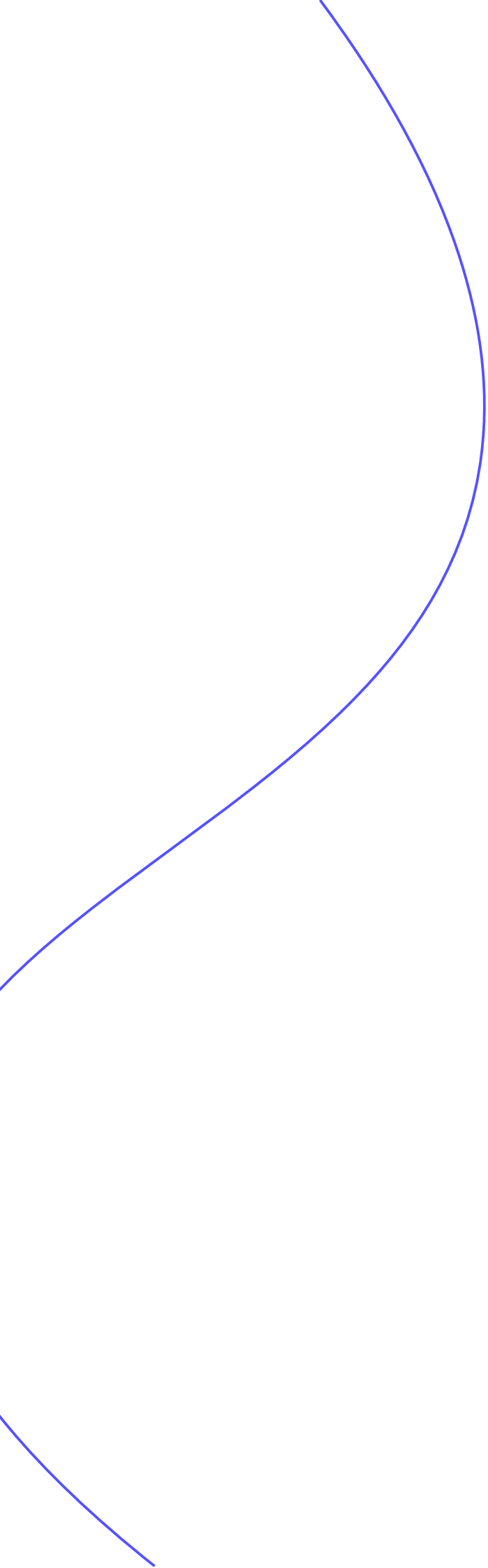
StitchPaths

Enhance learning and collaboration experiences in yarn crafter communities

Jadis Cueto



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Stitch Paths

Enhance learning and collaboration experiences in yarn crafter communities

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Abstract

In today's world, the new technologies and the Internet have allowed that people get access to more and more information, changing the way of how they learn. Moreover, the diversity and accessibility of digital information make it easy to get them any time. This thesis studies the learning process of yarn crafter beginners in digital spaces, and how technology and a Collective Intelligence approach can be applied to enhance their learning experiences.

Through the review of literature and case studies, the context of yarn crafters was better known, and the capabilities of technology and Collective Intelligence. The exploratory research applied to collect primary data of the target users and get a better understanding of them. The results revealed some of the problems they face in the making of their artifacts, and the diverse resources they combine to learn. Ultimately, these results were valuable insights for the final proposal.

This project proposes a collaborative digital platform for yarn crafters, where they can learn at their rhythm and unique way, where the creation of contents starts with themselves. The digital platform uses a content-based recommender system that gives suggestions of learning content and motivates yarn crafters to contribute with their own experiences and exchanging ideas. Finally, promoting an environment of creativity.

Keywords

Collective Intelligence, Learning Experiences, System Recommendation, Yarn Crafters, Creativity.

Abstract in Spanish

En el mundo de hoy, las nuevas tecnologías y el Internet han permitido que las personas tengan acceso a más y más información, cambiando a su vez la forma en la que aprenden. Además, la diversidad y accesibilidad de la información digital hacen que, a su vez sea fácil adquirirlos en cualquier momento. Esta tesis estudia, el proceso de aprendizaje de los tejedores principiantes en espacios digitales, y cómo se puede aplicar la tecnología y el enfoque de Inteligencia Colectiva para mejorar su experiencia de aprendizaje.

A través de la revisión de la literatura y los estudios de casos, se conoció mejor el contexto de los tejedores, y las capacidades de la tecnología y la Inteligencia Colectiva. La investigación exploratoria se aplicó para recopilar datos primarios de los usuarios objetivo y obtener una mejor comprensión de ellos. Los resultados revelaron algunos de los problemas que enfrentan en la elaboración de sus artefactos, y los diversos recursos que combinan para aprender. En última instancia, estos resultados proporcionaron ideas valiosas para la propuesta final.

Este proyecto propone una plataforma digital colaborativa para los tejedores, donde puedan aprender a su propio ritmo y forma, donde la creación de contenidos comienza con ellos mismos. La plataforma digital utiliza un sistema de recomendación basado en contenidos que brinda sugerencias de contenidos de aprendizaje y motiva a los tejedores a contribuir con sus propias experiencias e intercambiar ideas. Finalmente, promoviendo un ambiente de creatividad.

Palabras clave

Inteligencia Colectiva, Experiencia de Aprendizaje, Sistema de Recomendación, Tejedores, Creatividad.

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1 Introduction

1. Introduction

Nowadays, thanks to the Internet and social learning, yarn crafters have many ways to learn, connect, and share their crafts and knowledge with others, whether they are in a digital or non-digital space. For instance, some typical digital places they use are online communities, social media, and blogs. Others prefer to interact in Yarn Local Stores of their community (an example of non-digital space), where yarn crafters from different ages, backgrounds, and levels of expertise meet.

Regarding the ways yarn crafters learn, these will vary from one crafter to another; and will be determined by their motivations and skills to make their crafts. For yarn crafter beginners, the learning process can be an enjoyable experience but also a difficult one when it revolves around understand symbols, abbreviations, or follow pattern instructions, to name a few.

Around the world, there have been some initiatives and organizations like the Craft Council Yarn in the US that provide guidelines, standards, and helpful resources to encourage yarn crafters, designers, and people in general to learn. Despite this, and the many online resources they have at their reach, they still lack digital workspaces and tools that ease their learning process and boost their creativity. For that case, systems that use Collective Intelligence and technology to enhance their learning experiences.

Therefore, this master's thesis project focus on the following objectives:

- Understand the learning and the making process of artifacts that are made by yarn crafters.
- Determine how Collective Intelligence can enhance their learning process and promote collaboration.
- Discover how learning from others and the creation of contents are related to boost creativity in yarn crafter communities.

For this project, the target audience is yarn crafter beginners, people who do knitting and crocheting and the term yarn crafts, or artifacts will be used to refer to knitting and crocheting craft projects.

The research questions identified for this study were:

- What is the learning process that yarn crafter beginners use to make an artifact?
- What are the most effective learning methodologies or digital tools to enhance this process?
- How might we add Collective Intelligence in the learning process of yarn crafters?
- How content creation and learn from others are related to increasing creativity in yarn crafter communities? How this process ease and increase the knowledge of yarn crafter beginners?

1.1 Hypothesis

We live in an era where the information and digital resources are at our fingertips. However, it is precisely this diversity of information in quantity and quality that makes it difficult to find what yarn crafters need. Learn at their rhythm.

Yarn crafters beginners face challenges with spending more time looking for useful tutorials and understanding patterns than do their craft projects because of the variety of information on the Internet.

These assumptions are based in part as my own experiences as a beginner knitter and crocheter. I have experienced firsthand the overwhelming it can be to understand these standards or which resources to choose over others, particularly when you do not have someone else to teach you or any idea in how to start.

In this context, if we ease the learning of techniques and motivate content sharing through a Collective Intelligence approach, yarn crafters beginners will be more ready to engage with their crafts projects and boots their creativity.

1.2 Methodology

This project combined the review of literature, study cases, and research exploration to understand the learning process of yarn crafters and their main concerns.

In the research exploration, I immersed myself in social knitting gatherings to know how yarn crafters interact in these events and what artifacts they made. In addition to this, I conducted an online survey to collect more data and reach more participants.

Finally, through a human-centered design methodology and Collective Intelligence approach, the proposal and prototype of the system and tools were designed.

1.3 Concepts

In this project was used the following terminology:

Yarn crafter: People who make crafting with yarn, e.g., knitting, crocheting, home decorations, child toys, to name a few.

Knit Along or KAL: It is an online event, usually a forum thread where people work in the same project, sharing their progress, photos of their final items, exchanging ideas, or having inspiration from other's work.

Crochet Along or CAL: A Crochet-Along is an online event that gathers many people to work in one project. The differences between a KAL and CAL are mostly in the techniques and tools that they use.

Patterns: It is a set of instructions on how to make crochet or knitted artifacts. These instructions are written, visual, or a combination of both. Visual instructions are well known as chart patterns or diagram patterns. Some examples can be seen in the annex section.

Learning experiences: Different kinds of interactions where the learning takes place. According to IBE-UNESCO, these learning experiences are "a wide variety of experiences across different contexts and settings which transform the perceptions of the learner, facilitate conceptual understanding, yield emotional qualities, and nurture the acquisition of knowledge, skills and attitudes". (IBE-UNESCO, 2013, p. 36).

Creativity: It is the process to transform new ideas into solutions. In words of the author Naiman, "Creativity is characterized by the ability to perceive the world in new ways, to find hidden patterns, to make connections between seemingly unrelated phenomena, and to generate solutions". (Naiman, 2014).

2 Content Background

2.1 Literature review
2.2 Case studies

Figure 1. The People's Reef crocheted by citizens of New York and Chicago. Curated by Christine Wertheim for Track 16 Gallery, Los Angeles.

2. Content background

2.1 Literature review

To understand more about the learning and the making process of yarn crafters and how their work is changing due to the access to the Internet and emerging technologies, I began reading literature in craft and social learning. Then, I explored literature about Collective Intelligence to discover if applying this approach can make a difference in enhancing the learning process of yarn crafters beginners.

Crafting, Knitting, and Crocheting

In recent years, knitting and crocheting have become more popular. It is common to see different events, fairs, and fiber art expressions dedicated to these crafting activities. For example, Barcelona Knits is a specialized fair that connects crafters, artisans, indie dyers, and designers in one place.

Figure 2. Barcelona Knits, 2nd edition. (2019). First fair specialized in yarn.

In both handicrafts, the result is the making of an artifact. It could be a piece of cloth, a toy, or anything that the crafter wants to accomplish. Etymologically, the oxford dictionary defines knit and crochet as the making of clothes from wool or cotton thread. So, the differences between them are in the tools and techniques they use.

Another way of defining knit and crochet is in terms of their process. In knitting, the process starts with casting on several stitches using needles and yarn, creating interlocking stitches row by row until complete the final piece. Moreover, a knitter needs to visualize the final shape of the knitted artifact since the beginning, using instructions and calculations. (Arantes, 2020).

In contrast, the making of a crochet artifact implies the use of a hook tool where the stitches are made “wrapping the working yarn around the hook a variety of times before pulling it through the active loop”. (Visnja & Owyn, 2012, p. 57).

Since knitting and crocheting are crafting made primary by hands and different results can be accomplished according to the materials, tools, and unique projects that motivate the yarn crafter to pursue. We can refer too, at the definition of Adamson about craft, where he stated that hand skills are responsible for making something well. (Hofverberg et al., 2017).

Additionally, Gibson defines craft "as a process in which a skilled practitioner demonstrates mastery of materials and techniques in the production of an object." (Gibson, 2019). As a result, the making of an artifact will evolve when the crafter gains more skills and experience. For instance, a more experiencer knitter or crocheter knows better which materials and tools choose for each project, even combining techniques to create something new.
In contrast, a beginner yarn crafter needs to learn first, the basic techniques and tools before starting a project.

Besides, both knitting and crocheting are versatile crafts that can be done alone or in a group. Arantes, for instance, refer to knitting as portable crafting allowing knitters to engage at the same time in other activities, so the knitter can interrupt or continue his or her work at any moment. (Arantes, 2020).

On the other hand, practicing these crafting gives their practitioners some benefits like a sense of relaxation, accomplishment, focus, or exploration of their creativity. For example, in the online survey conducted in April, some knitters and crocheters said what they enjoy the most about the process of knitting and crocheting was the relaxing and calming effect that the repetitive movements produce. The image below shows in single words, some of these results.

Figure 3. Online Survey (2020). While you are knitting or crocheting these crafts, what do you enjoy about the process?

Moreover, in this process of making, yarn crafters do what they like and love for themselves or others. For instance, yarn crafters knit or crochet mostly for them but also for their family and friends, some typical items they made are shown in the image below.

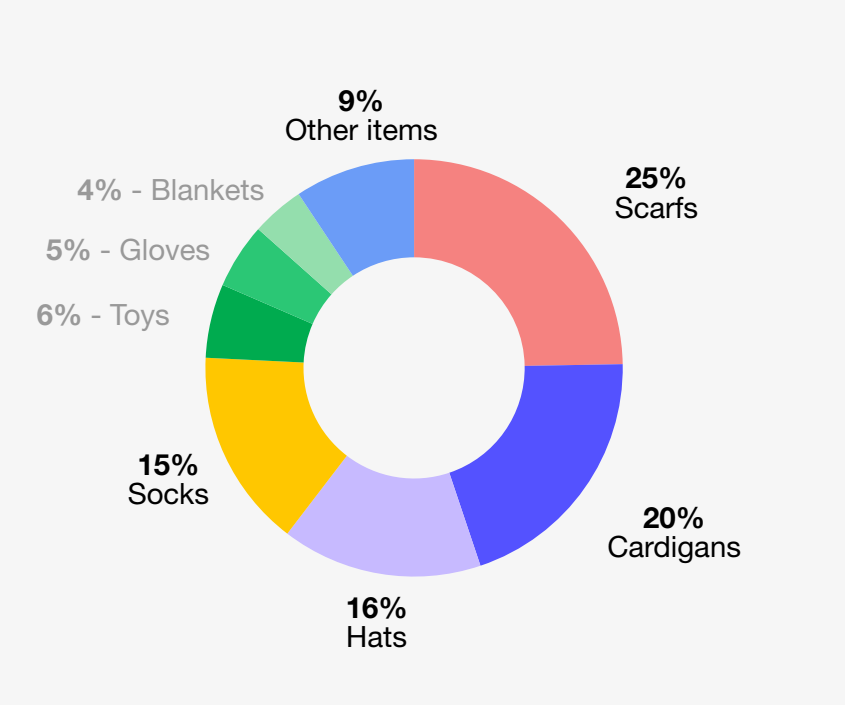


Figure 4. Online Survey (2020). What do you usually knit or crochet?

In the making of physical artifacts, yarn crafters express themselves. Anderson refers to this, to be a human where the “things we make are little pieces of us and seem to embody portions of our soul.” (as cited in Hofverberg et al., 2017, p. 14).

To sum up, the popularity of yarn crafting is manifesting in their different events and ways of how people from different ages practiced and expressed. As the authors above stated, a craft is a flexible activity that lets yarn crafters making them doing other tasks, e.g., knitting watching TV. Also, the yarn crafter needs to know how to manage materials, tools, and techniques to knit or crochet an artifact.

The learning and the making process of yarn crafters

What is the learning process that yarn crafter beginners use to make an artifact?

What are the most effective learning methodologies or digital tools for enhance this process?

To understand the learning process of yarn crafters in the making of a physical artifact. I will start with two different approaches of learning in crafting from the authors Hofverberg, Kronlid, and Östman. Expert-oriented learning and learning by doing.

In expert-oriented learning, a crafter learns from an expert, a person who can advise them on how to use the tools, which materials are fit for specific projects, and teach them the overall process itself. (Hofverberg et al., 2017). For instance, knitters or crocheters usually learn first, the foundation of yarn crafting from their family members such as their grandmother or mother. Others prefer to learn from books or by tutorials on the Internet. Either way, they always have a reference to start in these crafts. The next figure illustrates how yarn crafters primary learn:

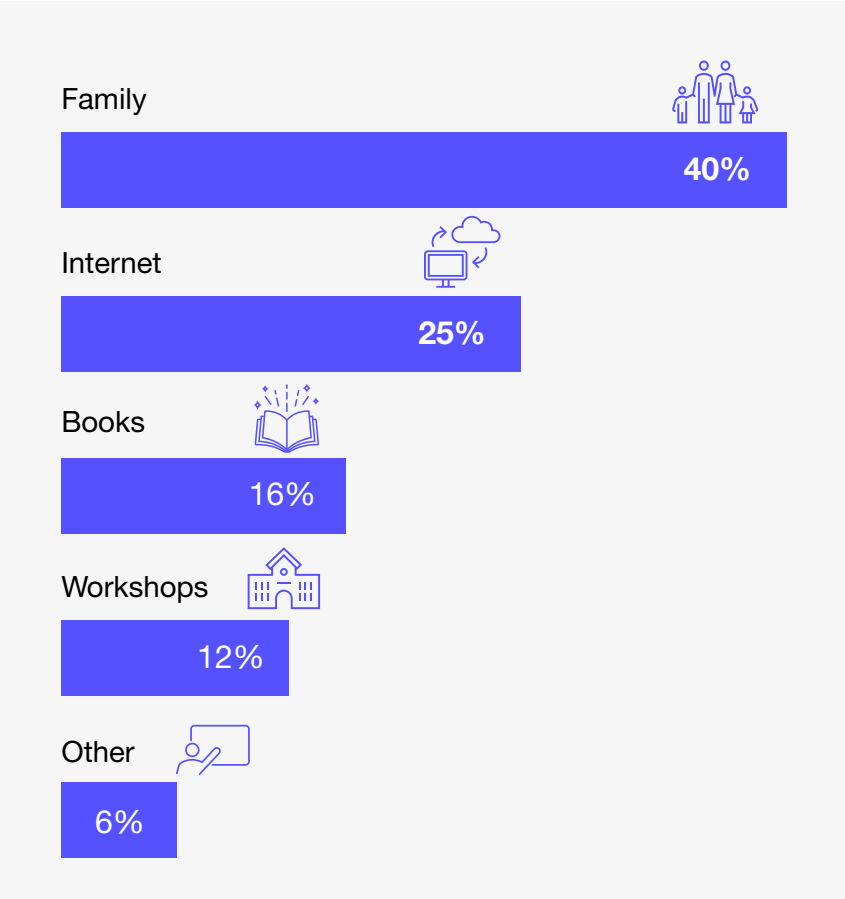


Figure 5. Online Survey (2020). How did you learn to knit or crochet?

This point of view has some similarities with the concept of Oakeshott about two types of knowledge, one more focus on the technical aspect and the other in the practical one. For Oakeshott, technical knowledge is possible to reach just by learning it from a book or a course, while practical knowledge is only "…acquired via apprenticeship, requiring constant contact with an expert who is practicing it". Additionally, Morris believes that apprenticeship is better to enhance if it takes place in a community of practice. (as cited in Gibson, 2019, p. 27).

Even though an expert-oriented learning approach requires the intervention of an expert, there are other learning systems like social learning that can give crafters other ways to learn and get knowledge.

For the authors, Williams and Highwood, social learning is "a system where the learning occurs with and from others". For example, a Crochet Along (CAL) is an online event that promotes crochet crafters to work in the same project but independently, sharing through the Internet or social media their progress and asking questions if they have difficulty with the craft they are making. (Williams & Highwood, 2018).

According to the answers of the yarn crafters surveyed, what they like about CAL, Knit Along (KAL), and other events, is the opportunity to share what they know, learn, and seeing other's people works. The next figure shows in words what they like about these events:

Figure 6. Online Survey (2020). What do you like of these events?

By way of contrast, in the learning by doing perspective, the crafters learn in the iterative process of making, where the crafters make the first attempt, if they do not have success, they do it again and again until they reach a final desired version. In this iterative process, is when the crafter learns and gains skills, the mistakes help them to identify what things to avoid and which parts to improve.

Regarding Mills, the learning happens through the crafter's works developing in the process, their capacities, and skills. (as cited in Gibson, 2019). For example, according to my surveyed yarn crafters, when they do not understand a pattern or technique, they usually read it and try it again until it works. Others prefer to ask directly to the designer or look for tutorials on the Internet, whereas others prefer to re-write some parts of the pattern to make the instructions clear.

Consequently, converging a way of applying both methods mentioned above (expert-oriented learning and learning by doing) with the sense of a community in the system to design was an important point to consider since people learn using different strategies.

The Internet and Communities of Practice

Given the rapid advances of technology and accessibility of the Internet, crafters have at their disposal access to many resources to learn and practice their craft. For instance, yarn crafters can use social media or join an online community to get information, learn, and connect with other people that share the same interests as them. As Gibson stated, "the Internet offers a new model of community in which we can connect with others through common interests and objectives creating new opportunities to learn and share". (Gibson, 2019, p. 32).

How content creation and learn from others are related to increasing creativity in yarn crafter communities?

How this process ease and increase the knowledge of yarn crafter beginners?

In addition to the above mentioned, Myzelev defines the Internet as "…an undefined space that does not have concrete temporal or physical demarcations". (Myzelev, 2015, p. 64). In this scenario, online communities take place, offering crafters a new space for sharing and learning.

68%

Learn through Social Media, Internet, and Online Communities.

For example, according to my survey respondents, they use social media such as Instagram, Pinterest, or Facebook. Also, they participate in online communities like Ravelry and use mostly the Internet to learn a new technique, pattern, stitch, or design.

Previously, we introduce the term communities of practice. For the authors Etienne and Wenger-Trayner, they define it as "...groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly". (as cited in Williams & Highwood, 2018, p. 17). e.g., Ravelry, this popular community gathers knitters, crocheters, designers, and fiber artists in one place, offering tools like forums and notes for their projects. As yarn crafters surveyed mentioned, to find patterns and get inspiration are some of the activities that they like to follow in an online community.

To sum up, the Internet and online communities offer to yarn crafters a digital space not only to look for information and get inspired but also to provide connection and sharing promoting the learning.

Collective Intelligence: people, data, and technology

How might we add Collective Intelligence in the learning process of yarn crafters?

With the rise of the digital era, Collective Intelligence (CI) is gaining more importance in organizations that want to apply it. To understand the value of CI in the context of yarn crafters, we will start first with its definition.

A more traditional explanation refers to CI as groups of people working together to accomplish something. Moreover, these people are smarter than individuals working alone because the diversity of each member enhances the capabilities of the whole group, promoting creativity and innovation.

Additionally, the authors Malone and Bernstein refer to another kind of Collective Intelligence that is emerging in the last years as "interconnected groups of people and computers, doing intelligent things". (Malone & Bernstein, 2015, p. 67). In this case, the collaboration between groups of people is amplified with the use of technology. For instance, as we mentioned before, the Internet offers a new space for people to connect and share without the boundaries of geographical distance.

Besides, these two elements that form CI, people, and technology. There is a third element, the data. For Nesta organization, different perspectives and experiences in groups of people that share ideas, gather data with the help of technology, can achieve greater things that go "…far beyond what any individual human or machine could achieve alone". (Peach et al., 2019, p. 17).

Considering the last definition of Collective Intelligence, for this project, we used that approach; the next step is to define which technology we will use to enhance it.

The challenge we want to address is related to the diversity of information that the Internet offers for learning, e.g., a yarn crafter beginner who wants to learn how to knit a sweater will encounter on the Internet different tutorials, patterns, and videos on how to make it. However, not all these tutorials will be understandable or have all they need to know to finish the project. So, it is very probable that they look for other resources.

Considering this, a system recommendation that classifies contents and shows relevant information to yarn crafters would be part of the proposal.

The following chapter explained more about the model chosen for this project and the content strategies to promote collaboration and content creation.

2.2 Case studies

To understand the ways and tools that yarn crafter beginners look for inspiration and support when they are making a craft, I observed how yarn crafters interact nowadays in online communities like Ravelry. Finally, I explored online platforms as references to social learning and to get to know the technology that supports it.

Online communities

Ravelry

It is a knit and crochet community that offers a place to yarn crafters to get inspiration from other people's works, and also provides a platform where they can get in contact with other crafters through forums and keep notes about their projects.

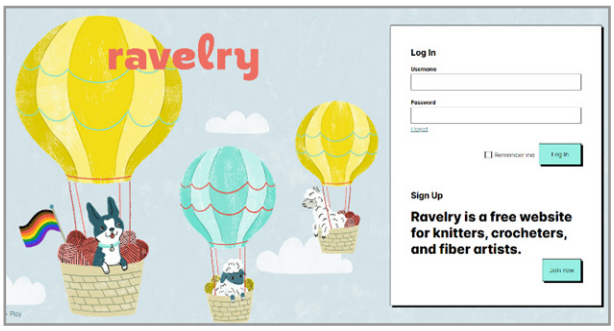


Figure 7. Ravelry, a free website for knitters, crocheters, and fiber artists.

Online platforms

Your Learning IBM

t is a learning experience platform that helps employees to get the skills and knowledge they need to know to continue advancing in their path careers.

It uses Artificial Intelligence and Watson's cognitive technologies to make the platform smart, gathering information to learn from each interaction with the user to give personalized recommendations. e.g., for a user that prefers to watch videos than reading papers, the platform will suggest content in the type that she prefers (videos), offering at the end a personalized and tailored user experience.

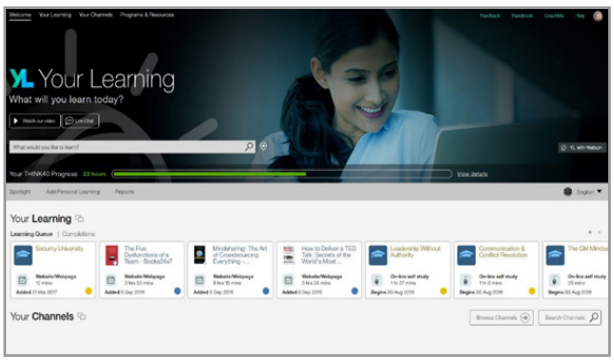


Figure 8. Platform Your Learning, IBM. (2017).

Conclusions

Both applications offer some attributes that addressed the challenge presented in this project.

In the case of Ravelry, a sense of community because collects thought their members, different knitted and crochet projects function at the end as a repository of projects to look for inspiration, buying, or making. Besides, it promotes collaboration and connection with people from different levels of expertise and interests.

In the case of Your Learning, offers tailoring learning experiences and sharing content.

The features described above will be explained more forward into the context of yarn crafters.

3 Design Process

3.1 Exploratory research
3.2 Content strategies

3. Design Process

To address the challenge presented, the process that I used combined the methodology of Human-Centered-Design and the approach of Collective Intelligence. In this way, it had three major stages.

In the first stage, I conducted exploratory research. The second stage involved the application of Collective Intelligence and the design of content strategies. In the third stage, I developed the concept of the proposal and designed the prototype.

Before we start with these stages, there will be a brief definition of Human-Centered–Design.

Human–Centered-Design (HCD)

Human-Centered-Design (HCD) is a design methodology for resolve problems focusing on people's needs. The organization IDEO define this design process in three phases.

First, the inspiration phase, where the purpose is to understand the people whom you are designing for, empathizing with them, and knowing their needs. A way to do that can be through observation, viewing users in their environment, interacting with them, and immersing yourself in their context.

Second, in the ideation phase is when you generate as many ideas as possible, exploring new and diverse approaches to solve the problem, building prototypes, and testing them with the users to get feedback and make changes, as necessary.

Third, in the implementation phase, after converging into a solution, you start creating an action plan to take your idea to the marketplace. This process could involve building a roadmap, partnerships, business model, communication strategy, and launching a live prototype to test the viability of your idea with users.

The next figure illustrates the HCD phases, along with the introduction of the Collective Intelligence approach.

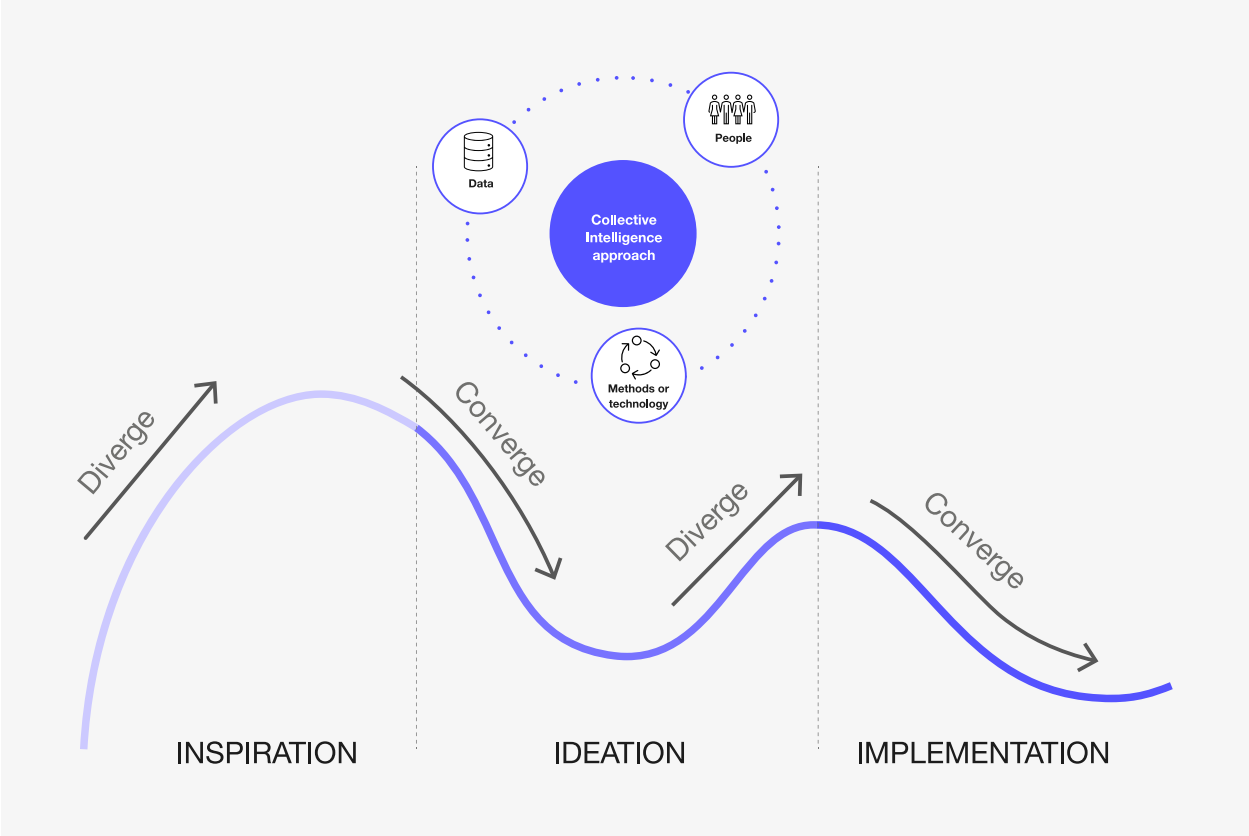


Figure 9. Human-Centered-Design adapted from IDEO.org.

In short, Don Norman refers to Human-centered design (HCD) as “the process of ensuring that people’s needs are met, that the resulting product is understandable and usable, that it accomplishes the desired tasks, and that the experience of use is positive and enjoyable”. (Norman, 2013, p. 219).

3.1 Exploratory research

Research methods such as observations and surveys were chosen to collect, qualitative and quantitative data.

The observations of knitting gatherings allowed me to get valuable insights from the community while the surveys were applied to reach a broad audience.

Both methods allowed me to know better my target users and their main concerns in their learning and making process.

Observations

Meet ups

It is a digital platform that lets people create their groups or join an existing one to then meet in person.

In February, I joined the local group Knitting Party Barcelona. They frequently gather every Wednesday from 6 p.m. to 8 p.m. in the Cosmos Cafeteria.

This group receives people from different nationalities between 5 or 6 persons. Each one of them brings their projects to work on during the meeting. A characteristic of this meetup is the social aspect. They meet to know other people, see what they are currently working on and help or assist when is needed.

Figure 10. Pardee, A. (2019). Meetups in cafes. THE SIX FIFTY.

Friday's night gatherings or Knitting Parties in yarn local stores

Similarly to a meetup, a "Knitting Party" reunites a group of people that have the same interests. They usually work alone in their projects, but share time helping each other, and learning from one to another. Also, it is a place where they got their supplies.

In February, I attended the Friday's night gatherings in the yarn local store "All you knit is love" in Barcelona. They usually gather every Friday from 5 p.m. to 8 p.m.

Figure 11. Friday's night gatherings in yarn local stores. The Columbian.

From the observation of these gatherings stood out the connection they have, some of them already knew each other. Also, they work on different projects such as sweaters, mittens, shawls, scarfs, among others.

This event was a great opportunity to watched more carefully some difficulties they have, e.g., one of the participants was working on a sweater and was following a chart pattern printed but, she was having problems tracking her progress.

Other participant showed me her written pattern that was adapted to make it easier to follow the instructions whereas others wait patiently that one of their friends help them to continue their work.

Those events let me comprehend the type of interactions that the yarn crafters have and how they make their artifacts interacting in those spaces. Also, detected which difficulties they were having working in their projects and how they resolved some of them.

Survey

In April was conducted an online survey to yarn crafters who have different levels of expertise from the community of Ravelry. The survey received 162 responses, and its purpose was to know how knitters and crocheters learned their crafts and how they are learning today.

The survey questions had four parts. The first part was related to knowing their motivations. I expected to understand how yarn crafters engage in their crafts and how often they knit or crochet and for whom. The second part was about their learning process. By understanding how they learned and how long they have been knitting or crocheting, I hoped to get valuable insights into the design of the solution. The third part was associated with technologies and resources. I wanted to know which apps or digital tools they were currently using to support their craft projects. The last part had questions about their background.

Some of the most representative answers are showing below, and the complete report is on the annex part.

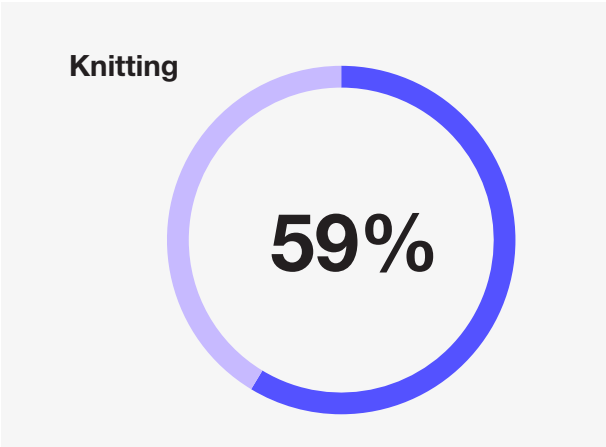


Figure 12. Online Survey (2020). Which of the following yarn crafts are you engage in?

Yarn crafters are engaged in more than one craft like knit and crochet or knit and weave, etc. However, according to the survey respondents, knitting is the most popular craft.

78%

Yarn crafters engage in their knitting or crocheting mostly daily, making different artifacts for them or their families.

77%

The most experienced knitters or crocheters are the ones that have been making artifacts for more than ten years.

50%

Ravelry is the online community of reference for yarn crafters, besides social media, blogs, and other video learning platforms.

Conclusions

Through the observations and the online survey results, experiencer and beginners yarn crafters seen to engage in their craft, relying on many resources like attended knitting parties or participating in online communities, among others.

However, there are some difficulties they face in the making of their crafts, such as tracking their progress, understand patterns, to name a few.

For instance, a survey respondent mention that the symbols in charts can be hard to remember while another user said that "...I don't like that I need a legend for the symbols I cannot memorize".

About written patterns without charts or schematics. A survey respondent remark that can be "...difficult to read and understand, especially if they are written by someone who has little experience in pattern writing, or if the pattern has been translated from another language". while another yarn crafter mentions "...I am left-handed and often need to reverse directions".

On the other hand, in the learning process, some yarn crafters prefer to read and see pictures going to their own pace, while others like to watch tutorials or ask a family or friend for support.

The next illustration presents a summary of who the yarn crafters are, their needs, and their concerns.

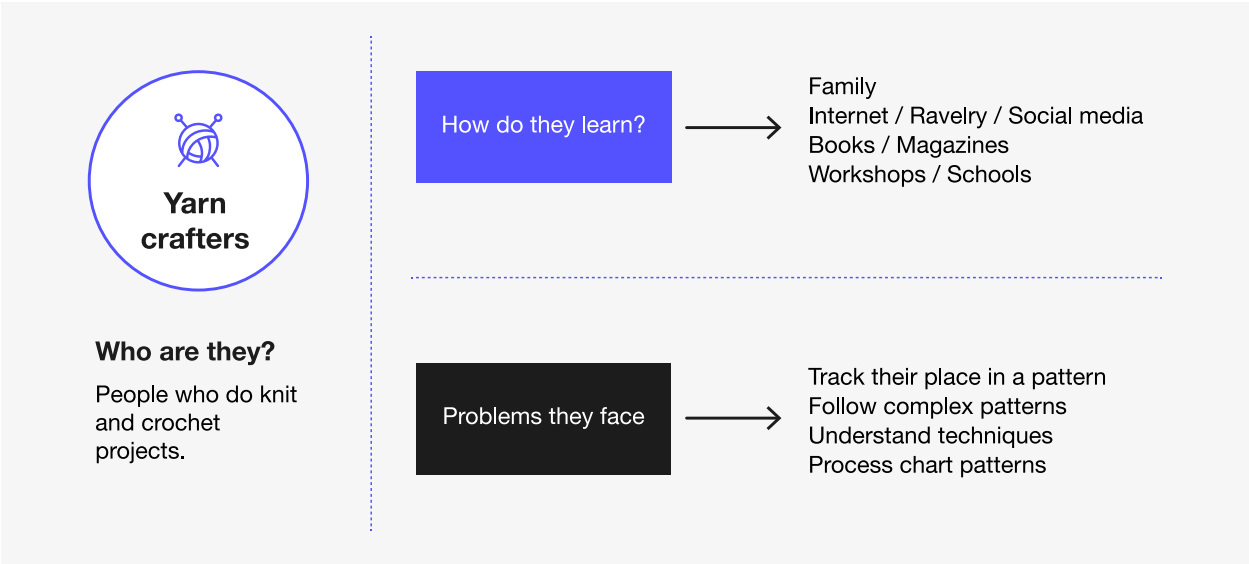


Figure 13. Yarn crafters and main concerns.

3.2 Content Strategies

In the first place, this stage involves the description of each component of the Collective Intelligence seen in chapter two. In the second place, the data component of CI will be detailed explained in the design of the content strategies for the final proposal, and the system recommendation used for this project.

Collective Intelligence approach

The purpose of the project is to help yarn crafters to learn comfortably in their unique way, promoting sharing and collaboration from one another.

People who will use the solution are yarn crafters. In the future, the platform will include other users like designers, yarn local stores, and artisans.
Concerning the data, yarn crafters will create it, e.g., patterns, sharing their experiences, tutorials, and make contributions with translations of patterns.
The technology that will support the platform will be a system recommendation of learning contents using the contents created by the yarn crafters.

The next figure shows the elements of CI chosen for people, data, and technology.

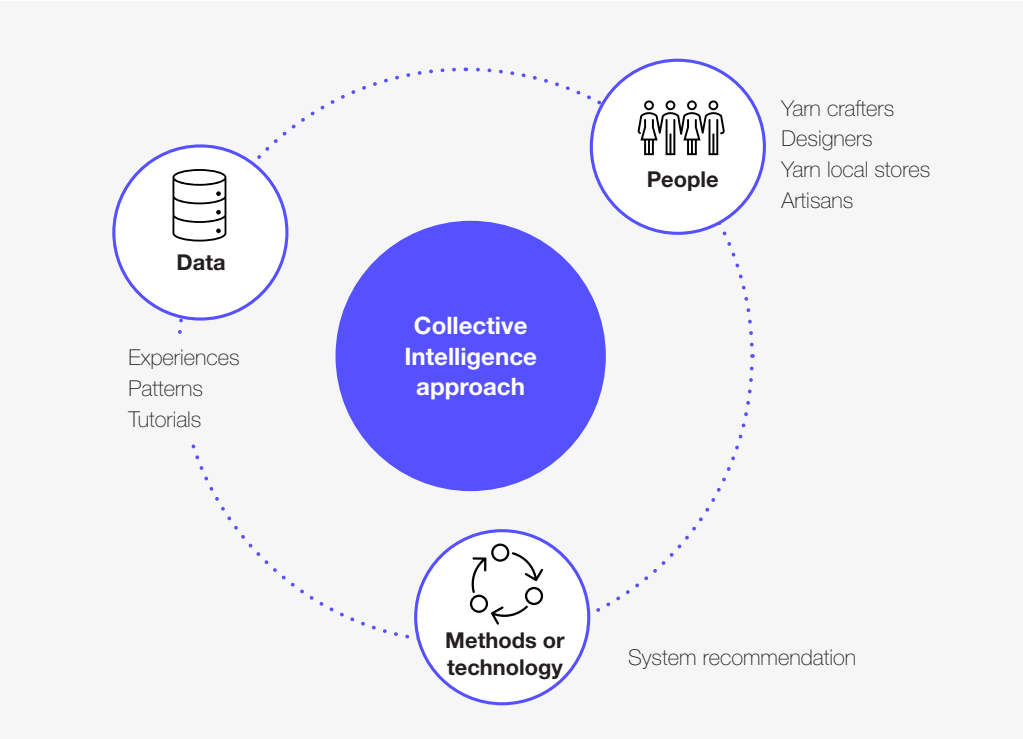


Figure 14. Collective Intelligence approach adapted from NESTA, 2019

Content strategies

To motivate yarn crafters to create content will be monthly challenges with specific topics. They must upload in the platform their creative contents such as videos, images, or steps by steps instructions. Then, the community will vote for the best content. Finally, the three most popular content will earn rewards like gift cards or materials and tools.

Another way that they can collaborate is through the translation of patterns. Likewise, to the monthly challenges, there will be events to encourage the community to contribute, e.g., translating a lace knitting pattern from English to Spanish.

All the content generated, will be stored, and will become part of the knowledge repository of the platform. In this way, they can access any time and look for specific information.

The following figure illustrates the type of contents expected from yarn crafters to create.

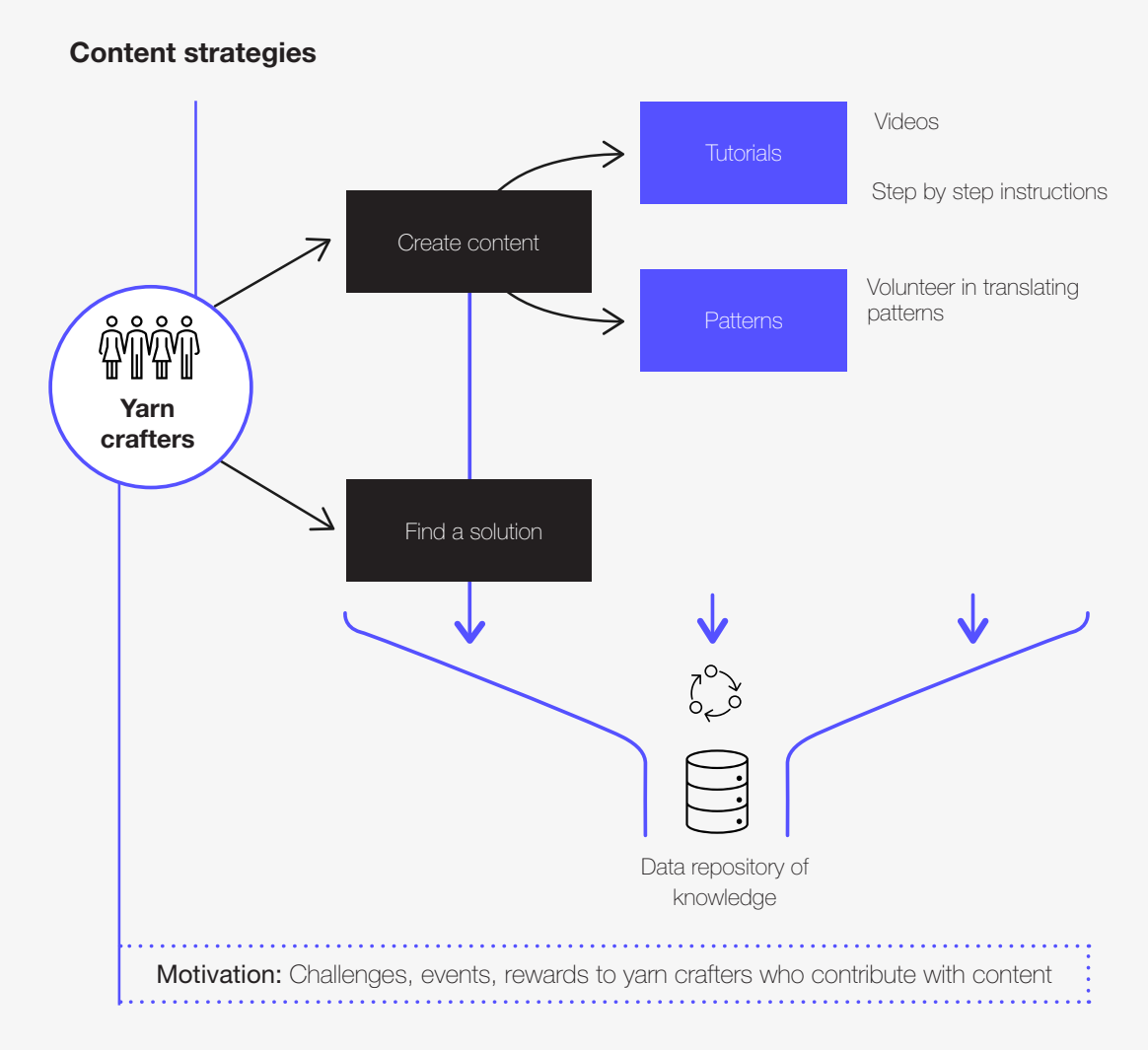


Figure 15. Content strategies

Content-Based Recommender System

The technology used for this project is a content-based recommender system. This system recommends content based on users' preferences and what they liked before. A "Content-based filtering uses item features to recommend other items similar to what the user likes, based on their previous actions or explicit feedback". (Google Developers, 2020).

In the context of yarn crafters, this recommender system will have three steps:

First, the input values or features come from the profile information and preferences of the yarn crafters. This information is retrieved when they register for the first time into the system, e.g., primary data about their level of expertise (beginner, intermediate, and advanced) is collected. Then, data about their learning interests like knitting or crocheting. Finally, the type of learning mode they prefer, such as videos, images, or patterns.

Second, according to the choices of the yarn crafters detailed above, the output values will be the system recommendations of learning content tailored to each one of them. For instance, a yarn crafter that is a beginner and likes to watch videos of knitting will visualize in her or his homepage contents tailored to her or his preferences.

Third, when the yarn crafters choose a recommended content, this will display different paths of learning. They can do every step suggested or avoid the ones that they do not need, e.g., a beginner knitter that wants to learn how to make a hat will have in her home page many options of different knitted hats such as beanies, tams, or earflaps. If she chooses to make a beanie hat, the system will display the contents needed to complete it like materials and tools, the technique, and the pattern.

In the following illustration is showing the components of the model chosen.

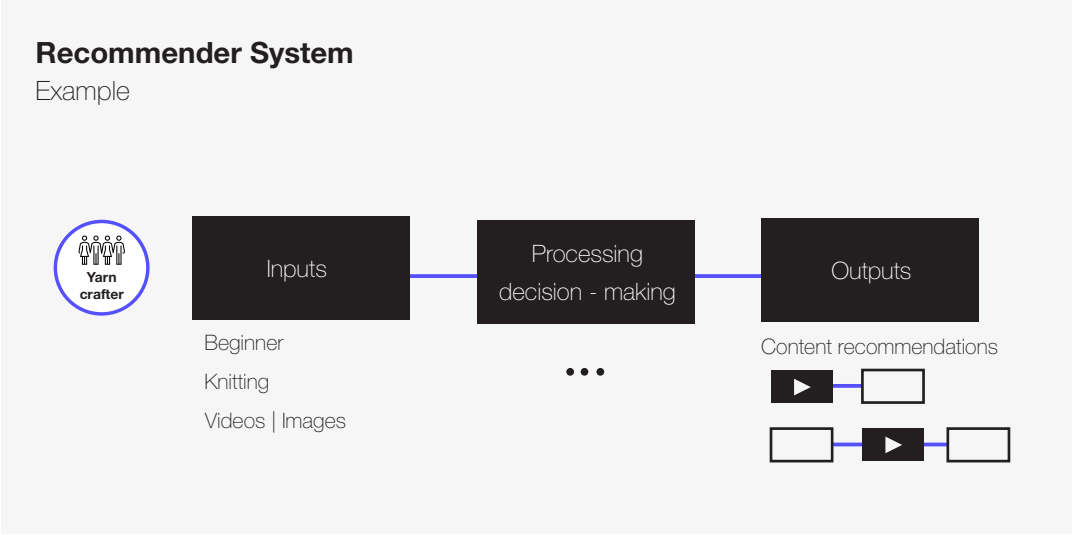


Figure 16. Recommender System Model. Example.

4 Proposal

4. Proposal

4.1 Stitch Paths

Concept

Stitch Paths is a digital platform that helps yarn crafter beginners to improve their learning and making process. This project born from the necessity to offer personalized learning content in yarn crafting and reduce spending time looking for information on the Internet, focusing on what yarn crafters value the most, the making of artifacts.

In this way, Stitch Paths offers that yarn crafters make their paths to learn and collaborate through the platform.

This digital workspace is a space where the yarn crafters will learn techniques, understand patterns, and have access anytime to a data repository of knowledge.

The generation of contents in the platform will be created by the yarn crafters themselves through monthly challenge events that motivating them to collaborate, exchange ideas, sharing experiences, and providing support to other yarn crafters.

How it works?

This digital workspace has four main components. The first is the area of the learning contents organized according to the preferences of each yarn crafter. The second is the workspace area where each knitter or crocheter can create and share their content. The third is the pattern repository, this section contains a basic library of the main techniques in knitting, and crocheting showed through interactive patterns. The four shows the community area where the events and different challenges will be published, also in this section, yarn crafters can contribute.

The interaction with the system starts when the new users register to the platform. In this section, the yarn crafters will complete information about themselves, such as their interests and preferences. These will be the first input values for the system recommendation.

After completing the registration section, the users will visualize the home screen, where the first learning contents tailored to their preferences will be displayed. As the user continues interacting with the system, the platform will recommend more content based on their preferences and user history. Each recommended content has a learning path, i.e., small steps for making a knit or crochet project, since the basic techniques and materials until the final pattern. Besides, from this point onward, yarn crafters can navigate to the other areas interchangeably.

In the workspace area, yarn crafters create and publish content that will be visible for the whole community, writing directly in the text editor or uploading images or videos. Then this content can be reviewed by the community.

The pattern repository area contains different basic pattern techniques in written and chart form. In each pattern, the user will have the option to track their position, visualize just written instructions or charts, and photos of the final artifact as a reference. Also, in this section, they can look for specific content through the search engine.

Finally, in the community area, monthly challenges events will be held with the purpose to motivate the content creation. Also, yarn crafters can collaborate translating in other languages, the patterns of the platform.

Figure 17 illustrates the information architecture for this project, showing the components of the system, concerning Collective Intelligence and content creation, and the type of interactions that the yarn crafters will have.

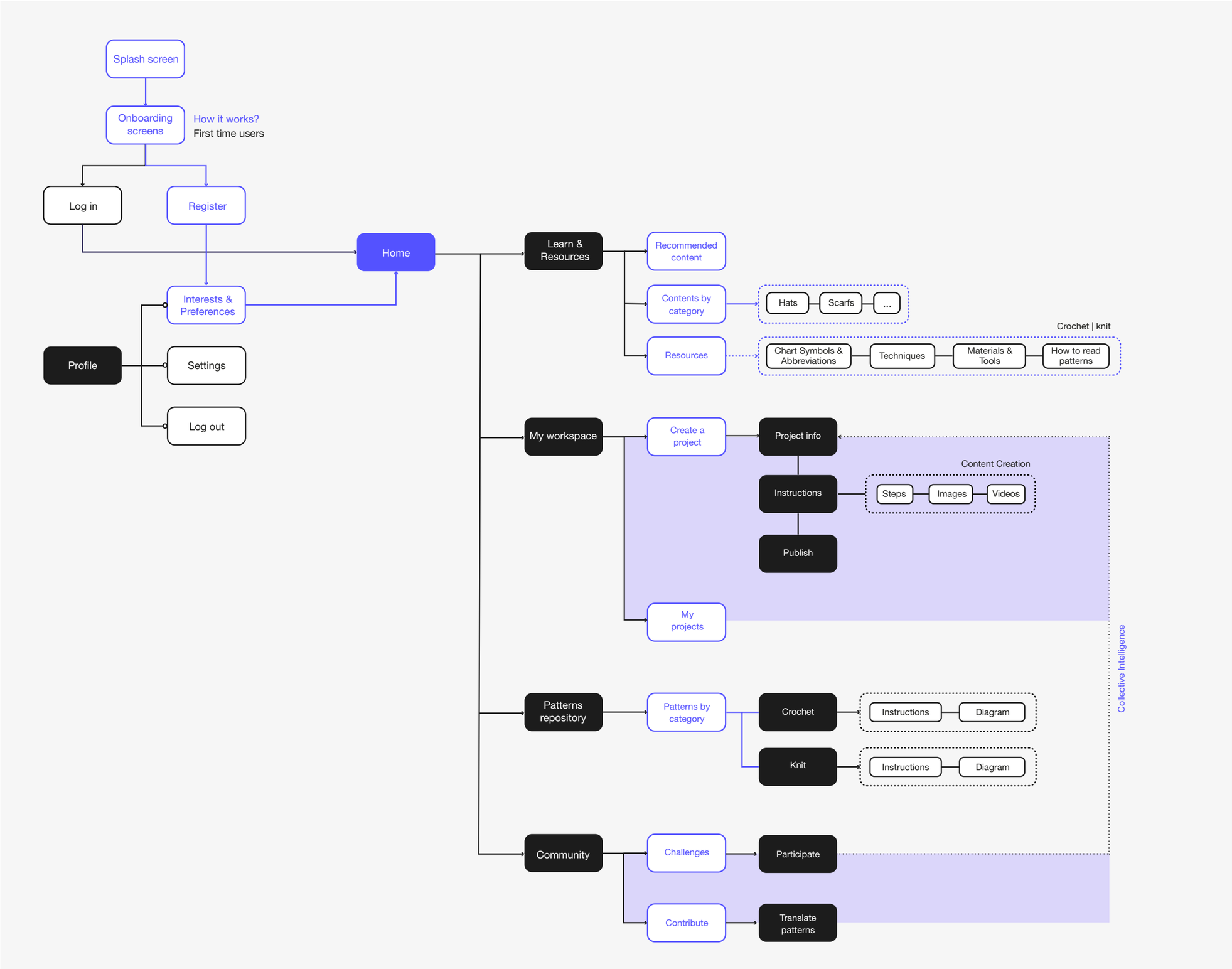


Figure 17. Information Architecture of platform Stitch Paths.

4.2 Visual Exploration

Sketch

The sketch work let me generate and visualize first ideas and functionalities for the digital workspace.

Figure 18. First sketches of platform Stitch Paths.

Wireframe

The development of the wireframing allowed me to define the user flow and interactions for the platform.

Figure 19. Wireframe of platform Stitch Paths.

Design system

For this project, the design of the user interface follows the guidelines and uses the iconography from Material Design.

The logo, typography, and colors have been chosen to express a minimalist design prioritizing the ease-of-use.

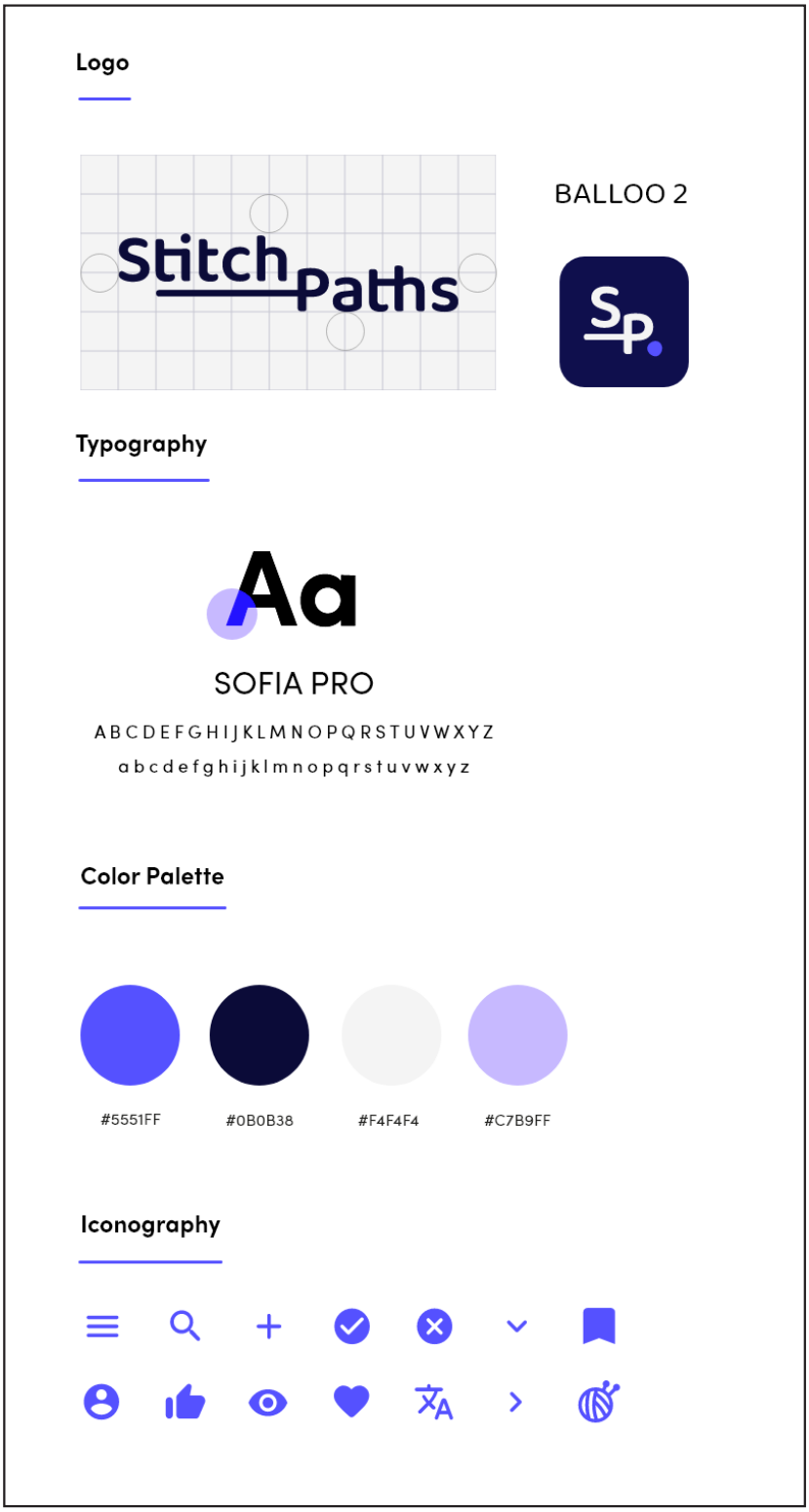


Figure 20. Design system for the Stitch Paths platform.

4.3 Prototype

The Stitch Paths platform consists of a mobile app. The design of the prototype of Stitch Paths will allow me to test this prototype with users and get their insights to continue iterating for further improvements in the mobile application.

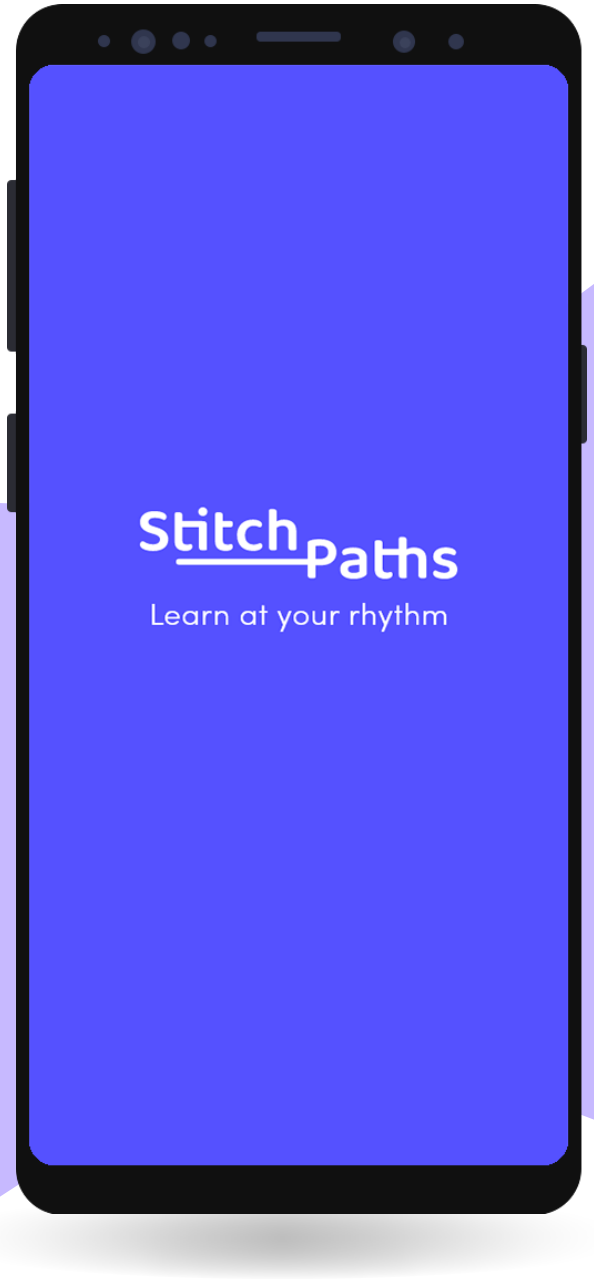


Figure 21. Prototype Stitch Paths. Splash screen.

Onboarding screens

The first time, yarn crafters enter the platform will visualize three onboarding screens. These screens explain how the application works and what steps they need to follow to start learning.

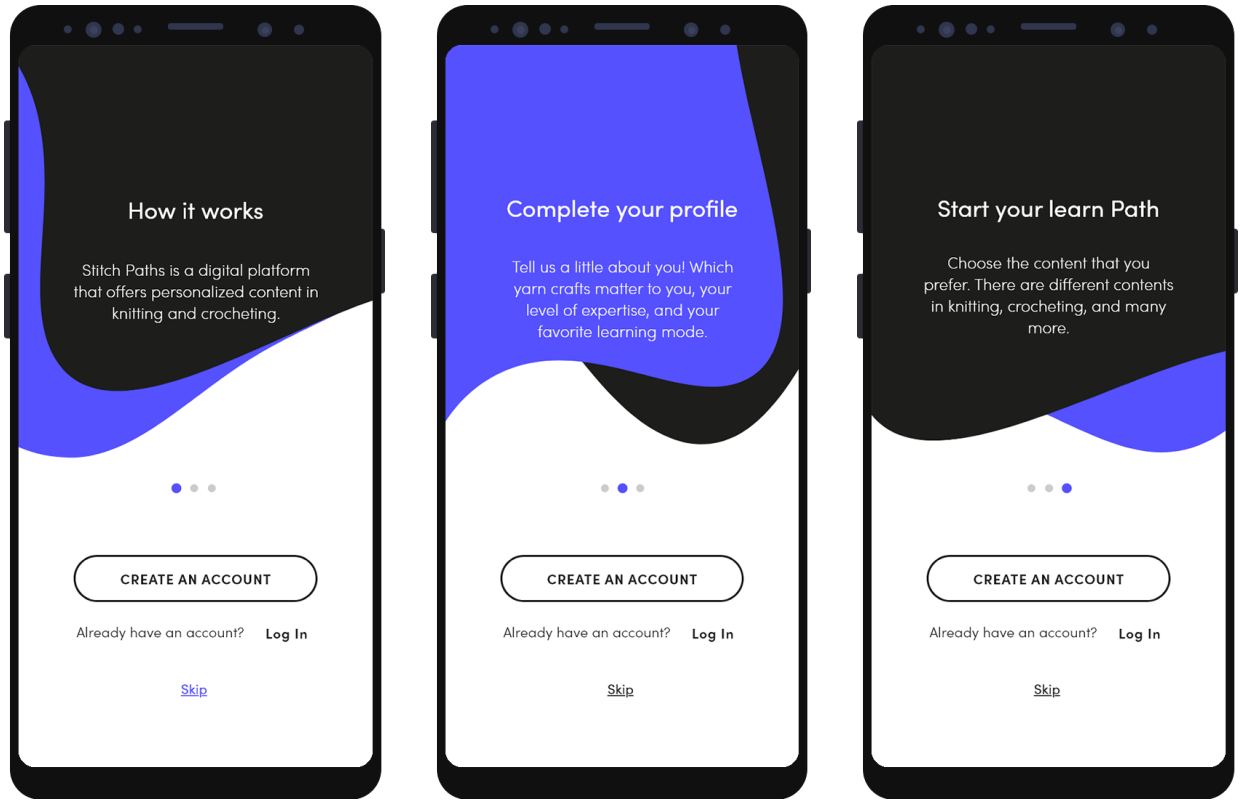
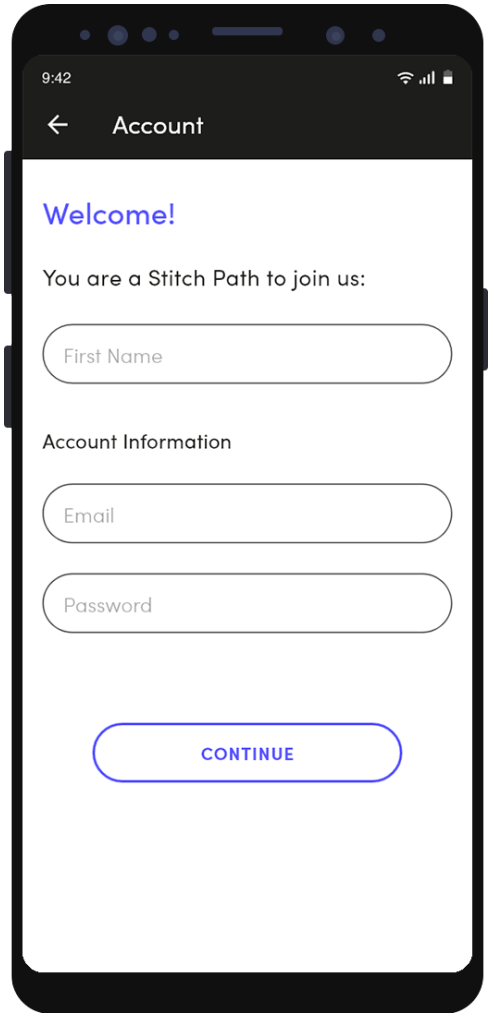


Figure 22. Onboarding screens.

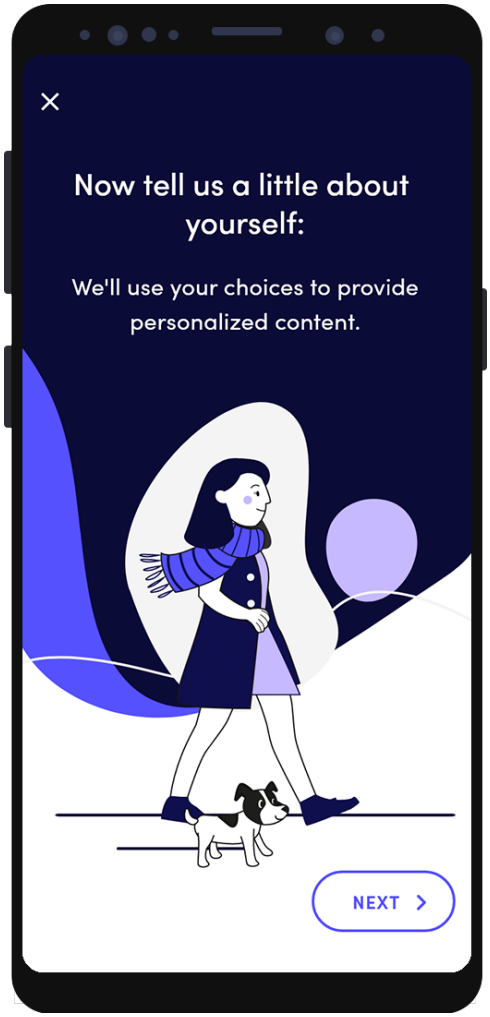
Registration

When yarn crafters register into the platform, they complete information about themselves, such as yarn crafts' interests, level of expertise, and type of learning they prefer. The next screens illustrate this process:

Figure 23. Registration screens.



(1) Screen of the account information



(2) A screen that invites the user to complete more information about themselves

Moreover, the main aim of this section is to gather initial data of the yarn crafter, that will be using it later in the recommendation of contents. For that, they choose between each text chips, the option they prefer above others.

These answers can be changed later in the profile section of the user.

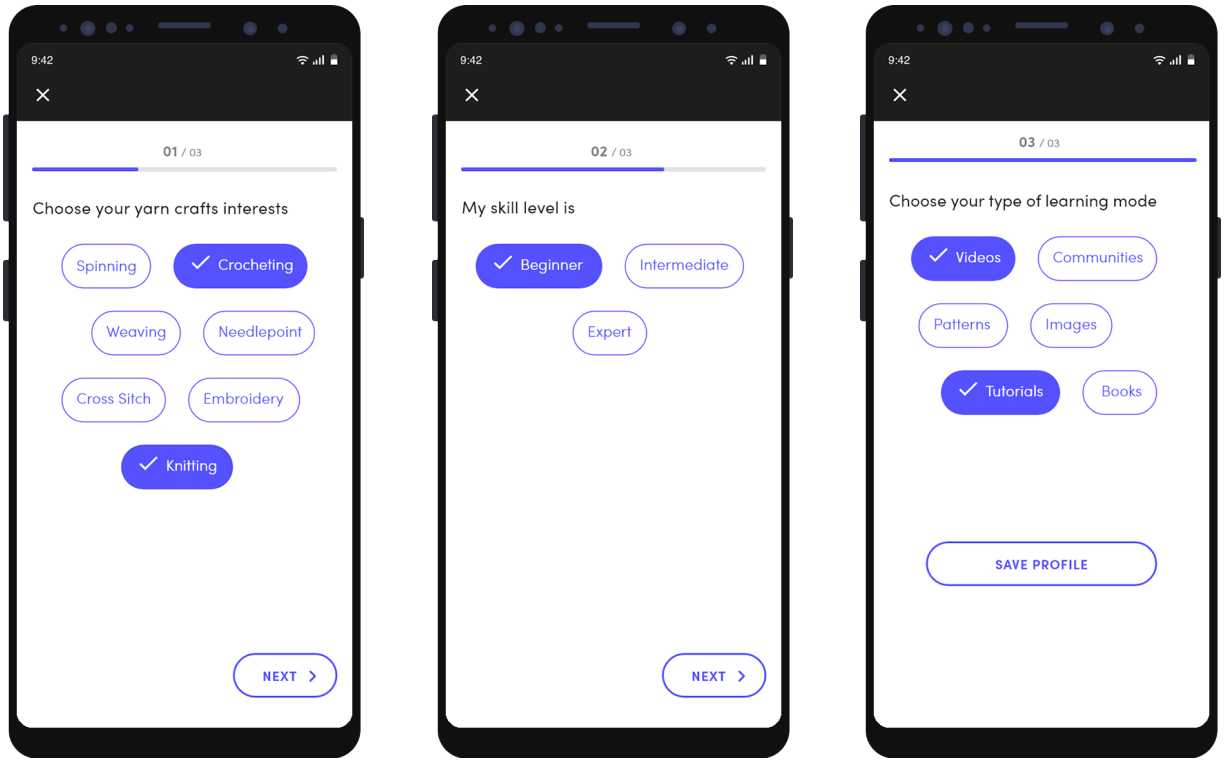


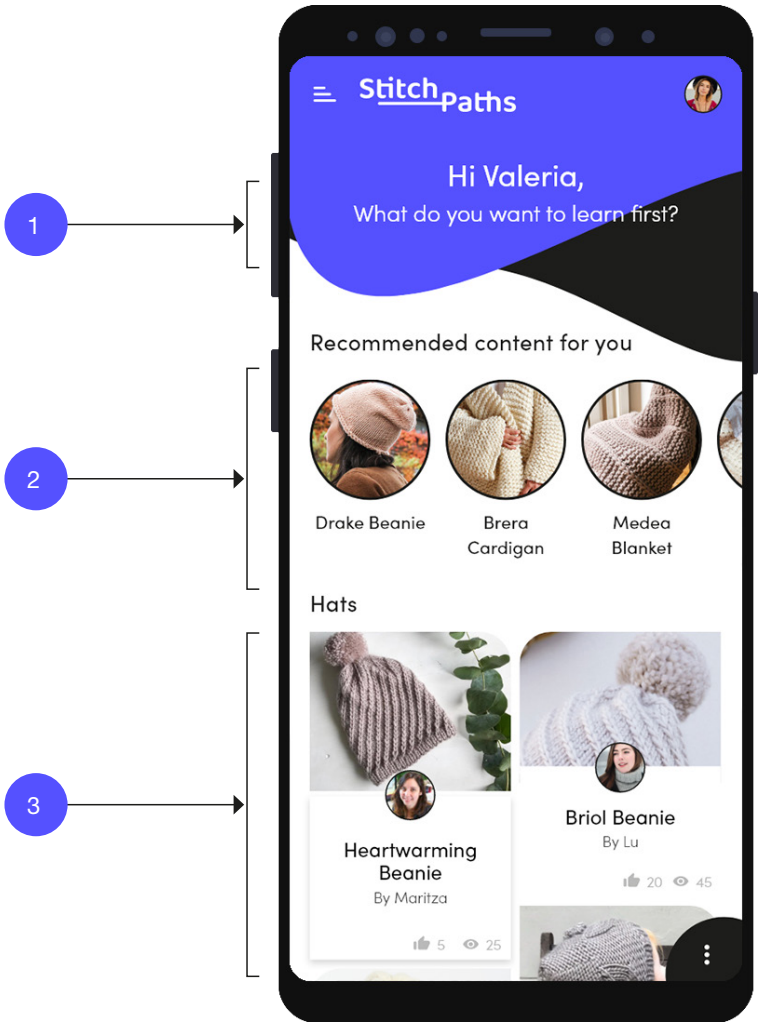
Figure 24. Screens of yarn crafts interests, skill level, and type of learning mode.

Homepage

The Stitch Paths homepage is where yarn crafters can see learning content tailored to their preferences. The main aim of this section is to help them to reduce time looking for tutorials and ease their learning with content created by other yarn crafters.

This section has three parts. The first part shows the text: “Hi, User’s name” that welcomes yarn crafters. The second part suggests content that they would be interested in learning, to access it, they can scroll horizontally. The third part shows extra content that is organized by category.

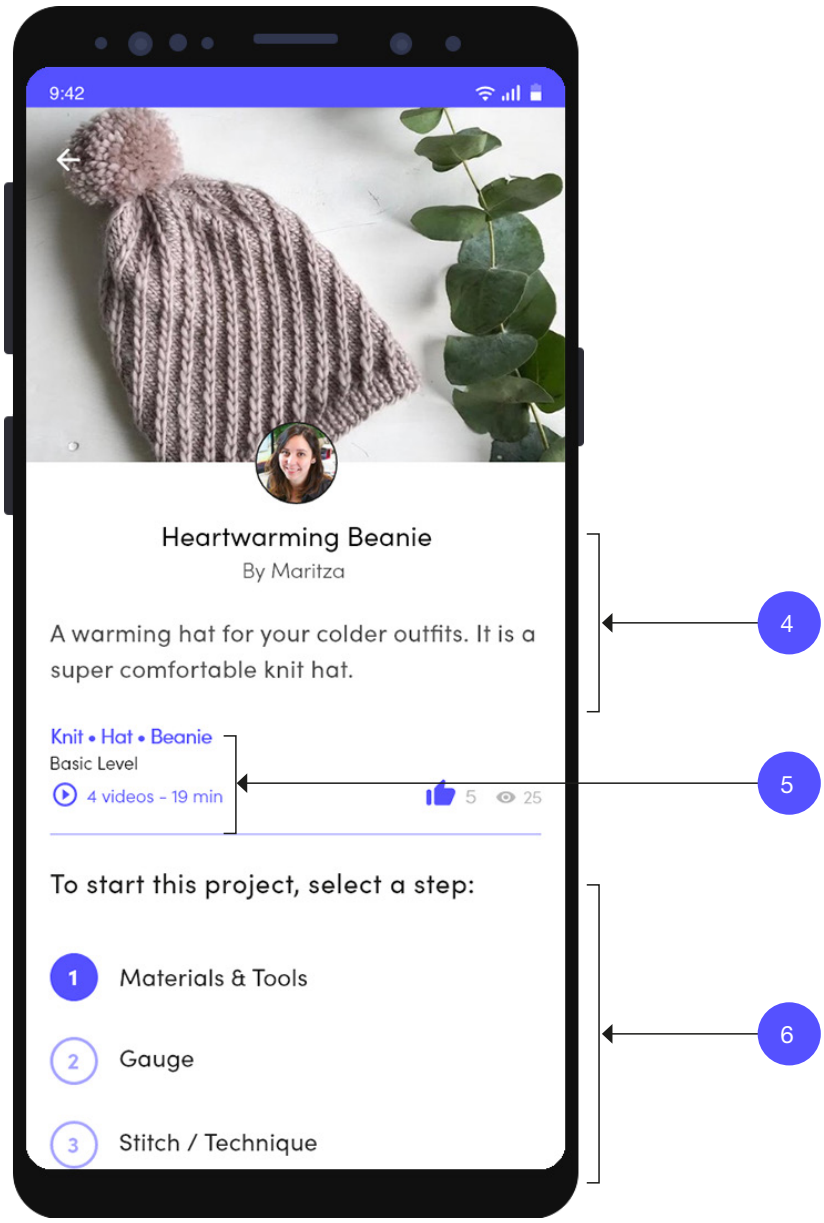
The platform will use each of these interactions to recommend them the next content.



(1) Welcome text
(2) Recommended content tailored to each yarn crafter
(3) Other contents sort by category

Figure 25. Home screen.

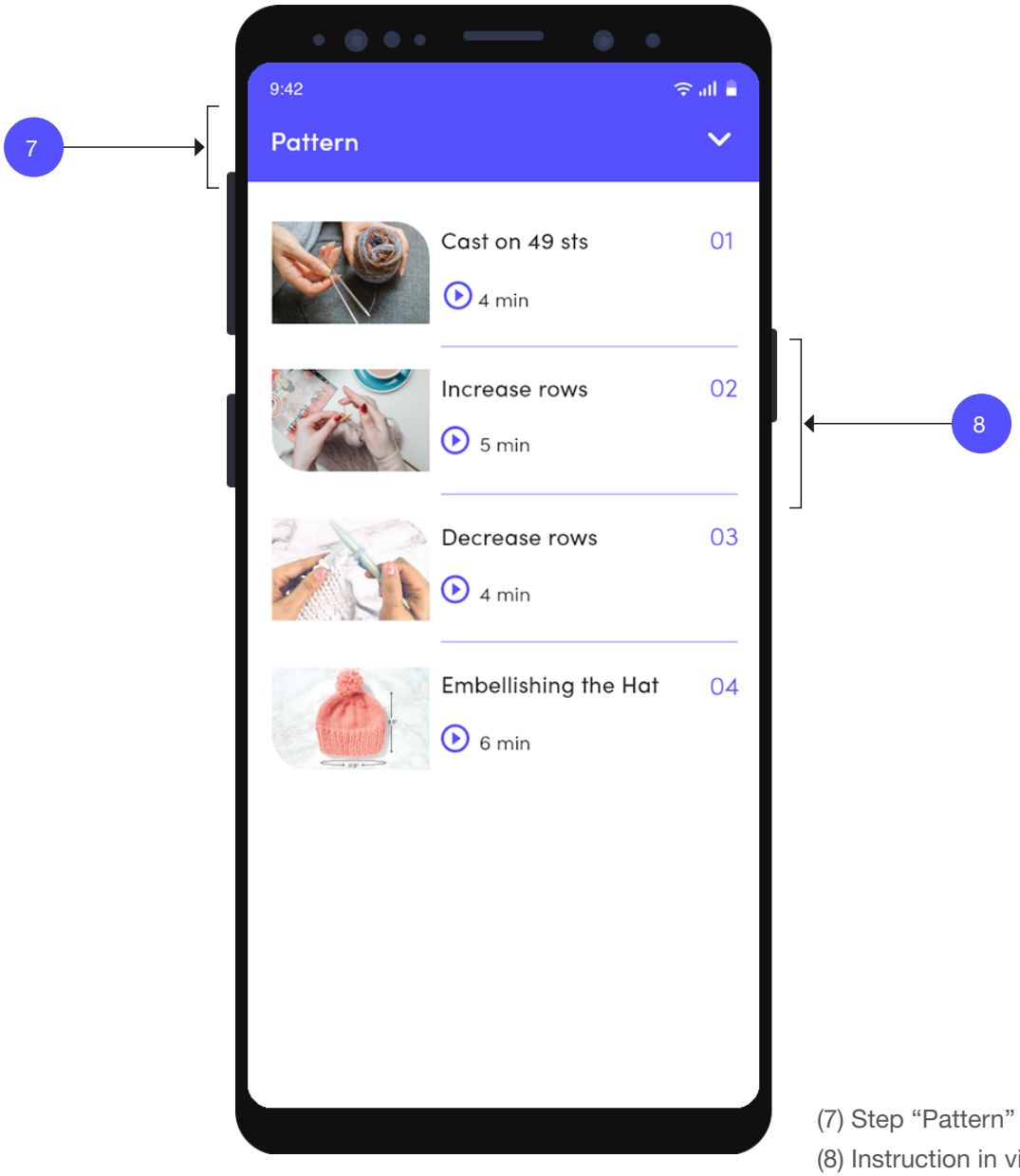
When they have found the content they like, they had to tap on it to see more details, i.e., a short description of the project, level, format, and the steps needed to complete the project will be detailed.



(4) Title of the project, author's name, and description
(5) Tags, level, and format
(6) Steps to complete the project

Figure 26. Content screen.

Each step is independent. In this way, the yarn crafter has not had to follow a sequence to learn. They can jump to the core content and avoid the steps they have already know. Moreover, the display of the contents is in the format they usually prefer, e.g., the next image illustrates the case of a user that prefers to learn through videos.



(7) Step “Pattern”
(8) Instruction in video format

Figure 27. Step “Pattern”.

Besides, there is also the resource menu that is fixed on the home page where yarn crafters can access any time and learn the basics in symbols, techniques, materials, and how to read patterns.

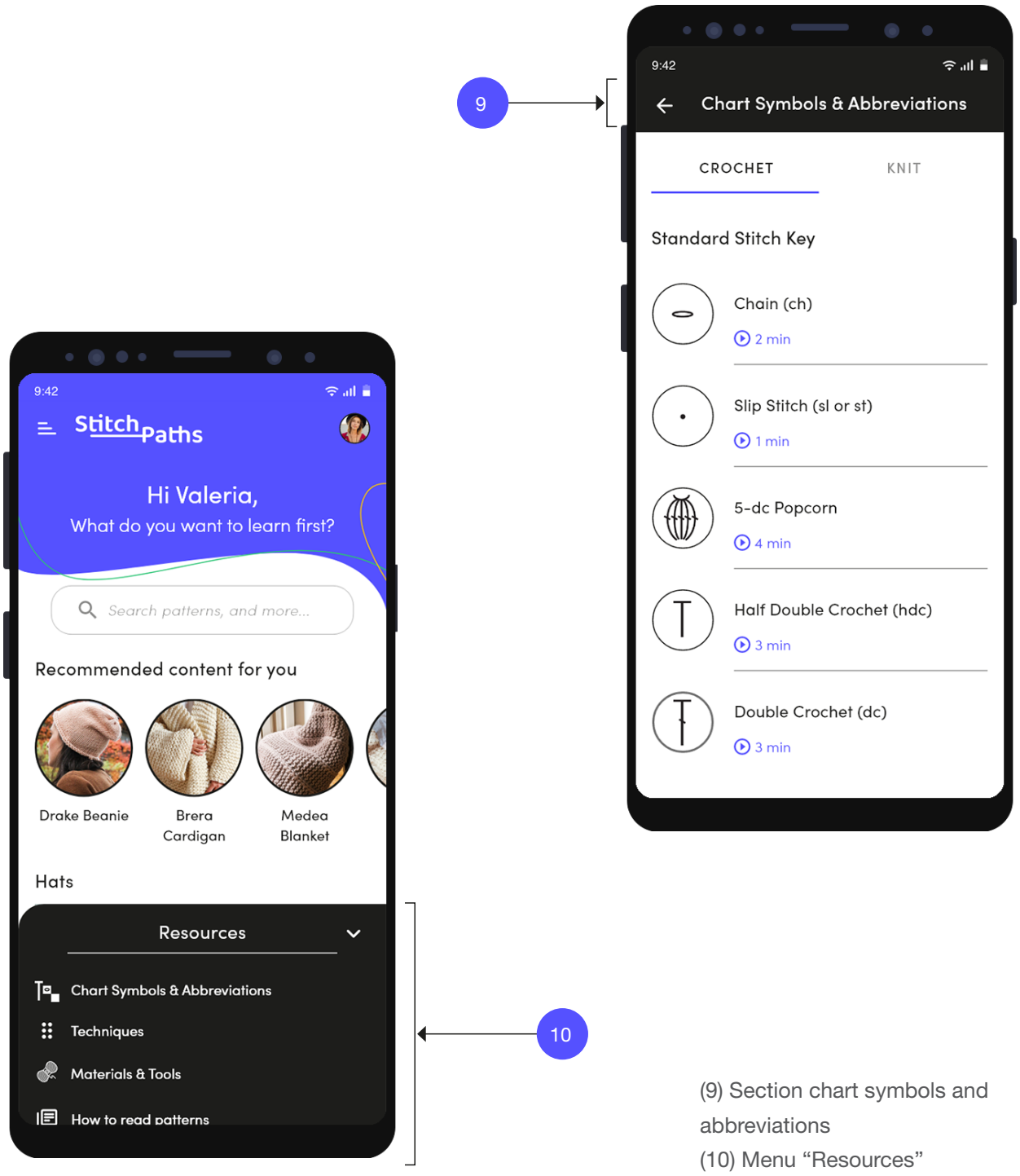
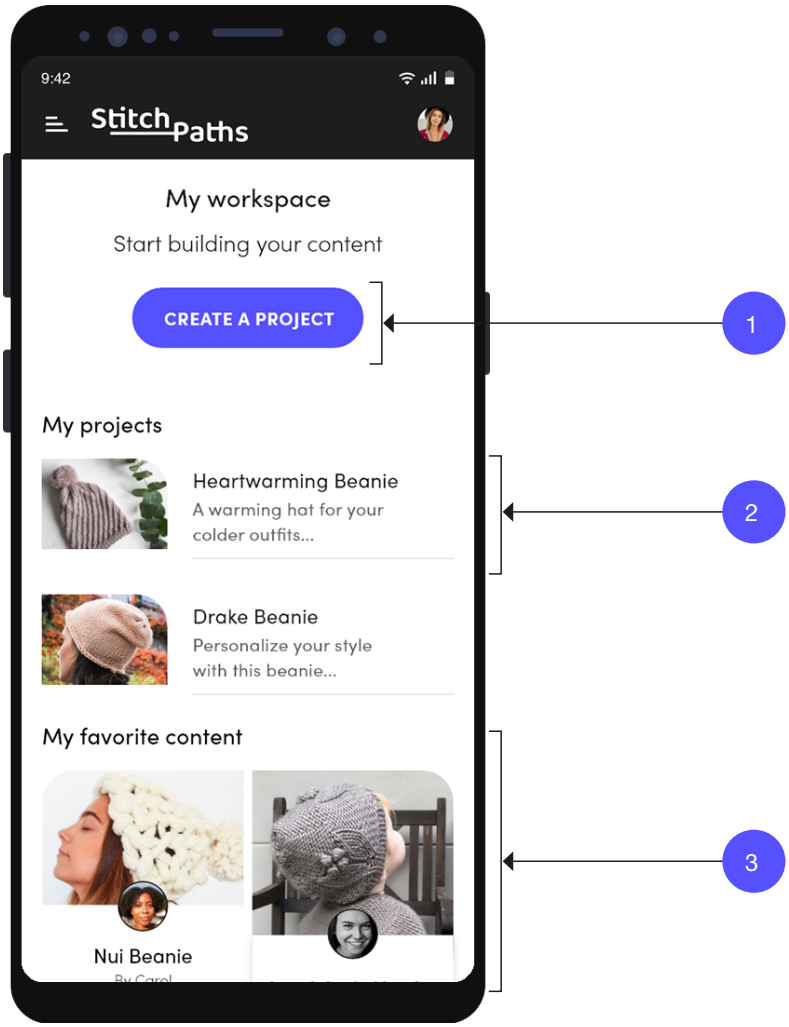


Figure 28. Menu resources.

Workspace

In the workspace area, yarn crafters start building and publish their content. The purpose of this section is to give them a space that facilitates content creation, and at the same time, generates more content on the platform that can be seen by other yarn crafters.

This section has three parts. First, it displays a button that calls action to create a project. Second, includes the projects that yarn crafters have already created. Third, presents their favorite content in card format.

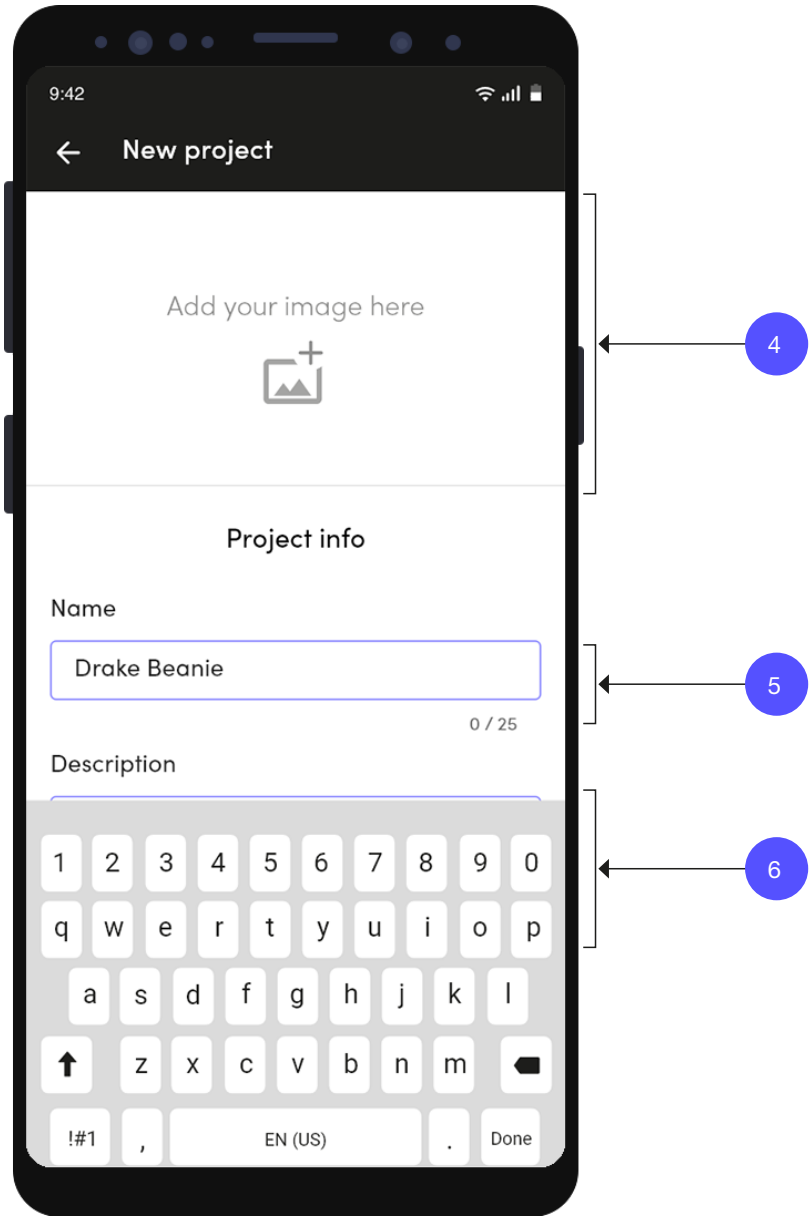


(1) Button that call to action to create
(2) Projects already created
(3) Favorites content

Figure 29. Workspace section.

When yarn crafters start building their content, the design of the interface will walk through them each step at the time to facilitate content creation.

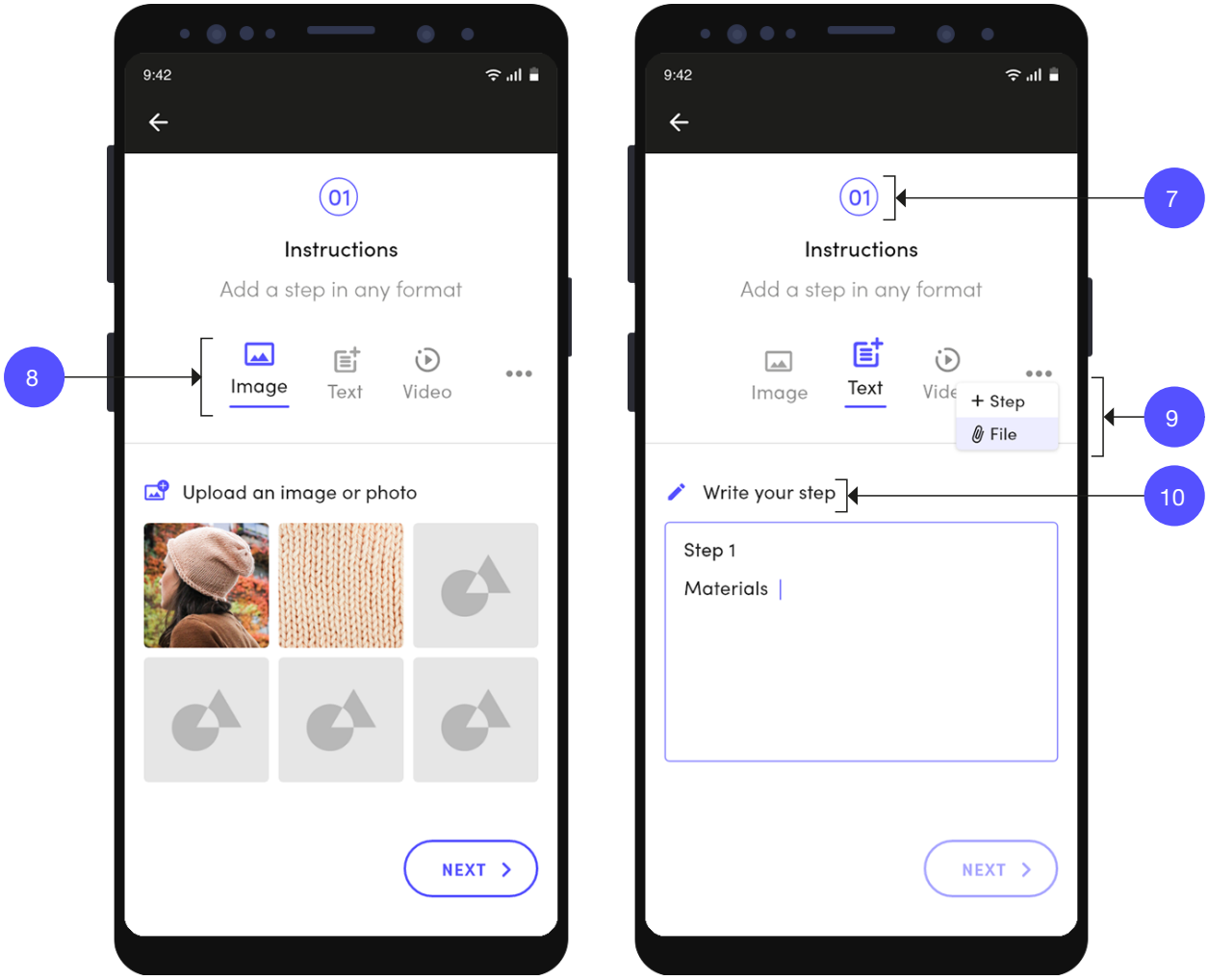
As a first step, they have to add an image of the artifact that they are making, then write down the title and finally a brief description of the project.



(4) Image of the artifact
(5) Tittle
(6) Description

Figure 30. New project.

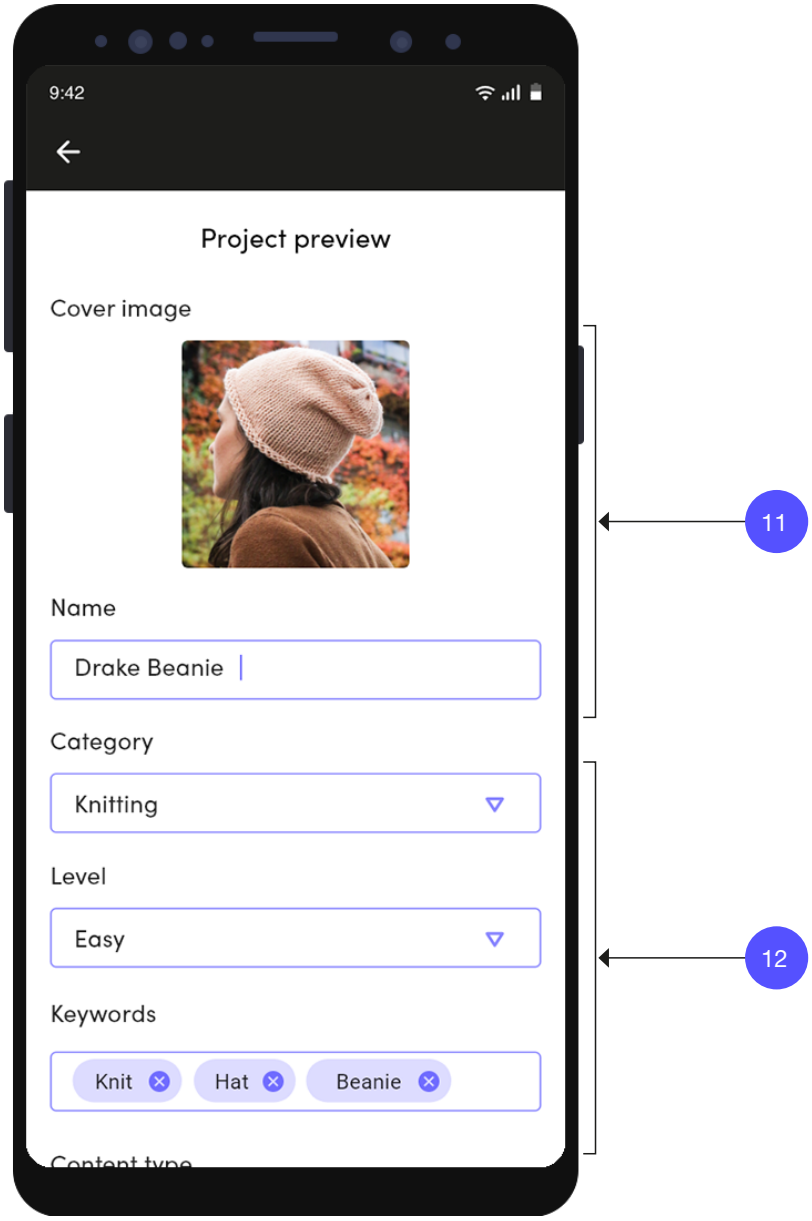
Then, in the next step, they will explain their making process, adding images, text, or link to videos. Also, adding additional instructions that will help to understand their process.



(7) Number of the instruction
(8) Section to add images
(9) The button “more” displays: add a step and attach a file
(10) Editor text to write the first instruction

Figure 31. Instructions.

Finally, before the publication, yarn crafters can see a preview of their content, and add additional information to ease their browse in the platform. When it is already published, this will be part of the contents of the platform.



(11) The cover image and tittle can be changed
(12) Additional information such as category, level, tags, and content type

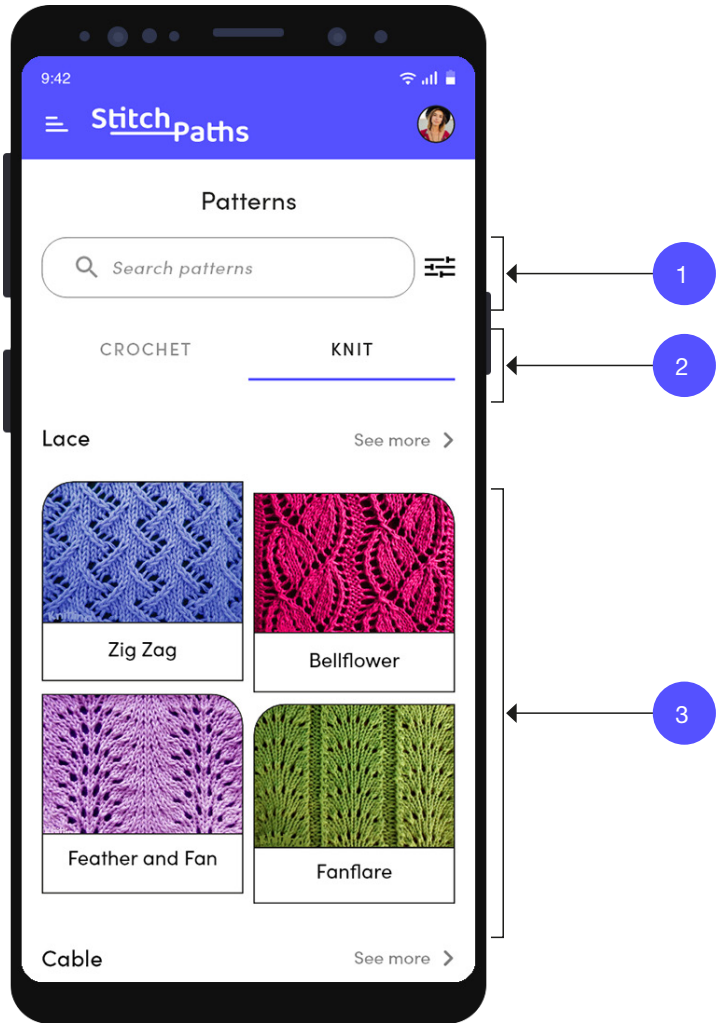
Figure 32. Project preview.

Patterns repository

The pattern repository section includes different basic patterns organized by category: Knit or Crochet. This section aims to ease the understanding of patterns and the learning of new techniques.

As we explained, at the beginning of this document, patterns are charted or written instructions, that in some cases, are more useful to explain complex or repetitive instructions.

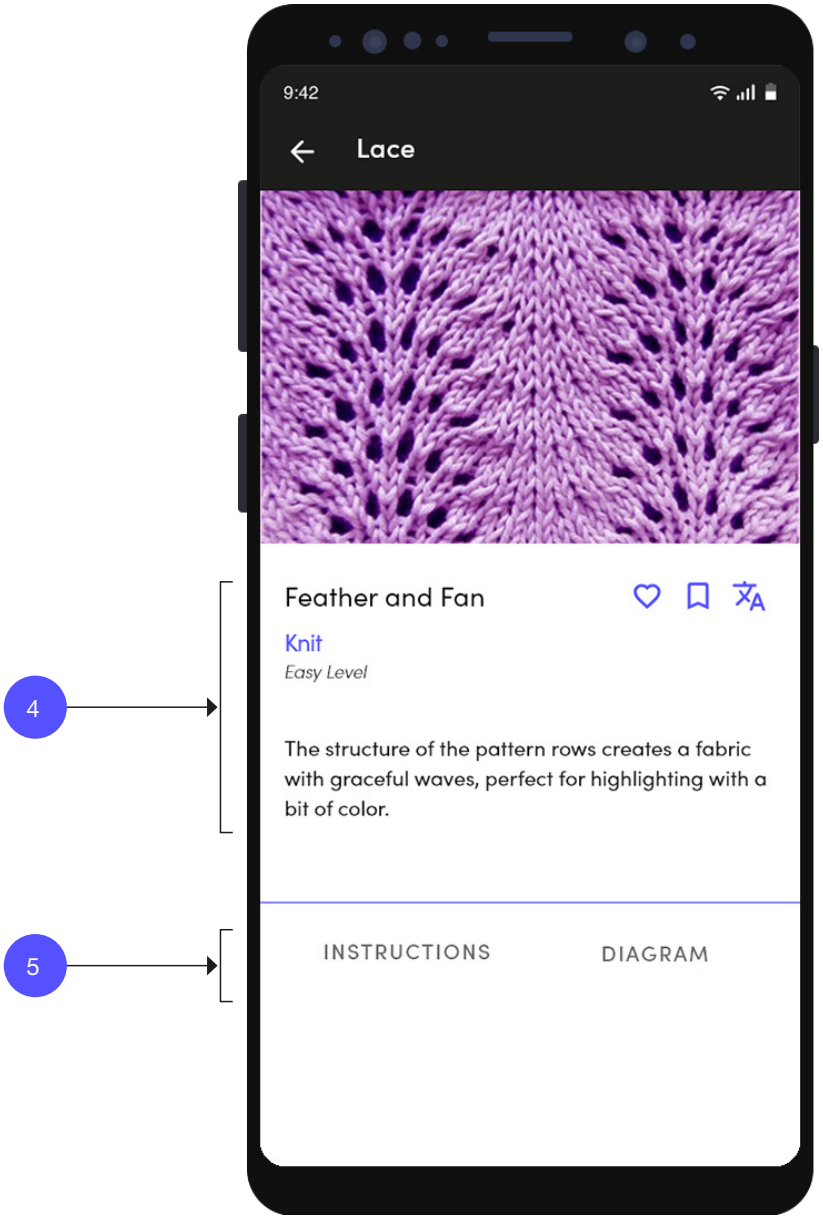
This section starts with a finder if the yarn crafter knows the name of the pattern, he or she just needs to write it down, to search that specific pattern.



(1) Finder
(2) Categories: Crochet or Knit
(3) Patterns

Figure 33. Patterns.

After yarn crafters choose a pattern, the next screen will display a photo as a reference of the final artifact, the title, a short description, and scrollable tabs. These tabs will redirect the users to the written, and chart, or diagram version of the pattern. In this way, a user can choose which instruction mode to follow or both. Moreover, if a language version is available, then the yarn crafters can choose which language to use.



(4) Title and description of the pattern
(5) Scrollable tabs

Figure 34. Example of a lace pattern.

In the instruction and diagram screens, the user will have the option to track their position, i.e., move into the pattern step by step. The step they are on is bold or highlighted. In this way, it will be easier for them not to lose their place in the pattern.

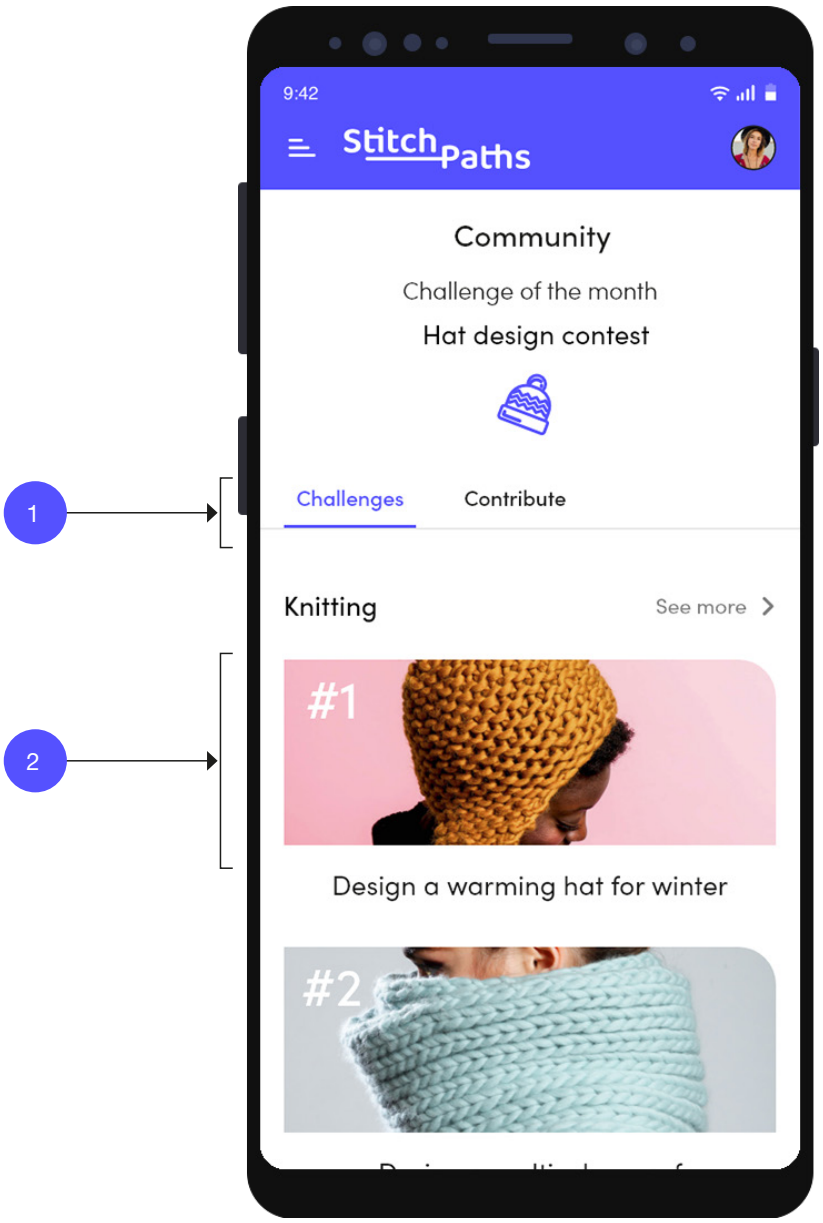
Moreover, both screens have a legend for abbreviations or symbols. In written patterns, the abbreviations explain to the user what the term is. Additionally, there are also tooltips across the whole pattern that helps the user to understand these terms. They need to hover over the element to see the informative text.

(6) Written step in bold and tooltip
(7) Diagram step highlighted
(8) Abbreviation section
(9) Stitch key in diagrams

Figure 35. Pattern instruction and diagram.

Community

The community section shows the monthly challenges or contests, and the ways in how yarn crafters can collaborate in Stitch Paths. The purpose of this section is to motivate yarn crafters in the creation of content. These contents will be part of the base of knowledge and can be accessed by anyone at any time.

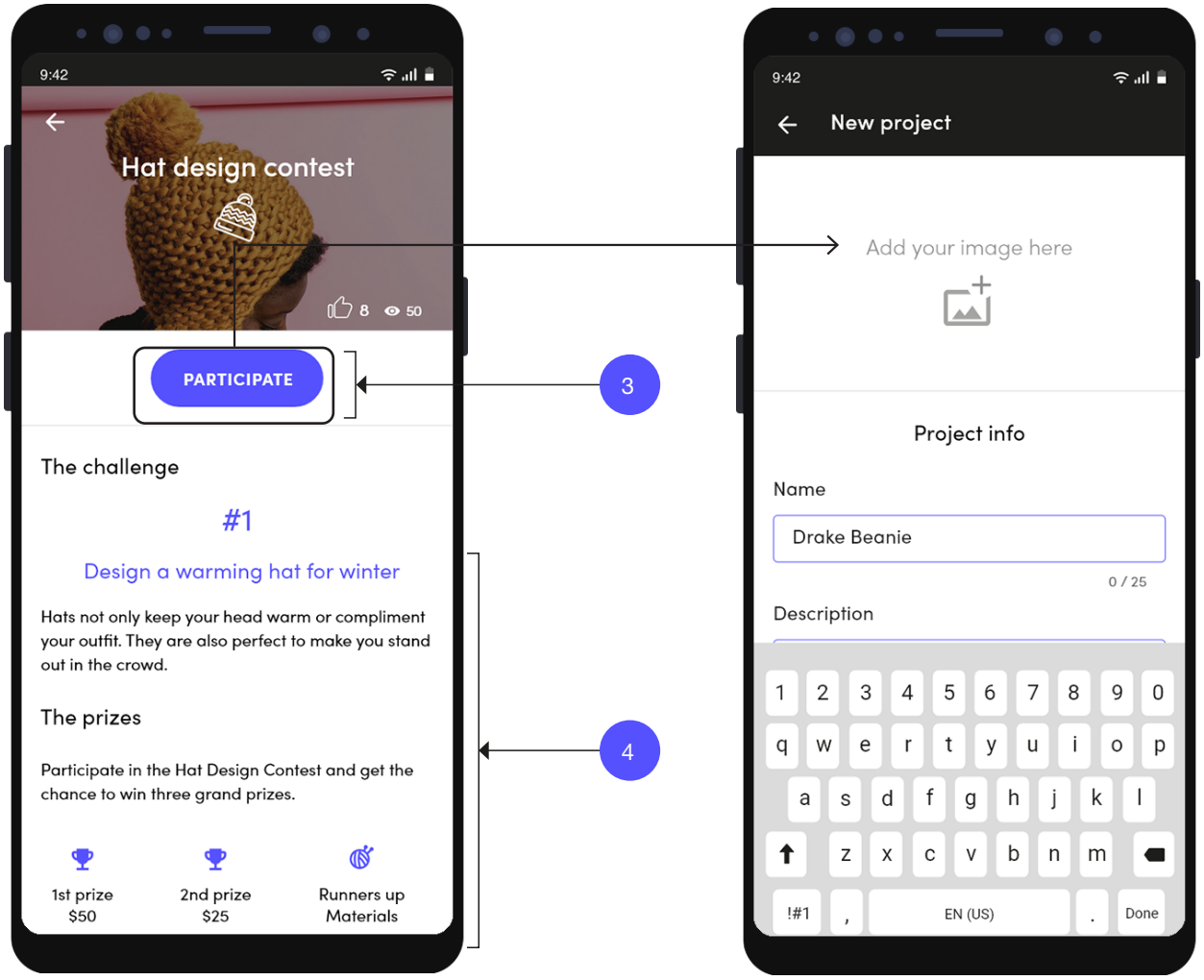


(1) Scrollable tabs: Challenges and Contribute
(2) Knitting contest of the month

Figure 36. Community.

When yarn crafters enter a challenge, they will visualize the name of the contest, a brief description of what it is about, the prizes, and the deadline to submit their contents.

The button “Participate” will redirect them to the screen “New project” from the workspace section. From that section onwards, they have to follow the same steps to create a new project.



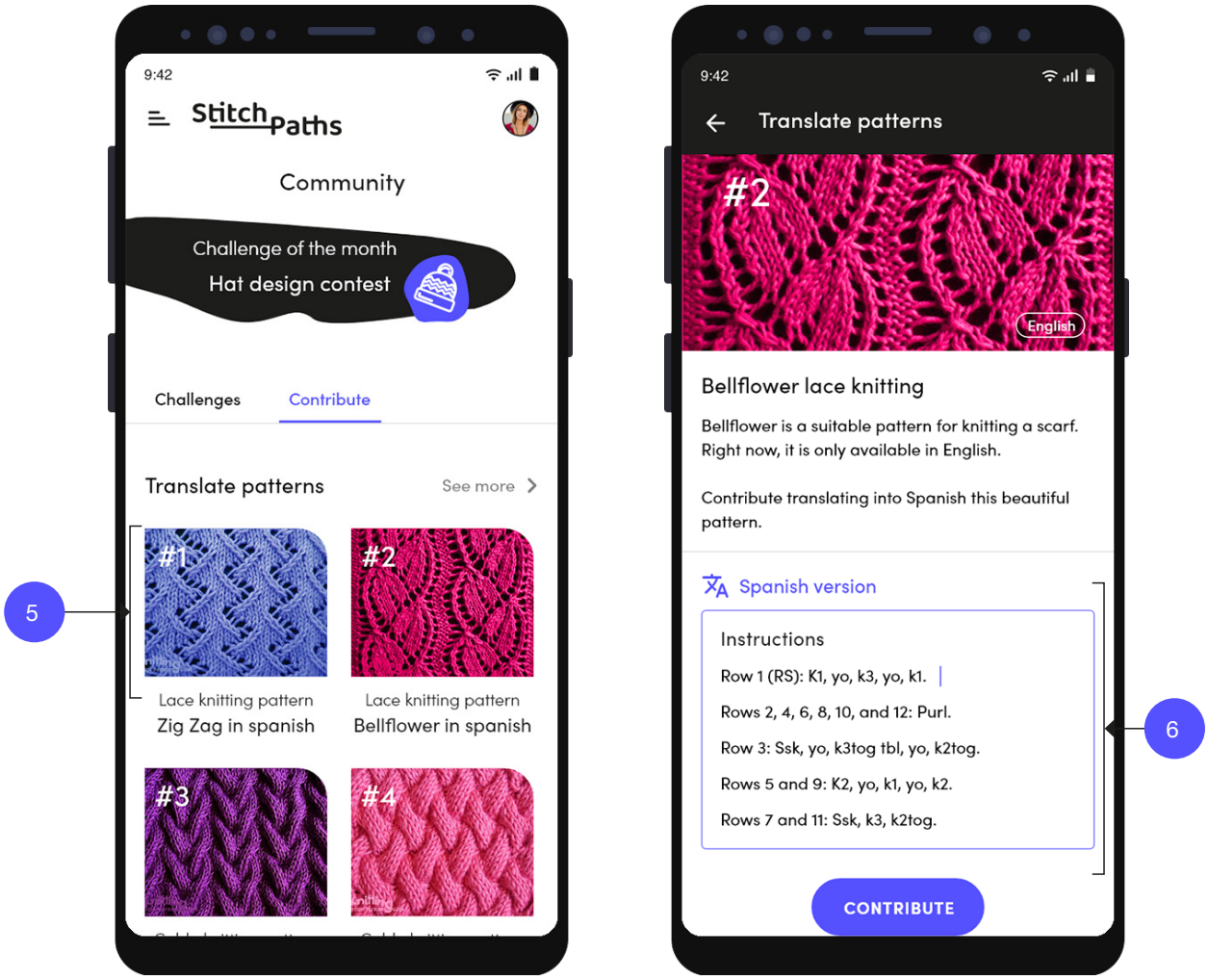
(3) Button participate
(4) Detail information of the contest

Figure 37. Community. Challenge section.

In the contribute section, the community can collaborate on translating patterns. So, anyone can access anytime to the resources and contents of the platform without being restricted by language.

To start contributing, yarn crafters have to select an available pattern and then use the editor to write down the required version, e.g., on the right screen below, the translation language required is Spanish.

By default, the pattern will be in the original language. The yarn crafter has to edit this version, using the editor and then press the button “Contribute”. So, the new language version of this pattern will be available on the platform.



(5) Knitting pattern to start translating
(6) Editor section to write down the language version required

Figure 38. Community. Contribute section.

5 Conclusions

5. Conclusions

This thesis project explored how yarn crafters beginners learn today and which methodologies can be applied to enhance their learning experiences. I have attempted to tackle problems such as the diversity of information that they face when they are learning, and the complexity that represents follow guidelines and standards instructions (patterns) to make a knitted or crocheted artifact.

Based on the analysis of the background content and exploration research, I learned how yarn crafters start their learning process. First, with their motivations to create something for themselves or others and the diverse resources they use to learn, e.g., the Internet, books, or a family member or expert that teaches them. Second, the online and face-to-face events, they pursue improving their skills and to connect with like-minded people, exchanging ideas, tips, and get inspiration. Third, learning from their mistakes, trying, and re-doing things until they succeed. For instance, when they cannot follow charts or written instructions, they use different strategies to overcome this problem since, try it again, or re-writing things in their own words to make it more understandable.

Furthermore, I found that making and creativity are boost in social environments like online communities or knitting parties where yarn crafters share the same interests, collaborate, and help others or get support. On the other hand, learning methodologies such as “learning by doing” and “expert-oriented” provided a clear path for the value proposition of this project. Recognizing the differences in how people learn, e.g., some people prefer to learn alone from a book or video tutorial. On the contrary, others prefer to be taught by an experienced knitter or crocheter. In this context, the contribution of this project focused on providing alternative ways of learning to yarn crafters beginners through a collaborative digital platform.

To promote collaboration and enhance the learning experiences of yarn crafters. This project applied a Collective Intelligence approach. Firstly, the CI was described base on the three elements that define it: people, data, and technology. In this way, yarn crafters (people) interact in the platform creating their contents (data) and accessing other content created by other users. The system recommendation (technology) procured that yarn crafters have at their disposal, content relevant to them.
Secondly, my process included the design of content strategies to promote collaboration and content creation between participants of the platform, presenting it through the design of a prototype of a mobile application for them.

As a final point, it was not possible to determine with numerical data that yarn crafter beginners will be engaging with their craft projects and boost their creativity. However, the design of Stitch Paths offered alternatives to facilitate the learning process, with the recommendation of contents, interactive patterns with access to other resources (such as patterns available in languages), and the promotion of social learning and collaboration among participants.

Limitations, future work, and recommendations

This research has some limitations. First, the study conducted through surveys and observations cannot be generalized or applied to all yarn crafters because it was restricted to groups from one online community “Ravelry” and two knitting gatherings in Barcelona. Future work should involve a more diverse sample.

On the other hand, concerning the prototype, it has designed according to the results of exploratory research. Future work would have to involve the development of the third phase of Human-Centered-Design and testing with more users to validate the functions of the application or make corrections or improvements if necessary.

Further applications should involve the addition of other functionalities to make the proposal more inclusive and oriented to universal design, e.g., people who knit with their left-hand needs sometimes to reverse directions to do their yarn craft projects.

Moreover, the inclusion of the design of patterns, e.g., when they upload their pattern design to the platform, they can receive from the community suggestions on how to enhance their design or look for testers in the community. Also, look for volunteers to help them translate the patterns into different languages. Besides content creation, yarn crafters can write directly on the platform their doubts or questions and receive help from others.

Finally, considering the intervention of other groups of people like designers, Yarn local stores, or artisans to grow the community and enrich the knowledge within the members.

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Images

Figure 1. McDougall, F. (n.d.). The People’s Reef crocheted by citizens of New York and Chicago. Curated by Christine Wertheim for Track 16 Gallery, Los Angeles. [Photograph]. https://crochetcoralreef.org/satellitereefs/

Figure 2. Barcelona Knits, 2nd edition. (2019). First fair specialized in yarn [Photograph]. https://barcelonaknits.com/barcelona-knits-2019/?lang=en

Figure 7. Ravelry, a free website for knitters, crocheters, and fiber artists. https://www.ravelry.com/account/login

Figure 8. Platform Your Learning, IBM. (2017). In IBM’s Your Learning and Watson, Together a game changer in learning. (p. 23).

Figure 9. Human-Centered-Design adapted from IDEO.org. https://www.ideo.org/tools

Figure 10. Pardee, A. (2019). Meetups in cafes. [Photograph]. THE SIX FIFTY. https://thesixfifty.com/move-slow-and-stitch-things-meet-silicon-valleys-most-dedicated-knitting-group-3f7196a11b54

Figure 11. Friday's night gatherings in yarn local stores. (n.d.). [Photograph]. The Columbian. https://www.columbian.com/news/2017/jan/24/blizzard-yarn-keeps-couple-busy-connected-with-knitting-community/

Figure 14. Nesta's Centre for Collective Intelligence Design. (2019). Collective Intelligence approach adapted from NESTA [Illustration]. Nesta. https://media.nesta.org.uk/documents/Nesta_Playbook_001_Web.pdf

Figure 39. Knitting chart pattern by Michele Wang. (n.d.). [Image]. Brooklyn Tweed. https://brooklyntweed.com/pages/reading-charts

Figure 40. Kinitting chart pattern by Norah Gaughan. (n.d.). [Image]. Brooklyn Tweed. https://brooklyntweed.com/pages/reading-charts

Figure 41. Crochet written pattern. (n.d.). [Image]. Yarnspirations. https://www.yarnspirations.com/how-to-read-a-knitting-pattern.html

7 Annex

7. Annex

Annex A

Examples of knitting and crocheting patterns

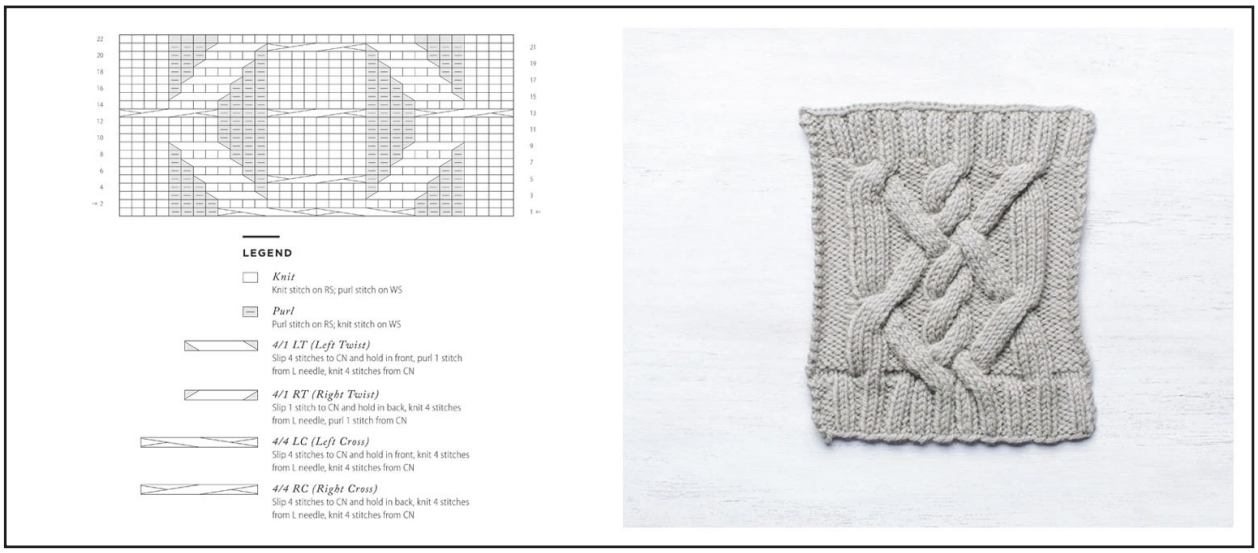

Figure 39. Knitting chart pattern by Michele Wang.

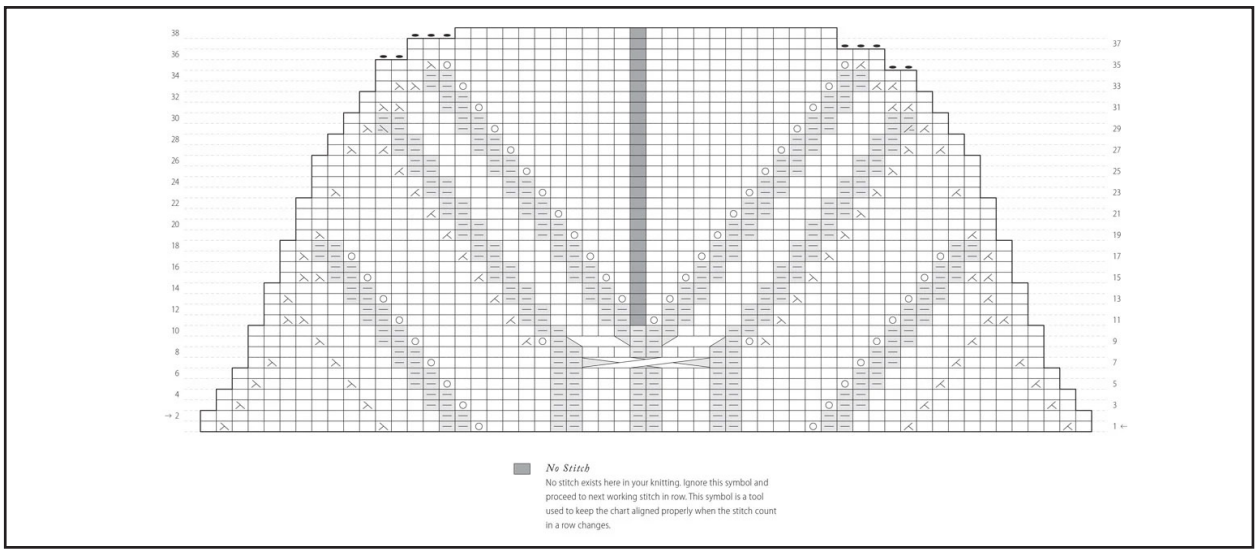

Figure 40. Kinitting chart pattern by Norah Gaughan.

Annex A

Examples of knitting and crocheting patterns

Yarnspirations™

spark your inspiration!

BERNAT CROCHET GRANITE STITCH FLOOR CUSHION | CROCHET

MATERIALS

Bernat® Blanket™ (10.5 oz/300 g; 220 yds/201 m)

Main Color (MC) Coal (10040)	**2 balls or 390 yds/355 m**
Contrast A Marrakesh (10814)	**2 balls or 375 yds/342 m**

Size U.S. K/10½ (6.5 mm) crochet hook **or size needed to obtain gauge.** 30" [76 cm] square pillow form. Five - 1" [2.5 cm] buttons.

ABBREVIATIONS

Approx = Approximate(ly)
Beg = Begin(ning)
Ch = Chain(s)
Pat = Pattern
Rem = Remain(ing)
Rep = Repeat
Rnd(s) = Round(s)
RS = Right side
Sc = Single crochet
Sl st = Slip stitch
Sp = Space
St(s) = Stitch(es)
WS = Wrong side

CROCHET I SKILL LEVEL: **BEGINNER**

MEASUREMENT

Approx 30" [76 cm] square.

GAUGE

10 sts and 7 rows = 4" [10 cm] in pat.

INSTRUCTIONS

Note: Pillow is worked in the round (rnd). Carry colors when not in use loosely up inside of work. To change color, work to last 2 loops on hook. Draw new color through last 2 loops and proceed.

With MC, chain (ch) 148. Join with slip stitch (sl st) to first ch to form a ring, being careful not to twist chain.

1st round (rnd): Ch 1. 1 single crochet (sc) in same space (sp) as last sl st. *Ch 1. Skip next ch. 1 sc in next ch. Repeat (Rep) from * to last ch. Ch 1. Skip last ch. Join A with sl st in first sc. 148 sts.

2nd rnd: With A, sl st in next ch-1 space (sp). Ch 1. 1 sc in same sp. *Ch 1. Skip next sc. 1 sc in next ch-1 sp. Rep from * to last sc. Ch 1. Skip last sc. Join MC with sl st in first sc.

3rd rnd: With MC, sl st in next ch-1 sp. Ch 1. 1 sc in same sp. *Ch 1. Skip next sc. 1 sc in next ch-1 sp. Rep from * to last sc. Ch 1. Skip last sc. Join MC with sl st in first sc. Rep last 2 rnds for pattern (pat) until piece measures approx 30" [76 cm] from beginning (beg), ending on 3rd rnd of pat (MC). Join A. Break MC.

Closure Flap: Work back and forth in rows as follows:

1st row: [Right Side (RS)]. With A, sl st in next ch-1 sp. Ch 1. 1 sc in same sp. *Ch 1. Skip next sc. 1 sc in next ch-1 sp. Rep from * 35 times more. Join MC. Break A. **Turn**. Leave remaining (rem) 75 sts unworked.

2nd row: [Wrong Side (WS)]. With MC, ch 1. 1 sc in first sc. *1 sc in next ch-1 sp. Ch 1. Skip next sc. Rep from * to last 2 sts. 1 sc in next ch-1 sp. 1 sc in last sc. Join A. Break MC. Turn.

3rd row: With A, ch 1. 1 sc in first sc. *Ch 1. Skip next sc. 1 sc in next ch-1 sp. Rep from * to last 2 sc. Ch 1. Skip next sc. 1 sc in last sc. Join MC. Break A. Turn.

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CROCHET GRANITE STITCH FLOOR CUSHION | CROCHET 1 of 2

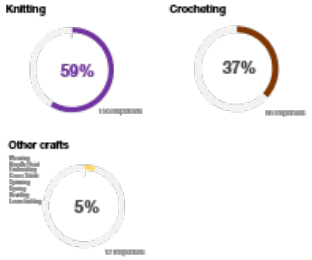
Figure 41. Crochet written pattern. Yarnspirations.

Annex B

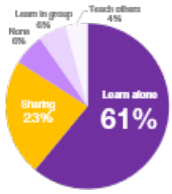
Survey results

Link to survey resutls

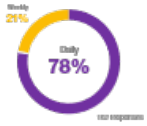
Which of the following yarn crafts are you engage in?



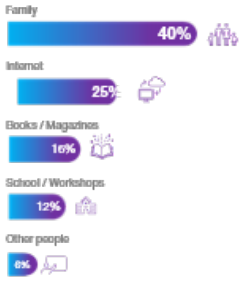
Which statement do you identify the most with?



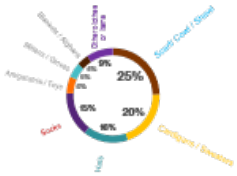
How often do you engage in these yarn crafts?



How did you learn to knit or crochet?



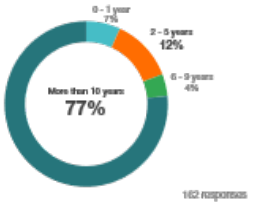
What do you usually knit or crochet?



While you are knitting or crocheting these crafts, what do you enjoy about the process?

		COUNT
25%	Relaxing / Meditative / Calming / Therapeutic	71
22%	Creating / Making / Designing / Productive / Artifact	65
11%	Keeping busy / Repetitive movements / Multitask	32
10%	Learning / Challenging	29
8%	Experimenting / Playing / Textures / Yarn / Color	24
8%	Process / Rhythm / Progress	23
7%	Accomplishment / Achievement / Satisfying	20
6%	Creativity / Unique	16
2%	Other terms (Sharing, Collecting, Sustainability)	5
1%	Interesting / Engaging / Fun	4

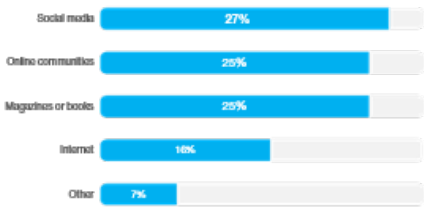
How long have you been making knit or crochet crafts?



For whom do you typically knit or crochet these yarn crafts?

		RESPONSES
FOR ME	38%	103
FAMILY	27%	72
FRIENDS	16%	42
CHARITY	13%	35
SELL	6%	15

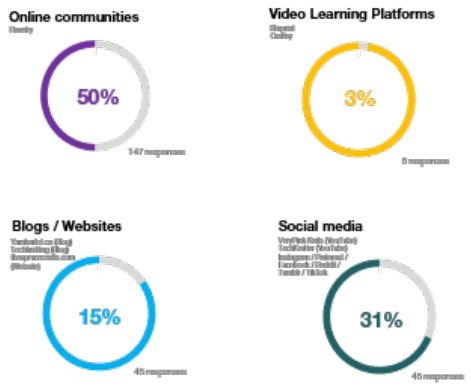
What resources do you use in order to learn a new stich, technique, pattern or design?



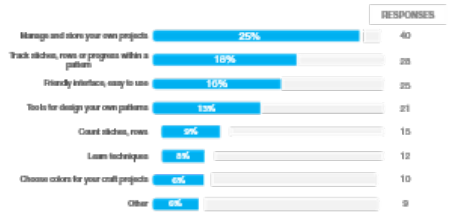
Annex B

Survey results

What blogs, online communities or video learning platforms for knitting or crocheting do you frequently visit?

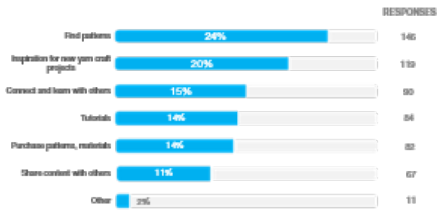


Which features of these apps or digital tools are the most that you like



What additional features would you like these apps or digital tools have? and why?

What do you like from these blogs or communities?

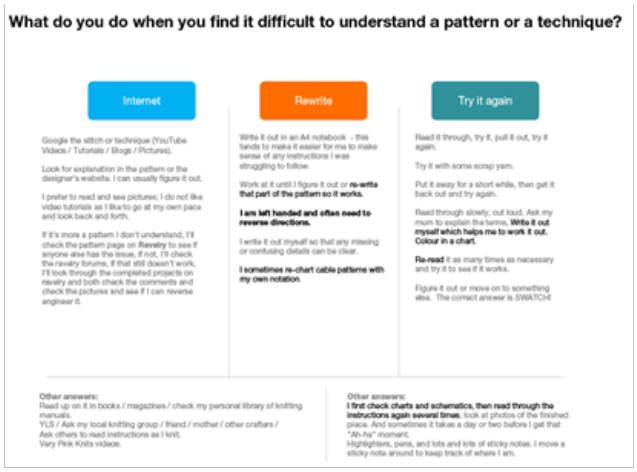


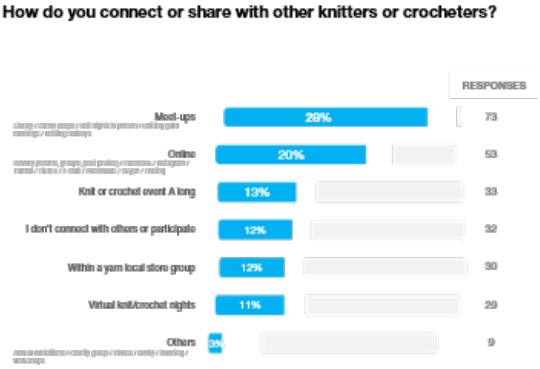
What type of patterns do you use for your knit or crochet crafts?

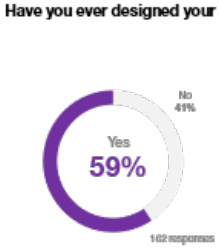
Do you use any app, digital tool or program for supporting your yarn craft projects?

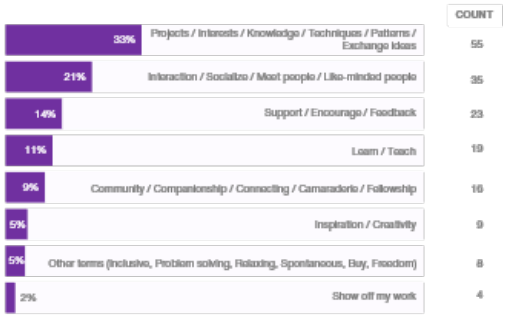
Annex B

Survey results





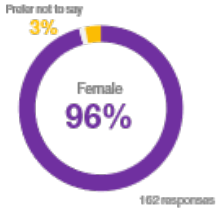




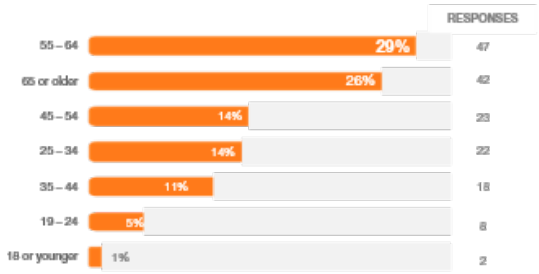
Annex B

Survey results

What is your gender?



How old are you?



Where are you from?

Which of the following best describes you?