from the last user evaluation. This process with the following design goal:

"Facilitating the user in a learning process with room for creative exploration and collaboration, that ultimately leads to the user being able to make fitting clothes from scratch."

From the overview of takeaways in the last chapter, it was clear that there needs to be more focus on allowing more creative exploration into the concept. This creativity is what caused the users to have fun and should therefore be emphasized. Next to this, a supportive tool in pattern drawing needs to be developed, so the facilitated learning process becomes smoother. Finally, collaboration becomes less important in this iteration round, as users do not need this as much as initially believed, this can be understated in the design goal. The design goal was rewritten accordingly (fig. 101).

The three pillars; creative exploration, the learning process and collaboration (as introduced in the Chapter 5.3 Design goal) are still present in the sentence.

However, in this updated design goal, they are no longer equally important. In this Iteration round, the focus on creative exploration is expanded and the focus on collaboration is reduced (fig. 102).

These pillars now indicate where to put the most effort in the process of ideation. However, they still remind us to think of ideas on all aspects of the concept.

6.3 Ideation

In this section ideas are generated to form an improved concept of Maki Makerspace. This is done through simple brainstorming sessions. Finally, all ideas are combined to form a second updated concept.

With the design goal giving some guidance, a process of ideation can start. The concept of Maki Makerspace is the starting point, and for

The red part is still the most important as this is what the user wants.

Creative exploration is emphasized in the sentence as this is what gives users energy.

The learning process will be better facilitated with the use of a supportive tool.

"Encouraging creative exploration in a learning process with supportive tools and the possibility of collaboration, that leads to the user being able to make fitting clothing from scratch.

Collaboration is now just a possibility and no longer a necessity.

Making fitting clothes from scratch

The learning process

Creative exploration

Collaboration

I can now ideate on how to improve for each pillar.

Fig. 101 Updated design goal.

Fig. 102 The pillars are no longer equally important.

each pillar, ideas are needed on how to improve on this concept. The takeaways from the user evaluation of Maki Makerspace are placed in an overview (fig. 103). For each pillar, a short brainstorm session was done where questions were asked on how to solve the problems of the takeaway. In this way, all takeaways will be discussed and ideated upon.

Creative exploration

Creative exploration

The user needs more support in freehanding curved lines with the help of a supportive tool.

The user needs more support in visualizing what the lines they draw will result in.

The sew-along should explain why the user is doing something so they will not skip steps.

The learning process

The user needs more support in freehanding curved lines with the help of a supportive tool.

Collaboration

The user wants to help but does not want to go out of their way. Collaboration should be better integratd.

The user needs to feel like others would respond.

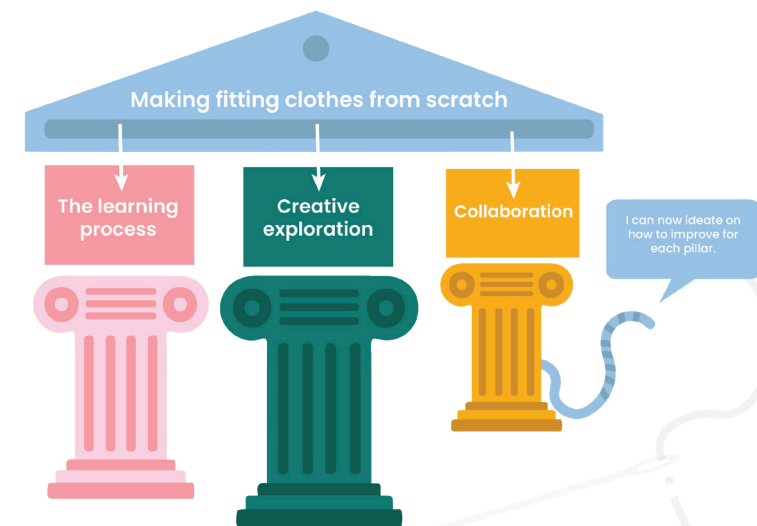The creative freedom was enjoyed. It could be extended and focused upon.

The user wants inspiration pictures with a more "home-made" feel to them.

The user should know what creative options they have beforehand.

All variation options should be supported throughout the entire sew-along.
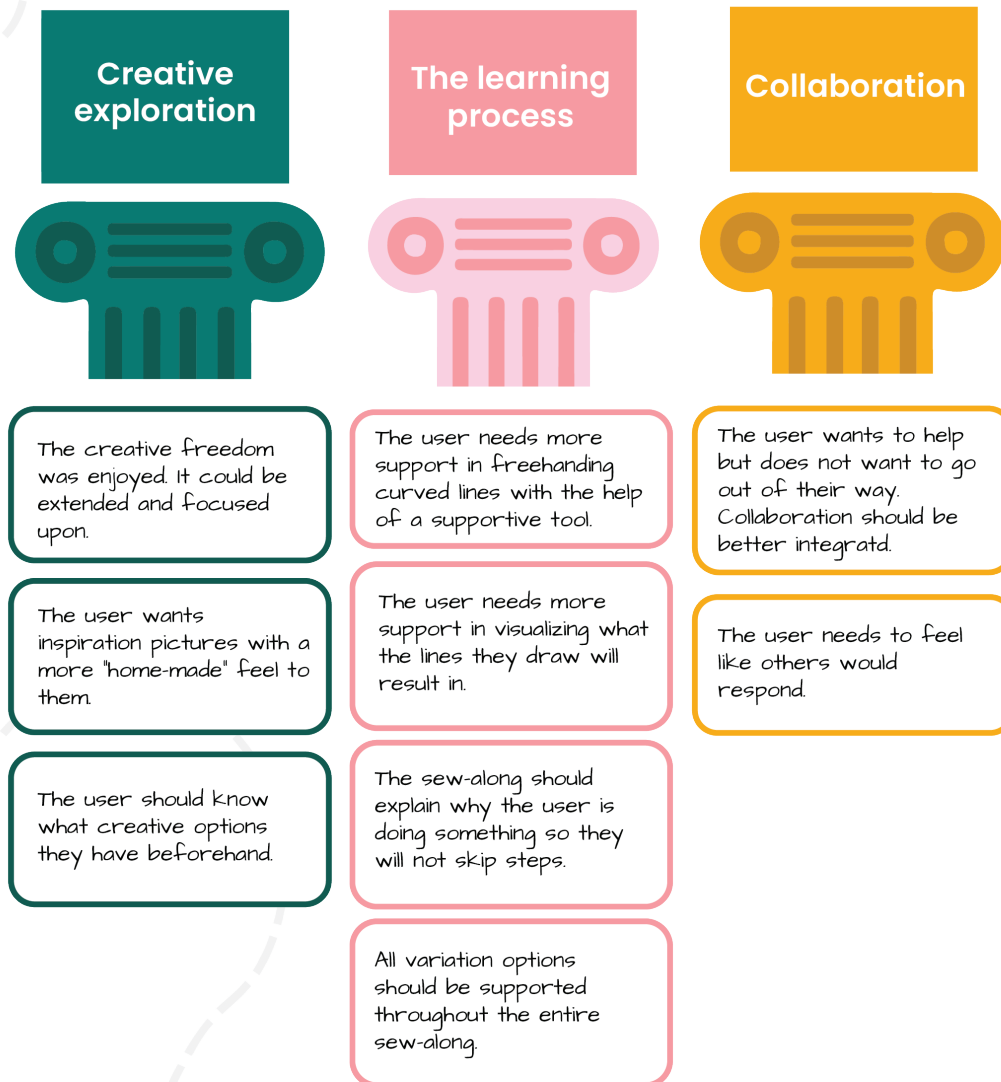
Fig. 103 Takeaways that need to be ideated upon.

Creative exploration

Creative exploration is now the focus of the concept. From the user evaluation, three takeaways were concluded to need improvement; creativity should be extended, the user needs more inspiration and wants to know all their options beforehand. In the last iteration round, the idea to let users go through a small design process first, was already introduced. In the ideation this idea is further explored (fig. 104).

Let's ideate on the three takeaways for this pillar.

The idea of letting the user go through a small design process is already there.

The creative freedom was enjoyed. It could be extended and focused upon.

The user wants inspiration pictures with a more "home-made" feel to them.

The user should know what creative options they have beforehand.
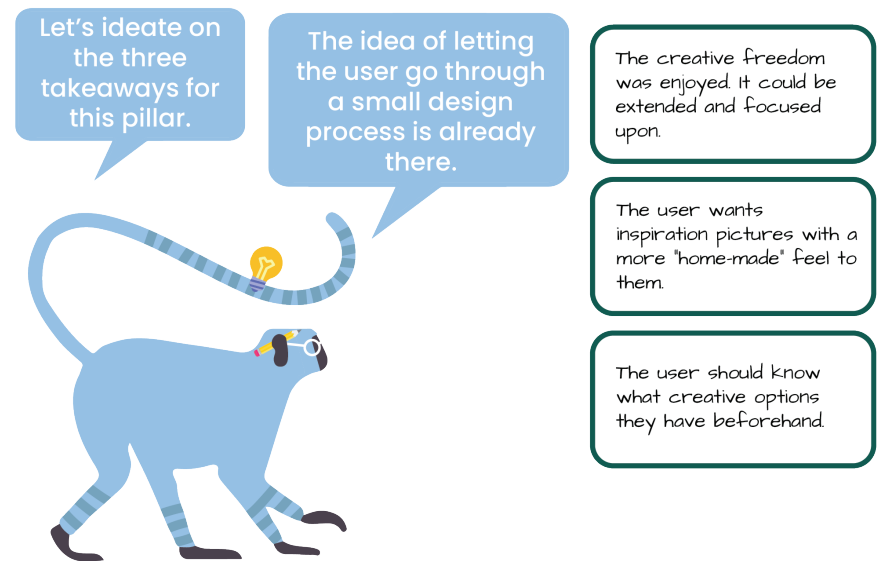
Fig. 104 Ideation on creative exploration.

Create a design space

Since users did not know what creative options they had in the sew-along, Maki could first walk users through a small design process. This could be done in a "design module" before the sew-along. Inspiration for this is taken from Puff and Pencils's (n.d.) sewing pattern generator. They took a dress and gave it modular parts, such as sleeves and collars. The user can make multiple combinations with these modular parts, so they get to create a personalized sewing pattern they can then print. This "design module" makes the creative options the user has apparent directly from the start (fig. 105). This is

Create a design space

The user should know what creative options they have beforehand.

The creative freedom was enjoyed. It could be extended and focused upon.

Design your slip-dress

Neck ‹ ›

Width ‹ ›

Length ‹ ›

Modular instructions

Neckline A

+

Width B

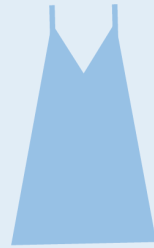However, Maki also offers the space to draw the pattern and make it fit. This is more personalized than a printable sewing pattern in convection sizes.

During the sew-along other small design decisions could still be made. I.g. how long a dress should be exactly. In this way there is a base, but still space to fine tune the small things to the users needs.

There was the idea to let users have a design process beforehand.

Create a 'design module' as done by Puff and Pencil.

I can take inspiration from how Puff and Pencil uses modular blocks.

FRONT BACK

BASE ›
SLEEVE ›
COLLAR ›
SIZE ›

€10,00

ADD TO CART

This will really show what creative options the user has as soon as they start.

But how would I show the options on the product-page before that?

Fig. 105 Introduce a design module in the sew-along.

something the concept of Maki Makerspace was still lacking. For this reason, such a module could work for Maki. This would mean that every sew-along would need to become modular; the instructions need to match the decisions you have made. This is where the concept will differ from Puff and Pencil, it will facilitate the user through the entire process of drawing the pattern and making it fit, unlike Puff and Pencil, where a convection size sewing pattern will roll out of the printer.

Now that the creative space is clear at the beginning of the sew-along, how can the creative space be indicated before the sew-along even starts?

Using GIFs to show variation.

In the last iteration round, the idea of creating the feeling of a "white canvas" was introduced. However, this was not received by users as intended. In the prototype, a greyed out picture of the slip-dress was used. However, it was not clear to the user that this was supposed to indicate that they have some design options. In hindsight, it makes sense, it is hard to show users the outcome and show that they can personalize it. Now there is a modular sew-along, with predetermined options, there is another way to show the user has options. A GIF could be used on the product page that walks through all the modular options. Because of the movement, a GIF will also draw attention on the page (fig. 106).

Using GIFs

The user should know what creative options they have beforehand.

The GIF walks through all the variation options and will draw attention on the page.

I could use GIFs to walk through all the options of the module.

The user will need inspiration to make these options their own again. How to improve that?

The outcome literally changing in front of the users' eyes will show them they have options.

Fig. 106 Using a GIF to show all variation options.

The GIF, together with the inspiration wall, will show the users they can make it their own. This inspiration wall could also use an update.

Give more inspiration

In the Maki Makerspace concept; inspiration pictures were given on the product page. This was called "The inspiration wall". This matrix of 4x4 images showed users some variations of dresses and some more random inspiration (much like a mood board).

The evaluation of the first concept revealed that users want more inspiring pictures of the item itself, preferably looking more homemade to make the platform more accessible and less "Picture perfect". The more

random inspiration images did not do much for them. For this reason, the inspiration wall will be pictures of only the item to be made in different variations and fabrics. Also, the work of other sewers that have already finished the sew-along will be displayed here to further inspire the user and give this homemade feel (fig. 107). This can also strengthen the sense of a "makerspace".

Give more inspiration

The user wants inspiration pictures with a more "home-made" feel to them.

There will be more inspiration images. This time, only the item that the user will make will be shown in different variations and fabrics.

All the modular options can be shown like this.

The product page will hold more examples of end-results for inspiration.

The work of other users can be used to create a more home-made feel to the images.

Fig. 107 Show more inspiration options.
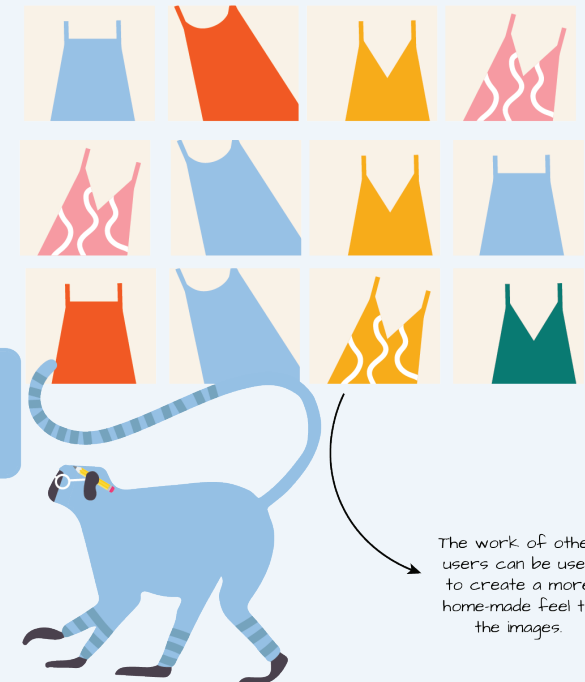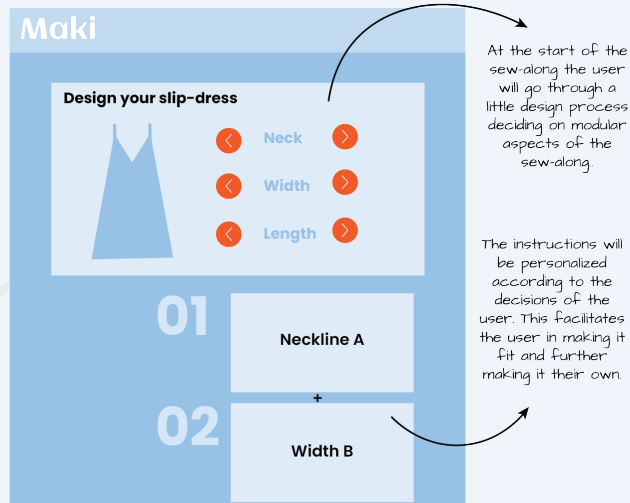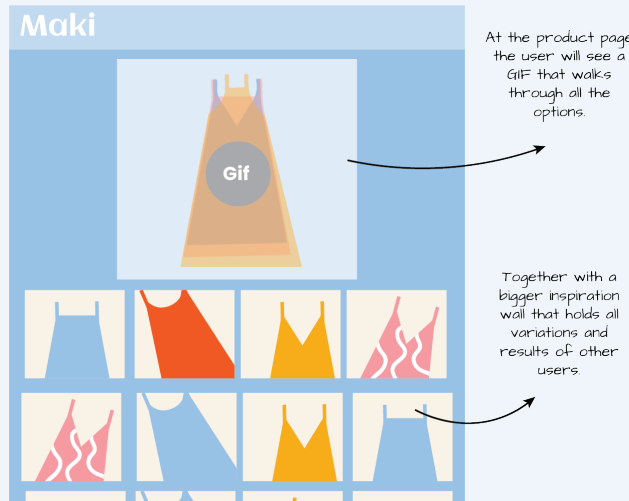
With the idea of making the sew-along consist of modular blocks that the user can combine to make the garment in their style, a space for more creativity is opened up. Next to this, the design options are now clear to the user beforehand. The user also has access to more fitting inspiration images (fig. 108). With these ideas, it was decided decided to continue ideating for the next pillar.

Creative exploration

The user should know what creative options they have beforehand.

The creative freedom was enjoyed. It could be extended and focused upon.

The user wants inspiration pictures with a more "home-made" feel to them.

Maki

Gif

At the product page the user will see a GIF that walks through all the options.

Together with a bigger inspiration wall that holds all variations and results of other users.

Maki

Design your slip-dress

< Neck >
< Width >

01 Neckline A

+

02 Width B

At the start of the sew-along the user will go through a little design process deciding on modular aspects of the sew-along.

The instructions will be personalized according to the decisions of the user. This facilitates the user in making it fit and further making it their own.

So we know how to improve on the creative exploration.

Let's now think of a tool to support the learning process.

Fig. 108. Overview of ideas for creative exploration.

The learning process

The evaluation of Maki Makerspace concluded that the user enjoyed drawing the pattern themselves. However, there were some takeaways that need to be improved upon. The most prominent goal of this ideation is to come up with a supportive tool for drawing patterns. In the conclusion of iteration 1, the idea of making some sort of rulers to assist in drawing curves, was already mentioned (fig. 109). These rulers can be inspired by the Pattern Master tools of DECODE (n.d.) Next to this, there was a focus on how to visualize the effect of what users are drawing and explaining more within steps.
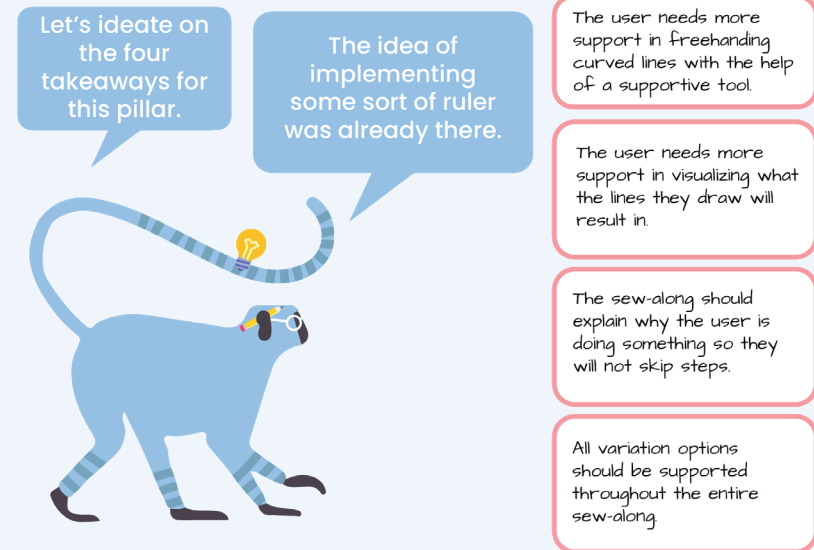
Let's ideate on the four takeaways for this pillar.

The idea of implementing some sort of ruler was already there.

The user needs more support in freehanding curved lines with the help of a supportive tool.

The user needs more support in visualizing what the lines they draw will result in.

The sew-along should explain why the user is doing something so they will not skip steps.

All variation options should be supported throughout the entire sew-along.

Fig. 109 Ideation on the learning process.

Design a ruler system for each garment.

Users need more support in drawing curved lines. In hindsight this is not surprising, the hardest part about drawing sewing patterns is the curves needed for, i.e., armholes or necklines. Most other lines are usually straight and easy to draw. A special "ruler" can be made for each project that helps the user draw curves, similar to the Pattern Master tools from DECODE (n.d.) as discussed in Chapter 4; Field research. These are rulers that support the user in drawing a zero-waste pattern.

These supportive rulers could be printed out on one or two A4 sheets of paper, this already reduces a lot of paper in comparison with printing a PDF sewing

A ruler system

Let's think about how such a ruler would look like and work.

I could copy the curves from the garment I want to make and translate them to a ruler.

We can take inspiration from French curves.

Create paper rulers for curves

Printable versions of these already excist. However, they are open to a lot of interpretation.

They start to resemble the concept op French rulers.

Printable French rulers already exist. However, the Maki rulers would be made specifically to make one garment. It would have the exact curves needed and is therefor open to less interpretation.

These might also look a bit too technical for a beginning sewer. It needs to be simpler for the Maki user.

But how will I make sure the cuves are applicable for multiple sizes?

Fig. 110 Introducing a ruler system.

pattern, but mainly this makes drawing the pattern a bit less technical for the user.

There are multiple ways to design such a ruler; users could fill in their measurements, and a custom ruler of the exact shape they need to draw is generated. This would make the process of drawing the curve much easier, but the user does not learn much, and this learning was the objective. Users should understand the relationship between curves and measurements.

Curved rulers or "French curves" (fig. 110) are often used to measure and draw curves in pattern making. They are standard curves that are used a lot in most garments. Using

these "French curves" might still be too complicated for the user, since they are open to interpretation on how to use them. Maki could offer rulers that work similarly to these, but provide more support. Such rulers could be made specifically for one garment and sew-along, similar to the DECODE rulers.

The specific curve the user needs to draw will be the exact shape of the ruler. The user can use the distances shown on this ruler to see how far they have to trace the ruler to make the pattern in their size (fig. 111). This comes closer to the experience of drawing of traditional pattern drawing then getting a fully personalized ruler and might facilitate the user better in obtaining a skill-set in this. With a prototype, it will have to be tested if this is feasible for multiple sizes.
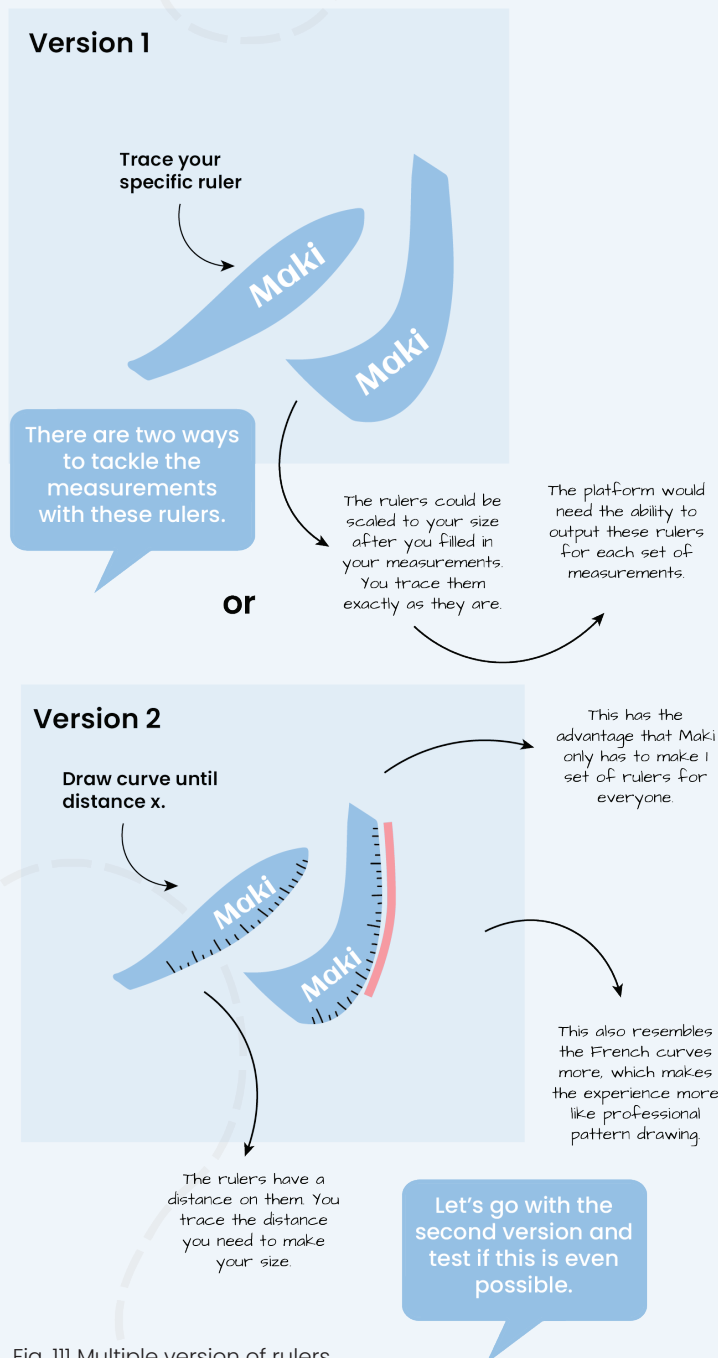
Version 1

Fig. 111 Multiple version of rulers.

Version 2
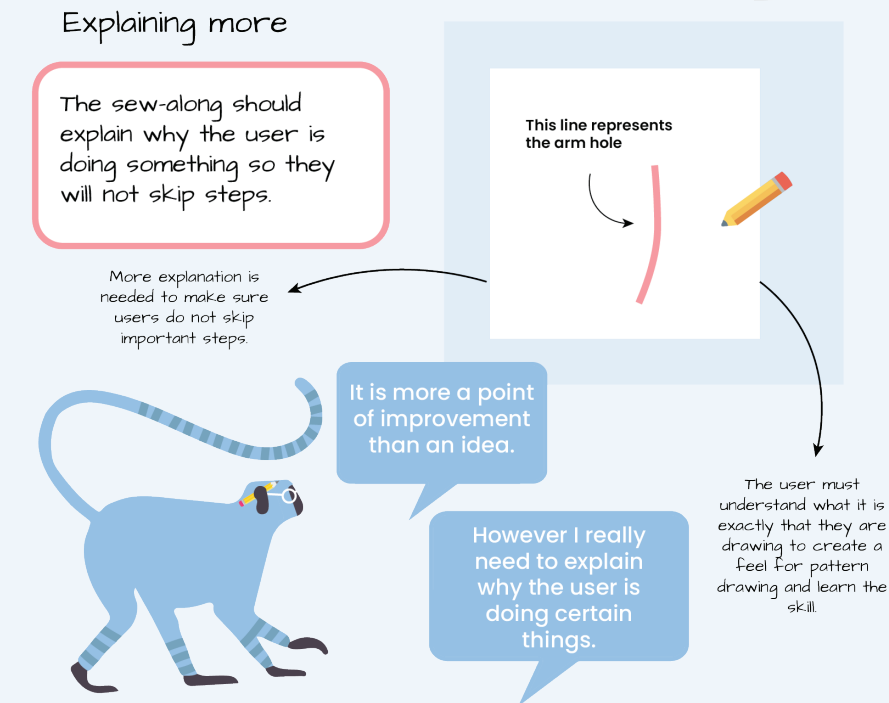
Explaining more

Fig. 112. Explaining more with each step.

Giving more explanation

A problem that arose in the last pilot was that users skipped some steps that were important. Furthermore, users did not always understand what exactly they were drawing. For this reason, it is critical to improve on explaining why the user has to do certain steps and what it is they are drawing. This will prevent them from skipping steps. It is more of a point of improvement than an idea, but is worth mentioning (fig. 112).

Visualizing images with transparency

When making the slip-dress, users had a hard time visualizing how the neckline they just drew would eventually sit on their body. Even with a modular sew-along where the users design that garment beforehand, they still have some small design decision left to make of in the sew-along, i.g

Using transparency

The user needs more support in visualizing what the lines they draw will result in.

This is what happens when you change the width.

Using transparency in illustrations might be a simple way to show an effect.

It could also be supported with images of different outcomes.

If the illustration would also move like an animation, render, or video, this might become to 'much' on the page. A simple solution like this could already be enough for the user.
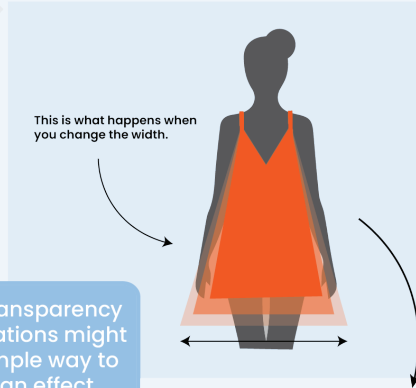
Fig. 113 Transparency in illustrations.

how long the skirt should be exactly. This is done so that during the sew-along creativity would also be implemented. There was not anything that showed the user how their changes to the pattern affect the result. A simple, yet effective way to show change is through using transparency in illustrations (fig. 113). Other things such as animations or renders could also be used, but those would take up a lot of storage space on the platform and might be too complicated to develop in the scope of the project. For this reason, it was decided to keep it simple and see if users already have enough support with a simple solution like this.

Modular instructions

During the sew-along of the Maki Makerspace concept, users were given multiple variation options, such as different necklines. Still, they were not supported in all of them throughout the sew-along. For example, they could decide to make a halter neckline instead of a V-neckline, but the illustrations and videos in the sew-along would still show how the dress should be put together for the V-neckline. With the idea of making the sew-along modular, this problem is already solved.

The instructions would also consist of modules. When taking the example of a dress, the user would first design the pattern and choose a combination of sleeves, collar, and a base. Then for each of these elements, an instruction module is created. The first module explains how to draw and sew the sleeve, the next describes how to draw and sew the base, etc., and finally, there would be a module on how to sew all components together. The complete instructions to make the garment are then composed of these modules. In this way, all the user's options are supported during the sew-along (fig. 114).

Fig. 114. Modular instructions.

Modular instructions

All variation options should be supported throughout the entire sew-along.

This problem is already solved with the sew-along becoming modular.

A personalized set of instructions could be made based on your decisions.

But how would that work?

For each decision a modular instruction module can be made.

That module would explain how to draw and sew that part of the garment.

Design your slip-dress

Neck
Width
Length

01 Draw the neckline — Instructions for drawing V-neck

02 Draw the length — Instructions for drawing long length

03 Draw the width — Instructions for drawing wide dress

04 Sew together — Instructions for sewing
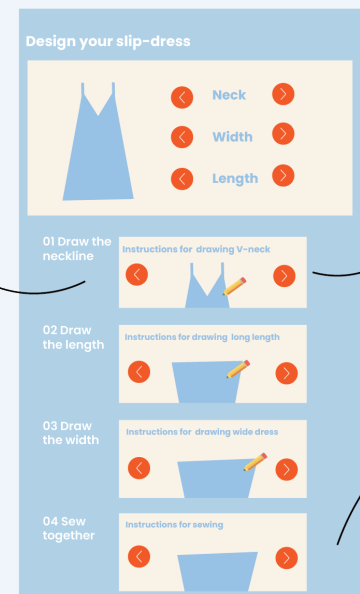
The modules could be placed underneath each other just like in the other sew-along.

Only now one module is multiple steps and the user can swipe rights and left to go through that module.

Finally there would be a module that explains how to sew all the components together.

The learning process

The user needs more support in freehanding curved lines with the help of a supportive tool.

The user needs more support in visualizing what the lines they draw will result in.

The sew-along should explain why the user is doing something so they will not skip steps.

All variation options should be supported throughout the entire sew-along.

Draw curve until distance x.

A system of rulers is introduced that will support the user in drawing curved lines. The user can print these rulers at home.

For each step the user will be explained what they are doing and why.

Transparency will help illustrate how changes affect the outcome.

This is what happens when you change the width.

This line represents the arm hole

So we found our supportive tool and made some improvements.

Modular instructions will support the users in all their decisions.

Design your slip-dress

Neck

Width

Length

01 Draw the neckline — Instructions for drawing V-neck

02 Draw the length — Instructions for drawing long length

03 Draw the width — Instructions for drawing wide dress
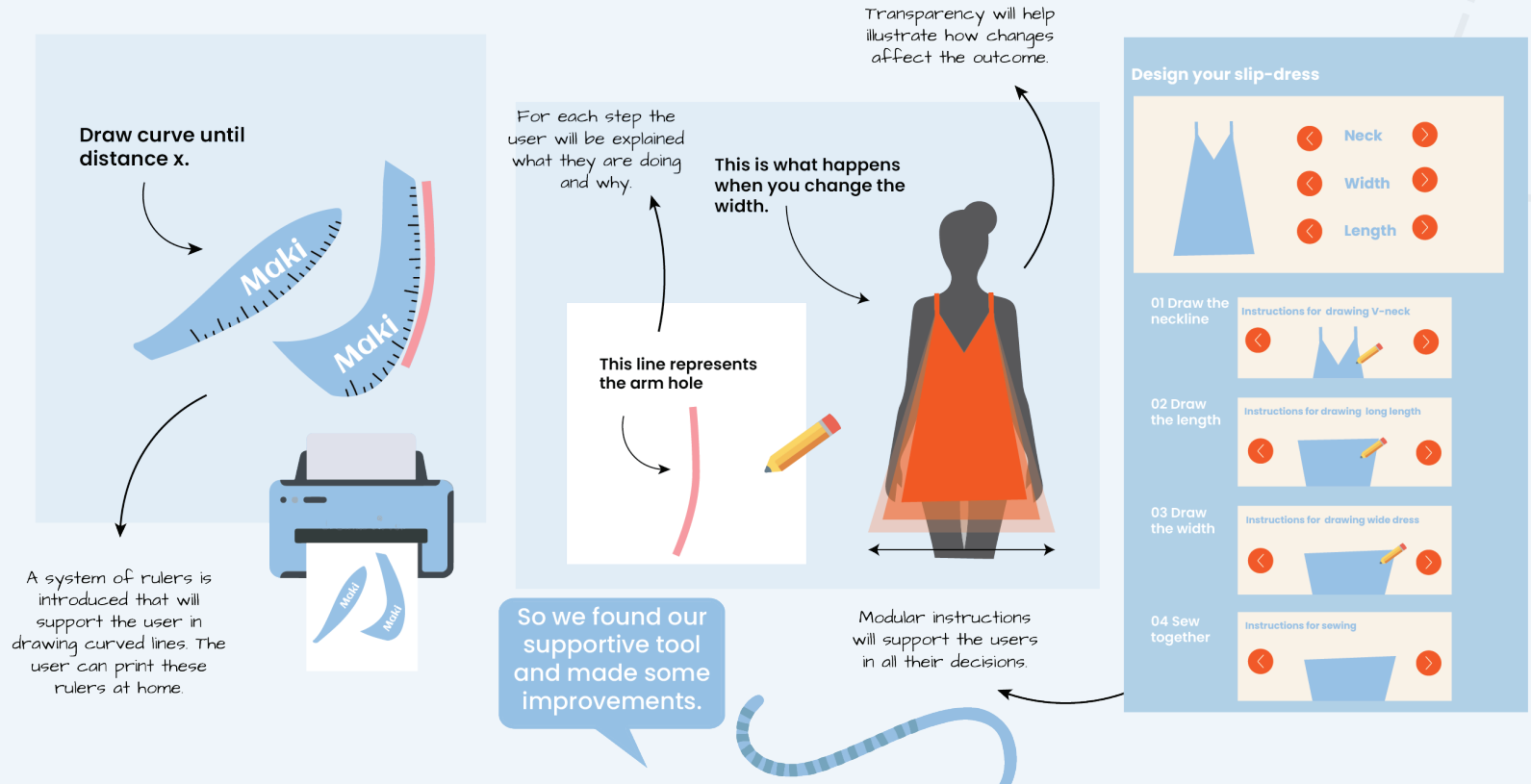
04 Sew together — Instructions for sewing

Fig. 115 Overview of ideas for learning process.

With the ruler system, the user is more supported in drawing the pattern and learning the traditional pattern drawing skills. They will receive more explanation on what they are doing and are shown illustrations that portray the effect of their actions. With the sew-along being modular, instruction modules can be used to support the user in all his design decisions. In this way, all the takeaways from the learning process are ideated upon (fig. 115). I decided it was time to move on to the collaboration pillar.

Collaboration

The focus of collaboration was minimized in this iteration cycle. However, the user evaluation showed that users can appreciate collaboration, it just has to be low-key and well integrated into the sew-along. For this reason, I did not want to let it go yet and decided to think of a few more ideas to integrate collaboration. The idea to take out the forum and to integrate a comment section was already there (fig. 116).
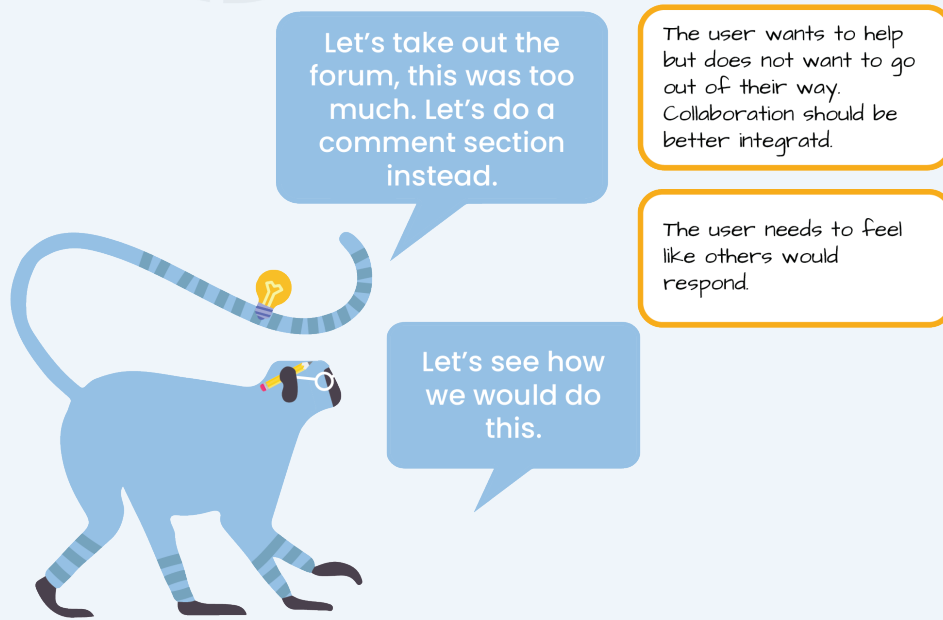
Let's take out the forum, this was too much. Let's do a comment section instead.

The user wants to help but does not want to go out of their way. Collaboration should be better integratd.

The user needs to feel like others would respond.

Let's see how we would do this.

Fig. 116. Ideation on collaboration.

Comment section

The user wants to help but does not want to go out of their way. Collaboration should be better integratd.

Instead of a forum I could integrate a comment section.

I could place them under each instruction module.

But how would users feel like others would respond?

01 Draw the neckline

Instructions for drawing V-neck

02 Draw the length

Instructions for drawing long length

I do not get this!

I got you!

Under each instruction module there is a comment section for questions.

Fig. 117 Placing a comment section under each instruction module.

Comment section in the sew-along.

In the evaluation from the last pilot, it was learned that users only want to interact if this collaboration is better integrated within the sew-along. Multiple users mentioned wanting comment sections under each step. Since the steps are very detailed, this might be too much for the page. However, with the instructions being separated into instruction modules, a comment section can be placed under each of those (fig. 117). In this way, the forum is taken out of the platform, but the main use of the forum is still there; the ability to ask questions and start a discussion. However, without it being on a different page, it is a bit more low-key.
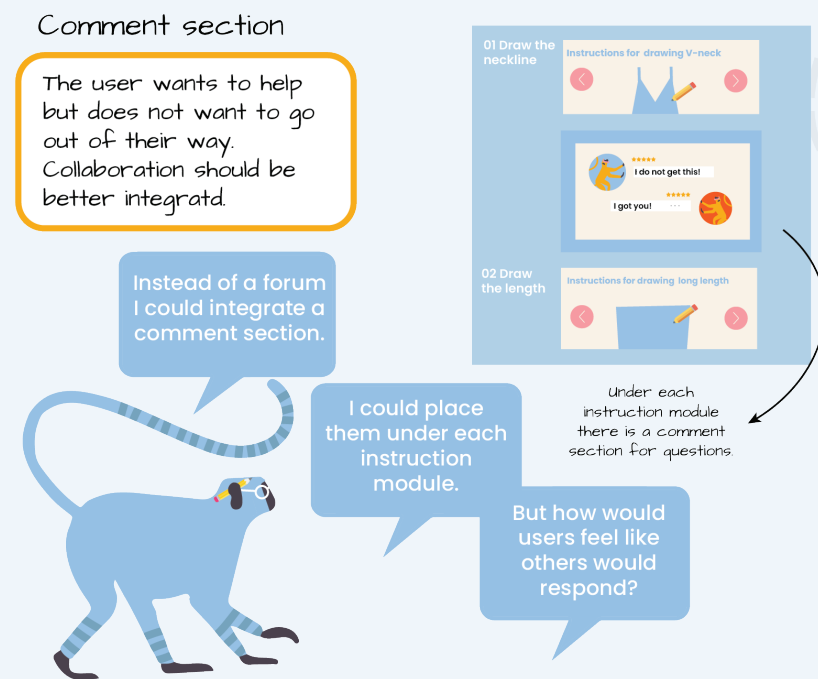
Showing the time of response

Some users mentioned they did not use the forum because they believed others would not respond. This was to be expected since the users knew they were on a pilot platform with only a few others. However, it still might be useful to think of ways on how to improve this, as Maki also wants to stimulate users to collaborate when she still has few subscribers. A simple solution to make users feel more confident that others will reply to their messages is showing the time a comment was posted (fig. 118).

Show response time

The user needs to feel like others would respond.
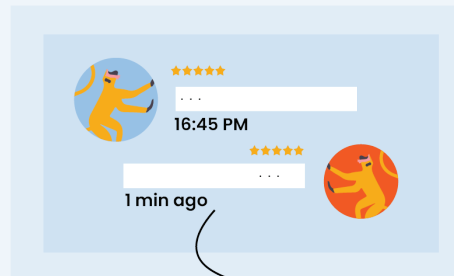
It might be as simple as showing when a comment was placed.

If this was only an instant ago the user might be more inclined to post something.

Under each comment the time it was posted will be shown. In the first minutes it will say: "5 minutes ago".

Fig. 118 Show response time

Since collaboration was not the main focus of this iteration round, it was decided to stop ideating here. However, these two ideas (fig. 119) might already lead to an improvement in terms of collaboration.
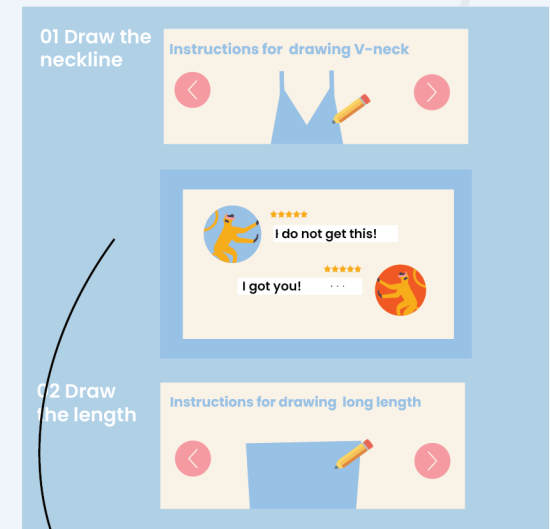
Implementing the ideas into the platform

All these ideas had to be implemented into the platform. An overview was made for what needs to change on each page to implement each of these ideas (fig. 120). This is further discussed now.

For the home page and profile page there were no changes needed. For the product page, the GIF that walks through all the options would need to be shown. Furthermore, the inspiration wall must be expanded with results from other sewers. For the sew-along, the design module has to be added. This must be linked to instruction modules that can be placed on the page.

Collaboration

The user wants to help but does not want to go out of their way. Collaboration should be better integratd.

The user needs to feel like others would respond.

01 Draw the neckline

Instructions for drawing V-neck

I do not get this!

I got you!

02 Draw the length

Instructions for drawing long length

The forum will be replaced with a comment section under each instruction module.

Collaboration was not the most important this iteration round.

But these ideas might improve it a bit.

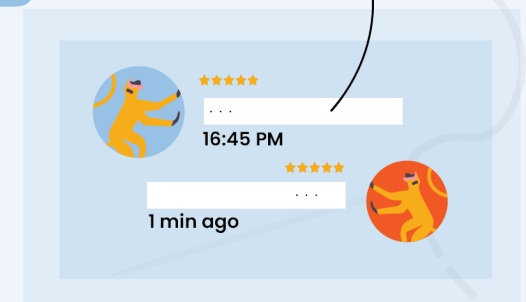To make users feel like others would respond, the time something was posted would be shown.

16:45 PM

1 min ago

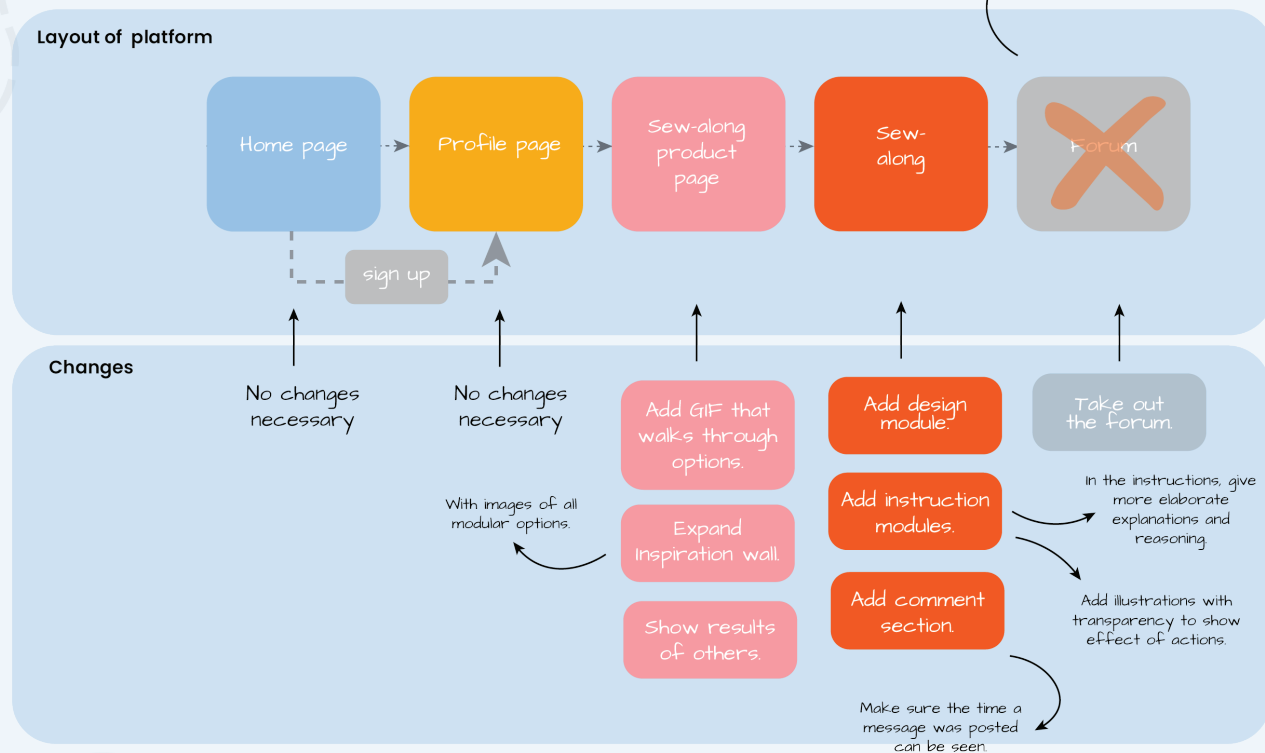Fig. 119 Overview of ideas for collaboration.

Changes needed for each page

Fig. 120 Overview of changes for the platform.

Fig. 121. Wireframes of sew-along and product page.

Next to this, a comment section would have to be added. This means the forum can be taken out completely.

Now that there is an overview of what pages need to change and how, updated wireframes can be made of how the product page and sew-along page would look like (fig. 121). The wireframes can be found on full scale in Appendix I

An improved concept of Maki Makerspace is starting to form. An overview of the updated concept will be given in the next chapter.

6.4 Concept

With the wireframes made, the concept of Maki Makerspace was updated into an updated concept called; Maki Creative space, as the focus was mainly on creative exploration. To explain this concept, an overview the users' journey when visiting the pages is presented (fig. 122). The things that remain the same
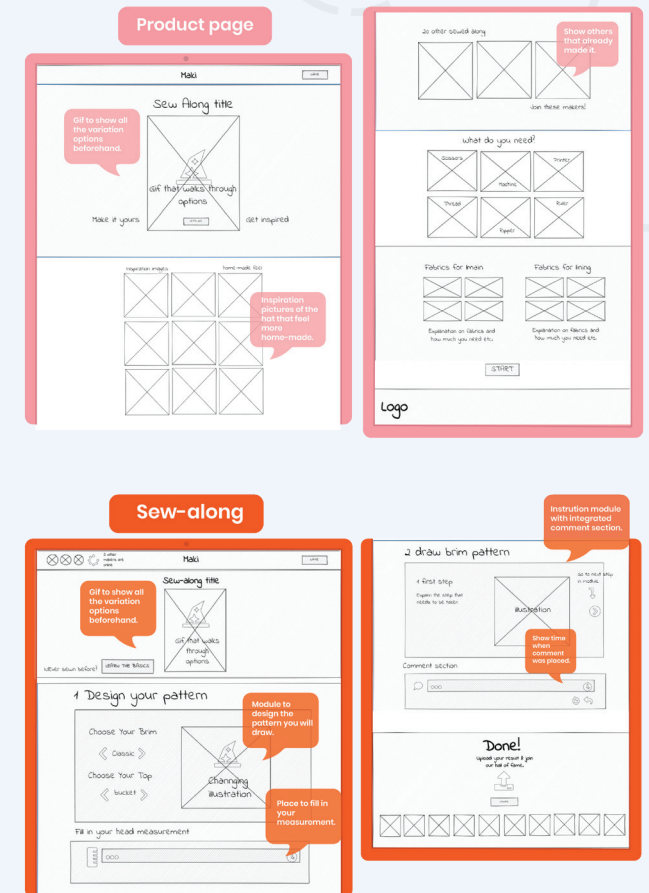
from the concept of Maki Makerspace are greyed out to emphasize the alterations. The figure will be further discussed in detail next.

Home page

Make the clothes that truly fit you

Explanation of the concept in 3 sentences.

Try Maki's first sew-along

Inspiration end-result | Inspiration end-result | Inspiration end-result

How does it work video?

Explain from scratch.

Explain pattern drawing

Explain community

Show community

Meet out makers

Footer

The home page first explains the concept of the sew-alongs.

Alright! So I can make clothing from scratch!

A video shows the user how the platform works.

Then the user is explained in 3 steps how it works again.

The user is also introduced to the community with pictures of sewers.

So I understand that this platform will help me as a beginner in making my own clothes from scratch in exactly my size....Let's try it!

product page

Maki

Sew Along title

Gif that walks through options

Make it yours | Get inspired

GIF

Inspiration images | home-made feel

Jo other sewed along

Join these makers!

What do you need?

Scissors | Printer
Machine
Thread | Ruler
Ripper

Fabrics for main | Fabrics for lining

Explanation on fabrics and how much you need etc. | Explanation on f... how much you...

START

Logo

I am inspired by some variation options. Seeing work of others also helps.

The product page also explains everything the user will need to start.

The GIF on the page shows me what my options are, I can really make it mine!

I think I like the straight neckline and big balloon sleeves like in the image! This cotton fabric should do well.

Sew-along page

Maki

Sew-along title

Gif that walks through options

Never sewn before? | LEARN THE BASICS

1 Design your pattern

Choose Your Brim
‹ Classic ›

Choose Your Top
‹ bucket ›

Channging illustration

Fill in your head measurement

I get to design my pattern first, that is new!

Design module

I need to fill in my measurements here! There will also be fit-checks later, so I learn how to make it fit.

The sew along allows the user to make a pattern in their measurements using printable rulers.

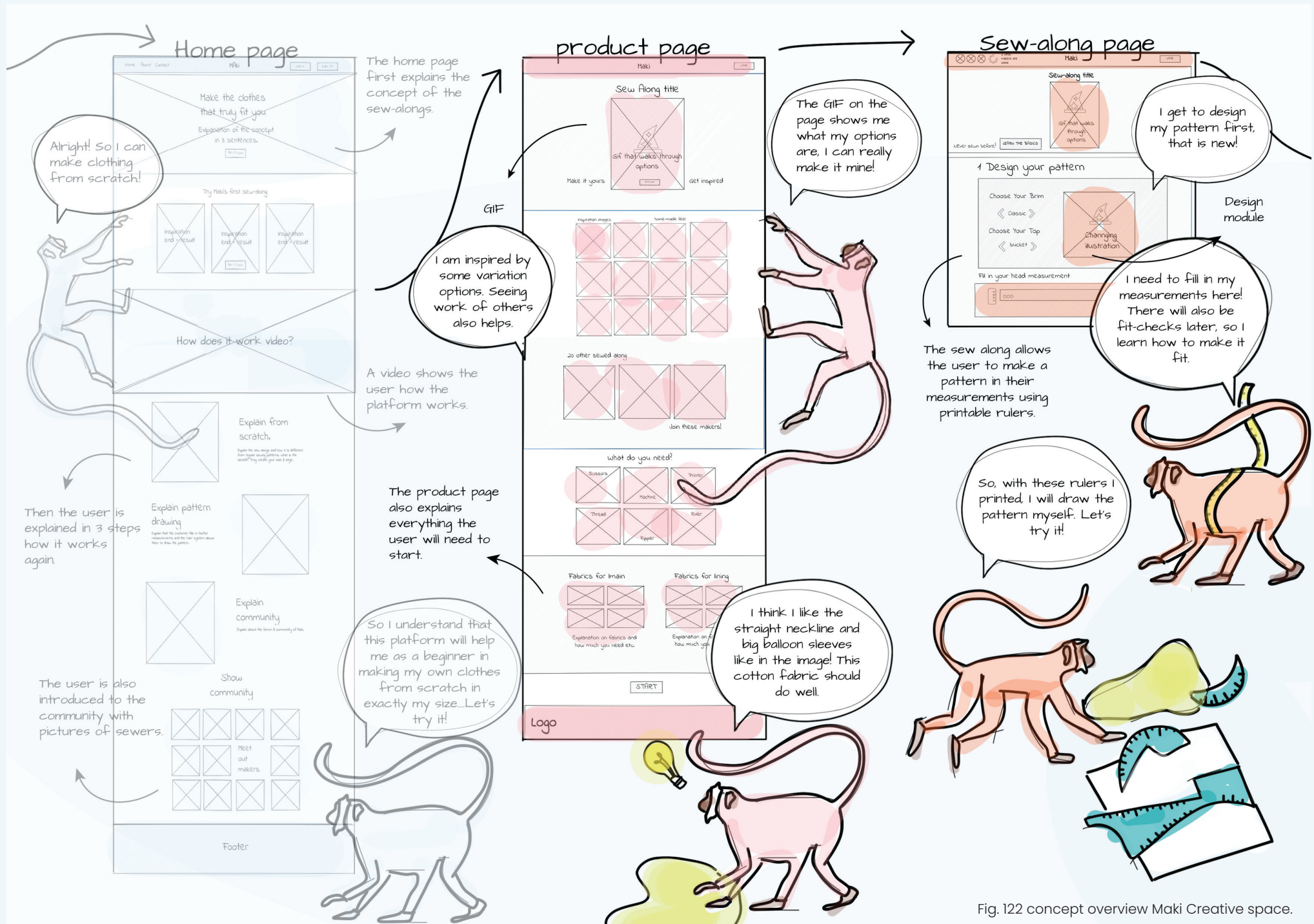*So, with these rulers I printed, I will draw the pattern myself. Let's try it!*

Fig. 122 concept overview Maki Creative space.

Sew-along page

2 draw brim pattern

1 first step

Explain the step that needs to be taken

illustration

Go to next step in module

Comment section

Done!
Upload your result & join our hall of fame.

So the steps are composed of my decisions. Every module has steps with illustration, text and video's....This should be doable!

Extensive explanation is given on how things are done and what effect it has using illustrations with transparency.

At the end of every sew-along users can upload a picture to share with others.

AAAAH! I am stuck. I will use the comment section to ask if anyone knows what to do now. I see someone responded just now.

Underneath every instruction module there is the option to comment to get help from other users. It shows at what time a comment was placed.

Profile page

Maki   NAME

Completed projects

Name

Skill level
Rising rookie

Measuremetns
waist   Hips
Upper bust   Arm lenght
Full bust   Neck

Logo

Home About Contact

I am actually a beginner skill-level now, but I will grow!

So the profile page is where I store my measurements. Good to know!

I finished my first dress completely from scratch!

I am starting to understand how this pattern drawing works.
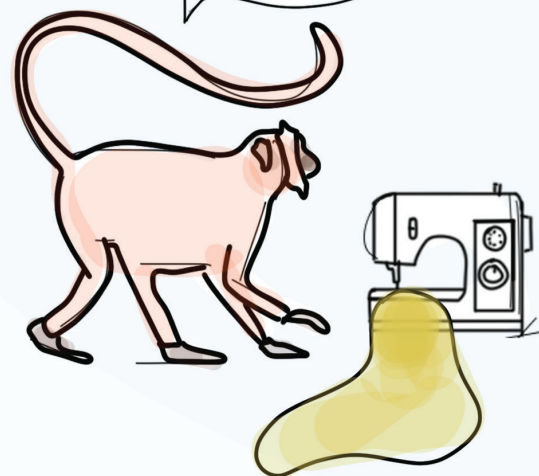
The concept of Maki Creative Space is an online platform with sew-alongs that facilitates users in designing and sewing a garment from scratch. The goal of the concept is to teach a user a basis-skill set in pattern drawing and garment making, so ultimately they obtain true creative freedom and make anything they want without the help of Maki.

When entering the website, the user will be shown a GIF that walks through all the various options they have in making a specific garment. This means the user immediately knows what their options are. Next to this, the user will be shown many inspirational images that show multiple outcomes of the sew-along. They are also shown results of others to create a "home-made" feel, so the user is not intimidated.

Before the user starts the sew-along, they will have a chance to design the garment that they want to make. This is done by offering a **modular sew-along.** In a design module, the users decide which segments, like a sleeve or collar, are combined before starting the sew-along. Once the user has designed the item, a set of instructions on how to draw the pattern and how to sew it together, will be composed using instruction modules.

During the sew-along, the user will be **facilitated in learning how to draw a fitting pattern** themselves. A ruler system is used to support them in this process. These rulers are specific for each sew-along and can be printed by the user on 1 or 2 A4 pages. These rulers help with the complex curves the users need to draw, and although they are similar to french curves, they are easier to use, but can help the user in gaining further understanding of pattern drawing. Furthermore, the platform will further focus

on explaining what the user is drawing and what this means for their result. This means that the user can still be given more creative options in drawing the pattern even during the sew-along. These will be small things like the exact length of a skirt or the amount of puffiness in a balloon sleeve.

If the user gets stuck, **there is a chance to collaborate.** Underneath every modular instruction segment, a comment section is placed. In this comment section, users can ask questions and respond to others. This is a low-key way of interacting with other sewers. When they finish the sew-along, they can upload their images to the website.

The creative freedom in this concept is expanded in comparison to the concept of Maki Makerspace, the user now goes through a small design process. **Together with a supportive tool in pattern drawing, the user is further facilitated in making something that truly fits their style and needs** while learning. In this way, the user comes closer to their goal; being able to make anything. With the updates in Maki Creative Space, the platform is starting to grow into something that shows more potential to be a gap in the market; **a combination where creativity and learning are both well facilitated**, a combination that other interventions seem to lack. It will be interesting to see if this will be confirmed in the user evaluation.

6.5 Prototype

To find out if this platform was feasible and to evaluate the concept with users, a prototype was built. For this prototype, the existing platform was used as a starting point and updated according to the new ideas. In this chapter, the process of building a prototype is described, starting with developing a modular sew-along and the accompanying rulers and ending with the development of the online platform.

Developing the modular sew-along.

Since the last sew-along took a long time to finish for participants, it was decided to have users make a smaller item for this sew-along. Next to this, it needed to be an item that had numerous curves so that the rulers could be optimally tested. For this reason, it was chosen to have participants make a bucket hat during the sew-along.

The hat needed to have modular elements and the ability to be made to size. I started by thinking of modular options. It was decided that both the brim and the top part of the hat are interchangeable. Three common styles of bucket hat tops were selected; a round top, a high-top and a classic top. For the brim there is the wiggly brim, the classic brim and the floppy brim. This led to the following modular elements (fig. 123):
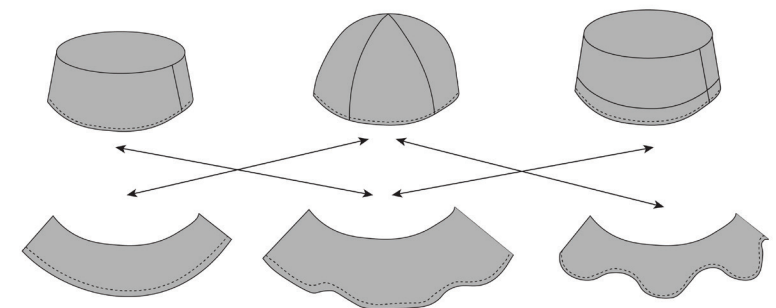

Fig. 123 Modular options for the hat.

With three options for both the top and the brim, nine different hat combinations can be made.

When it came to designing the ruler system, a commercial bucket hat pattern was used from ElbeTextiles (n. d.) (fig. 124).

The curves in this pattern were copied and extended to form the rulers (fig. 125). In this way, multiple sizes would be feasible by extending the curve. The sizes would be based upon the circumference of the head with a little ease added. To make placement of the ruler easier while drawing, I made sure the angle at which they had to be placed was integrated withing the curve. This process is shown in figure 126.

Since the top part of the hat held a curve that could not just be extended to make different sizes, the user will have to cut this ruler to fit their size.

After this, I played around with different configurations of these curves until some logical shapes were created (fig. 127).
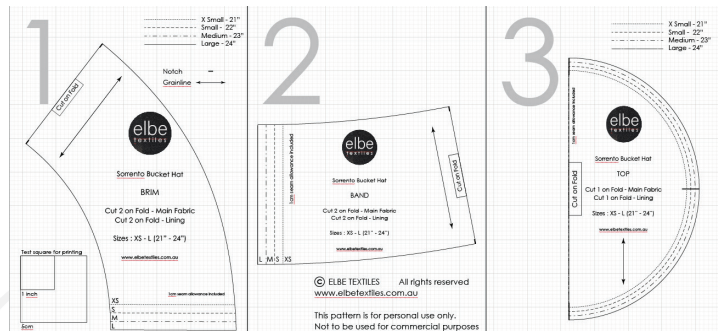
Fig. 124 Commercial pattern from Elbe patterns.

With SolidWorks and Illustrator, the curves were given measurements. It was decided to leave the rulers black-and gray, so the user would not have to waste any colored ink. They were given a gray dotted pattern do they were easier to distinct from the background (fig. 127).

A different set of rulers was necessary to make a bucket hat that has a round top. The same process was followed in developing these. When the user chooses to make the round top in the design module, they will be given this set of rulers, instead of the others.
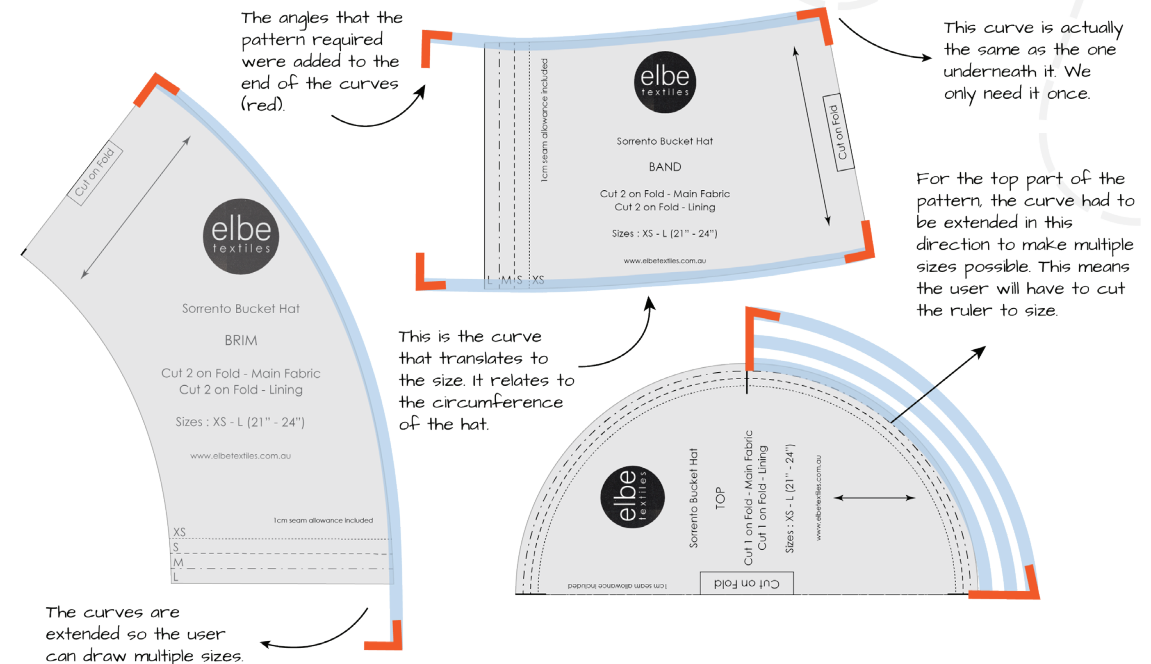

The angles that the pattern required were added to the end of the curves (red).

This curve is actually the same as the one underneath it. We only need it once.

For the top part of the pattern, the curve had to be extended in this direction to make multiple sizes possible. This means the user will have to cut the ruler to size.

This is the curve that translates to the size. It relates to the circumference of the hat.

The curves are extended so the user can draw multiple sizes.

Fig. 125 Process of translating commercial pattern to curves.
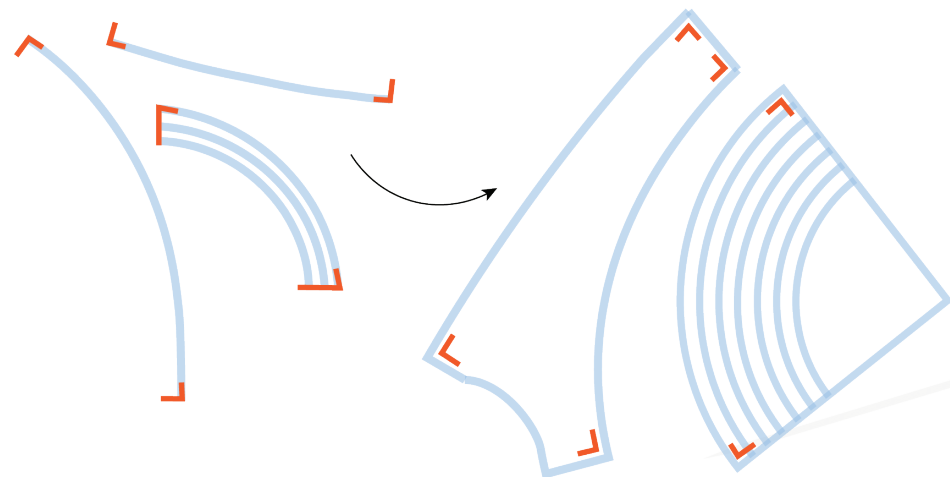
Fig. 126 Process of translating curves to rulers.

Fig. 127 Final rulers.

Fig. 128 Testing the rulers for all variations.
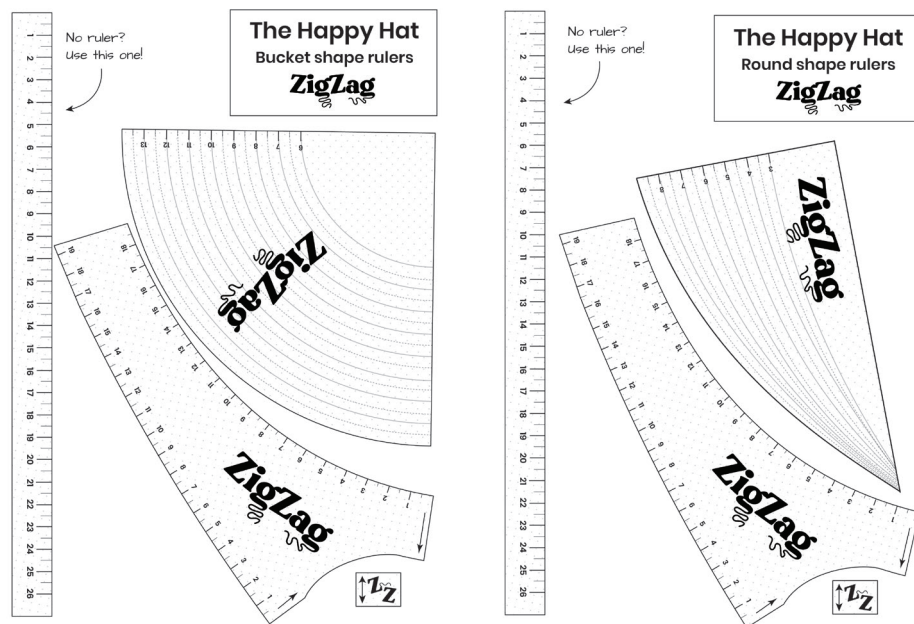
The user needs two rulers to draw the hat's pattern (fig. 127), the printable versions can be found in Appendix J. The rulers were placed on one A4 piece of paper; however, there was still space left on the page. To get as much functionality out of this one sheet of paper, it was decided to integrate a regular ruler to measure and draw straight lines. In the last pilot, the user had to cut a strip of paper to mark the seam allowance around the pattern. This little strip of paper is also present on the sheet and is called the "seam helper" in the sew-along (rectangle with the Z's). The rulers were tested (fig. 128) for all the hat variations with my own measurements and resulted in decent-fitting hats. Next to this, the rulers were tested the rulers for someone with a larger head circumference to make sure the rulers still function with larger sizes.

The instructions from the commercial pattern were taken as inspiration and extended with the instructions on how to draw the pattern for every variation. Since there were 3 brim options and 3 top options, I underestimated the amount of work it took to make all the steps with illustrations and text (122 steps). Some examples of steps are shown below to give an idea of how these rulers, the little seam helper, and instructions on sewing were illustrated. (fig. 129). This also gives an idea how the rulers are supposed to be used.

Since making the steps took quite a lot of time, it was decided to leave out the video's for every step in this design prototype to get back on schedule. The videos will still be a part of the concept of Maki Creative space, only they will not be integrated into this prototype to save time. The videos were already evaluated in the last iteration cycle. The last pilot showed that

users mostly looked at the illustrations and used the video's to check if they did something right. The ability to check is very valuable, and therefore the videos should remain part of the concept; However, they are not highly necessary and since this concept also has numerous other aspects to evaluate, such as the rulers, they were left out of the prototype. If the concept of Maki Makerspace would be realized, they will definitely be there.

With the steps done, Instruction modules were formed for every variation. The structure of these modules stays the same for every hat; only the content within them changes based on the design decisions the user makes. This means the sew-along will have the outline as presented in figure 130.
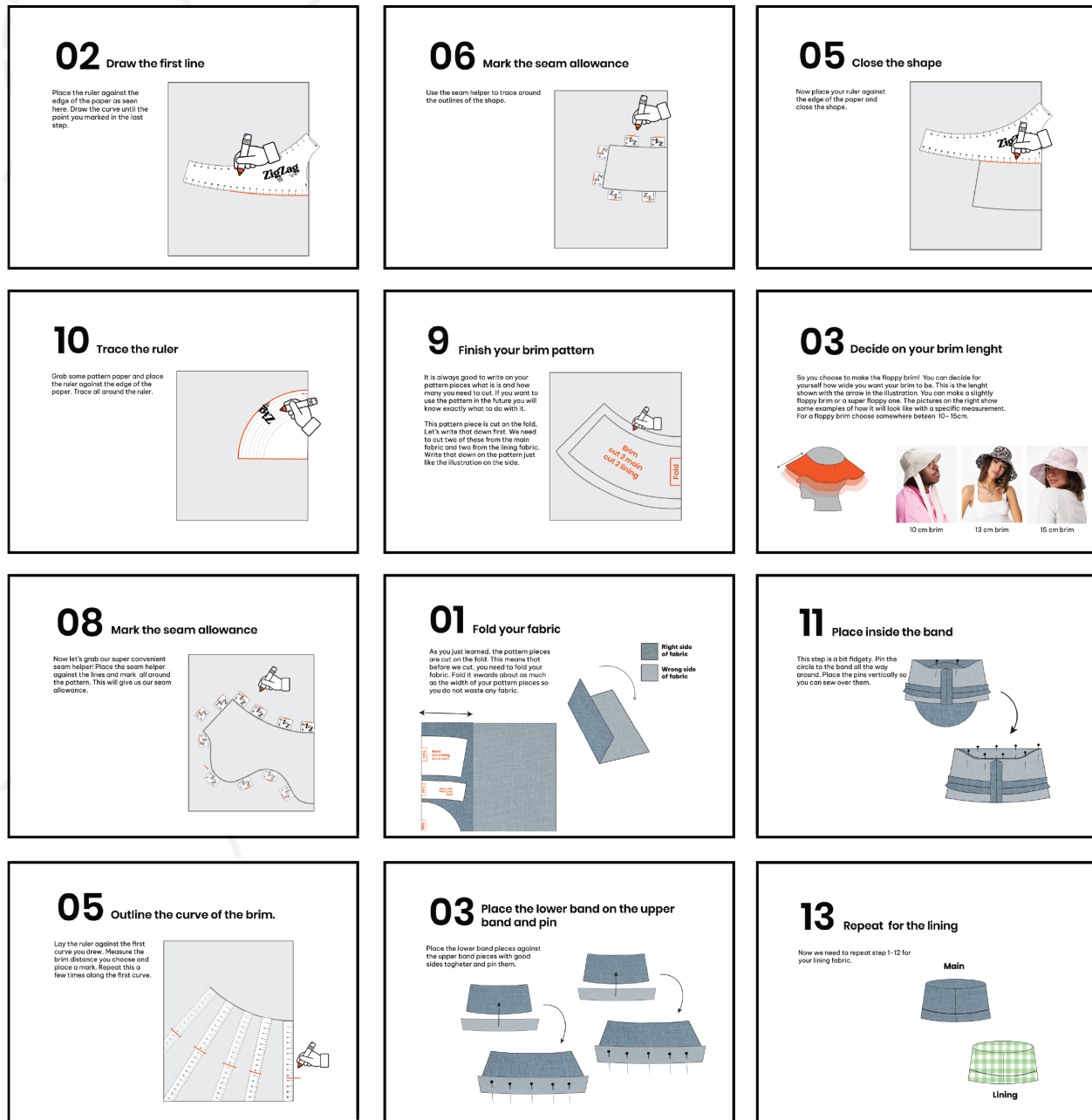
Design

02 Draw the first line

Place the ruler against the edge of the paper as seen here. Draw the curve until the point you marked in the last step.

06 Mark the seam allowance

Use the seam helper to trace around the outlines of the shape.

05 Close the shape

Now place your ruler against the edge of the paper and close the shape.

10 Trace the ruler

Grab some pattern paper and place the ruler against the edge of the paper. Trace all around the ruler.

9 Finish your brim pattern

It is always good to write on your pattern pieces what is is and how many you need to cut. If you want to use the pattern in the future you will know exactly what to do with it.

This pattern piece is cut on the fold. Let's write that down first. We need to cut two of these from the main fabric and two from the lining fabric. Write that down on the pattern just like the illustration on the side.

Brim
cut 2 main
cut 2 lining

Fold

03 Decide on your brim lenght

So you choose to make the floppy brim! You can decide for yourself how wide you want your brim to be. This is the lenght shown with the arrow in the illustration. You can make a slightly floppy brim or a super floppy one. The pictures on the right show some examples of how it will look like with a specific measurement. For a floppy brim choose somewhere beteen 10- 15cm.

10 cm brim   13 cm brim   15 cm brim

08 Mark the seam allowance

Now let's grab our super convenient seam helper! Place the seam helper against the lines and mark all around the pattern. This will give us our seam allowance.

01 Fold your fabric

As you just learned, the pattern pieces are cut on the fold. This means that before we cut, you need to fold your fabric. Fold it inwards about as much as the width of your pattern pieces so you do not waste any fabric.

Right side of fabric
Wrong side of fabric

11 Place inside the band

This step is a bit fidgety. Pin the circle to the band all the way around. Place the pins vertically so you can sew over them.

05 Outline the curve of the brim.

Lay the ruler against the first curve you drew. Measure the brim distance you choose and place a mark. Repeat this a few times along the first curve.

03 Place the lower band on the upper band and pin

Place the lower band pieces against the upper band pieces with good sides togheter and pin them.

13 Repeat for the lining

Now we need to repeat step 1-12 for your lining fabric.

Main

Lining

Fig. 129 Examples of steps during the sew-along.

Same for everyone

Module 1: Preparation

Based on brim choice

Module 2: Draw brim pattern

Based on top choice

Module 3: Draw top pattern

Based on brim choice

Module 4: Sew brim

Based on top choice

Module 5: Sew top

Same for everyone

Module 6: Sew elements together

Fig. 130 instruction modules in a specific order.

Design

The user designs the hat in the first module. However, during the sew-along they also have some minor design decisions to make, like the exact width of the brim. These will not affect the outcome as much, so the user does know what they are making when they start.

Since users have a hard time visualizing what these decisions mean for their final result in the last pilot, pictures were added together with illustrations that use transparency to show the effect of their decisions. To illustrate this, the step where the users decide on the width of the brim is shown (fig. 131):
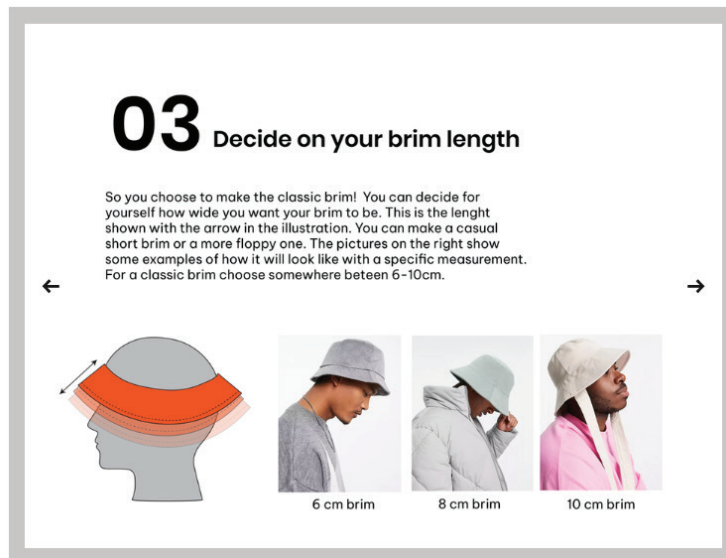
Fig. 131 Step for deciding the brim length with example images and a GIF that shows how the decision will affect the result.

With the content for the instruction models, and the accompanying rulers, the prototype of the platform can be built.

Building the platform.

In the last pilot, the platform was already built with a web developer (Wix). This will be the starting point for this prototype as well. The new sew-along needs to be promoted on the home page, and some pages need to be re-designed to conform to the new concept. The design of the updated wireframes was translated to the pages. With the use of additional JavaScript functions, the design module for the sew-along was programmed into the website (fig. 132).

The design module allows the user to click through all the different options. It will change the top or brim as soon as you click the buttons, so the user really sees the design they will end up making. It was decided to use gray illustrations for this to still create this "white canvas" feel.

These buttons will also update the instruction modules to show the matching steps. With arrow buttons, you walk through the steps in each module. An example of such a module and its steps is given here (fig. 133 & 134).
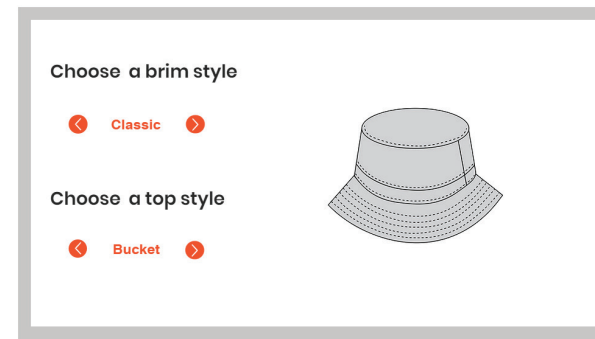
Fig. 132 Design module
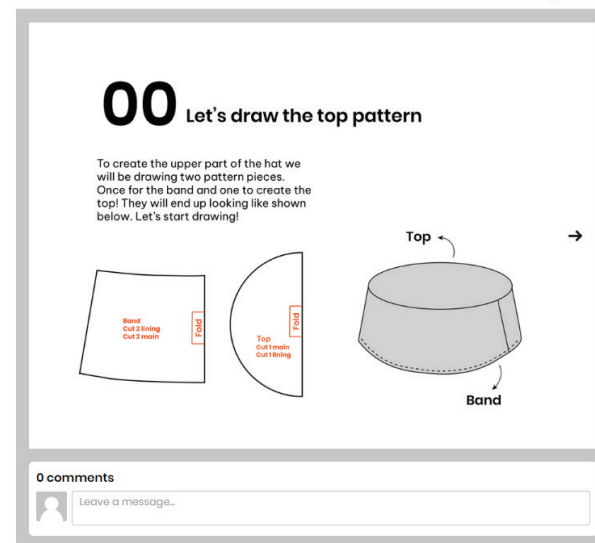
Fig. 133 Instruction Module
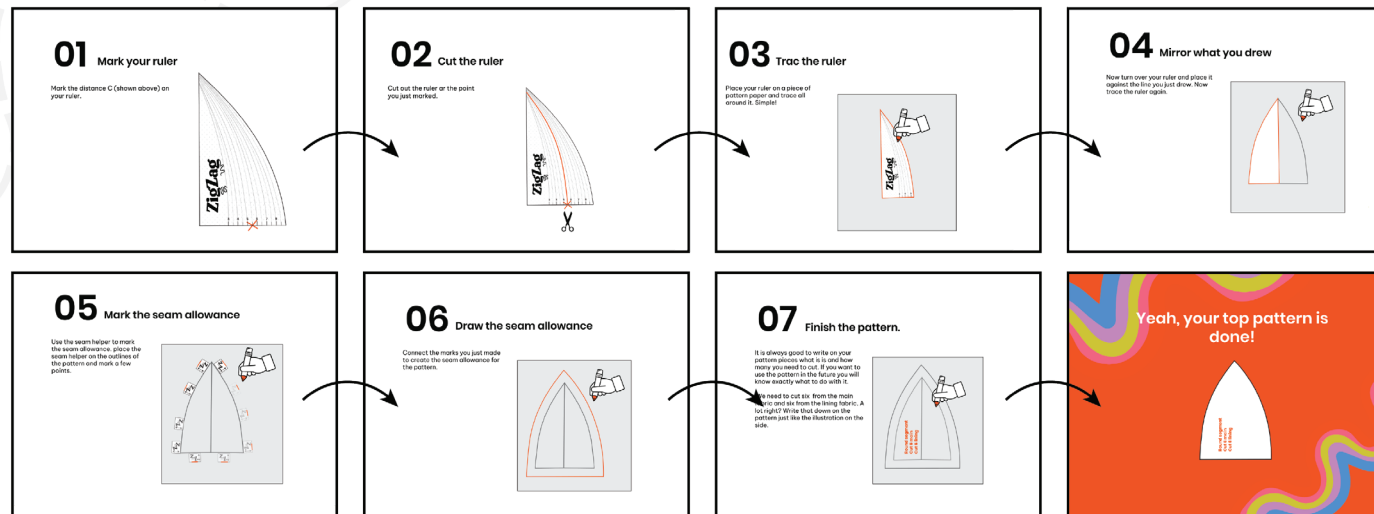
Fig. 134 Content of instruction module.

Finally, a function was written to input the user's measurements (fig. 135) and translate them to the distances in the instructions.

The platform was ready to go (fig. 136). Full-scale screenshots of the pages can be found in Appendix K.

Fig. 135 Measurements input field.
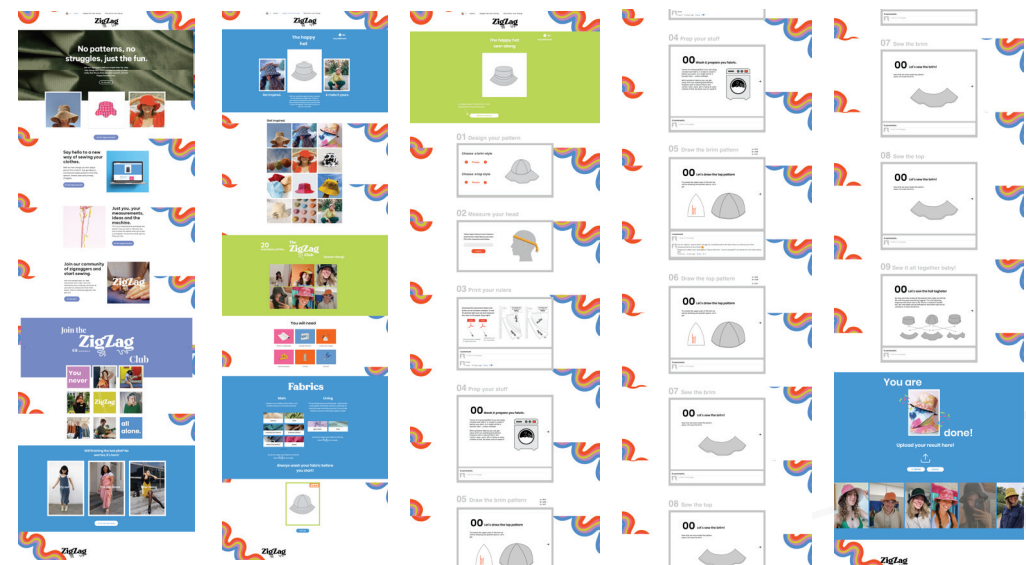
Fig. 136 Screenshots of platform Maki Creative space.

6.6 User evaluation

After the prototype was made, the concept was evaluated by users. To see if Maki Creative space was an improvement compared to the first iteration, it decided to tackle the evaluation in the same way; a pilot followed by a questionnaire and interviews.

This section will discuss the process of evaluating Maki Creative space. First, the approach of the evaluation is discussed. Then the process of formulating a research question is presented.

Then, another pilot is conducted, and the results are discussed. Furthermore, a questionnaire and interviews are done to conclude the pilot. The chapter ends with an overview of insights that determine the direction of the third iteration round.

Approach

In this iteration round, two aspects of improvement were the most important; creative exploration and facilitated learning with a supportive tool. For this reason, the two main research question for this evaluation were:

How does the creative freedom in this concept affect the user?

How does the use of a supportive tool; rulers, affect the user's learning process in drawing the pattern?

There are however also smaller improvements that were implemented, such as the comment section. The design goal had three pillars; creative exploration, the learning process, and collaboration. These pillars will again be used to make sure all the aspects of the concept are assessed (fig. 137).

To answer the research question, a pilot was used that had users make a hat with the prototype.
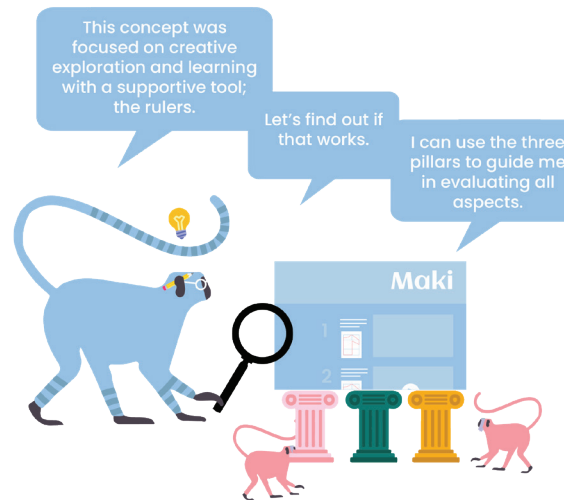
Fig. 137 User evaluation plan.

In the last iteration round, participants were collected through Instagram. However, this resulted in many people not finishing the sew-along on time and me having a hard time tracking what people were doing. Next to this, participants struggled with buying fabrics on time. For this reason, it was decided to select 5 beginning sewers in my immediate environment and give them some fabrics to choose from before the pilot. This will ensure that they finish the sew-along on time and that it is easier to keep track of what they are doing.

Furthermore, 5 additional participants were gathered through a small Instagram campaign (fig. 138). There was less enthusiasm for making a bucket hat compared to the slip-dress. This makes sense when looking back at Chapter 3; User research. Users want to learn how to make their own clothing and not accessories. However, for this pilot it would have to do. Next to this, there was no dependency on these participants from Instagram anymore, and they were considered extras.
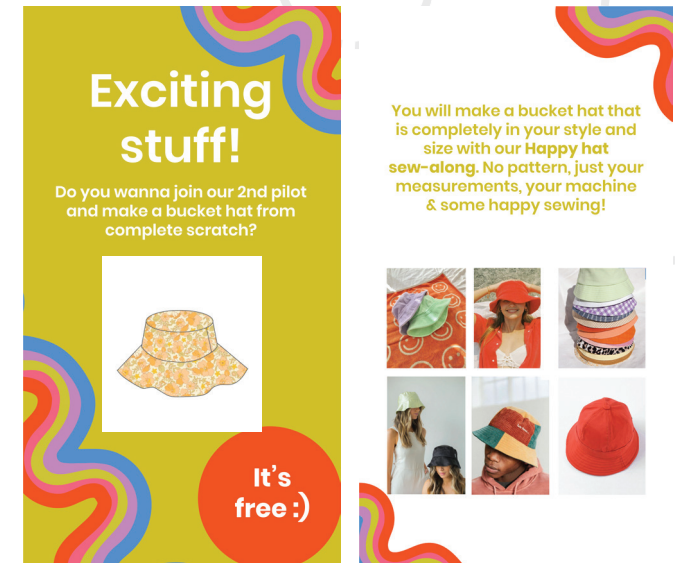
Fig. 138 Instagram campaign for making the bucket hat.

The participants were offered to make a hat from scratch with the help of the platform. They were again given two weeks to complete this on their own. Just like the last pilot, this was done to get as close to the real experience with the platform as possible. The pilot takes about four hours to complete (quite a lot to ask from someone) and so users appreciated being able to do the pilot in their own time. However, one participant was again observed to see the response to the platform.

Next, the pilot will be discussed and what insights were gained from observing a participant making its own hat.

Pilot

For the pilot to start, a link to the platform was sent to 10 participants. 5 participants were given material beforehand. To make sure they had some freedom in choosing fabrics (so no creativity is taken out of the process here), they were offered different fabric swatches. Eventually, they were sent a package with their choices (fig. 139).

Fig. 139 Packages of fabrics and materials ready to be delivered to the participants.

In the end, 4 of the participants that were given materials, finished the pilot. Only 2 participants from the Instagram group ended up finishing the pilot. This was to be expected. However, six results will still be enough to draw some conclusions. This pilot round was much easier to manage with a little less participants and them being in a close environment.

One participant was observed during the pilot. The insights from this observation will be discussed now.

Observing a participant

One of the participants was observed during the pilot. The participant did not have much sewing experience, apart from using a sewing machine at an internship once. This made it enjoyable to see how he responded to a sew-along where he had to make an item of clothing from scratch. An extensive overview of the observations and takeaways can be found in Appendix L. Figure 140 shows observations and accompanying insights. This will be further explained now.

When entering the platform, the participant immediately knew he had options. Unlike in the last sew-along, he started to think about his design before the sew-along even started. He spent quite some time browsing the images on the product page and designing his pattern in the design module. Since he wanted to use many fabrics, inspired by an image on the site, he even made a drawing of his design. It seemed the creative exploration in this concept is enjoyed.

When starting the sew-along, the ruler system was clear to him, even though he used it in his way. Since the pattern paper he was given was see-through, he decided to trace the rulers; he did not cut them out of the A4 sheet. This inventiveness reminded me of how makers will find their own solutions, this should not be interrupted, and so I let it be. Apparently, the platform made him feel free enough to explore this method, even with me watching him. This shows how the platform facilitated the user. The platform does not force the user to do something in a certain way. Steps can be skipped and methods can be changed.

During the sew-along, the participant had the tendency to be ahead of things. He kept assuming what the next step would be, without reading the text. He kept wanting to know what was next the minute he started a new step. Giving some more overview on the sew-along page could help the user in knowing what is to come.

Since he had never used a home-sewing machine before, he did need some help with threading the machine etc. These are minor things that could be implemented on a page in the final concept. A page that holds all information for ultimate beginners could be designed.

At some point, he decided to deviate from the sew-along and altered the sewing pattern. This is usually hard for a beginner. He wanted to have a band of fabric on the outside, but not on the inside. He did it correctly because he understood how the sewing pattern was built up with seam allowances and all, since he drew it himself—an excellent accomplishment for a beginning sewer. This is a significant moment, since the platform has the goal of facilitating users in learning to draw their own pattern without the help of Maki. The rulers seemed to support the user well in this process, he understood how to use them for altering the pattern. Overall, the user seemed to understand what he was doing better than in the last pilot, resulting in a beautiful creative process that shows the concept of Maki Creative space is on the right track with these improvements on becoming a facilitator in a creative learning process where users learn how to make clothing from scratch.

Online participants

After two weeks, some pictures of the results were uploaded to the website. With participants being in a close environment, it was easier to keep track of their progress. In the end, not everyone uploaded a picture to the platform, some sent it directly to me. This is most likely because there was closer contact during the pilot. Next to this, the comment section was barely used, only one comment was placed by a user that wanted to test if the comment section even worked.
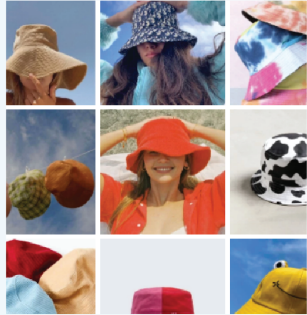
In figure 141, the results of the users are shown. Next, it will be further explained what insights resulted from these.

Fig. 140 Summarized overview of observations and insights.

When opening the website the user immediately started to make creative decisions for his hat.

The creative space the user has seems to be clear from the start.

The user decided to make a high-top with floppy brim. He tried multiple combinations to see which he liked.

Choose a brim style
Floppy
Choose a top style
High Bucket
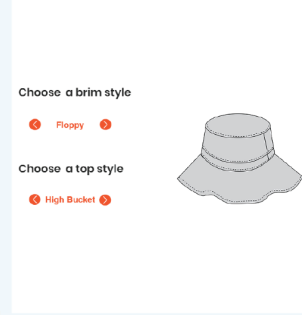
The design module gives the user a good overview of their options.

The user wanted to use a lot of different fabrics. He decided to make a sketch of his hat.

The design process of the hat is really enjoyed and even extended with a sketch.

The user read through all the steps first and decided he could also trace the rulers and not cut them.

Users will find their own inventive methods of doing things. If it works, it works.

The user did not understand he needed to add a seam allowance and started too close to the edge.

Explain what is too come next so the user knows where he is going and does not make mistakes like this.

The user wanted to deviate from the sew along by altering the pattern of the top half. He did this correctly.
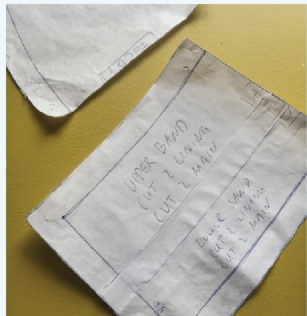
Because the user was explained what he was drawing, he understood how to make changes on his own.

During the sewing the user had the tendency to want to be ahead of things. He barely read the text.

Users like to know what the next step is. The modular blocks give less overview than the steps underneath each other.

The user had never threaded a machine, he struggled but figured it out with a little help.

Users do need a certain amount of skills to start sewing. A seperate page can be designed for these with absolute basics.

The user mentioned feeling really proud after top-stitching his hat. It motivated him to keep going.

Small steps can have big consequences for the motivation of the user. Every step should be celebrated.

The user experimented with different up and bottom threads to explore if this was possible.
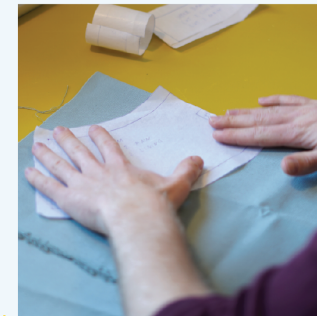
When given the right creative space, users will keep exploring their options during the sew-along.

These first two have a really nice fit!

This user decided to add extra lenght because she was scared it would not fit, it turned out a bit bigger than she wanted.

This user did a little bit of embroidery on her hat to make it more her own. She also added elastic to make it stay on her head while cycling, inventive.

This user made a very large brim, larger than recommended in the sew-along.

All the hats seem sewn togheter well. There are no clear signs of mistakes.
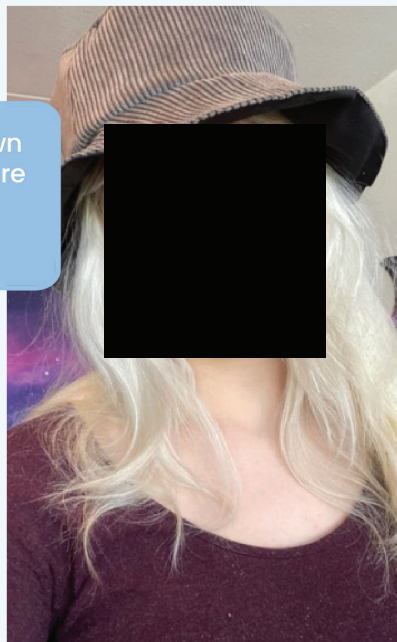
The creative space users are given seem to work well, they all made unique hats!
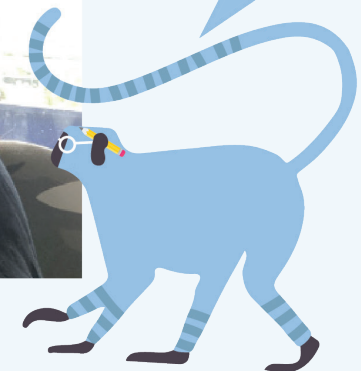
Fig. 141 Happy hat results.

The users made very different looking hats. It was again evident how users really used the creative space they were given.

One user decided to add extra length to the hat. She did this because she was scared it would not fit otherwise, as commercial sewing patterns always resulted in garments that did not fit her right. The hat came out a bit too big now. As Maki used the user's measurements, it is important for the user not to add extra length. Maki should give the users the trust that the outcome will fit.

Other users again showed some explorative creative play within the sew-along. One user added some embroidery to her hat, another extended the brim length further than was advised in the sew-along. She told me that later she did take it in. A user trying out an alternative route is typical of a maker, they learn through experimenting and so nothing should be done to change this. Another used added elastic to make sure the hat would stay on while cycling, another example of experimentation.

Summing up all the insights of the pilot leads to the following takeaways for the next iteration round (fig. 142):

Pilot

The platform guides the user into a creative process where they keep exploring.

The user needs more overview on the page so they know what comes next.

There needs to be a page with basic skills like threading a machine.

The rulers worked well for the users. They made a fitting hat.

The comment section was barely used.

Fig. 142 Overview of takeaways from the pilot.
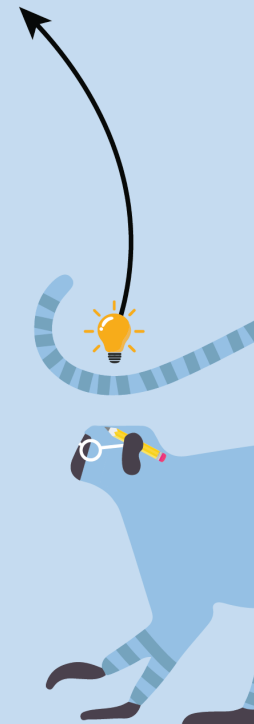
Questionnaire

To understand what participants experienced during the pilot, they had to fill in a questionnaire (fig. 143). All 6 participants filled in the questionnaire.

In the last iteration round, Likert scales were used in the questionnaire, as they were believed to be easier to fill in than open-ended questions, and would still show an intensity towards a statement. However, it was hard to draw conclusions from these statements with only a few participants. The most insightful part of this questionnaire was the spaces the user had gotten to elaborate. It would be more valuable to use simple open-ended questions. Furthermore, feedback was received that this questionnaire was very long, and so this questionnaire should be shorter.

For every pillar, four to five questions were stated about the experience with the platform. The complete list of questions can be found in Appendix M.

For each pillar, interesting quotes were collected. The full list of answers can be found in Appendix M. An overview of these quotes and what this means for the platform is given here (fig. 144). The results will be further discussed now.
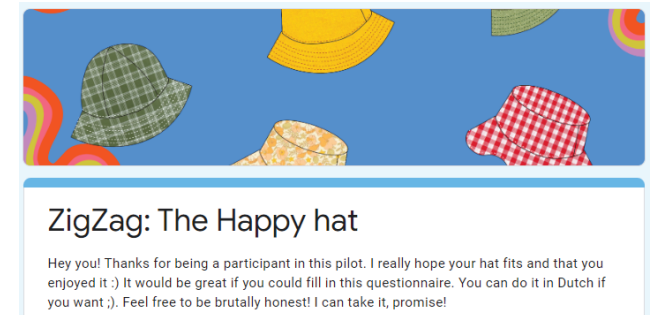

ZigZag: The Happy hat

Hey you! Thanks for being a participant in this pilot. I really hope your hat fits and that you enjoyed it :) It would be great if you could fill in this questionnaire. You can do it in Dutch if you want ;). Feel free to be brutally honest! I can take it, promise!

Fig. 143 Questionnaire.

The communication of the concept is still not very clear.

"I knew I was making a hat but I did not realize that I would not do it without an old fashioned pattern"

"I didn't know I would be able to choose the brim and top combination, but was positively surprised. The amount of choices was just right."

The creative freedom that was given seems to be just enough.

"With choosing the fabric and choosing from 6 styles, I had enough to choose from. I would have a hard time choosing from more options."

"This platform gave you enough freedom to decide for yourself how you wanted it! That was very nice."

"Through all the examples of bucket hats I knew what I was going to make."

"Oh, I was definitely inspired. Because of the photos and examples. I would have liked to make a hat with crazy colors, but unfortunately I didn't have nice fabrics at home. "

It needs to be clearer how the instruction modules work. Maybe bigger buttons can already be enough.

"It took a while (short) before I realized that for each step you had to click on the arrow to continue."

The inspirational images that were used served their purpose. The user used them for inspiration.

I only had a very fuzzy vision of what I wanted to make. Actually seeing the fabric, and especially seeing (pictures of) hats really helped to envision it."

The small and detailed steps work. This keeps being confirmed.

"I like the scrolling in each step, made it very clear what had to happen and it made each small step feel like an achievement."

User were able to make a hat that fits their needs.

"I used some fabrics I had still laying around. It did not make it really weird or special, but it is in my style."

"The design of the platform motivated me to work with bright colors and patterns in my bucket hat."

"I am very happy with it, I made a little mistake myself but it turned out super cool nonetheless."

Fig. 144 Quotes taken from the questionnaire.

"I tried making my own bucket hat pattern in the past and then it was either too big or too small. So this guideline of measuring my own head gave me confidence it would actually fit."

This would not have been a problem if the videos were there.

"I needed some time to figure out where to place which template and how. I think real pictures next to it could clarify things a lot."

The process of drawing the pattern feels personal to the user.

"Drawing my own pattern is an extra step I like to do, gives me more the idea I'm creating something especially for me."

The purpose of the rulers was clear and appreciated.

"Very nice that those rulers were included, especially those curves. That's always hard to draw yourself."

There were 90 degrees angles on the rulers, they should be indicated so the user knows this.

"It was nice! Very clear. Maybe add a 90 degree angle to them so you can help with finding how to place the ruler."

The user explains they have learned about pattern drawing. This was the goal of the rulers.

"It was really cool. I never thought about it this way and I learned a lot from building up the pattern like this."

The comment option was not used, but that does not mean it was not appreciated.

"I thought the option to comment was very nice! Because I understood every step I didn't need it, Otherwise, I would have reached out."

"Uploading a picture in the end is very nice. It made me feel like belonging to a community of people who love to sew."

This shows the need for a sewing community. It might not be a big need, but it is there. For this reason collaboration should stay in the concept.

"If I was really stuck somewhere I would definitely use the comment section."

Users enjoyed the concept of Maki Creative space. The creative freedom in the concept was again enjoyed. Multiple users mentioned that this was the right amount of freedom, and that more choices would lead to "choice overload". The inspiration that users were given worked well. Users mentioned being inspired to make the hat in crazy colors or feeling creative through the inspiration images and playful design of the platform.

There was still a problem with users understanding the concept. For multiple users it was not clear that they had creative options. The GIF used to show variation options showed the users they could make variations, but they did not fully understand what they could vary yet, this was only clear once they reached the design module. Some steps in communicating the concept better can be made.

The rulers and steps were overall clear. One user mentions she thought it was nice that the rulers were added as she always had difficulty with drawing curves. Another mentioned that through these rulers she learned a lot about how to build up a pattern. Just like in observing a participant, this shows that the concept of Maki Creative space is supporting the user in building an understanding of pattern drawing. The rulers are supporting the user in this process. One user mentioned she would have like to have had 90 degrees angles on the rulers, the rulers can still use a bit more design work to add features like this.

Another user mentioned wanting real-life images to show more clearly how the rulers should be placed. Normally, the videos would be there; however, they were left out in this prototype to save time in developing. The videos would have already helped the user. This confirms again that video is a valuable aspect for the user.

The comment section was barely used. However, users did mention they like having the option to comment. One user mentioned they would definitely use it if she had gotten stuck somewhere. Next to this, a user mentioned that uploading a picture in the end made her feel like she belonged to a community. This shows that it was a good decision not to let go of collaboration completely. Users did appreciate collaboration when it is a bit more low-key. These insights are captured in a list of takeaways in figure 145.

Questionnaire

The creative freedom was considered as just right. Users were inspired by the images.

The user still did not fully understand they got to design their hat. The communication of the concept needs improvement.

The rulers worked well. They do need a bit more design work, like showing 90° angles.

The overview of the sew-along page needs improvements. The instruction modules were not always clear.

The comment section was appreciated. Although not used often, it does belong on the platform according to users.

Fig. 145 Overview of takeaways from the questionnaire.

Interviews

Just like in iteration 1, three participants were selected to do follow-up interviews online (Zoom). This was done to give some participants the chance to elaborate on the answers from the questionnaire and to allow for things to come up that were not mentioned in the questionnaire. Since the interviews from the last iteration round were very insightful, the interviews for this round were handled in the same way. The platform was screen shared during the interviews.

The participants were asked to share whatever came to their minds when revisiting the pages. In addition to this, there were a few guiding questions to make sure the conversation would flow and that all the aspects of the platform are discussed. For each pillar, a few questions were stated. After the interviews, the answers were written down and translated. The list of questions and their answers can be found in Appendix N.

The interviews were analyzed and summarized. The results will be discussed now togheter with some first ideas on how to improve on the concept.

Results

The concept of the sew-along was clear to the interviewees, unlike in the questionnaire, it was mentioned that they understood that they would have multiple variation options. However they only understood this during the sew-along.

One interviewee said she did not understand yet that this creative freedom was offered in the form of choosing a top and brim combination within the design module.

In hindsight, this is not so strange. This was never mentioned anywhere before the sew-along. The GIF just showed different variations but was not clear on how the user could actually vary this. It shows that the communication of the concept needs improvements.

Something that would already be an improvement in communicating the design is showing an example of a design module on the home page and telling what the user can vary next to the GIF.

The interviewees all appreciated the rulers. One interviewee mentioned how the rulers gave her some understanding of pattern drawing. One of them came with the idea of making one standard set of rulers and exploring silly features in the design of the rulers. This is something that can be interesting for Maki to explore further, as the rulers can become something that separates Maki from other interventions in the sewing industry.

The interviews gave a bit more insight into why the comment section was barely used. One user said, "if there would be a vibrant community, I would definitely interact". She suggested letting the platform grown and see how it developes on its own.

All these insights from the interview are captured in a list of takeaways. This list is presented in figure 146.

Interviews

The creative freedom was appreciated in this concept. There should not be more freedom.

The design module could be shown on the product page so users understand this earlier on. The concept needs better explanation.

The rulers could be further explored, users see more uses for them. Maybe one set of rulers?

The comment section will be used as the community grows.
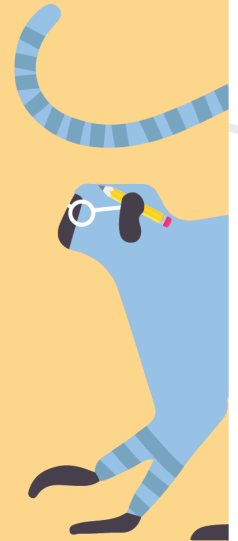
Fig. 146 Overview of takeaways from the interviews.

Conclusion

To conclude the user evaluation, the research questions can be answered.

How does the creative freedom in this concept affect the user?

In the concept of Maki Creative space, the creative exploration users are given is perceived as sufficient and is really enjoyed. Each participant made their own version of the hat and felt like they had enough options to choose from. It was mentioned that more creative freedom would lead to a choice overload, and so a nice balance was achieved.

By giving the user creative options directly at the start and setting up an inspirational environment with using pictures and results of others, the user is encouraged to keep creatively exploring outside the limits of the sew-along as well. Users added embroidery and altered patterns. This underlines the role of the platform as a facilitator in this process.

Overall, this was a nice result for a pilot focused mainly on this creative exploration. One thing that could improve is how the concept, with all its creativity, is communicated. The user did understand the options that were given, but it remained unclear to them how they would use these to get to a design, they only understood this once they saw the design module at the start of the sew-along.

How does the use of a supportive tool; rulers, affect the user's learning process in drawing the pattern?

The ruler system worked to create well-fitting patterns. Users mentioned enjoying the process of drawing the pattern and showed they gained a more profound understanding of how a pattern works because of it. This was the main goal of adding these rulers in the first place; supporting the use in learning to pattern draw, so ultimately they have the freedom to create anything they want.

In this iteration round, unlike last time, the user did not mention wanting more support. They understood how what they were drawing affected the outcome. One user even managed to make alterations to the pattern that were not explained in the sew-along. This shows he understood what he was doing. The platform became a facilitator in creating the pattern he needed.

With the new modular instructions blocks, some users mentioned they lost overview of the steps to come and that the order of the process was confusing to them. Furthermore, it was mentioned that it would be beneficial for the platform to have a page with basic sewing skills, such as threading the machine or winding a bobbin. An idea that is easy to integrate into the platform.

Although this iteration cycle did not have a large focus on collaboration, there were some insights worth mentioning. The comment section was used once throughout the sew-along. Although this was not much, users said they would use the option when a more vibrant community would be active. Multiple users convinced me to keep the option to comment on the platform, so it can become more active once the community grows.

6.7 Conclusion

This iteration cycle had the purpose of improving the concept of Maki Makerspace. This was done with an updated concept called Maki Creative Space. There was a focus on expanding the creative space with a design module and supporting the user further with a ruler system. With the takeaways from the user evaluation, we can decide in what direction we should go for the third iteration cycle.

All the takeaways from the user evaluation are collected and placed in the overview presented on the next page (fig. 148). All the similar takeaways are merged. Most of the takeaways were not about integral problems to the concept, but about minor improvements that are necessary, e.g. creating a bit more overview on a page or adding a page with some basic sewing skills or communicating the concept a bit better. These are adjustments that can easily be implemented, but might not be that important to focus on. With the adjustments needed being on this level of detail, one more iteration cycle might not be necessary.

Something that would be interesting to explore further are the rulers. This is a more innovative part of the concept that really helped the user in gaining an understanding of pattern drawing. This understanding can help them in obtaining the skill to truly make the clothes that fit their size and style, which was the design goal. Furthermore, the rulers have the potential to further distinguish Maki from competitors. There might be ways to make a standard set of rulers, or as one user mentioned: "optimize these rulers with silly features". If these two aspects are further explored, the concept becomes more complete. When developing such a standard set of rulers, it will be interesting to explore what type of garments the user can make with this.

Consequently, it can be explored how the platform would look like when multiple sew-alongs for multiple garments are integrated. Currently, a sew-along for a slip-dress and a bucket hat was made and these were presented on the website individually. What happens when multiple sew-along need to be promoted? Maybe exploring this can also help with improving the communication of the concept.

Considering this, a third iteration cycle becomes redundant. Instead, two topics can be explored; developing a standard set of rulers, and exploring how the concept would work on a larger scale with multiple garments. This is not really a process of iteration, it is more a process of exploration. Therefore, the next chapter will be called; the exploration cycle (fig. 147).
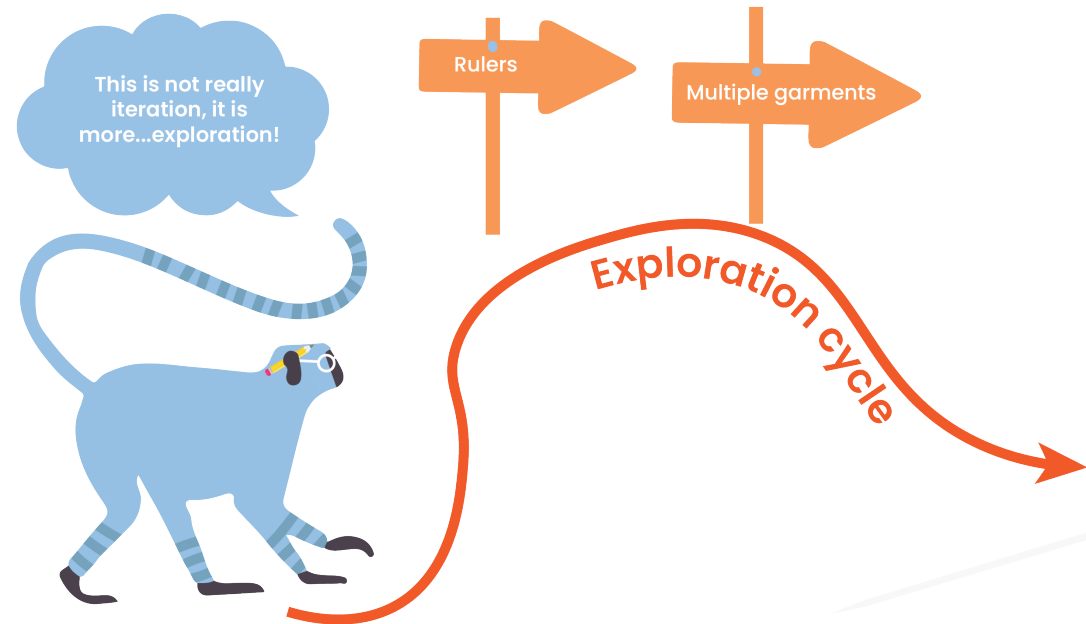
Fig. 147 The direction for the exploration cycle.

Learning process

There needs to be a page with basic skills, like threading a machine.

The overview of the sew-along page needs improvements. The instruction modules were not always clear.

The rulers could be further explored, users see more uses for them. Maybe one set of rulers?

The overview on the sew-along page is such a detailed adjustment, it can be done in the future.

The basic sewing skill page can be added but does not really need development.

There are some minor improvements to be done. However, it will be more interesting to focus on developing the rulers further to be used for multiple garments, as they are now integral to the concept of Maki.

Creative exploration

The platform guides the user into a creative process where they keep exploring.

The concept needs better explanation as users still did not understand how they would design their pattern.

To do this I need to make some decisions on how the concept will work for multiple garments.

The concept works in facilitating creativity, however it needs to be explained better. The concept has so many aspects and options that communicating it to the user is challenging. Although not integral to the conept, some epxloration can be done.

Collaboration

The comment section was appreciated. Although not used often, it does belong on the platform according to users.

This part of the concept really has to grow with the community. I can leave it as it is for this stage of Maki.

Fig. 148 Takeaways from user evaluation; iteration 2.

7 Exploration cycle

Developing rulers and exploring multiple garments to create a final concept.

These puzzle pieces all fit together quite well, adding some others makes it complete.

The second iteration round resulted in minor adjustments that need to be implemented. As this is not as interesting to focus on in this stage of Maki, it was decided to explore some topics that would be more valuable to the project; exploring a standard set of rulers and making the concept work for multiple garments (fig. 149). For each of these, an explorative process is done. These subjects will help to make the concept more polished and profound. With these aspects, the final concept for this project is presented in the form of a mock-up; a non-functional prototype of the website used for showcasing the concept. Finally, a final questionnaire will be done with this mock-up on how this concept meets the design goal. This is done so that in the last

chapter, Chapter 8; Final design, substantiated recommendations can be given on how to improve the concept in the future. The blue design Maki will walk us through these explorative processes.

7.1 Method

The purpose of this exploration cycle is to explore some topics that resulted from the second iteration cycle. When the metaphor of a puzzle is again used, the process can be explained as follows: with the concept of Maki Creative space, a puzzle was finished; a platform was created that meets the user's needs. However, some pieces could still be added or polished (fig. 150). In this cycle, it is explored what these pieces can look like.
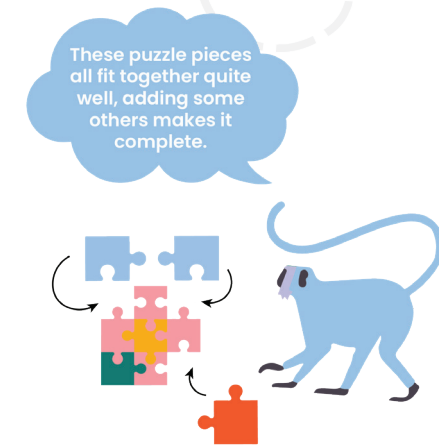
Fig. 150 Exploring new puzzle pieces to finish the puzzle.

The overview of the process is shown in figure 151 and discussed in detail next.

The process starts with exploring the rulers. First, it needs to be explored if it is possible to make multiple garments with standard rulers and find how to best approach this. This is done with a short ideation session. After this, a prototype of the ideas is made and tested through drawing some patterns. As the interaction with the rulers have already been tested in the second iteration cycle, it does not have to be evaluated with users again. Instead, as a proof of concept, there will be an attempt to draw different garments with them.

To see how the concept will work with multiple garments, it is explored how much creative freedom can be given for each sew-along and what type of garments can be made with the rulers. Ideas are generated on how to present this to the user on the platform. Consequently, this might help in improving the communication of the concept as well, although this is not the primary focus of the exploration.

After this, a final concept is presented where the findings from the explorations are integrated into the concept of Maki Creative Space. This concept is translated to a mock-up in the branding style of Maki. With this mock-up, a final questionnaire is done to see how the final concept meets the needs of the user. The insights from the questionnaire will result in substantiated recommendations for further developing the platform in the future.
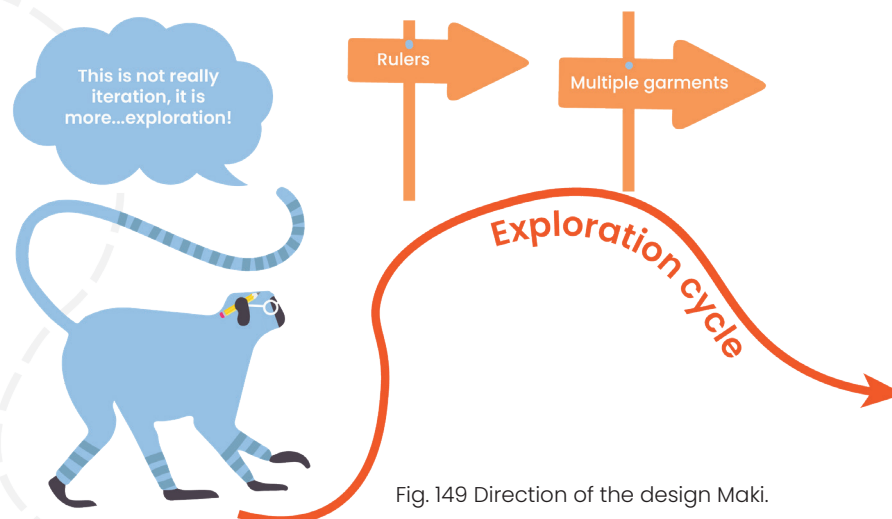
This is not really iteration, it is more...exploration!

Rulers

Multiple garments

Exploration cycle

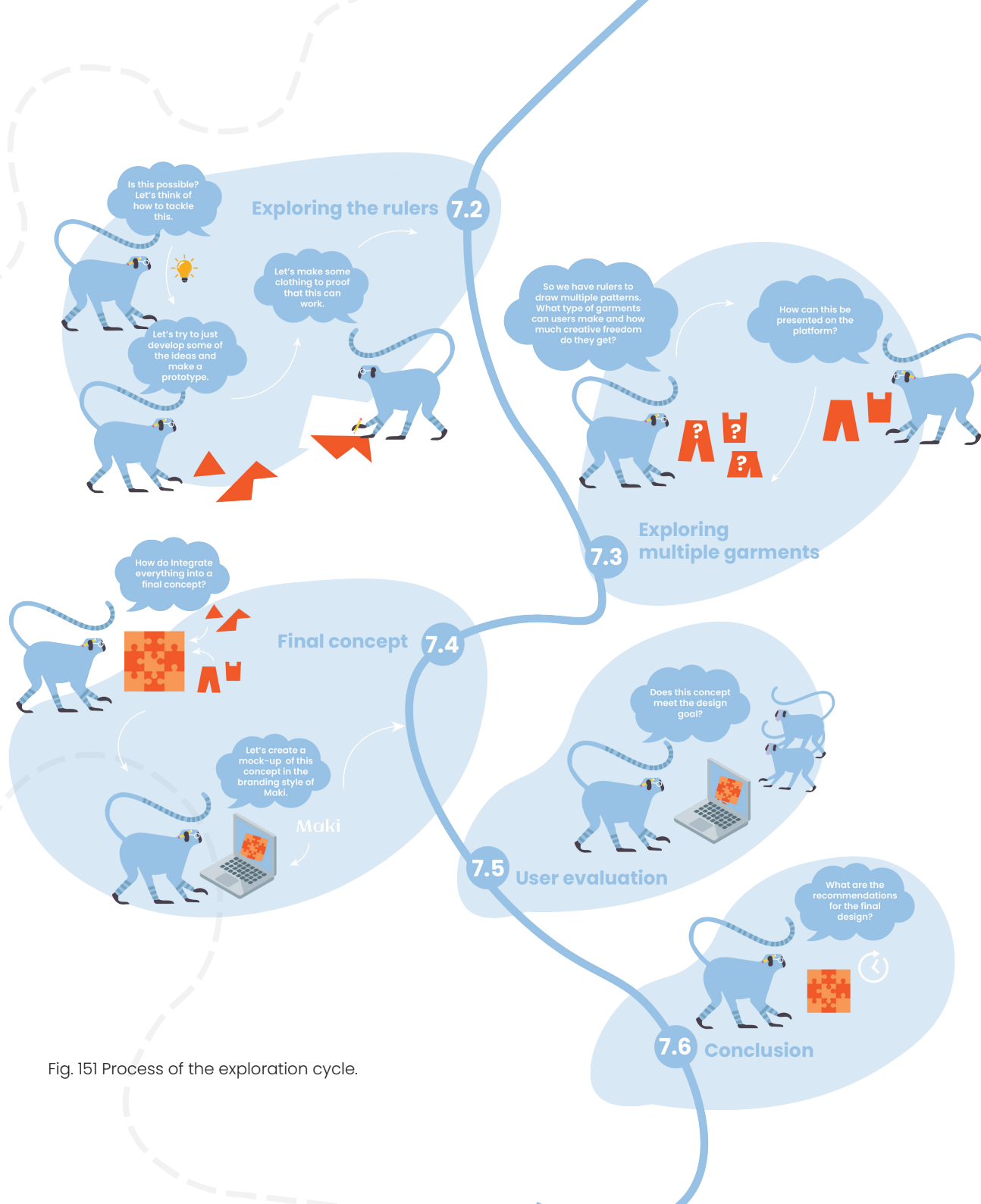Fig. 149 Direction of the design Maki.

Fig. 151 Process of the exploration cycle.

7.2 Exploring the rulers

In this section, the process of designing a standard set of rulers is discussed. This process starts with a small ideation session on how they could be formed. After this, the ideas are transformed into a prototype. With the prototype, some patterns will be drawn and used to create some garments. This will show how they can be improved and ultimately, function as a proof of concept to see if Maki should develop this set of rulers further in next stages of the business.

Having a standard set of rulers can be advantageous for multiple reasons; It makes the platform simpler as now not every sew-along requires its set of rulers. Furthermore, the amount of paper and printing effort is reduced, as users now only need to print the rulers once to do multiple sew-alongs. However, the most valuable advantage might be that the user gets closer to the experience of pattern drawing with French curves as these are also used to draw multiple garments. In this way, the user gets closer to traditional pattern drawing and meeting their goal of being able to make anything in the future.

However, unlike French curves, Maki has complete control over the design of these rulers, so complexity and interpretation can be taken out. This will make the Maki rulers function as a stepping stone towards using French curves. Next to this with a permanent set of curves, Maki has control over what the user can make and how, so they can be optimally facilitated in the sew-alongs.

Ideation

To design a set of rulers applicable to multiple garments, I started with investigating what curves are needed to draw the most basic clothes. These are a t-shirt, pants, and skirts. In these garments, there are some curves that are more important than others in making the pattern fit. These curves were selected to form permanent curves on the rulers. In the overview presented (fig. 152), it is shown how starting with these basic garments led to a selection of curves to construct the rulers with. This is explained in further detail now.

The crotch curve on the back pattern is usually the same as the front, but shortened at the end. The same ruler can be used for these curves.

The line for the crotch is important for the fit and is the same for all pants. It should be on a ruler.

For larger sizes this curve can be extended on both sides.

Extension for multiple sizes.

Pants pattern back

Pants pattern front

These curves are less important for the fit, unless you need tight fitting pants. However, those are too challenging for a beginner anyways.

For a tighter skirt, the hip curve can be important. This curve can also be used in some pants.

Extension for multiple sizes

Skirt pattern

For larger sizes the curve can be extended on both sides.

The sleeve curve is also important. It determines the shape of the sleeve so making it standard, limits some sleeve options.

Extension for multiple sizes.

Sleeve

The neckline is an important curve to have, because it can also be used to draw a pattern for a collar.

Extension for multiple sizes.

For larger sizes the curve can be extended on both sides.

Extension for multiple sizes.

The armhole curve can be identical on both the front and back pattern as long as the fit is wider.

T-shirt pattern front

T-shirt pattern back

By using only a fragment of this curve under a different angle, the back neckline can be drawn.

Fig. 152 Process of selecting curves.

For making pants there is one essential curve, the curve that is used to create the crotch. When making tighter, or more fitting pants, some other curves are needed, but assuming that very fitted pants are too complex for a beginning sewer to make, these curves do not need to be integrated into a ruler for now. To draw a simple pattern for a top, the armhole, neck, and sleeve curve are needed. Finally, to make a skirt, a hip curve is needed.

All of these curves can be extended in order for the user to be able to make multiple sizes. This means that when a user needs to draw a larger size, they simply extend the curve further. However, this method of drawing multiple sizes does create a problem.

When making a pattern in multiple sizes, a process called pattern grading is performed; up or downsizing a pattern while maintaining the same fit and shape of the garment. There are many ways to grade a pattern, but it comes down to a process that is more complex than just adding some length or width. In figure x, it is shown how the curve of an armhole slightly changes in a graded pattern (fig. 153).
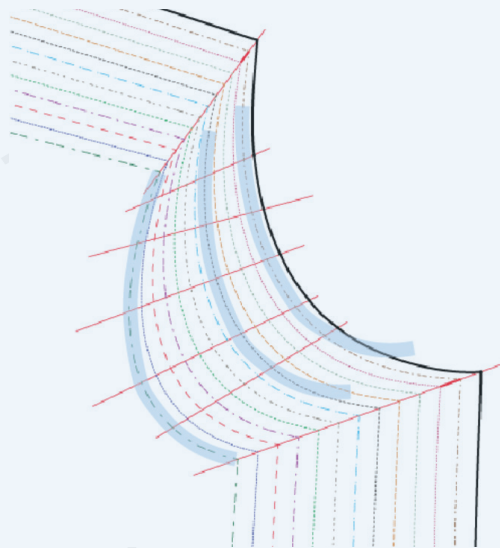
The difference between one or two sizes is minimal and will most likely not cause any problems, but with larger size differences, the effect can create issues when making more fitted items. Since it is important for Maki to be size inclusive, this should be taken seriously. If some length would just be added to the end of the last curve in figure 160, it would go in the entirely wrong direction, and you would end up with an armhole that sits too high under your armpit. To prevent this from happening Maki could make rulers in multiple size ranges that would cover a certain range of measurements.

Within this range, the difference between these curves would be minimal and will not cause concerns. This would result in for example 3 sets of rulers, for different size ranges. The rulers would still allow the user to draw the pattern exactly in their size with a very minimal margin or error (fig. 154).

The user would fill in their measurements on the platform and the platform creates a download link for the set of rulers with the least amount of error. In this way, the downsides of convection sizes

are still circumvented. I, personally, believe it is important not to highlight that users get a "larger" or "smaller" set of rulers and keep this process in the background. In this way, there are no labels connected to sizes, and your size is just, your size. Users just fill in their measurements and get a set of rulers that works for their body.

After a solution was found for this sizing challenge, the rulers were formed with the curves that were selected. The rulers were arranged in different compositions until a composition was found that resulted in decent looking rulers. To make the rulers simpler, closely related curves, such as the armhole and sleeve are integrated in one ruler (fig. 155).

Fig. 153 Grading of armhole in pattern.

What the user sees:

Fill in your measurements

...

...

...

Submit

Download your set of rulers here!

What happens in the background:

When measurements between 1- 10 — Ruler set 1

When measurements between 10-20 — Ruler set 2

When measurements between 20-30 — Ruler set 3

The ruler will receive a set that matches with their measurements.

Fig. 154 Having the platform output multiple sized rulers.

Curve for crotch, pants.

Armhole curve

Hip curve

Sleeve curve

Neckline curve
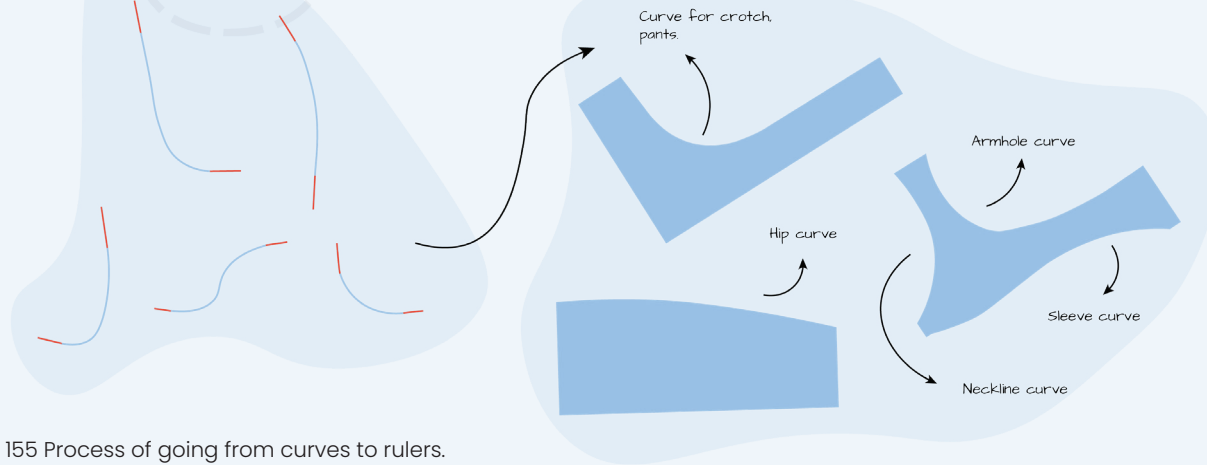
Fig. 155 Process of going from curves to rulers.

Fig. 156 Ideation of extra feature.

There could be space for a protractor so users can draw and measure angles.

This ruler could be extended so that the user also has a ruler to measure longer distances.

The little seam helper could be added to the page.

This ruler already has quite a lot going on with three curves.

1 cm

It could have two lengths so you can flip it.

2 cm

Show a ruler on every straight side so you always have a measuring tool.

It can be formed like a cross so it is easier to handle.

There is a lot of space left on this ruler, There could be a "dart helper". That makes it easier to draw darts fast.

The user would puncture a hole with a pen so they can mark a dot on the pattern on the right distance.

Since users have to print pages, Maki might as well try to get as much out of these pages as possible. One user already suggested adding some silly and clever features to these rulers. A small brainstorm session was done on simple features that could be added to these rulers to make them more convenient. An overview of this ideation is shown in figure 156, and will be explained in further detail now.

The rulers could have a protractor, so it will be easy for users to measure and draw certain angles. Next to this, the ruler with the crotch curve could be extended, so users can measure over longer distances. Furthermore, a tool to support drawing darts could be added. With this tool, the user can easily measure the distance over which the dart should be drawn.

Finally, the seam helper as discussed in Chapter 6.6; Prototype, was upgraded. In the last iteration round this was a simple rectangle in the width of the seam. This was a bit difficult to handle. For this reason, a horizontal rectangle, on which you can place your fingers, was added.

After this ideation on how to make these rulers, a prototype was developed.
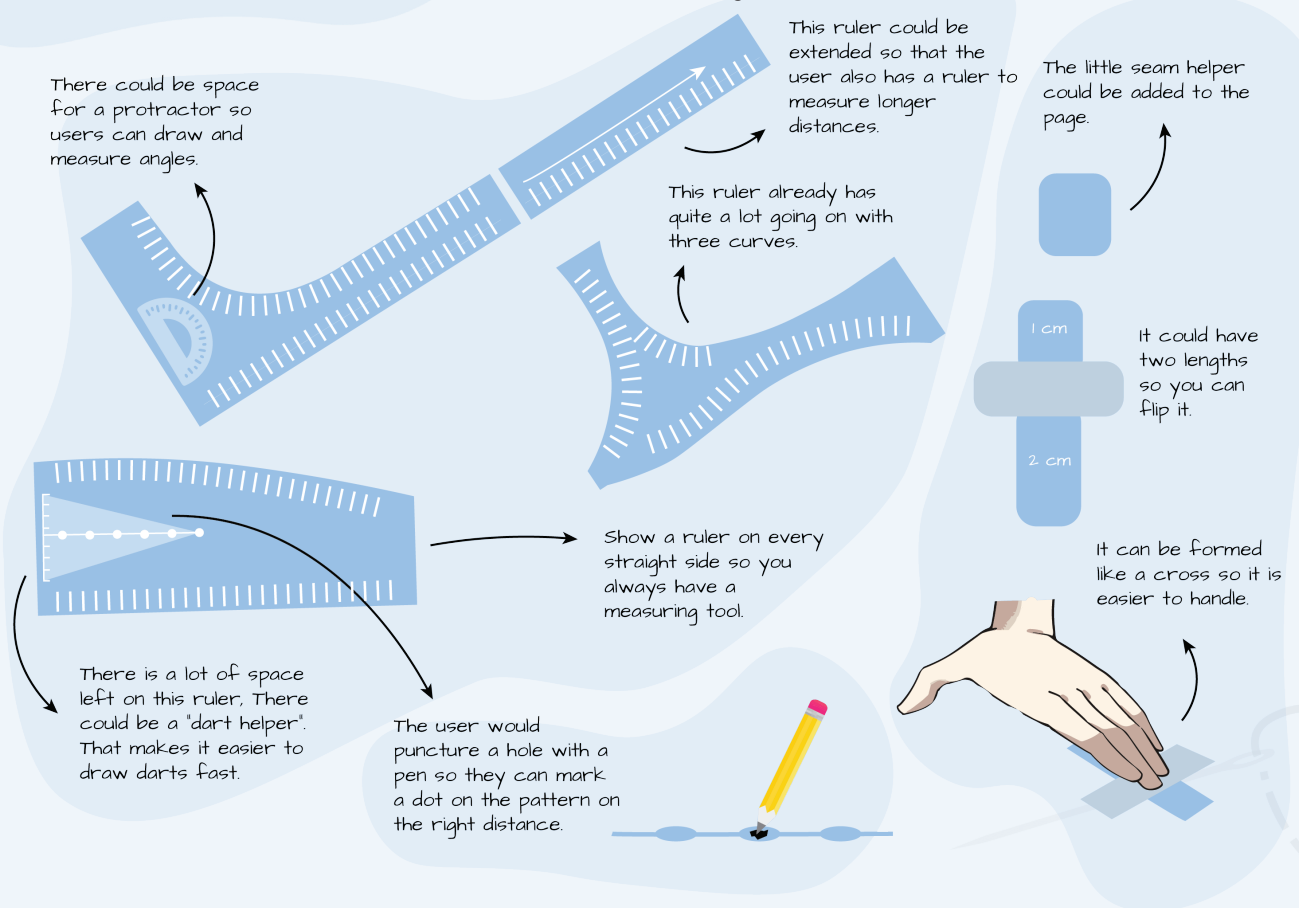
Prototype

With a rough idea of how these rulers should be made and what features they should have, a prototype can be made to test with. It was decided to make only one set of rulers (instead of multiple sized rulers as discussed above) that would fit my measurements to test if such rulers would work.

The same process for making the rulers was used as described in Chapter 6.6; Prototype. A summary of the process will be given now.

The process started with tracing curves from basic commercial pattern pieces. For example, a more fitted t-shirt and wide pants. To make the rulers, Adobe Illustrator and SolidWorks were used. The curves were merged into the shapes as shown in the ideation. After this, distances were added with SolidWorks. With the outline of the rulers ready, they had to be fitted on a minimal number of A4 sheets. This was a bit of a puzzle, but three pages sufficed. The first ruler, however, did not fit and needed to be sliced in half. This means the user would still have to glue it together. All the features were added to the rulers. The rulers were made in black and gray, so users would not have to waste expensive colored ink. To distinguish the rulers from the background, they were given a dotted pattern.

With the rulers prototyped, they were ready to test with (fig. 157).

Testing

Now that there is a prototype, some tests can be done. The purpose of this exploration is to come to a proof of concept, and not to fully develop the rulers, as time is limited and this would take a long process of drawing, fitting and iterating.

With this in mind, the test would be to take the measurements of my dress form, and convert
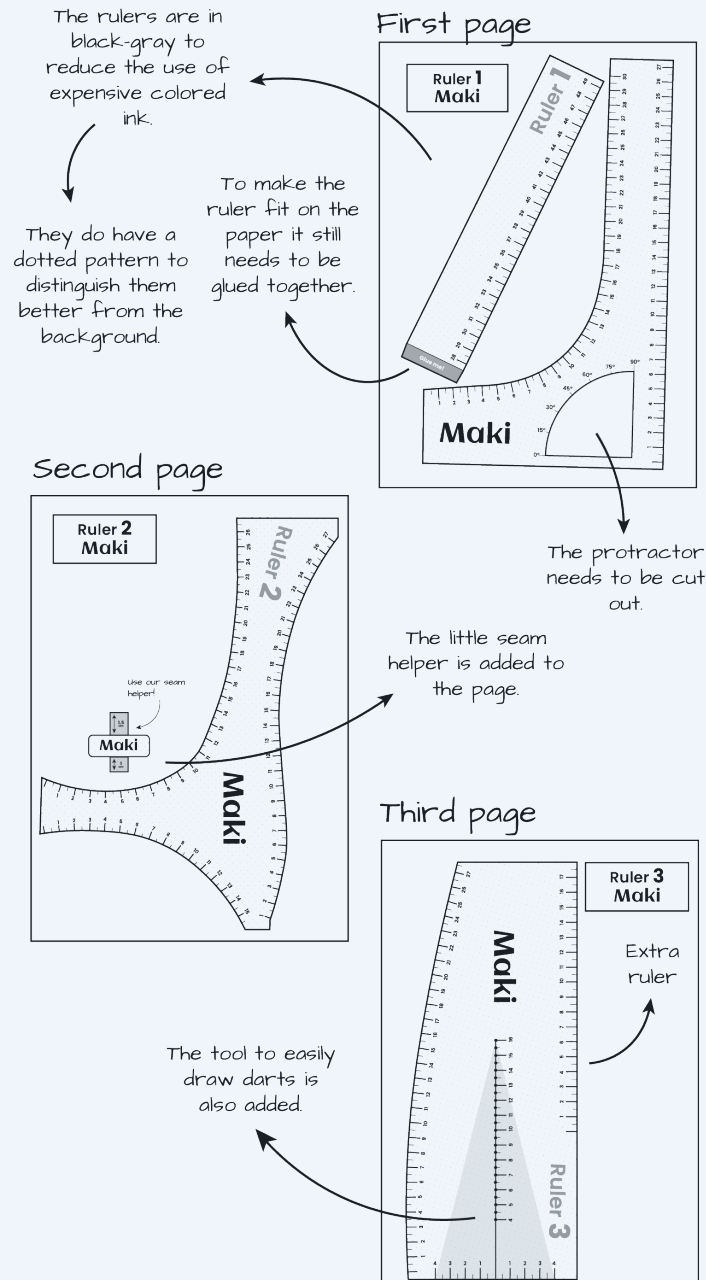
them into a pattern for a shirt and a simple pair of pants. In the overview presented in figure 158, it is shown how drawing these patterns led to some improvements to the rulers until finally decent fitting patterns were achieved. The process will be discussed in further detail now.

First, the rulers were printed and glued together. They were printed on multiple paper thicknesses. As can be expected, the rulers work best on thicker paper as this makes them easier to trace. However, even with regular printing paper they worked fine.

For drawing the pattern of the shirt, it was decided to use the same structure created for the slip-dress. This structure was already developed, and the rulers will eventually also be used in combination with such a structure (this structure is discussed in Chapter 5.3: Ideation). Next to this, I drew a pattern for a simple pair of pants. This pattern was extremely basic, so only one measurement was required for drawing it.

In drawing these patterns and comparing them to my dress-form and a pair of wide fitting pants, I found which curves were not quite right yet. Next to this, some other small errors were found in the rulers, such as wrong distances. It was decided to do one iteration round to take the bigger errors out. After this, the patterns were redrawn, and they seemed to result in a much better fit. Drawing the pattern in this way was a process that took a matter of minutes and that I found very enjoyable. After assembling the shirt and pants in fabric, I tried them on, and they fit quite okay. The garments that resulted from the process are very basic, but can be a base for more complex garments. There are many improvements that can still be done regarding the fit and curves, but overall this test gave me the confidence that these rulers could work. The final rulers are shown in figure 159 and can be found in Appendix R.

The rulers are in black-gray to reduce the use of expensive colored ink.

They do have a dotted pattern to distinguish them better from the background.

To make the ruler fit on the paper it still needs to be glued together.

First page

Ruler **1** Maki

Ruler 1

Maki

The protractor needs to be cut out.

Second page

Ruler **2** Maki

Ruler 2

use our seam helper!

Maki

Maki

The little seam helper is added to the page.

Third page

Ruler **3** Maki

Maki

Ruler 3

Extra ruler

The tool to easily draw darts is also added.

Fig. 157 Rulers for testing.

First, the rulers where printed and glued together. Printing them on stiffer paper works the best.

After this, they were cut and ready to be used!
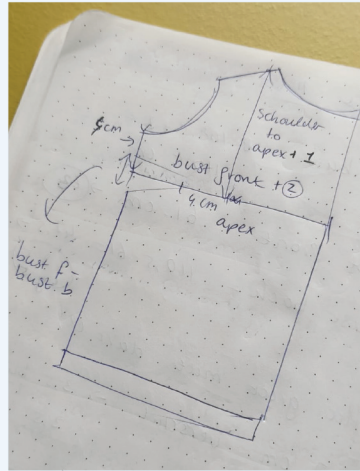
I used the structure I designed in the first pilot. This time I would draw it with the help of the rulers. I used the measurements of my dress form.
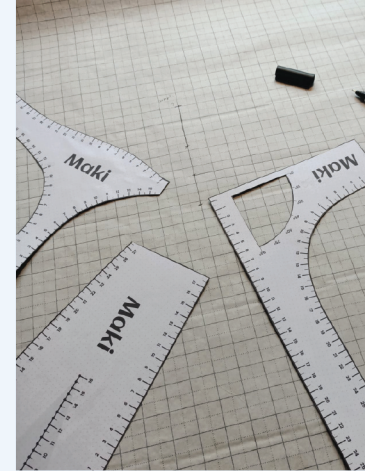
Using all three rulers, I drew the structure. Having the longer ruler was very nice as this made measuring easy.
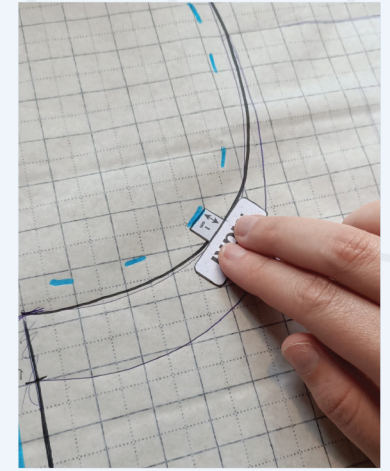
The little seam helper worked as intended. The horizontal space added for the fingers made it easier to hold.
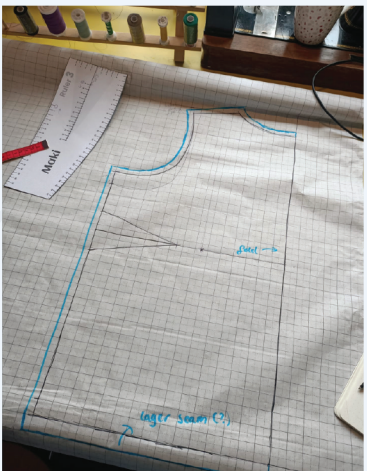
The pattern was finished and ready to be cut out.

Fig. 158 Process of testing.

I placed the pattern on my dress form to see if there were some issues with the curves. Some curves where too small and had the wrong deflection.
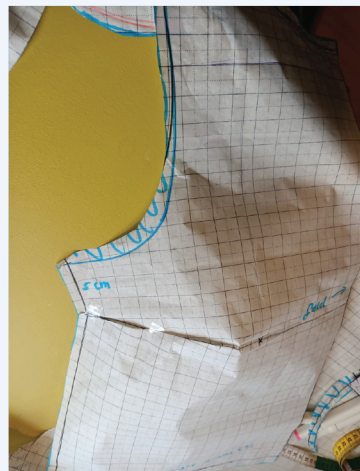
I marked my pattern with improvements and wrote these on the rulers so I could take these mistakes out.
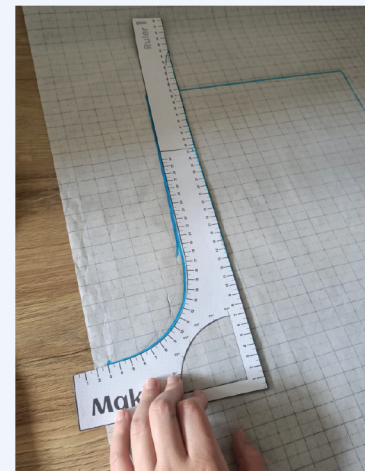
I proceeded with drawing a pattern for simple pants. I used my hip measurements for this together with the long ruler.
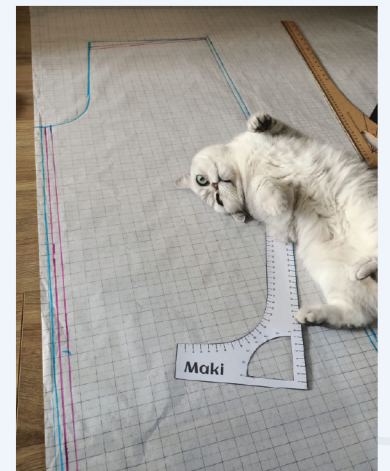
Pants cannot be fit onto a dress-form and so I used some wide fit pants to see if the pattern was somewhat correct. As you can see, I had some help with this...
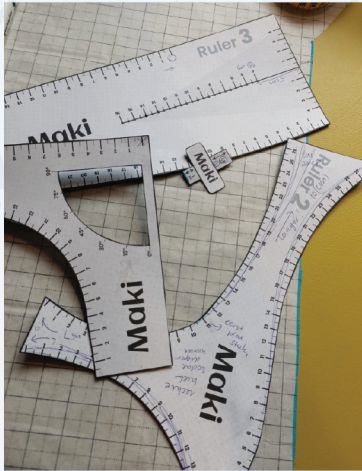
For each ruler there were some improvements needed. For some there were small mistakes in distances, others had curves that were a bit off.
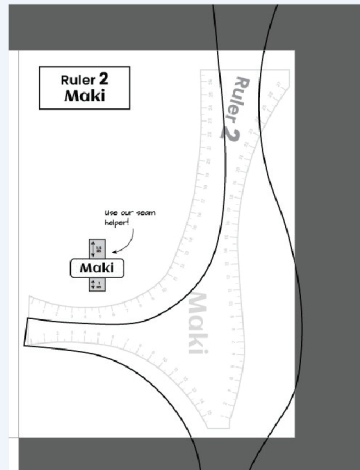
The second ruler needed to be much bigger as two curves needed to change. This ruler now also needs to be sliced to fit on an A4-page.
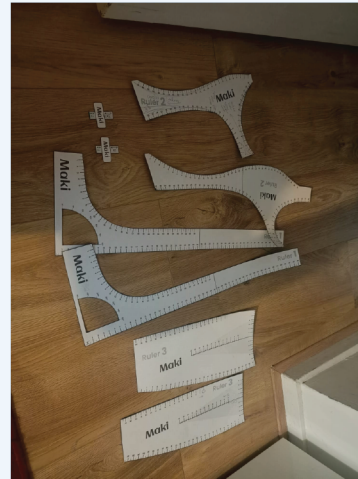
The updated versions were printed again. Some with minor adjustments, some with bigger adjustments.
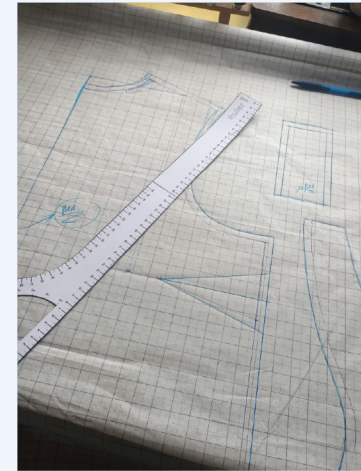
With the rulers updated, I created a new pattern for the top.

When placed next to the other pattern, the difference is minimal but does really effect the fit. I also made an updated version for the pants pattern.

Finally I sewed the top using the pattern. It fit my dress form quite well.

The pants fit as well. It is good to mention that these are extremely simple garments to see if the fit is right, but they can form the basis for more complex projects.
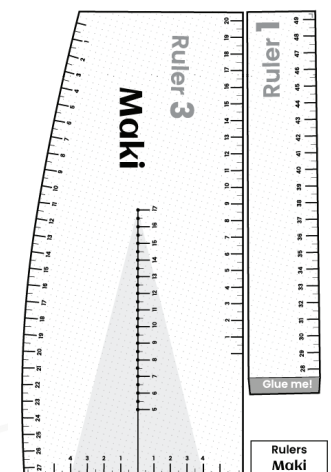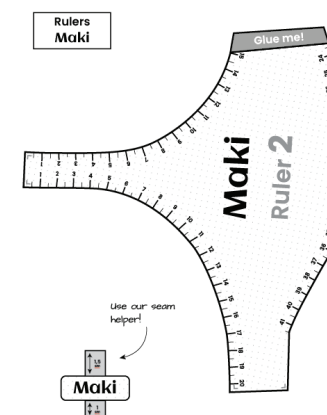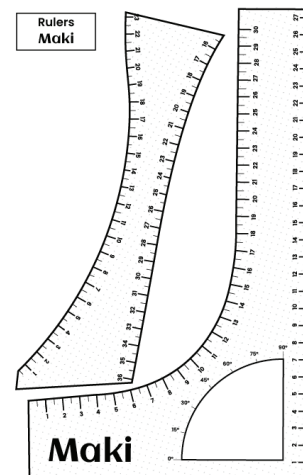
Fig. 159 Final Maki rulers.

Design

Conclusion

Drawing a pattern with these rulers was a simple and enjoyable process. After the first iteration had taken out the biggest errors, I had the pattern drawn up in a matter of minutes. As someone who is more experienced in sewing, I still enjoyed the simplicity of it. I could easily draw and measure curves and extend these patterns to more complex items if I wanted. The rulers should still be further developed to work adequately with multiple sizes, but overall, I think the concept of a standard set of rulers is proven to work. I am convinced these rulers can become a good stepping stone towards users learning some pattern drawing skills.

In the next section, exploration will be done on what type of garments can be drawn with these rulers and how these rulers can also be limiting in making some garments.

7.3 Exploring multiple garments

The pilots that were done taught that the concept worked for making a slip-dress and a bucket hat. However, it is interesting to explore how having multiple sew-alongs for multiple garments would look like with this concept. What type of garments are appropriate for beginners, and what can be drawn with these rulers? Next to this, how much creativity can be given for each garment? All these aspects can be explored to invigorate the concept. Ideation is done on the type of garments that can be made with the rulers. After this, the creative space within this is explored. Finally, there is a focus on how this can be presented on the platform.

What garments can be made with the rulers and are appropriate for beginners?

The rulers support the user in drawing curves. However, with a permanent, standard set of curves, the user is somewhat limited in what he or she can make. A fitted blazer will be hard to draw with the Maki rulers. However, Maki is focused on beginning sewers, and such a blazer will be too complex for them in the first

place. The limitations of the rulers might balance out with the skill level of the beginning sewer.

A small explorative session was done to see what kind of garments can be made with the rulers and what garments fit a beginners' skill level. An overview was made for tops and pants to give an idea of what these rulers can allow a user to do (fig. 161). Obviously, there are more options, the overview just illustrates that there is enough room to keep expanding the platform with new sew-alongs if the rulers are integrated into this concept.

Looking at this overview it can be concluded that there are a few characteristics that a garment needs to have, so they can be drawn with these rulers and are appropriate for beginners.

If the garments are made out of non-stretch fabrics, the garments cannot be very fitted. They should have a wider or looser fit; otherwise more curves are required. Sleeves can exclusively be used for wider tops, as the sleeve and armhole curve are permanent. It was chosen to make these for a wider top because this is easier to make for a beginner. However, the form of the sleeve can be adjusted, i.g a balloon sleeve or a straight sleeve. In Chapter 3.3; User research, the user mentioned that they often started with more wide fitting garments, so this might not be a problem in the first stages.

For more fitted garments, elastic fabrics could be used to prevent having to make complex patterns. Furthermore, with the use of drawstrings, elastic, buttons and ribbons, more technical sewing skills such as inserting zippers can be circumvented. However, since Maki is a learning platform with the purpose of giving users creative freedom to make what they desire, it could expand to more complex garments in the future.

Finally, examples were found on that have the characteristics as described above, to give a broader overview of the possibilities for other types of garments, like dresses or skirts. This can be found in the overview (fig. 160). It shows that with these rulers there should be more than enough options in facilitating the user to make their own clothing.
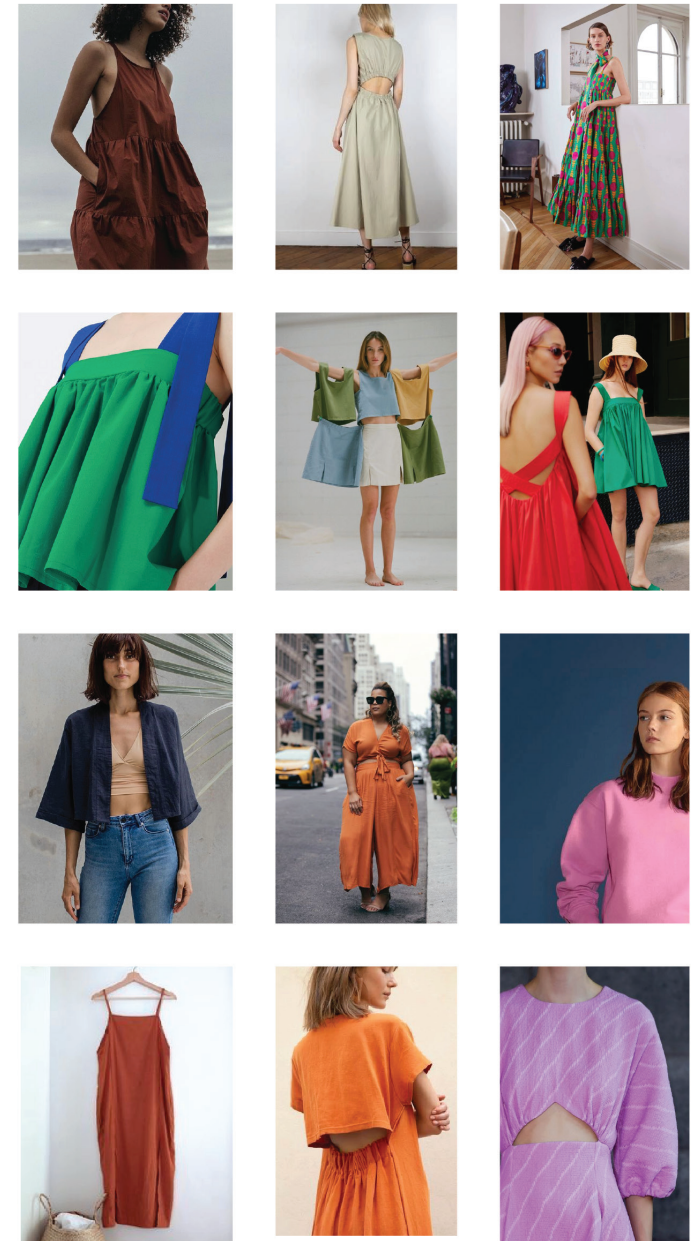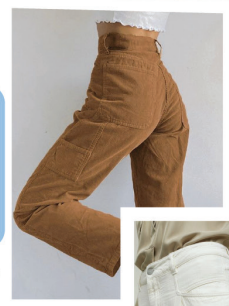

Fig. 160 Example of possible garments.

Pants

Let's explore what options we have with these rulers.

Fitted pants might be hard to make as more curves are needed to draw these. Also, a lot of measurements are needed to make it fit well.
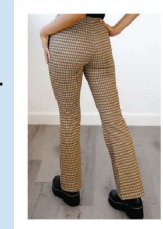
More wide fitting pants or straight leg pants are possible with these rulers, as they only really require the crotch curve to be precise.

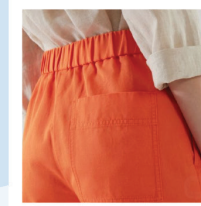Pants that are tighter because of elastic fabric can also be drawn with the rulers.
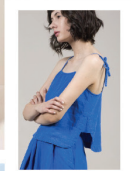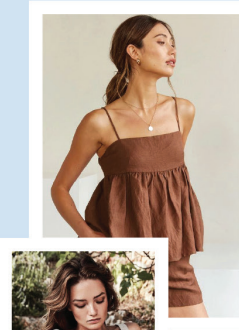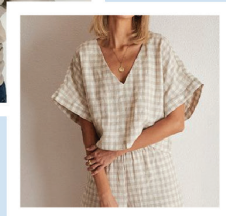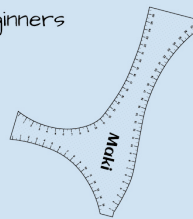
Drawstring and elastic are perfect for beginners in making pants.

Different lenghts can be drawn.

These pants also need zippers and buttons, something very challenging for an ultimate beginner.

Tops

Blouses that are more fitted cannot be drawn with the rulers, as the armholes and sleeve curve will not allow this, also collars are quite hard for beginners.

The rulers will only work with sleeves, if the fit is a bit more oversized. However keeping a wide fit is easier for beginners anyways.

Lots of tops can also be made with using only rectangles.

The rulers will work great for tops like this. They are a nice base to start with for beginners.

Drawstrings and elastic are easy for beginners and create a lot of options in making tops.

Fig. 161 Overview of possible garments.
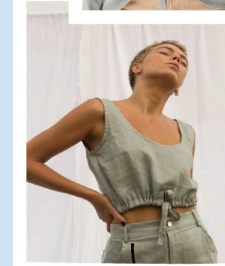
Creative exploration

Characteristics of garments that could be drawn with the rulers and are appropriate for beginners are described. A significant aspect of the concept is creative freedom. In the concept of Maki creative space this was implemented with a "design module" at the beginning of the sew-along (Chapter 6.3: Ideation) where users got to design their own pattern before they started. This would mean that each of the garments would have multiple variation options.
However, in the second pilot, it was learned that

it is possible to have too much creative freedom. The user was happy with only a few options within a garment. They mentioned more options would lead to 'choice overload'. In making the hat, the user had 2 aspects they could vary, the brim and the top. For each of these they had 3 options. These 9 variation options were considered enough. For this reason, it was decided that each sew-along should have about this many options. Two examples for what this would look like in different garments are given to show how these variation options can be implemented (fig. 162)

Promoting multiple sew-alongs

Since in the last pilot, there was only one sew-along to be promoted on the platform, the GIF that walked through all variation options was placed on the home page with some pictures of hats next to it.

However, when there are multiple sew-alongs they will all need to be promoted on the platform. With multiple sew-alongs, there needs to be some sort of "shop" page, where, just like in a web shop, the sew-alongs are on display like products to choose from. However, when only showing the GIFs on such a shop page, it might not really speak to the users' imagination of how it would look like. The pilots taught that pictures of results really inspire the user in forming this image.

The GIF could still be used as it proved a useful tool in showing the user has variation options. However, it can be expanded with a few finished examples. A sew-along can then be presented like this on a shop page (fig. 163):

Fig. 162 Amount of variation options for each sew-along.

Fig. 163 Block that presents sew-along on the platform, With GIF and end-results.

This way of presenting takes out the feeling of a "white canvas" as discussed in Chapter 5.3: Ideation. This meant that no end-results were shown, so the item becomes more open to imagination and the end-results do not steer the user into a direction.

However, with the knowledge that the user enjoys seeing inspiration images, and the "white canvas" not really working as intended, adding end-result images might at least underline the different options the user has. Since this was not clear yet, it might communicate the concept better.

Next to this, the blocks could show how much time the sew-along would (on average) take. The user research in Chapter 3: User research, informed that users like to sew in their spare time, and that sewing classes are too much of a commitment. This shows time is an important factor for them.

For each sew-along such a block can be made. They can then be placed on a shop page. A wireframe was made for what this shop page would look like (fig.
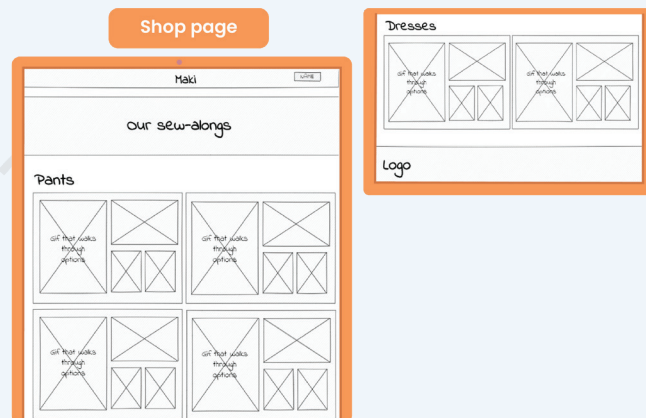
164 & 165). The page is similar to a regular web shop site, where all the items, in this case sew-alongs, are presented in these blocks. The blocks can be categorized in different types of clothing. Next to this, the wireframe of the home page was updated with how the blocks could be promoted here. They can be found full scale in Appendix O.

Conclusion

With the rulers multiple garments can be made that are appropriate for beginning sewers. These garments have some characteristics, such as being more wide-fitting when made out of non-stretch fabric, and not having a lot of variation options in sleeve fits. However, with the use of stretch fabrics, elastic, drawstrings and ribbons, a wide range of garments can be made, enough for making different sew-alongs. In the future, Maki could expand to more complex sew-alongs and grow with the user.
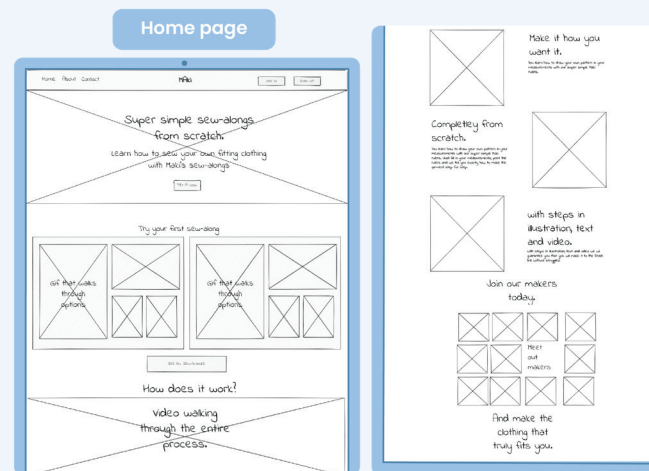
For each sew-along a maximum of 9 variation options can be presented, so the user does not experience the feeling of "choice overload". The sew-alongs can be presented in blocks where a GIF is shown that walks through all the variation options, together with some images of different end-results. The blocks also show the average duration of the sew-along. A wireframe for the shop page is made, together with an updated wireframe for the homepage to present how to promote these blocks.
In the next section, these aspects will be implemented into the final concept.

7.4 Final concept

In this section, the final concept of Maki is presented where the set of rulers and the sew-along blocks with multiple garments are added to the concept of Maki Creative space. First an overview is given on how the final concept would work for the user and what this means for their sewing journey. After this, the concept is explained in detail.

After two iteration cycles and explorations on creating a standard set of rulers and making multiple garments, the final concept is presented in figure 166. The figure explains the process of going through the pages that make up the platform together with the process of learning the user undergoes. It will be explained in further detail now.

Fig. 164 Wireframe of shop page.

Fig. 165 Wireframe of update home page.
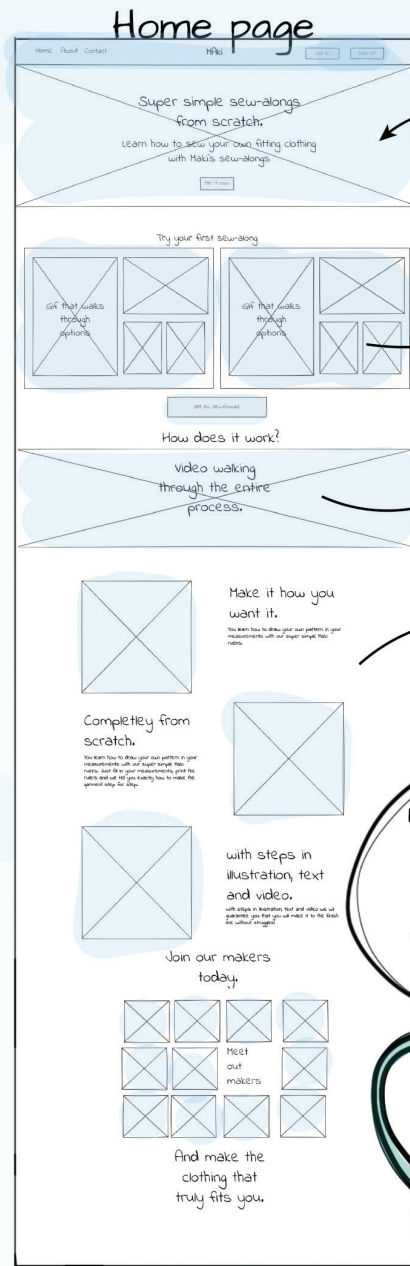
Home page

First, the homepage explains the concept of Maki; making clothes from scratch with super simple sew-alongs that teach you how to sew and draw patterns.
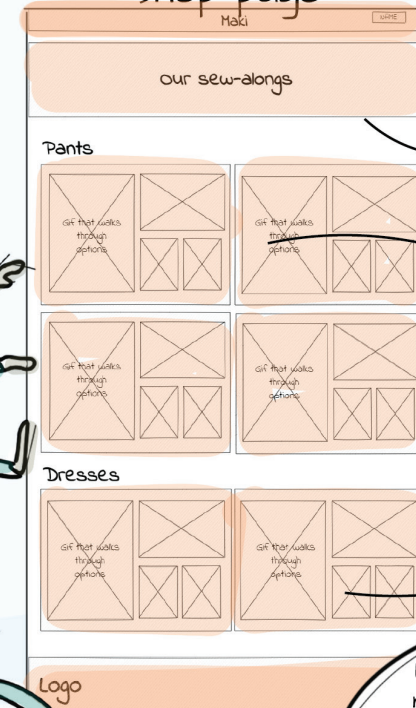
The sew-alongs are presented on the homepage like products in a web shop.

A video explains the concept and shows that Maki works with a set of printable rulers to help you draw the pattern.

After this is explained step-by-step, the user is introduced to the community.

shop page

After the homepage the user arrives at the shop page. Here, all the sew-alongs are shown like in a web shop.

For each sew-along a GIF is shown that indicates that the sew-along allows for different variations.

Also, some possible end-results are shown so the user further understands the creative space.

I want to learn how to make clothes in my style that fit right. It looks like Maki could help me with this.

Start

I will start with making a simple dress. Let's do a sew-along for this. It appears I have some variations to choose from.

Fig. 166 Final concept of Maki.

Product page

When the user has chosen to do a sew-along they enter the product page.

A GIF shows the user all the variation options.

An inspiration wall shows the user multiple outcomes and ideas for the garment.

Work of others is shown to make the platform more accessible and to inspire users.

The user is explained what fabrics and material are needed.

Profile page

Before the user can start sewing, they need a profile.

The profile holds all of their measurements, completed sew-alongs and personal details,

I like this one in the image, I see another user made something similar, I can probably do it too then.

I first need to fill in my measurements, I guess it will really fit me in the end!

I have got all my materials ready to go. Let's start the sew-along.

Sew-along page

Finally, the user enters the sew-along. Here they start with designing their pattern by combining modular elements.

Instruction modules are generated that fit the choices of the user. They explain how to draw the pattern and sew it together. The steps are in text, illustration and video. The user needs to print a standard set of rulers to support.

When the user is stuck, there is a comment section to get help from others!

When the user is done, they can upload a picture so they can inspire others in the community as well.
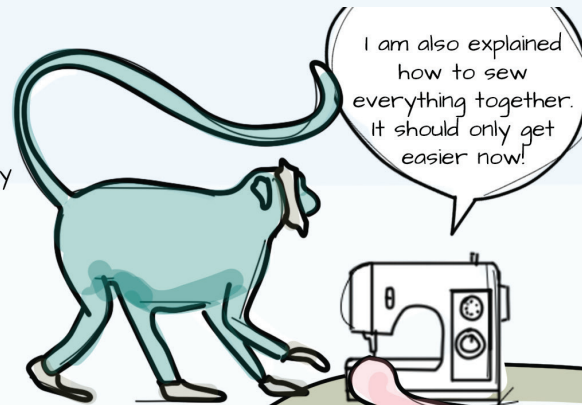
Throughout the sew-along the user is explained how to make it fit using fit-checks. The users learn how to alter the pattern if needed.
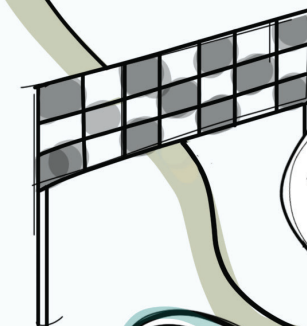
Maki is a platform that helps beginning sewers reach their goal of making clothes from scratch that fit their style and size. To do this Maki facilitates the user in a creative learning process with hands-on sew-alongs, where the users design and make garments from scratch starting from a base. With every sew-along, the user gains a more profound understanding of pattern drawing and sewing, so that ultimately Maki will no longer be necessary for the user to create garments.

The platform consists of a homepage where the user is explained the concept. The homepage tells the user that they will be making garments from scratch with sew-alongs, supported by a printable set of rulers (fig. 172).

On the homepage, the user is shown these sew-alongs (fig. 167). Each sew-along offers the user creative space in giving many modular variation options to build up the garment, i.g a different sleeve or collar. These sew-alongs are presented in a block that holds a GIF and some images. The GIF walks through all the variation options that the user has for making the item, and the images show some possible end results to inspire the user.
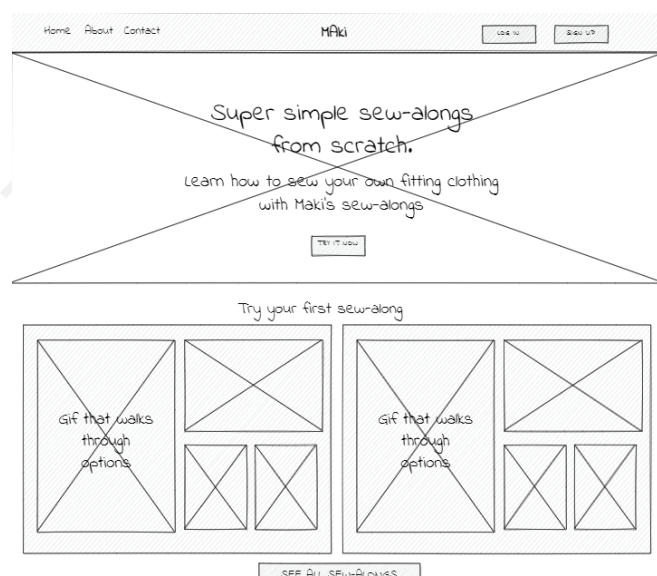

Fig. 167. Wireframe of update home page.

These blocks representing sew-alongs are also found on a shop page, where the user can select a sew-along; there is a range of garments they can choose from and that Maki can keep expanding. Since the garments should be beginner-friendly and fit to be drawn with the printable rulers, these garments have some characteristics, such as being more wide-fitting when made out of non-stretch fabric, and not having a lot of variation options in sleeve fits. However, with the use of stretch fabrics, elastic, drawstrings and ribbons, a wide range of garments can be made (fig. 168). Maki can expand to more complex sew-alongs in the future, to grow with the user.
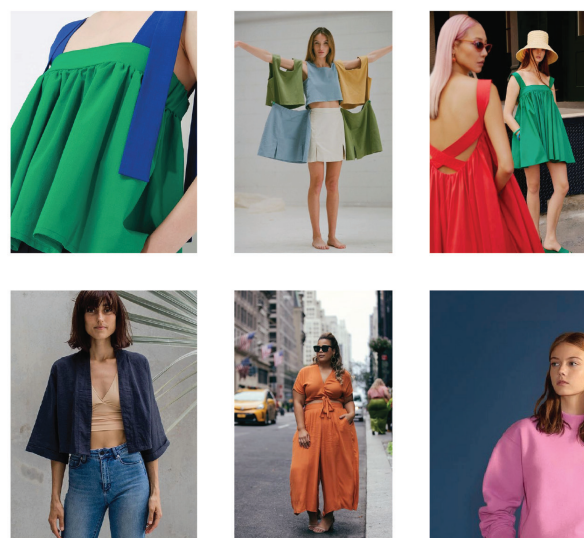

Fig. 168 Examples of garments Maki could offer sew-alongs for.

After the user has chosen a sew-along on the shop page, they are directed to the product page. Here, just like in a web shop, the specifications of the product are shown. The user sees the GIF with all the variation options together with an inspiration wall (a matrix of images), that works similar to a mood board. It shows different variations of the garment and different outcomes to inspire the user. To make the sew-along feel accessible and to further inspire users, the product page also shows end-results of other Maki users.

Furthermore, the users are explained what materials are needed to start.

After the product page, the user has to make a personal profile. Here, the user fills in their measurements and all personal data is stored.

With the user having a profile, and filled in measurements, they can start the sew-along. Each sew-along starts with a design module (fig. 169) where the user can choose between various modular segments. For each sew-along a maximum of 9 variation options are presented, so the user does not experience the feeling of "choice overload". After the user has made a decision on what modular elements to combine to form a garment in their style, the decisions are used to form a set of instructions.
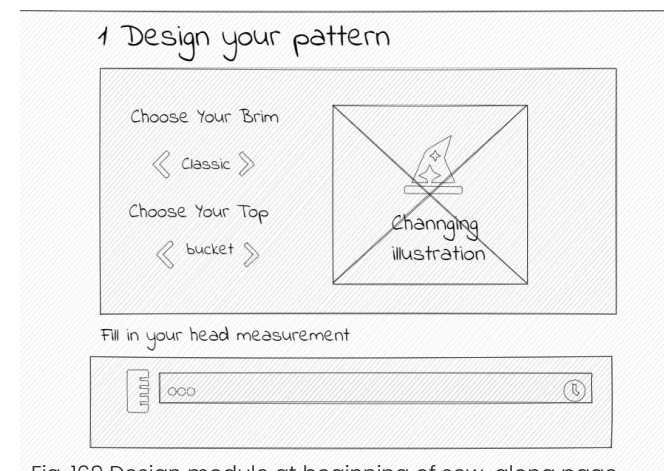
Fig. 169 Design module at beginning of sew-along page.

These instructions are built up from instruction modules. These are modules of which the content can change based upon the user's decisions. The order of the modules always remains the same. First, a module on drawing the pattern pieces, then a module about sewing the individual parts, and finally, a module that explains how to sew it altogether. The user can click through all the steps in the module before moving on to the next. Each step in the module explains to the user the activity they should do in text, illustration and

video, so the user is supported as much as possible in understanding what they have to do (fig. 170).
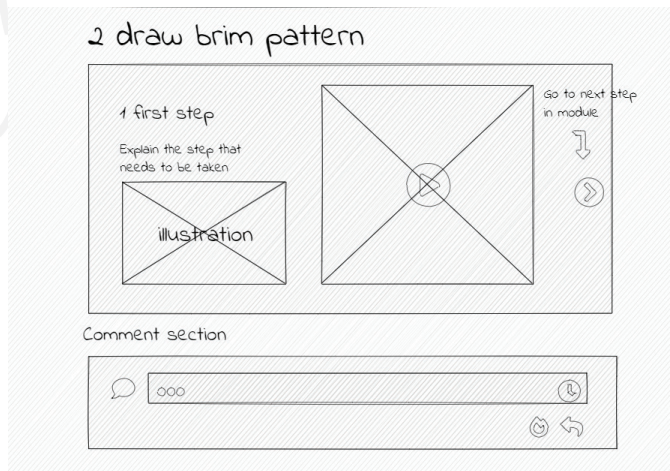
Fig. 170 Step in instruction module. Text, video and illustration is used.

The sew-along explains to the user how to draw the pattern. This is done with the help of a set of rulers and a simple structure of straight lines based upon their measurements. The sew-along will show the user how to draw the structure. Then, the user will use the printable Maki rulers to draw the curves of the pattern in this structure. These rulers can be printed out on a few sheets of A4-paper. The rulers imitate the use of French Curves, as often used in traditional pattern drawing, this will help build the user's understanding of the skill. The rulers have multiple clever features, such a tool to help draw darts, a protractor and a seam helper. After the user is explained how to draw the pattern, they are shown how to sew the garment together. During the sew-along the user will come across fit-checks, where the user is explained how to alter the garment to make it fit better. This will help deepen their understanding of pattern drawing and sewing clothes that truly fit them.

When a user gets stuck or has a question, a comment section is placed underneath each sew-along. In this way, the user can reach out to others and a small community can form. At the end of the sew-along the user is also given room to upload pictures of their end-results (fig. 171). This can help inspire others and make the platform feel more accessible.
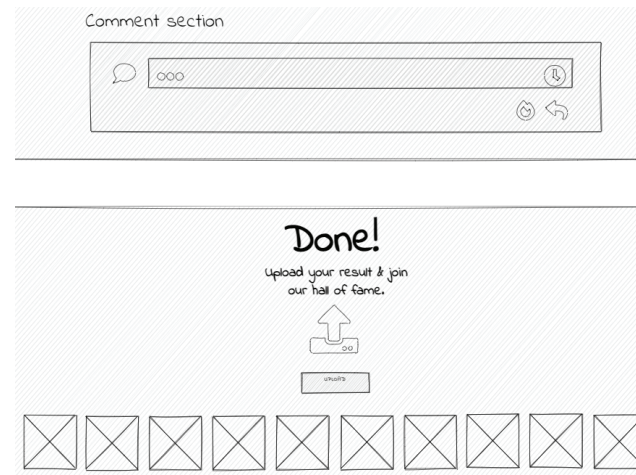
Fig. 171 Possibility of uploading a picture at the end of the sew-along.
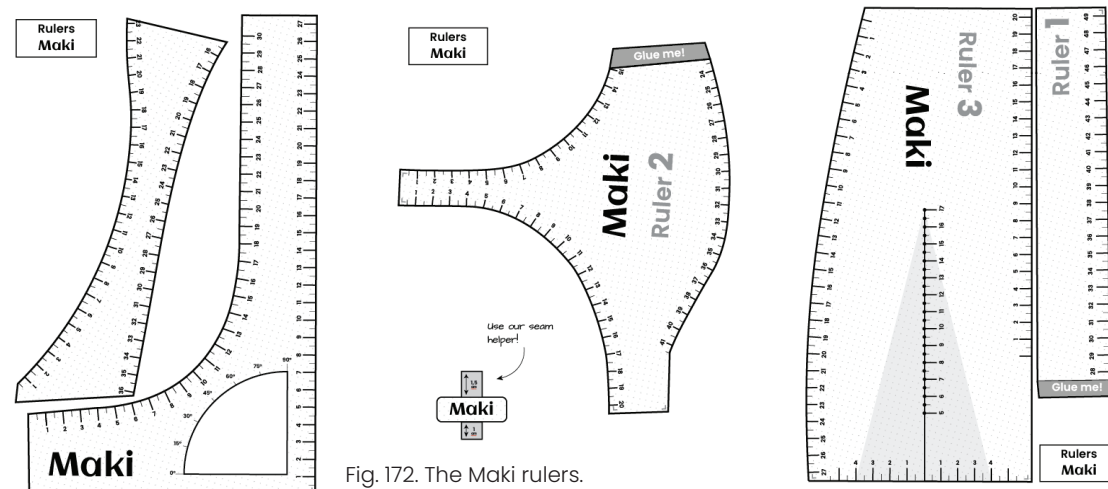
The final concept is a stab of meeting the most recent design goal: "Encouraging creative exploration in a learning process with supportive tools and the possibility of collaboration, that leads to the user being able to make fitting clothes from scratch", as described in Chapter 6.2; Design goal. To see how this design goal is met, a mock-up will be made, together with a final questionnaire. This process will be described in the next sections.

7.5 Mock-up

The final concept is described. To conclude the project, a final questionnaire on the concept will be done. To do this questionnaire, users will need to understand the concept. For this reason, a mock-up was made that users could visit. In this section, this mock-up is discussed.

A mock-up is a non-functional prototype of the website used for showcasing the concept. In making the mock-up, the wireframes that were made throughout the project were used. This means that for every page the most recent wireframe was used. For the homepage and shop page these are found in Chapter 7.3 Exploring multiple garments, for the product page and sew-along the wireframes can be found in Chapter 6.3: Ideation.

Fig. 172. The Maki rulers.

Since it was outside the scope of this project, there was not a large focus on what the platform should look like in terms of branding and design. Next to this Maki already has a branding style developed. However, in the first two pilots, I played around with the design of the platform and accidentally learned that users enjoyed the "creative design" of the platform. The colors and "rainbow swirls" made them get in the creative mood. As one user said:

"The design of the website was very creative, you immediately want to get started!"

For this reason, it was decided to make the mock-up for the final concept a mixture of the design of the first two pilots, and the usual branding of Maki. Screenshots of the platform can be found here (fig. 173). The full-scale screenshots can be found in Appendix P.

Fig. 173 Screenshots of mockup.

7.6 User evaluation

To get a final opinion from users on the design, and to have a substantiated list of recommendations to end the project with, a questionnaire was done. This section describes how this questionnaire was executed.

Questionnaire

The questionnaire was meant to find out if the design meets the most recent design goal: "Encouraging creative exploration in a learning process with supportive tools and the possibility of collaboration, that leads to the user being able to make fitting clothes from scratch."

In the questionnaire the mockup will be shown to the users with explanation on the concept. First, they will get three questions about the concept in general. After this, two or three questions are stated for each of the three pillars, as first discussed in Chapter 5.3: ideation, as they make up the important aspects of the design goal. Finally, to cover the exploration cycles, questions are asked about the standard set of rulers and the garments Maki expects to offer in the sew-alongs.

When asking questions about a final concept, it is important not to steer the user in a direction or make the user feel like they have to be positive. In the questionnaire it is mentioned that this concept is a possible direction for Maki to go in and that Maki wants to know what to keep and what to let go of this concept. This is done, so users might feel more open to answer truthfully. Next to this, the user is never asked directly about their opinion, but asked about what they expect the platform can do for them or if they have tried something similar before. The list of questions can be found in Appendix Q.

The pilots taught that for a low number of participants, open-ended questions are the most insightful. For this reason, all questions were open-ended. The questionnaire was shared on Instagram. Eventually, 9 subscribers ended up filling in the questionnaire. The answers can be found in Appendix Q.

Analyzing

The questionnaire was analyzed by extracting interesting quotes on all sections. This led to the following overview in figure 175. This will be explained in more detail now.

The questionnaire mostly confirmed a lot of knowledge that was already there. The user understands the purpose of the concept and realizes that the sew-alongs result in the ability to make fitting clothes in their style. However, a few interesting insights were gained on what Maki could further explore in the future.

First, the concept still seemed to have a communication problem. Some users did not immediately understand the value of the concept until they had visited all the pages. This should be improved upon. Next to this, some users still did not seem to grasp that this concept is meant for ultimate beginners. They might still need some reassurance here.

The number of creative options the users were shown to have in the mockup was again considered as enough. One user mentioned that having these options can result in people adding their own degree of creativity. Ultimately, this is what the concept tries to do, to be a facilitator in a creative learning process.

The questionnaire showed a need for the user to also learn more technical skills such as hoods and zippers. In Chapter 7.3; Exploring multiple garments, they were assumed as too complex for a user in the first stages. Next to this, one user also expressed the desire to make clothing that is more fitting and complex, like corsets. With Maki having the intention to be a learning platform, Maki could also support this. Maki could grow with the user in developing more complex sew-alongs that hold more complex skills.

The rulers were appreciated by the user; however, they did express the concern that printing the rulers might be difficult with scaling. Next to this, some users mentioned that they would like rulers made from a harder material. To achieve this, Maki could sell these, or have users glue the rulers onto a material like cardboard. The latter might be interesting as some users also mentioned that the rulers were very accessible and low-risk as you can print them at home to try and see if they work for you. However, if the rulers prove to be effective in the future, Maki might be able to sell plastic or wood versions of the rulers. These insights are captured in the overview presented in figure 174.

Questionnaire

> The communication of the concept should be improved.

> Users should be reassured that the platform is suitable for beginners.

> Maki should grow with the users in making more complex garments that require more complex skills.

> Maki could explore the possibillity of making the rulers from other materials when they are further developed.

Fig. 174 Overview of insights taken from questionnaire.

Users understand the value of the concept.

"Really cool and nice! Learning to sew in your own measurements is something I don't really see on the Internet."

The creative freedom that was given seems to be just enough.

"This platform gives you enough freedom to decide for yourself how you wanted it! That was very nice."

"In the 1st communication it was not entirely clear to me what was unique about it. When I opened it, it became clear what the uniqueness of this is."

This shows the user feels facilitated rather then instructed.

"I think if I want to add/change something myself, I'll do it. I don't feel tied to doing exactly what it says because of this platform."

Although communication still remains a problem.

"It sounds good that I am no longer dependent on patterns where the sizes are never right."

"I find it hard to imagine what it will look like. I would also be afraid to do something wrong with a pattern that I would draw myself."

The user still feels insecure about the concept. They need more reassurance.

"Working with those rulers is really cool. Not that hassle with those huge sheets and the limitations of the 10 patterns in such a sheet."

"By having options, people can apply their own degree of creativity."

"I like that I can learn to make clothes in my own measurements. Patterns on the Internet often don't suit my body type."

The platform can easily explain the user how to do this.

"I want to learn how I take my measurements exactly."

The rulers still need to be printed. Scaling this can indeed be difficult. Something could be developed to make this an easier process.

It was mentioned multiple times that users also have an interest in learning more technical skills as zippers. Maki could grown with the users.

"I do not know whether this is in the concept but printing patterns / rulers yourself is quite difficult in the right scale."

"I would like to learn about details, such as zippers or hoods or adjusting a pattern if it's not quite right."
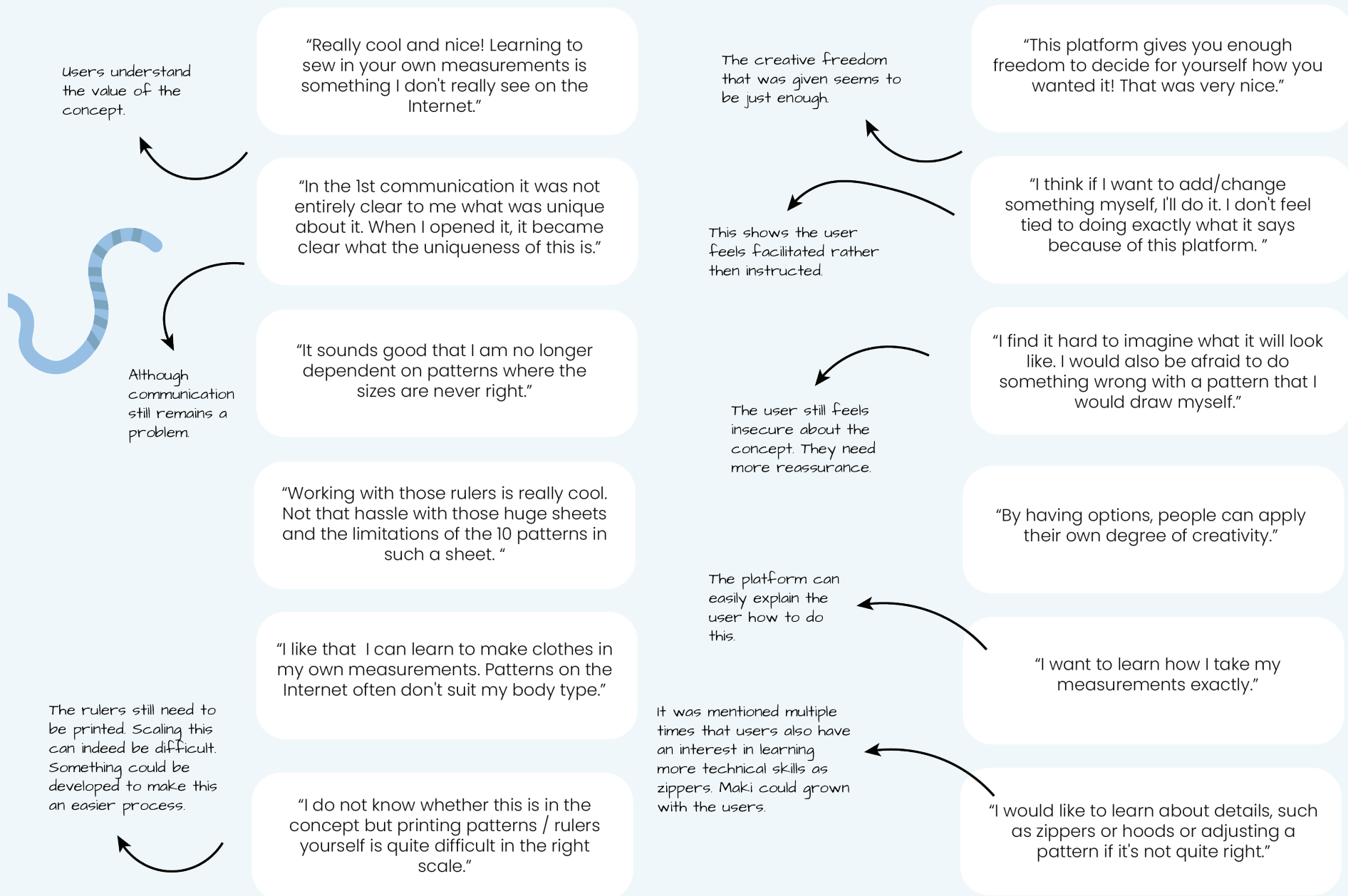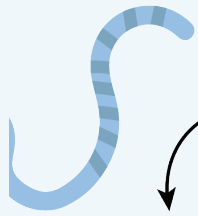
Fig. 175 Quotes from user taken from questionnaire.

"Sometimes you run into something and then others can easily help! Together we have a much greater knowledge and we should make use of it."

It is confirmed that users have mixed feelings about collaboration.

"I don't know very well whether I want to work with others. I prefer to be busy myself. But to sometimes have the option to work together is a nice idea."

"Work of others motivates me to start something new myself."

It is confirmed that work of others leads to motivation and inspiration..

"Seeing work of others gives me inspiration and motivation! So nice to see how everyone uses different colors, patterns, etc."

Plastic or cardboard rulers could be sold in the future.

"The rulers are nice and accessible, but the fact that they are made of paper can also be very irritating. Perhaps an option to be able to buy a set of hard material (wood, bamboo, plastic)."

The user could also glue then on cardboard themselves in order to make them more durable.

"The rulers are a nice extra. I would put them on cardboard or something like that, to ensure they remain accurate."

The user still sees the rulers as something for the more advanced. They should be reassured that it is meant to work for complete beginners.

"The ruler is very cool for the more advanced, you learn a lot from it!"

"I would like to make a corset one day! But basically everything, jackets are really cool!"

The user shows a need to also learn to make more complex garments. Maki could offer these in the future to grown with the user.

"I like some more fitting, tighter clothes. I also want to learn how to make summer dresses."

7.7 Conclusion

This exploration cycle had the purpose of exploring a standard set of rulers and making the concept suitable for making multiple garments. Finally, these explorations were integrated into a final concept that was evaluated with users in the form of a questionnaire.

This chapter started with exploring a standard set of rulers to draw multiple garments with. The rulers were developed through tracing curves from some basic garment items. These rulers were tested in making a top and a pair of pants. Although the rulers would still need a lot of development, the test proved that the concept could work, and they could be an interesting direction for Maki to go in.

Furthermore, it was explored what type of garments could be made with such rulers and what type of garments are appropriate for beginners. These garments had a certain set of characteristics; being more wide-fitting when made out of non-stretch fabric, and not having a lot of variation options in sleeve fits. However, with the use of stretch fabrics, elastic, drawstrings and ribbons, a wide range of garments can be made, enough for making different sew-alongs. To communicate sew-alongs for multiple garments on the platform, the sew-alongs could be presented in blocks that show both a GIF that walks through all variation options, and some possible end-results to inspire users.

These findings were integrated into the concept of Maki Creative space to form the final concept; a learning platform that facilitates the user in a creative process of making fitting clothes from scratch with the help of a supportive set of rulers. This concept could be the stepping stone to the user finding what they desire; the ability to make anything they want. A mockup was made and presented to users.

This evaluation resulted in some recommendations for the final concept; The communication of the concept can still be improved. Next to this, the user should be reassured that the platform is truly meant for beginners. The user also expressed the desire to make more complex types of clothing, Maki could grow with the user in offering these more complex sew-alongs. Finally, the rulers should be further developed and could possibly be made out of other material than paper.

The next chapter will recap the final concept in terms of feasibility, viability and desirability and end with a final list of recommendations for Maki in the future.

Conclude

8 Final design

A concept for maki.

Fig. 177 Maki Concept

The project started with literature research on the maker and their motivations, user research on the beginning sewer and their wants and needs and field research to gain inspiration. After two iteration cycles of evaluating with users were done and finally multiple topics were explored in an exploration cycle. This resulted in a final concept. This concept is extensively described in chapter 7.3: Final concept. In this chapter, a summary of the concept is given. After this, the project is concluded by explaining how the concept rates in terms of desirability, feasibility and viability and recommendations are given on how to strengthen these aspects in the future.

8.1 The final concept: summary

Maki is a platform that facilitates the user in making the clothes that truly fit them in both size and style. This is done through offering the user hands-on sew-alongs. In these sew-alongs the user learns a basic skill set in pattern drawing and sewing while making garments (fig. 176 & 177).

In every sew-along the user makes a certain garment, such as a halter top, a ruffle dress or a wide-legged pants. For each sew-along a lot of variation options are given in terms of e.g necklines, sleeves or collars, so the user goes through a creative process of designing their garment. In this way, the user already gets the creative freedom they desire to make clothing in their style, while they learn new skills.

 In the sew-alongs the user is supported with a simple set of printable rulers (fig. 178) that can be used to draw patterns. It is explained to the user how to do this in combination with a simple structure; the user fills in their measurements and the sew-along tells them how
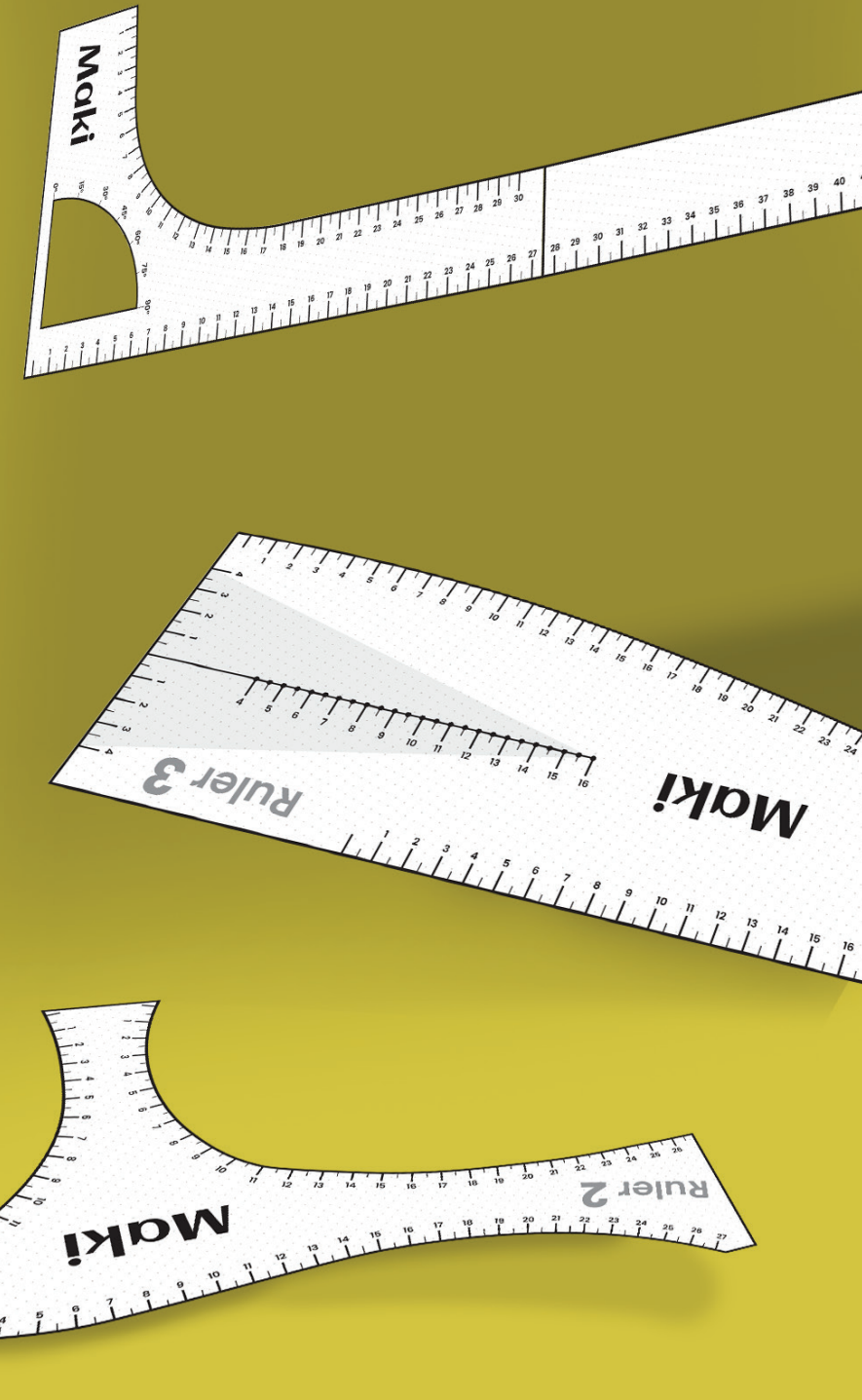
Fig. 177 Maki Concept

Fig. 178 Maki Rulers

to draw the structure to their size, and outline the pattern with the rulers. When the user has drawn the pattern, the user is explained how to sew it together and make alterations to the fit. In this way, the user already gets to make clothing truly in their size.

All the steps in the sew-along are explained in text, illustration and video, so the user is optimally supported in their journey. Furthermore, comment sections are added to the sew-along, so the user can interact with other users when they get stuck. Finally, the user has the chance to upload a picture and inspire others and be inspired by end-results.

The sew-alongs facilitate a process of learning and create a scaffolded and safe environment for the user to experiment. This falls back to the quote that opened the project: "to truly have the freedom to create anything you want, you must first commit to building the necessary knowledge and skills". With the concept of Maki, building this necessary knowledge and skills becomes a journey with fun and hands-on projects. In this way Maki becomes a stepping stone in meeting the goal of the user; finding the true creativity to make anything.

8.2 Desirability

This section will explain how the aspect of desirability, the addressing of the user's values and needs, was integrated into the project. Finally, it is discussed what can be done to improve desirability in the future.

Desirability in the current concept

Over the course of the project a lot was learned about the needs and values of the user. This was integral in steering towards a desirable design. In this project, we started with the goal of facilitating beginning sewers in making clothes. Through initial interviews with beginning sewers

before the project, it was learned that users face struggles in their sewing journey. Sewing classes are considered too time-consuming and focused on technical skills. Online tutorials do not support the user in making the work their own and commercial sewing patterns are often too complex and only come in standard convention sizes. An online platform had to be designed that would take out these struggles for the user.

The literature research introduced the maker mindset, a set of attributes that is characteristic for makers, such as beginning sewers. The literature research concluded that a process of facilitated hands-on learning, with room for creative exploration and collaboration, such as in makerspaces, would best suit the users needs.

The user research seemed to confirm this maker mindset, and traits of the makers were found in statements of the users. Furthermore, the user research gave insight into what the user wants and needs; to make fitting clothes from scratch in their size and style. Users expressed a desire for more creative freedom than initially believed. They wanted the ability to make their own designs that truly fit their body. This need indeed mismatched with the tools already available to the user, such as commercial sewing patterns. These do not allow a lot of creative freedom or give the support to make it fit outside of convection sizes. In order for users to get to the point of making what truly fits them, they would need a suitable skill-set in pattern drawing and sewing. Maki can be a stepping stone in creating this freedom and can make building this knowledge and skills easier and more fun.

Field research was done on how learning to draw patterns and encouraging creative exploration within making garments could be done. This resulted in a design goal that captures what the user truly wants:

Conclude

"Facilitating the user in a learning process with room for creative exploration and collaboration, that leads to the user being able to make fitting clothes from scratch."

A first concept was developed and evaluated with users. It was learned that creativity is the most enjoyed aspect of the learning process and that collaboration was less desired than believed at first. Next to this, the user needed more support in drawing patterns. Some sort of tool had to be developed for this. The design goal was sharpened with these new insights about the user.

"Encouraging creative exploration in a learning process with supportive tools and the possibility of collaboration, that ultimately leads to the user being able to make fitting clothes from scratch".

With this design goal, a second concept was developed that formed the foundation for the final concept. The evaluation of this concept with users showed that the design goal seemed to match what the user wanted and so more exploration was done on how to invigorate the concept.

This way of coming to the final concept led to a design that puts the needs and values of the user first. The final design of Maki facilitates the user in their desire to build a skill set to one day be able to make anything they want that truly fits their style and body. To end this section on desirability I would like to highlight a quote from a user taken from the final questionnaire as described in Chapter 7.5 User evaluation.

"I think this is a really cool project. It's exactly what I'm looking for and it's so much fun learning how to make clothes."

Expanding desirability in the future

Overall, the final design has proven to be desirable for users. However, there are still points of improvement for the future. The concept is quite extensive and holds numerous features and aspects. Throughout this project, it became evident that communicating this to users in a clear way was difficult. Maki should focus on how to communicate the concept effectively, so users are also drawn to the concept, before even having used it. Next to this, the final questionnaire resulted in some users saying that the rulers were nice for more advanced sewers. However, the rulers and the final design are mostly focused on beginning sewers. Maki should somehow reassure the beginning sewer that the platform will fit their skill-level and that they will also be able to do these sew-alongs. The users also expressed the need to make more complex pieces of clothing, such as jackets and corsets. To become more desirable to the user, Maki should grow with the user in complexity in the sew-alongs (fig. 179).

Desirability

Fig. 179 Desireability

This concept is exactly what I need to learn how to make my own fitting clothes from scratch. I get a lot of creative options to make it my own! It forms a nice starting point with some fist simple sew-alongs and a set of rulers. Maybe in the future there will be more sew-alongs that help me make more complex garments, so I really learn to make anything.

8.3 Feasibility

This section will explain how the final design is feasible and what can be improved in the future.

Feasibility in the current concept

Throughout the project, two pilots were done with users. These pilots were focused on recreating the interaction of the user and the platform as realistically as possible. For this, prototypes of the online platform were made. These prototypes were fully functional and made with a web-builder and some simple JavaScript code. With current web-building platforms such as Wix and WordPress, building the final design of the platform for Maki should be perfectly feasible. The challenges of the concept in terms of feasibility lie in the rulers and the offer of sew-alongs for more complex garments.

In the project a standard set of rulers was explored. These rulers can be used to draw multiple garments. Since the rulers were a result of the last user evaluation that was done, there was no time to fully develop them. This puts question marks on how feasible they are in making a large array of garments that truly fit each user. Some first solutions were found to ensure that with the standard set of curves that the rulers hold, fitting garments can be drawn in multiple sizes. This was done through offering multiple sets of rulers in size ranges.

As a proof of concept some simple patterns were drawn with the rulers that resulted in simple, decent fitting garments. The rulers have the purpose of being a stepping stone to more complex pattern drawing in the future of the user, so it might not be problematic that in the beginning they somewhat limit the user in making everything they want. Their skill-level does not allow

them to do this yet anyway and the rulers do give them a basis in *understanding curves and sizes. In this regard,* the rulers seem feasible for the beginning stages of Maki and offer enough room for creating sew-alongs that facilitate making garments that are fitting to the skill-level of a beginning sewer.

Expanding feasibility in the future

The rulers should be developed further to make sure they are fit to draw patterns in multiple sizes for multiple types of garments. Also, Maki could explore the option of selling the rulers in other materials to eliminate printing struggles for the user and making the rulers easier to trace.

The final questionnaire in Chapter 7.5 User evaluation, concluded that users would like to make more complex garments, such as jackets or corsets. The rulers might limit them in making these garments as they simplify the process too much with having a minimal standard set of curves. In other words, this might not be feasible. When saying that Maki should grow with the user in complexity of sew-alongs, the rulers should grow with in this complexity as well. This should be further explored in the future of Maki. The rulers should be a supportive tool in the process, and not eventually start holding the user back from meeting their goal. Maybe the sew-alongs could eventually show the user how to eliminate the rulers as a supportive tool (fig. 180).

Feasibility

The rulers can really help me in drawing my first patterns. They are simple and fit my skill level right now. I would even buy a set made out of wood. Eventually, I might outgrown them. Maybe Maki can develop the rulers so they grown with me or support me in letting the rulers go when I get closer to my goal of making anything I want.

8.4 Viability

This section will explain how the final design is viable and what can be improved in the future.

Viability of the current concept

Within the project, there has been a focus on facilitating the learning process of beginning sewers. This is a process that expands over time. Saying the concept is viable, would be the same as saying that Maki succeeds in staying relevant in this learning process of the user. In achieving this Maki can become profitable and separate itself from competitors in the field that do not offer to grow with the user.

The ultimate goal of Maki is to have users gain the creative freedom where they eventually do not need Maki anymore. This was a desire the user had that was discovered in user research. Although, having the goal of a customer not needing them anymore, seems conflicting for a business.

However, throughout the project a lot was learned about what this learning process of the user entails and how Maki can support them in this process. Learning a skill set in pattern drawing and sewing is not something done overnight. And so, Maki can stay relevant for quite a while in the learning journey of the user.

The current concept has the advantage that the user learns hands-on. They do not get lectured in technical sewing skills and follow literal instructions on making a specific predetermined item. They are facilitated in a creative process in making fitting garments, that has learning as a result. In this way, the platform already satisfies the need of the user to make clothes in their style and size, which might motivate them to keep using

Maki. Maki can keep promoting new sew-alongs that build in complexity and skills.

Currently, no other interventions in the field of home-sewing offer the combination of a facilitated learning process in pattern drawing and sewing, while allowing the user many creative decisions in the process. This is how Maki can remain relevant in the learning journey of the beginning sewer and the field of home-sewing.

Expanding Viability in the future

In order for the concept to stay relevant through the entire learning process of the user, Maki should have a good understanding of what the user needs and wants throughout their learning process and what Maki should offer at which point in their journey. Maki should simply start offering sew-alongs and have a close feedback loop with users to learn about their growth. In this way, Maki can expand their sew-alongs in complexity and skills to cater to this growth at the right time (fig. 181).

Viability

Fig. 181 Viability

This concept is a great starting point for me, it is different from other things out there. It really facilitates me in my journey. To stay relevant Maki should really understand my learning process and come up with new sew-alongs that grown in complexity and skills. In this way I will keep being motivated to use Maki over other interventions!
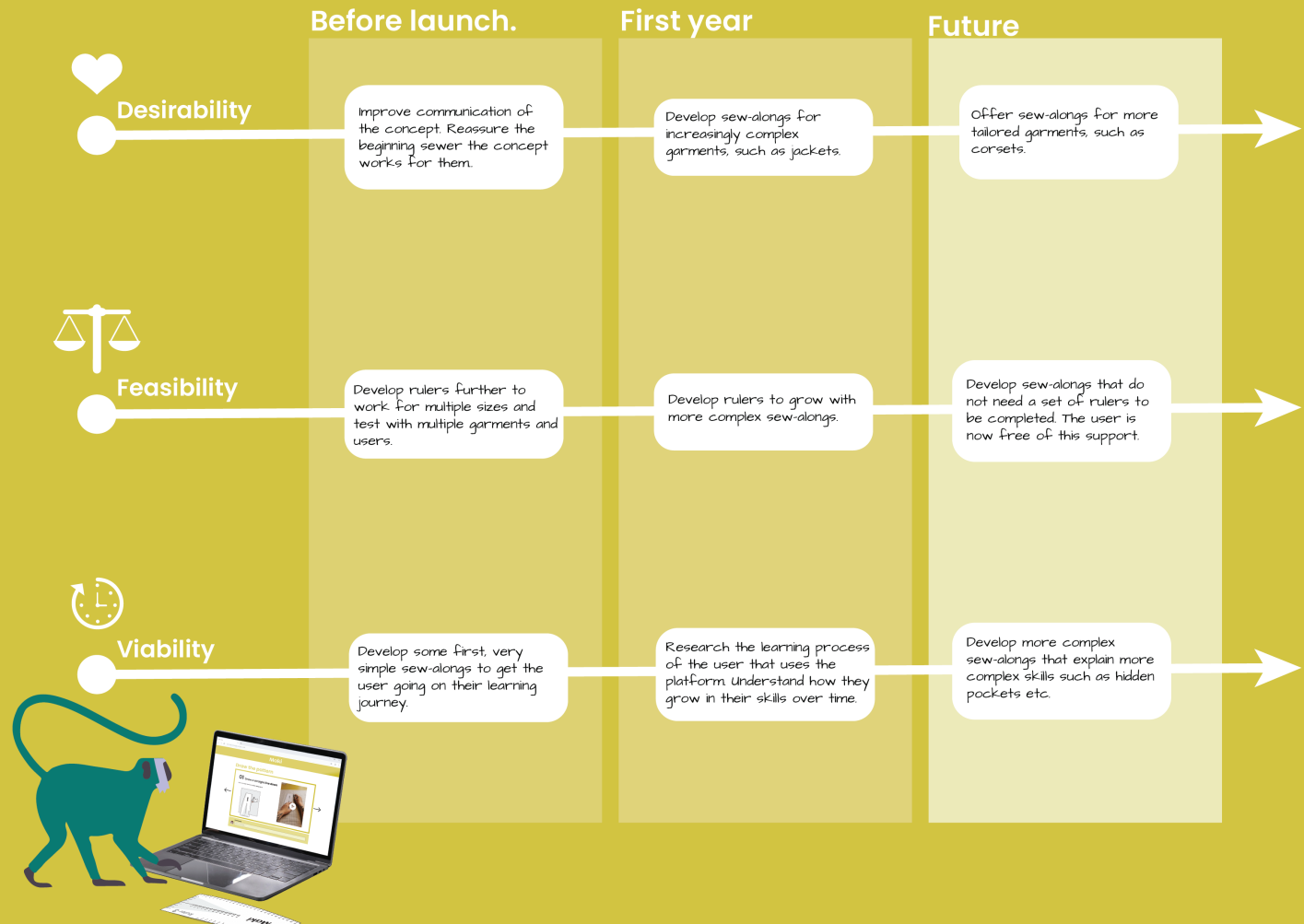
8.6 Maki in the future

In the last sections, recommendations were given for Maki in the future. To conclude the project a rough timeline is shown (fig. 182) on how Maki could implement these recommendations. This will be explained in further detail now.

Before the launch of this concept, Maki should further develop the rulers to work. They should be tested with multiple sizes and iterated upon to work for multiple types of garments and body types. Next to this, Maki should improve the communication of the concept, so users know what the value of the concept is when they enter the platform. Some first simple sew-alongs should be developed that gets the user going on the platform.

In the first year of Maki, increasingly more complex sew-alongs could be developed. In the meantime it will be important to keep a close eye on the learning process of the user and to have a short feedback loop with customers to really get to know their learning process. Maki should also start looking into how the rulers could work when offering more complex sew-alongs in the future. Maybe the goal could be to develop sew-alongs where the rulers are no longer necessary as a supportive tool, as the user has built their confidence in pattern drawing.

This means that further in the future Maki might have sew-alongs that explain more complex skills, such as fitted pockets and invisible zippers. The user might be able to draw these patterns without the rulers. In this way Maki can support the user all the way to their ultimate goal; having the ability and confidence to create anything they want from scratch and experience what it means to have built the skill set and knowledge to create true creative freedom.

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Fig. 182 Maki in the future

Before launch.   **First year**   **Future**

Desirability

Improve communication of the concept. Reassure the beginning sewer the concept works for them.

Develop sew-alongs for increasingly complex garments, such as jackets.

Offer sew-alongs for more tailored garments, such as corsets.

Feasibility

Develop rulers further to work. For multiple sizes and test with multiple garments and users.

Develop rulers to grow with more complex sew-alongs.

Develop sew-alongs that do not need a set of rulers to be completed. The user is now free of this support.

Viability

Develop some first, very simple sew-alongs to get the user going on their learning journey.

Research the learning process of the user that uses the platform. Understand how they grow in their skills over time.

Develop more complex sew-alongs that explain more complex skills such as hidden pockets etc.

9 Reflection
Final words.

This thesis has provided me the opportunity to work on something that I am truly passionate about. I have met the most amazing young sewers and found a community of enthusiastic makers. They have truly inspired me during the project to continue this journey of Maki.

During this thesis, I have learned more than I had initially expected. The process of writing the thesis has been one with ups and downs. I have struggled with forming a coherent story and finding a balance between my IPD background and the more DFI nature of the project. I have been challenged in going out of my comfort zone in this regard, and hope to have successfully found a balance between the two.

Furthermore, structurizing the project sometimes distracted me from the design process. A design process is a fluent process that can be structured, but eventually needs to be able to change direction when necessary. I think that sometimes I was too attached to the structure that I had made at the beginning of the project. I wonder what would have happened if I had let that go a bit more. This is something that I can take with me into future projects.

Looking back, the feedback that I have gotten throughout the project has always made sense and helped me to improve my work. The questions that I was asked about what I actually designed and what this actually means, helped me to see value in what I created. I was told to describe my design process more explicitly. This helped me in reflecting on my own work. I learned that sometimes even the decisions that were seemingly made intuitively, might have more of a thought process behind them. Explaining this thought process helped me understand my own process better and see the bigger picture. I enjoyed reflecting on my own work like this, and it made me realize that even though I might be close to obtaining my master's degree in design, there are still many things for me left to learn as a designer.

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