

# **Weave: User-centered design and development of a mentoring application for entrepreneurs in emerging economies**

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<p>The aim of this thesis was to research, design and develop a mentoring and business development application concept aimed at entrepreneurs in emerging economies. Sponsored by Avis Charles Associates, the concept for the application provides a design proposal for a platform through which entrepreneurs can receive mentorship, training and guidance via a native mobile application.</p> <p>The application will provide access to three key areas: a communication platform, mentoring and business development advice, and an education and training portal with links to courses in collaboration with educational institutes or international non-governmental organisations.</p> <p>This thesis covers the user research, requirement analysis and design prototyping stages of the user-centered design process, and presents a comprehensive user study, as well as a high-fidelity prototype.</p> <p>Qualitative research methods, such as interviews and questionnaires, will be utilised in order to gain primary information on both the user requirements, as well as insights into the target users, in order to determine the core features of the application.</p> <p>Although the project will require a significant amount of additional development in order to establish the requirements, content and features for a project of such a large size, the objectives of this study were achieved successfully, and a thorough user study, as well as an interactive design prototype were completed according to the original project plan. The sponsor was pleased with the outcome of this study, and felt it produced a valuable resource to aid future development of the project.</p> <p>This study was commenced in May 2018, and completed in November 2018. Since the application is a concept that will to be pitched for further development in 2019, this study serves as a research study and design proposal for future iterations of design and development, and does not include a functioning prototype within the scope of the project.</p>	
<b>Keywords</b> User-centered design, User Experience, User Research, Requirements Analysis	

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# 1 Introduction

Globally, there are numerous mentoring programmes, which aim to mentor entrepreneurs and craftworkers in emerging economies, and provide assistance and training in the development of their businesses. As one of the biggest employers of women in emerging economies, the craftwork industry is valued at over \$32 billion, and provides further benefits to entrepreneurs, such as a greater sense of support within communities, as well as sustainable employment (Nest 2018).

Continuous training and mentoring is required to be able to coach these entrepreneurs, however, this training is not sustainable in a face-to-face format due to the resources involved. In order to maintain a constant level of mentoring, this requires the development of a digital channel through which this training can be continued remotely. The aim of this thesis was to produce a proposal for a mentoring application to address this issue, through the user-centered design process comprised of extensive background research, a comprehensive user study which addresses the needs of the users and stakeholders, as well as a high-fidelity prototype to illustrate the final concept.

## 1.1 Background

In 2010, the International Trade Centre (ITC), a joint agency of the United Nations and the World Trade Organization, launched a 10-year business initiative, The Global Platform for Action on Sourcing from Women Vendors. This initiative aims to increase the amount of educational, corporate and government aid to women vendors in developing nations (International Trade Centre 2018). As part of the mentoring scheme, Avis Charles Associates (ACA), a strategic fashion consultancy business from London, played a key role in a mentoring scheme organized by the ITC to advance the business strategy and international reach of nine businesses from developing nations including Papua New Guinea, Ethiopia, Peru and Mongolia.

After the success of the first stage of the business initiative, where selected high growth potential entrepreneurs were assisted in the development of their business models with the aid of business mentors, the next stage of the project is to develop a mentoring application for further fashion entrepreneurs in developing countries, in order to increase the reach of these mentoring opportunities. In order to make such educational and business opportunities available, the application aims to provide a direct line of contact between entrepreneurs and business mentors, as well as access to virtual classrooms and business information, in order to bridge any gaps in their knowledge.

It is crucial for entrepreneurs in developing countries to get business mentorship and advice in order to develop their businesses, and the development of a business mentorship platform allows these businesses to access this information quickly, whatever their geographical location. Making these courses accessible via mobile makes it possible to provide artisans in developing countries with the necessary skills to develop their businesses, without the need to own a computer.

## **1.2 Objectives**

The objectives of the project were to research and determine the mentoring and business development needs of fashion entrepreneurs in developing countries, in order to determine the user needs and requirements for the application through discussion with stakeholders. After ascertaining clear requirements, which were agreed upon with all stakeholders of the project, comprehensive background research and a thorough user study were completed, before proceeding to the design and development of an interactive prototype, which was researched and designed according to design principles.

## **1.3 Work Statement**

The aims of the work project were to gather and refine requirements, according to the needs of the users and stakeholders, and create a preliminary design proposal and framework for an educational business mentoring application for fashion entrepreneurs in developing countries, which will be pitched for further development at a future stage of the project.

## **1.4 Research problem**

The research problem of this study was to research, design and develop a concept for a mentoring application using User Centered Design principles, which caters to the needs of the target users of the application. In addition to satisfying the business requirements of all stakeholders and users, the final product also aimed to fulfill the core principles of usability and user-centered design.

In order to fulfil these aims, this study had to address the following issues:

- What are the user requirements of the entrepreneur user group?
- What are the user requirements of the mentor user group?
- What are the usability issues that must be considered when designing a digital product for users in developing countries?

### **1.5 Delimitation**

The final deliverables of the project include a comprehensive user study, including user research, affinity diagrams, user scenarios, user journey maps and task analysis, as well as a high fidelity prototype, which has been developed with the aid of wireframing and low fidelity prototypes.

### **1.6 Out of scope**

This study does not include the development of a functional mobile application. The final application presented as the product of this study provides a visual representation of the first visual draft of this application, which will need to go through further iterative rounds of testing and design in order to arrive at a final product for further development.

Additionally, the user-centered design process does not include usability testing of the application, due to the need for further research, design and development of the concept, prior to the testing phase.



## **2 Research Background**

The craftworker industry is one of the leading employers of women in emerging economies. These artisans, however, are in need of constant mentoring and subsequently, a digital platform is required to provide these highly valuable educational, mentoring and communication services online.

The key factors that must be considered when creating a digital product for developing markets involve choice of platform, availability of access, and the approach to usability when catering to international audiences. The research background explores the background of the business case, research into the current market in emerging economies, existing initiatives launched by other associations, as well as the concepts involved in the user-centered design process.

### **2.1 Company Background**

Avis Charles Associates (ACA), a strategic fashion consultancy, which specializes in creative direction, product development and mentoring, was founded in London in 1995. In addition to her work in the development of educational programmes for fashion, Avis has been involved in product development programmes for the IFC/World Bank, the International Trade Centre, as well as consulting for academic institutions, corporations and NGOs. As part of her own brand, Kivu, Avis actively supports women's progress in developing countries and regularly mentors female artisans from Ethiopia, India, Mongolia, Peru, Palestine and Papua New Guinea. (LDNY 2018.)

### **2.2 Research Background**

According to Nest Group's 2017 annual impact report, the artisan, or craft sector, is the 2nd largest employer of women in emerging economies, and is a \$32 billion dollar industry worldwide (Nest 2017). The majority of the world's craftworkers and artisans are most often women, and researchers of the reported also said that the work is mostly done in homes, writes Women's Wear Daily (WWD 2016).

These factors present their own challenges, and especially in communities where poverty displacement, or gender inequality threatens the local economy, hand production can be done with little training, limited infrastructure, and few resources. The promotion of artisan businesses can provide these underserved communities with multiple benefits such as the

alleviation of poverty through sustainable employment, empowerment of women, as well as the creation of support networks through work in local communities. (Nest 2017.)

Globally, there are numerous mentoring programmes, non-profit organisations and collectives who play a part in the development and training of small or grass-roots businesses in developing countries, including the Nest Guild, and SheTrades, an initiative founded by the International Trade Centre, but most operate on a face-to-face basis, as opposed to through digital channels.

These mentoring programmes can be extremely valuable to entrepreneurs, and can help artisans from emerging economies reach global audiences, as demonstrated by Mahlet Afework, one of the artisans involved in the original Global Platform for Action on Sourcing from Women Vendors programme held in 2013. Originally from Addis Ababa, Afework took part in the programme in 2013, before going on to develop a high-profile career with her brand Mafi, collaborating with UK fashion designer Markus Lupfer, exhibiting at New York Fashion Week, and getting featured in CNN style. Afework, in turn, is now able to employ local Ethiopian weavers from rural areas, helping the local economy. (CNN 2015.)

Such success stories can not only boost the profiles of these emerging designers and businesses, but also in turn, provide support and other artisans and craftworkers from their local community.

### **2.2.1 Nest Guild**

Nest Guild is a non-profit group, which aims to help artisans across the globe develop their businesses and overcome supply chain hurdles with direct programming to help them increase sales and profits (WWD 2016), especially the female artisans who make up the majority of the workforce. Nest has worked directly with Eco-Age in a joint venture, providing mentoring and business development services for its artisans, and works with 180 artisan businesses, and 36,000 workers around the world, in 40 countries including Peru, India and Bangladesh.

Nest has a number of initiatives including the Nest Professional Fellowship program, which provides artisans and craftworkers the opportunity to connect with professional experts, and Nest Connect, which promotes learning and growth through expert-led industry webinars, personalized phone consultations, downloadable resource guides and intensive mentorship projects with professional fellows. (Nest 2018.)

Within their mentorship and business accelerator programmes, Nest aims to pinpoint the most significant challenges faced by participating artisan businesses. When accepting new artisans and entrepreneurs into their programmes, Nest issues an intake survey to all artisan businesses with whom they partner with to directly collect data surrounding their greatest hurdles to business growth and successful brand partnership (WWD 2016), explains Rebecca Van Bergen, the founder of Nest. In regards to the challenges that artisans face in their production process, Nest lists quality control and product consistency as one of the major pain points, especially when these products get exported to international markets, where quality control is a much more stringent process.

Although Nest operates primarily on a face-to-face basis, they provide some digital services such as webinars, white papers and phone consultations hosted for artisan businesses across the world (Zoe's Fashion Fix 2016). Nest connects mentors and artisans both on-site, as well as online, utilizing technology such as Skype or Whatsapp to work with artisans remotely.

### **2.2.2 SheTrades**

The SheTrades initiative, founded by the International Trade Centre, a branch of the United Nations, is one of the biggest initiatives globally to assist entrepreneurs and develop businesses around the world. SheTrades provides women entrepreneurs around the world with a unique network and platform to connect to markets, where corporations can meet and identify women-owned supplying companies of goods and services. (SheTrades 2018.)

The SheTrades platform allows women to connect through forums, attend webinars and online courses, and get business guidance from mentors worldwide. The SheTrades app lets women entrepreneurs improve their skills and as a result their businesses. SheTrades is designed to help women entrepreneurs to share information about their companies, increase visibility, find new business and partnership opportunities, expand their network, and improve their skills through events and webinars organized by SheTrades and its partners. (SheTrades 2018.)

SheTrades currently has several hundred women entrepreneurs participating as part of its initiative, and aims to connect one million women entrepreneurs to market by 2020.

## **2.3 Technological considerations**

The key factors that must be considered when creating a digital product for developing markets involve the choice of platform, availability of access, as well as the approach to usability when catering to international audiences.

According to Nest, most artisan businesses today have access to the internet and at least one English speaker on-staff, which means that there is more that can be done to leverage today's cutting technology to reach more artisans (Zoe's Fashion Fix 2016).

There are, however, particular regions where connectivity and Internet access are more problematic, comments Juan Hoyos of the International Trade Centre, during an interview held as part of the user research chapter of this study (Chapter 3.2.1). Bilum craftspeople in Papua New Guinea, for example, are very limited in terms of technology, as Internet access is incredibly expensive and accessible only to a very limited amount of people.

This sub-chapter explores the issues of usability involved in the development of this project, including the adaptation of mobile technology across different regions, the forecasted development of mobile technology, as well as further usability issues that play a part in the design and development of applications in emerging economies.

### **2.3.1 Adaptation of mobile technology in developing countries**

The global phenomenon of leapfrogging in Internet access is an extremely relevant concept in the development of a digital platform or service for developing countries. In the last decade, the number of mobile phone users has grown to four billion, with 37 percent of that growth occurring in developing economies (Borgen Project 2018).

Internet penetration varies globally, with Northern Europe leading the statistics at 94% Internet penetration, as well as Western Europe at 90% and Northern America at 88%. Various regions in Africa, however, have significantly lower penetration rates, as shown in Figure 1 below. The regions of Middle Africa and Eastern Africa have the lowest penetration rates worldwide, at 12% and 27% respectively. (We Are Social 2018).

January 2018

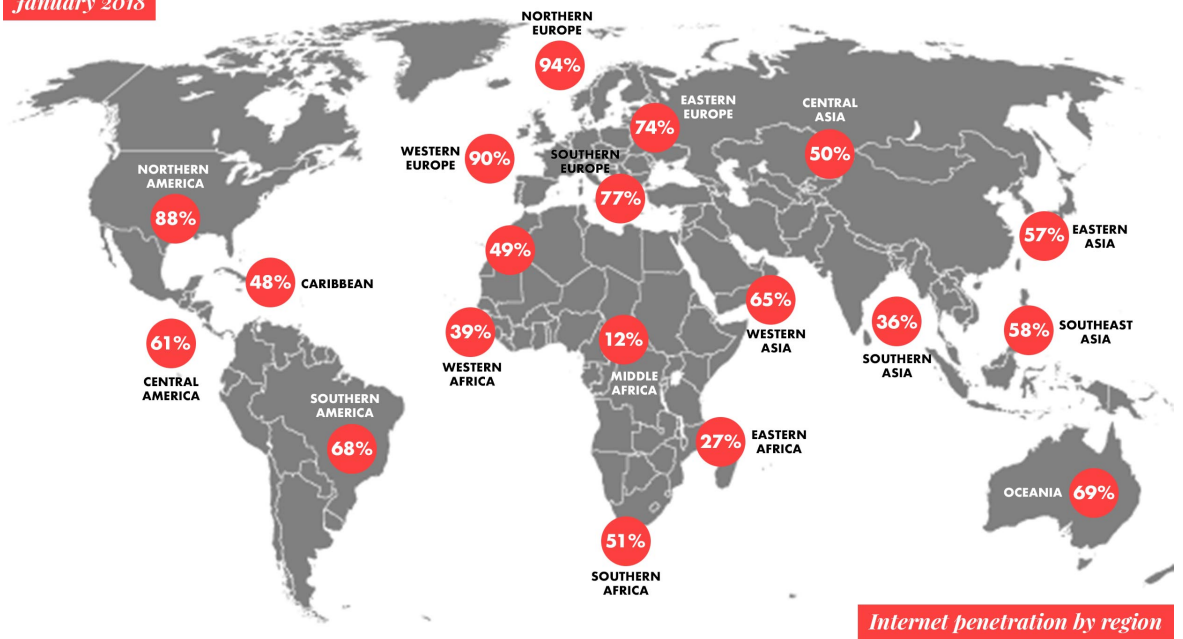


Figure 1: Internet Penetration by Region (We Are Social 2017).

The rapid spread of mobile technology, however, is helping even the least developed nations access the internet, and is helping developing countries “leapfrog”, or bypass more traditional technologies such as landlines, allowing countries to make a quick jump in economic development by harnessing technological innovation (Forbes 2018).

According to Forbes, smartphones count for a third of all handsets in Africa, and many of the 50 countries in sub-Saharan Africa are expected gradually to close the gap on the rest of the world as handsets become more affordable. In developing countries across Asia and Africa, smartphones can now be purchased for approximately \$30, leading to increased access to digital marketplaces. (Forbes 2018.)

### 2.3.2 Usability Design for developing countries

In order to create a product that caters to a global audience, there are many usability factors, which influence the design, development and technological specifications of the applications, particularly in the development of the content involved.

According to a forecast published in the latest annual Ericsson Mobility report 2017, the number of 4G LTE subscribers in Sub-Saharan Africa will grow from just 30 million this year to 310 million in 2023. With investments being made in Sub-Saharan Africa, the number of WCDMA/HSPA [3G] and LTE [4G] connections in 2023 are set to rise to 90% of all subscriptions. (Connecting Africa 2017.)

There are, however, still a large amount of users operating on sub-3G networks, so one of the key usability elements that must be addressed in the development of a mobile platform is the optimization of the size of the content, such as the compression of images to reduce data size. In order to make the mobile web sustainable for all users, there needs to be a more simplified version of the content that can be easily processed by slower mobile web subscriptions. (ICS 2016.) This means that websites or applications must be efficient, and reduced in size, in order to cater even the most remote locations.

Price is also a significant factor in mobile data usage. Countries such as Tanzania or Kenya are countries where mobile phone plans are more expensive and people usually pay for every megabyte they download (Fast Company 2016). This means text, for example, is cheaper in terms of data, whereas graphic design needs to be kept visually simple, and animations should be avoided.

## **2.4 User-Centered Design Concepts and Definitions**

A term coined by Donald A. Norman, and later popularized by his book, *User-Centered System Design: New Perspectives on Human-Computer Interaction* (Norman & Draper 1986), User-Centered design has become central to the process of the design and development of smart products, which are designed with the user in mind.

User-Centered Design (UCD), is a design philosophy that puts the user of a product, application, or experience, at the center of the design process. (Pratt & Nunes 2012, 12). Through phases of research, design, prototyping, testing and evaluation, it is possible to create a design, which above all, takes the user's needs into consideration, and evaluates the value provided to the user after completing all these stages.

### **2.4.1 User Research**

User Research, according to the Interaction Design Foundation, is the systematic investigation of users and their requirements, in order to add context and insight into the process of designing the user experience (Interaction Design Foundation 2018). It is the process of understanding the behaviours, needs and motivations of users, through user research techniques such as observation and analysis, in order to create empathetic and relevant designs, which focus on the user, and respond to their needs.

The User Research process includes various stages of research, including the creation of user personas, which represent the habits, goals and lifestyles of our target user group. According to Usability.Gov, the purpose of personas is to create reliable and realistic representations of your key audience segments for reference (Usability.gov 2018). After gathering user insights and establishing a user persona, the user story, scenario map and sitemap can then be created to map out the journey the user will take when they use the application, as well as the flow of actions taken when completing tasks.

These are important points to establish prior to starting the design process, as they guide the layout, placement and features of each application page.

## **2.4.2 User Interface Design**

User Interface Design focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate those actions (Usability.gov 2018).

The design process for the user interface also consists of various stages, including the creation of sitemaps, wireframes, low and high fidelity prototypes, after which the visual design aspect, which involves colour schemes, icons, typography and logos. The User Interface Design should be evaluated by following Nielsen's 10 Usability Heuristics (Nielsen 1994, 152-158).

- Visibility of System Status
- Match between the system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose and recover from errors
- Help and documentation

These usability heuristics will be explored more in depth in Chapter 5.5.2, where the final design prototype will be evaluated according to these guidelines.

### 2.4.3 Usability

Usability is a term that refers to the degree of ease, effectiveness and efficiency that a product is to use. As defined by the ISO, usability is the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (ISO 2018).

Usability is a crucial aspect of any product or service on the web, as it determines how long visitors will spend on the website, how soon they will leave, and how willing they are to explore further. Defined by five key qualities, usability is measured by learnability, efficiency, memorability, amount of errors, and user satisfaction.

Learnability, according to Nielsen (1993, 27) is the most fundamental usability attribute, since most systems need to be easy to learn. Users should be able to achieve a sufficient level of proficiency within a reasonable amount of time in order to be able to find the system useful. Efficiency of use, in turn refers to the time it takes users to learn how to use the product, as well as the user's performance in completing tasks.

Memorability refers to the ease of which users are able to reestablish proficiency, and remember how to use the product after a significant period of no use. A product with a strong mental model makes it easier for users to return to the product time after time. In regards to errors, users should make as few errors as possible when using a computer system. (Nielsen 1993, 32.) Any action that causes the user to fail to accomplish their goal should be avoided at all costs, as this can decrease satisfaction and productivity, discouraging the user from returning to the product.

The final usability attribute is measured simply by how pleasant it is to use the product. Factors such as safety, pleasant interface, ease of use, and helpfulness all contribute to the user satisfaction of the product, and can also be influenced by the design elements of the product.

Due to the amount of applications available on the market, it is extremely important to ensure that a product, above all, has a great user experience. In order to make sure that users of the application do not get frustrated with the application, all five of these qualities must be fulfilled.



### **3 User Study**

In order to define the required features for the Weave mentoring application, a comprehensive user study was created to determine the business development & mentoring needs of fashion entrepreneurs in emerging economies. This User Study involves background research through qualitative research methods, as well as user research through affinity diagrams, user personas, scenarios, journey mapping and task analysis.

#### **3.1 Research Methods**

The objectives of the project were to research and determine the mentoring and business development needs of fashion entrepreneurs in developing countries, in order to ascertain the requirements for the application through discussion with stakeholders, and subsequently, the desired features of the service.

Qualitative research was used as the chosen method for the data collection. Qualitative research, which is used to gain an understanding of underlying reasons, opinions, and motivations, provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research (Snapsurveys 2011). Since the primary form of data collection for this study includes interviews and questionnaires to discover the user needs, this was the most relevant method for the study.

The research process involved primary data collection through questionnaires with a select group of entrepreneurs from around the world who represent the target group, as well as more extensive interviews with selected business mentors, associations and collectives who work with similar entrepreneurs in the mentoring and development of their businesses.

The entrepreneur questionnaires were provided to the target users in a structured format, with the use of the Typeform data collection tool, using a variety of multiple-choice, open text and other questions in order to gain the most valuable feedback possible, in a suitable format.

Although the initial aim for the more extensive business mentor interviews was to hold structured interviews, with a set of pre-determined questions, the final interviews were of a semi-structured nature. The interview questions, which were initially drafted for the purpose of the interviews, explored some of the technological and business issues facing

these entrepreneurs, as well as the nature of the work that the mentors do when mentoring and developing these businesses.

Additional user research methods, such as the creation of personas, user journeys, affinity and flow diagrams also aided the study. The aim of the User Study was to explore the methods used to gather this data, as well as completing thorough analysis of the data gained in the process.

### **3.2 User Interviews: Business Mentors**

Worldwide, there are numerous mentoring programmes, non-profit organisations and collectives who are dedicated to the development and training of small or grass-roots businesses in developing countries. In order to gain further information about the user needs from a mentor perspective and to establish the mentor profile for the application, qualitative research was gathered from this user group through a set of interviews.

For the purposes of this research study, five interviews were conducted with key business consultancies, mentors and representatives from these development initiatives, as well as companies who employ, and work with these artisans on a regular basis. The following five subjects, chosen for their particular expertise or experience with artisans at various stages of their development, were interviewed at length between July 2018 and August 2018:

- Juan Hoyos, Advisor for the International Trade Centre
- Harriet Vocking, Head of Marketing and Communication for Eco-Age
- Tukwini Mandela, Marketing Director for the House of Mandela
- Richard Mkoloma, Creative consultant and business mentor
- Avis Charles, Founder of Avis Charles Associates

Conducting interviews and gathering primary data from these various sources helped to provide a broader overview of the user needs of these business mentors, when they are providing mentorship, guidance and business development advice, as well as the needs and requirements of the entrepreneur user group.

Often, small business owners and entrepreneurs in grass roots stages have particular skills, or unique products, but lack the skills to structure their businesses. Gaining perspective on what they believe the entrepreneurs need, and what they have observed throughout their work with these artisans and entrepreneurs was extremely valuable, as

they are able to see the problems of the artisans from an outside perspective, and have experience working with a variety of businesses, from the grass roots stage, to more established brands.

The information presented in the following sub-sections originates from the interviews held with the subjects listed above.

### **3.2.1 ITC**

Due to the extensive work SheTrades does across the world with entrepreneurs and artisans, they were a key contact to gain further insight into the issues faced in the mentoring process, as well as the key requirements of such a platform. The International Trade Centre was also of the first contacts for the development of this platform, as Avis Charles works closely with the ITC in the mentoring and development of entrepreneurs, and subsequently plays a large part of their mentoring and development process. A Skype interview was held with Juan Hoyos on the 2<sup>nd</sup> August 2018. Juan is the Sustainable and Inclusive Value Chains advisor for the International Trade Centre, and one of the key advisors for the SheTrades initiative.

Since the Global Platform for Sourcing from Women Vendors, the initiative has been growing and many developments have taken place. The aim of the initial Global Platform in 2013 was to connect women with vendors, but during the interview, Juan comments that extent of the mentorship was very light, and not long-term enough, due to the need for face-to-face mentoring on location in London. The entrepreneurs involved in the mentoring initiative were from Peru, Papua New Guinea, Mongolia and Ethiopia, and thus were limited in the amount of face-to-face mentoring opportunities, due to the geographical distance and the cost involved. The challenge is now to expand these mentoring possibilities through digital means.

In 2015, ITC launched a tech challenge in collaboration with Google, with the aim of creating a platform through which corporations can meet and identify women-owned supplying companies of goods and services (International Trade Centre 2018). The winning application, SheTrades, was then launched in 2015 and has evolved into a full initiative.

There are many challenges facing the shift to a more digital platform, however. Online training is very limited, and not for everybody, Juan comments. Some people can benefit well from online platforms, whilst others cannot. The ITC currently provides online courses via their trade academy, SME, and are currently in the process of creating a virtual learn-

ing space, which is free to register for everyone. The ITC also works with partners such as Sigley Austin, who provide pro bono law consultancies for brands.

In addition to learning, Juan stresses that it is crucial not only to educate entrepreneurs, but to coach them at the same time to change their behaviour. Although the online training, homework and forums are valuable tools, these alone aren't enough to mentor the entrepreneurs into changing their mindset. These entrepreneurs require training through webinars, followed by further face-to-face mentoring. Even though the nature of online training alone is still quite light, the entrepreneurs do still learn a lot through the online training sessions and webinars.

The shift to online education and mentoring also faces another issue- connectivity. SheTrades works with women in more remote areas such as the Pacific Islands, where the artisans are extremely limited in terms of technology. Shedding further light into the technological situation in more remote areas, Juan explains that in Papua New Guinea, Internet access is so expensive that only a few people have full time access to it. However, with connectivity growing globally, he notes that even in developing countries, people do have access to smart phones.

Due to the resources required to mentor artisans both in terms of time and funding, SheTrades invites everyone who complies with the criteria to join the SheTrades initiative, and then selects a small batch of companies that show the most promise in terms of future growth prospects. SheTrades then sponsors their participation in international events, and provides training, as well as face-to-face coaching by ITC's roster of consultants. In this sense, the SheTrades app is used mostly for qualification and review at this stage, although the virtual learning space is currently in development to make it more sophisticated.

### **3.2.2 Eco-Age**

Eco-Age is a sustainability and brand consultancy, which helps businesses grow by developing sustainable strategies, increasing brand awareness and providing commercial and supply chain insights. In addition to their work with brands, Eco-Age works closely with suppliers and artisans and connects them to brands worldwide. (Eco-Age 2018.)

In the recent Commonwealth Fashion Exchange, developed in partnership with Swarovski and Google Arts & Culture, many of the designers worked with extremely small communi-

ties where artisans worked in groups to create specialized handcrafts specific to that area. (Eco-Age 2018.)

During the interview with Eco-Age, several areas of business development, technology in emerging economies, and habits of the entrepreneurs Eco-Age works with were discussed to gain further insight into the situation. When working with small brands, Vocking explains the issues that most small businesses face and the areas they need most assistance in is scalability. In addition, she mentions that scalability is often the biggest issue in terms of brand and craft development, and growing small handcrafts into bigger, more profitable businesses is often the issue.

Collaborations between Eco-Age, designer brands and artisans often require a lot of communication throughout the course of a project. According to Vocking, communication would happen mostly via email and phone, however in some cases, even social media channels were utilised. In the case of a bigger brand, brands might speak directly with the entrepreneur or artisan, whereas if they were at a small, grass roots level they might have a representative who they would speak to on their behalf. The amount of communication between brand and artisan also varied a lot and would be totally individual to each relationship.

Issues that arose during these collaborations often centre on communication and scheduling, Vocking comments. In regards to the feasibility of an application, Vocking agrees that it could assist the process, especially if entrepreneurs could sign up via a registration form. She comments that a directory of artisans for brands would be the most important and useful tool, as that does not currently exist.

### **3.2.3 House of Mandela**

The Mandelas work with entrepreneurs from South Africa and the local area, helping entrepreneurs develop their businesses. The Mandela family also works with local businesses, all the way from grass-roots artisans to larger suppliers in the production of jewellery, art pieces and South African wines. (House of Mandela 2018.)

As part of the House of Mandela product range, the Mandela family also produces a range of commemorative jewellery, manufactured in South Africa. One of House of Mandela's suppliers is a collective of 5-10 women in Soweto, South Africa, who work on traditional Zulu beading techniques.

Communication happens mostly through phone and email, as well as Skype. In terms of arranging communication, even with smaller suppliers in South Africa, Mandela explains that technology is never really the problem. Communication via application would also be an extremely feasible option, due to the high levels of mobile usage and the usage of tablets in her community.

Skype or video conferencing is also extremely important when communicating with suppliers, as at times it is just not possible to be in the geographical area. Video conferencing facilities are no longer expensive, especially in South Africa, so this lets entrepreneurs have increasingly more access to such facilities.

On the subject of the issues that smaller grass-roots businesses, or entrepreneurs face, Mandela comments that scalability, financial structure and cash flow management, increasing sales, as well as catering to an international market are the most prevalent.

Scalability is often the problem, according to Mandela. Often, entrepreneurs are trying to do this and grow their businesses, but they don't necessarily have the skills or the knowledge to achieve it, Mandela comments. When creating a product, it is crucial to make money and distribute it to a large audience. Acknowledging that the product needs to be brought to international markets, as opposed to just the South African market is also an important part of the process to globalize their businesses.

Financial investment, managing cash flow, and establishing a structure for their business are the keys to success, Mandela comments, as it allows entrepreneurs to support themselves through their businesses. They need support from people with a financial background who can help manage all of these things and put a financial structure in place for them that they can easily manage themselves later, because ultimately they need to do the work themselves. Entrepreneurs need to take into consideration the cost of raw materials, their rent, the labour costs, as well as any administrative costs, all into their final budget.

#### **3.2.4 Richard Mkoloma**

Richard Mkoloma is a multi-disciplinary creative consultant who specialises in brand conceptualisation and creative strategy, apparel design and research in areas of womenswear, menswear, accessories and lifestyle. Richard has a diverse portfolio of clients that also includes charities, social and educational organisations. (Richard Mkoloma, 2018.)

Although Richard's experience is primarily with more established brands than the initial target users, grass roots enterprises in developing countries, his experience as a mentor brought up some valuable considerations, even at a smaller scale.

The two main considerations Richard brought up when discussing brand mentorship was the importance of being able to provide a unique mentoring package for each brand which is specific to their needs, as well as the establishment of limitations in regards to the extent of the mentorship programme provided.

As Richard emphasized in his interview, a "one size fits all" approach would not be a viable option, and in order to create a successful mentoring app, any application which provides mentorship services would have to be customisable in order to allow each brand to receive the kind of mentoring that is applicable to them. Richard also recommended researching current mentoring applications in order to assess the gaps in the market, in terms of features and the services they provide.

In order to provide each brand with a unique mentoring package, the application would have to take a number of considerations into mind- including the area they want mentorship in, how long the mentorship is needed for, the stage they are in as a business, as well as the relationship between the brand and the mentor.

These limitations also present an issue in regards to the provision of an address book of mentors. Although mentors can provide general help without a thorough assessment of the brand's current situation, further consultation would be required in order to provide individualized advice.

In order to address the issue of scheduling, the application would also need to have inbuilt scheduling software in the form of a booking system and calendar app in order to provide a clear, organised system for both mentor and entrepreneur. This would allow clear booking of meetings, options to cancel or rebook meetings, as well as provide clear schedules.

When it comes to the length of the mentorship packages, these are business requirements which need to be pre-defined by both the mentors, and the service providers in order to define how much time the mentor can allocate to each brand. Are the packages entirely customisable, or does the service provide pre-planned packages to choose from, and edit as needed? Is the mentoring charged per question, per session or per package?

Mentorship fees would also require a payment system within the application. If there are pre-determined mentorship packages, these can be integrated into the payment system as options, however, if the mentorship package requires an entirely unique, customisable schedule, the mentors would need to determine the fee themselves via a billing system.

Further issues that arose after the interview include the feasibility of the information forum. Although this can be an incredibly useful tool, the issue of competition must also be considered. Will all brands want to share useful information to each other, especially if they are competing in the same business area, or country?

### **3.2.5 Avis Charles**

Initially proposed by Avis Charles Associates (ACA), a strategic fashion consultancy based in London, the design will be presented to ACA and select business mentors as a concept for future development.

The application will serve as both a communication channel, as well as an educational platform for fashion entrepreneurs in developing countries to communicate with, and get advice from selected business mentors. The application aims to provide general business information and advice about fashion entrepreneurship, virtual classrooms for monetised courses, as well as direct messaging channels to business contacts. The application not only needs to provide an educational service, but a clear, user-friendly design to cater to non-native English speakers in developing countries who are less familiar with technology.

It is important for fashion entrepreneurs in developing countries to get business mentorship and advice in order to develop their businesses. Although there are foundations and business advisors to help these entrepreneurs grow and transform their businesses from grass roots companies to global businesses, the issue lies in how to provide these educational services, so they are accessible at anytime or place, regardless of the time zone, or location they are in.

Entrepreneurs in developing countries require a way to communicate with these mentors and advisors via a communication channel other than phone, or email, as these limit the times when they are able to get advice. The development of a business mentorship platform, which is able provide an instant messaging service, as well as an educational environment with access to business advice and virtual classrooms in order to gain further knowledge about areas such as production, patterncutting and development, will allow these businesses to access this information quickly and wherever they are. Making these



courses accessible via mobile makes it possible to provide artisans in developing countries with the necessary skills to develop their businesses, without the need to own a computer.

### **3.3 Application Requirements**

In order to establish the requirements of the applications, the requirements were determined through two methods- the sponsor requirements, as well as the additional user requirements discovered through user research.

Although the sponsor provided initial key business requirements for the application, the additional needs and features which came up through the mentor interviews and target user questionnaires helped define and refine the core features of the application concept.

### **3.4 Application Requirements provided by the sponsor**

Before ascertaining the final requirements through the user research, the sponsor provided some initial business requirements for the application, which are as follows:

- To provide a communication platform through which business mentors and artisans and entrepreneurs can communicate instantly via mobile
- To provide artisans and entrepreneurs with up-to-date business advice and tips via an information section within the application
- To provide a link, or portal to an online classroom where artisans and entrepreneurs can further their education and training

It is also important to note that in terms of the delimitation of the requirements application, the sponsor also specified that the application is mainly for education and mentoring purposes- and does not aim to cover areas such as supply chain management, production or manufacturing.

#### **3.4.1 Useful Information section**

One of the key areas of the application specified by the sponsor is an information section, which artisans can refer to as the first port of call when searching for advice or information. This area provides useful documents, a library section and a selection of webinars. The information section provides areas of information, grouped by different business ar-

eas such as business development, design and production. Business partners, such as the Cherie Blair foundation, will provide the data for these sections.

Examples of the information provided include:

- Shipping information by country
- Business plan development guides
- Guides for brand and collection development, with documents including how to create a critical path
- Useful links to material including eBooks and websites

### **3.4.2 Communication section**

Another key section of the application is centered on communication services. The application provides a chat section, similar to other messaging services such as Whatsapp or Messenger where artisans can communicate with business mentors for free without the need for emails or calls, as well as a discussion forum, where entrepreneurs can discuss various topics and share information.

The messaging service also provide features often used in messaging services, including a chat log, with a contact list and options for group chats, video calling and file sharing. The contact also has a user profile with online status, profile image and chat settings.

An additional feature, which was requested specifically by Eco-Age, was the inclusion of a directory of artisans. This contact list of artisans provides a useful list of contacts for both the mentors and potential suppliers, as well as fellow artisans.

### **3.4.3 Virtual Classroom section**

The third key area of the application aims to provide a portal to an online classroom area, where artisans are able to access free and online courses to further their knowledge and education. The application will partner with an educational institute such as London College of Fashion to provide a selection of monetized online courses at different levels, ranging from free courses, to premium courses, which are paid for via the application. Some educational partners already provide a selection of online courses, so the courses will not have to be developed from scratch for the application. Educational institutes such as the London College of Fashion are ideal candidates for such partnerships, as they are

already involved in various initiatives in the development of businesses in emerging economies.

One of the key usability considerations for this section is the use of data. Since a number of developing countries charge data usage by the megabyte, the content will have to be tailored in order to provide courses that are accessible to all users, in order not to exclude large numbers of artisans or entrepreneurs who are limited by the amount of data.

The key features of the classroom section are as follows:

- A portal to online classrooms
- Free basic courses
- Monetized premium courses
- A progress board, which shows courses in progress, completed courses and the courses that have been taken. In order to monitor how entrepreneurs are progressing, the mentors can also access this feature. A progress bar will also be included to improve usability, and provide psychological rewards.

#### **3.4.4 Further Features**

Additional features that are included in the application include the user profile, registration and login area, as well as a settings section. After speaking with the business mentors, it also became apparent that the registration area should not only gather the contact details of the participating artisans, but gather further information of the artisans' individual mentoring needs in order to be able to provide a better service. By including a short questionnaire, which requires the artisans to fill in their current challenges and needs, this will also help chart the need for particular mentoring areas.

The user profile includes separate entrepreneur and mentor sections, which provide customized areas. Entrepreneurs are also be grouped internally into various stages, from grass-roots entrepreneurs, to businesses at a further stage of growth.

#### **3.4.5 Technological specifications provided by the sponsor**

The sponsor specified that the application should be a native application, developed for iOS. However, after researching usability issues in developing countries, and global operating system market shares, it is critical that the application should be developed for the Android operating system as well.

According to the IDC, the Android market share currently stands at 84,8% and is expected to rise to 85,5% by 2022, as illustrated in Figure 2. (IDC 2018.) As a result of this research, the proposed change was presented to the sponsor, and agreed upon for future development.

Year	2016	2017	2018	2019	2020	2021	2022
<b>Android</b>	84,6%	85,1%	84,8%	85,2%	85,3%	85,4%	85,5%
<b>iOS</b>	14,7%	14,7%	15,1%	14,8%	14,6%	14,6%	14,5%
<b>Others</b>	0,7%	0,2%	0,1%	0,1%	0,1%	0,1%	0,1%
<b>Total</b>	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Figure 2: Worldwide Operating System Market Share, IDC

Although the global Android market share is considerably larger than iOS, the user research results presented in Chapter 3.6.2 indicates that 29% of the target users contacted via the user questionnaire owned an iPhone. Since this figure represents almost a third of users, it is important to develop the application for both operating systems.

In regards to the choice between the development of a native, or web-based application, both solutions provide their own pros and cons. Although web-based applications provide more flexibility in terms of development, and are accessible online at any time (Lifewire 2018), one of the key aims of the application is to provide information to users that they can access at all times. Since some users in more remote locations may not yet have constant access to mobile Internet at all times, a native application would be the more reliable option.

### 3.5 Application requirements gained through user research

Although the sponsor provided initial key business requirements for the application, the additional needs and features which came up through the mentor interviews and target user questionnaires helped define and refine the core features of the application concept.

After conducting qualitative user research through the form of questionnaires and interviews, a number of features and requirements became apparent. The following features added to the list of the sponsor requirements are focused mostly around communication, as well as the structuring of the mentorship.

- A directory of artisans to help more established brands connect with artisans and smaller suppliers
- In-built scheduling software in the form of a booking system and calendar app in order to provide a clear, organised system for both mentor and entrepreneur and allow meetings to be booked, cancelled or rebooked, as well as schedules of webinars, mentor meetings, etc.
- A billing system with both pre-determined mentorship packages, as well as customisable mentorship fees for custom packages. The mentorship packages provided by the application need to be pre-defined by the mentors in terms of pricing, length, and subject area for the purposes of the application, or be customisable through the application.
- Video conferencing capabilities

### **3.6 User Research: Artisans**

In addition to the interviews held with the business mentor user group, it was crucial to speak with the other set of target users of the application- the artisans and entrepreneurs. A recruitment process was held in order to determine the sample for the research, and an online survey, which aimed to discover further information about the user group's business needs, habits and profiles, was sent to this sample in order to gain quantitative research results. See Appendix A for the full questionnaire.

#### **3.6.1 Research Method**

Quantitative research, in the form of an online survey, was held for this target user group in order to gain data about their businesses, development challenges and technological habits.

A user questionnaire was created with the Typeform platform, which allows users to respond to online questionnaires and online data to be collected. The structured questionnaire was made up of 20 questions, including multiple choice and open text questions to allow for more information to be provided.

In addition to profiling the business needs or the areas that they need most help in, it was important to establish their technological habits and capabilities to understand what technology they use on a daily basis, what kinds of applications or platforms they currently use, which channels they use most often to communicate, as well as their daily work

habits. These factors were important to gain a better understanding of how to approach these entrepreneurs and provide features and capabilities that work best for everyone.

The questionnaire also covers the company profile, how many employees the business has, where they are located and how they function, in order to create thorough user profiles for future user studies and user-centred design approaches.

### **3.6.2 Participants**

A recruitment process was held in order to determine the sample for the test. A sample, as defined by Lang and Howell (2017, 38.), is the small group of people who will be giving you insights into your audience's needs and behaviour. After profiling a number of key small-sized businesses, and making sure this sample fulfilled the factors of validity and achievability, questionnaires were sent out to these entrepreneurs through business representatives.

Sample validity refers to how well the sample represents the population, whereas achievability refers to how possible it is to contact these target users. (Lang & Howell 2017, 38.) The validity factor was fulfilled, as the target user group were chosen specifically by the sponsor for their suitability, and represented the target user well. Although achievability was a trickier issue due to privacy issues and availability, eventually, the sponsor was able to reach a suitable sample of users, and the questionnaire received 17 responses in total from potential target users.

### **3.6.3 Results**

The process of receiving responses faced many unanticipated challenges, including privacy issues and low response rates, however, the questionnaire ultimately received 17 responses from artisans and entrepreneurs, which provides valuable insights into the technological capacity, business needs and daily habits of the target users.

The complete set of responses can be found in Appendix 1, and the key findings of the user questionnaire are as follows:

- Respondent gender: 100% respondents were female.
- Age of respondents: The majority of the questionnaire respondents (41%) were in the 25-34 age demographic, with the second highest amount of respondents (29%) in the 45-54 age group.
- Job function: The majority of the respondents were either in managing or founding positions, or in design roles.
- Area of business: Most respondents were in the fashion industry, either in the design, or garment manufacturing sector.
- Country of origin: The majority of the respondents (88%) were from Barbados.
- Number of years in business: 59% of respondents worked for businesses which had been operational for up to 5 years, with 35% of those in their first or second year.
- Number of employees: A large majority (82%) of the respondents worked in businesses which employed up to 5 people, with 53% of these working as sole entrepreneurs.
- Type of business: All of the respondents worked in private businesses, with 2 out of 17 respondents also working in collectives.
- Collaboration with business mentors: 41% of all respondents currently work with business mentors.
- Participation in mentoring programmes: The majority (76%) had previously taken part in mentoring programmes.
- Mentoring needs: Out of the 11 areas of development, business expansion (82%) was ranked as the most critical need, followed by business development and exporting. PR was ranked at the least critical area of mentoring, albeit still at 59%.
- Communication channels: Email was ranked as the most used form of communication (88%) when dealing with suppliers or retailers.
- Mobile phone: The most popular mobile phone brand amongst respondents was Samsung (47%), followed by iPhone (29%).
- Most used applications: The most popular application amongst respondents was Whatsapp, at 94%, followed by Instagram at 65%.
- Mobile phone usage: Approximately half (47%) of respondents claimed they use their phone for equal amounts of time across work, and personal reasons.
- Usage time: Approximately half (47%) of respondents used their phone for about 1-2 hours each day.
- Additional technology: In addition to mobile phones, the most popular device across respondents was a personal laptop. (94%)

- Communication issues: In regards to communication with suppliers, businesses and mentors, the most prevalent issue respondents experience is scheduling (59%).
- Connectivity: The majority of users (71%) had a 4G mobile connection.

Although many of the responses were in line with previously predicted responses, there were some unexpected responses, which also help guide the development of the application, as well as the target user groups. In regards to the age group represented across this group of entrepreneurs, the majority of respondents were in the 25-34 age demographic. This contradicts the previously predicted age group of 35-44, which was initially predicted for the purposes of the user study. The user persona age was subsequently changed to 35.

In addition to the age demographics, the connection speed was also much faster than previously predicted, with 77% of respondents having access to 4G or connections- or faster.

### **3.7 User Persona**

In order to establish a deep understanding of the target users for the application, user personas are created to identify exactly whom the application is being designed for. A persona, as defined by Lang and Howell (2017, 174), is an abstracted set of user needs, normally presented in the form of an imaginary person. By creating a persona, which encompasses the user's habits, needs, beliefs and motivations, this helps stakeholders understand the user's perspective and expectations, and thus have a greater empathy for them and refine their design strategy more precisely.

Since the application aims to serve two sets of users- the entrepreneur, and the mentor- two key user personas were created for the purpose of this application.

#### **3.7.1 User Persona (Entrepreneur)**

Nansalmaa is a 35-year old business owner, who is married with three children. Nansalmaa is the owner of a cashmere company, based in Ulaanbaatar, Mongolia. She is a graduate of a technical university, and founded her business to support her family and her community. Nansalmaa and her family live in a house outside the city, and own a car.



As illustrated in Figure 3, a User Persona chart that explores Nansalmaa’s user profile in detail, Nansalmaa is self-motivating and family-oriented, with a strong focus on social networks to support her community. Her motivations in life are her family, and growth, and building a strong community around her. She is a principle-oriented leader and connector in her community, and believes that by creating a career as an entrepreneur, she can improve the life of her family. She is an early mainstream adopter, and always innovating and coming up with ideas.



Figure 3: User Persona (Entrepreneur). User image (Unsplash 2018).

Nansalmaa spends about 2 hours a day on the Internet through Google Chrome, researching information for work, and owns a Smartphone and a tablet. The connection speed in her area is average, but slightly on the slower side. Technologically, her computer proficiency is medium, and has an average level of user expertise.

Nansalmaa hopes that the application will be better than other products she has used before, and hopes it will provide her more information about areas such as finance, importing and exporting.

### 3.7.2 User Persona (Business Mentor)

Charlotte is a 40-year-old Marketing Director for a sustainability consultancy, who lives in a townhouse in Wimbledon, London, with her 5-year old daughter and husband Dominic, who works for a Digital Marketing agency. She has a Bachelor's degree in International Business, and earns more than 50,000 pounds a year.

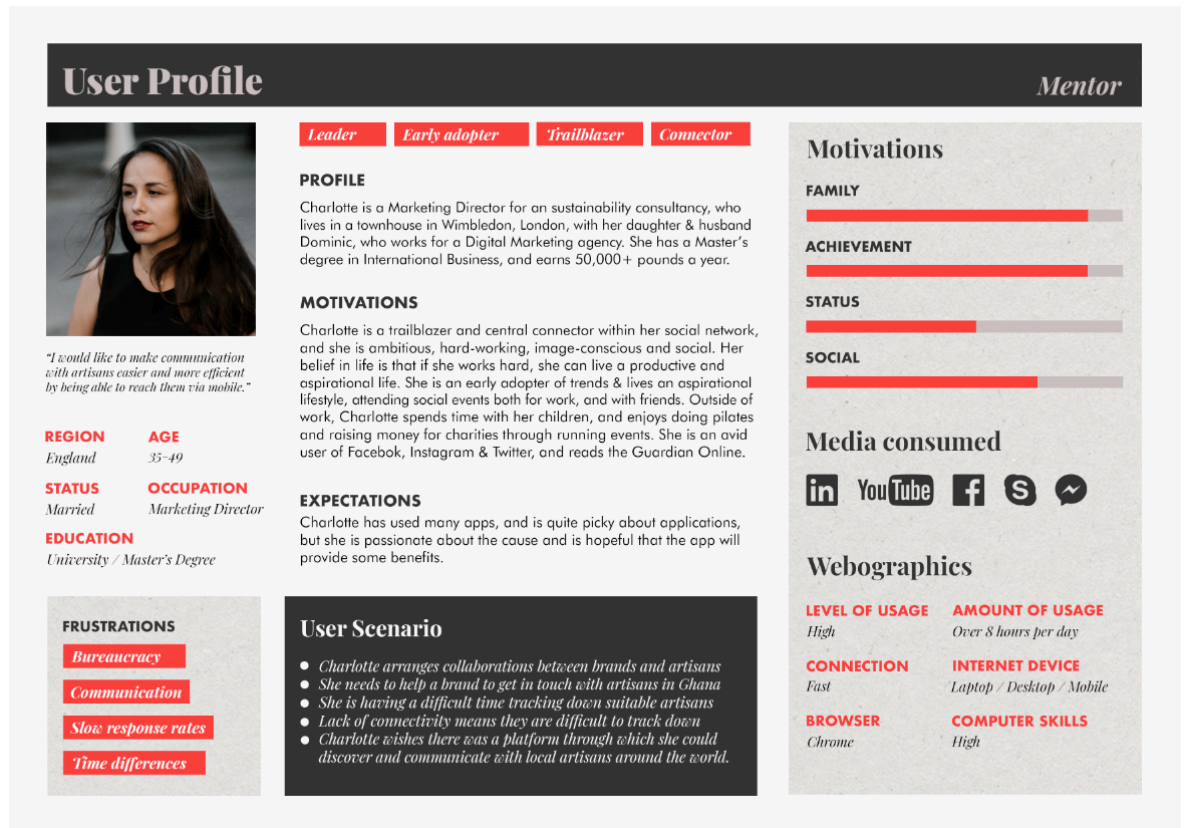


Figure 4: User Persona (Mentor). User Persona Image: (Unsplash 2018).

As illustrated in Figure 4, the User Persona for the Mentor, Charlotte is a trailblazer and central connector within her social network, and she is ambitious, hard working, image-conscious and social. Her belief in life is that if she works hard, she can live a productive and aspirational life, and her motivations are her family, career achievements and social network. She is an early adopter of trends, and lives an aspirational lifestyle, attending social events both for work, and with friends.

Outside of work, Charlotte spends time with her children, and enjoys doing Pilates and raising money for charities through running events. She is an avid user of Facebook, Instagram and Twitter, and reads the Guardian Online to catch up on the news every morning. Charlotte and her family shop at Waitrose, and consume brands like Adidas, Lululemon, and Apple.

Charlotte is technologically sophisticated, and spends over 8 hours a day on the Internet, both at work, as well as in her free time. She browses the web through her smartphone, tablet, desktop computer and laptop, and has a fast Internet connection. She has a high level of computer proficiency and user expertise, and has a medium level of technological expertise. Charlotte has used many apps, and is quite picky about applications, but she is passionate about the cause and is hopeful that the app will provide some benefits. Her current frustrations in her line of work are slow response rates, and bureaucracy around certain working practices.

### **3.8 User Story**

Nansalmaa's user story is, "As a user, I would like to communicate with business advisors and mentors via mobile to get business advice and technical help."

Charlotte's user story is, "As a user, I would like to make communication with artisans easier and more efficient by being able to reach them via mobile."

### **3.9 User Scenario**

Nansalmaa is the owner of her cashmere production company, and faces many challenges in her production process. Her company produces a high-quality cashmere product, but struggles to import them to international markets. She lacks information about how to do it, what the process is, and the exporting rules between countries, including cashmere-exporting quotas and existing bans. She has access to the Internet, and owns devices through which she can access information, but does not know where to find it. Nansalmaa wishes she could access this kind of information more efficiently and easily, in one place. Nansalmaa's User Journey is illustrated below in Figure 5.



## User Journey Map

Searching for exporting information

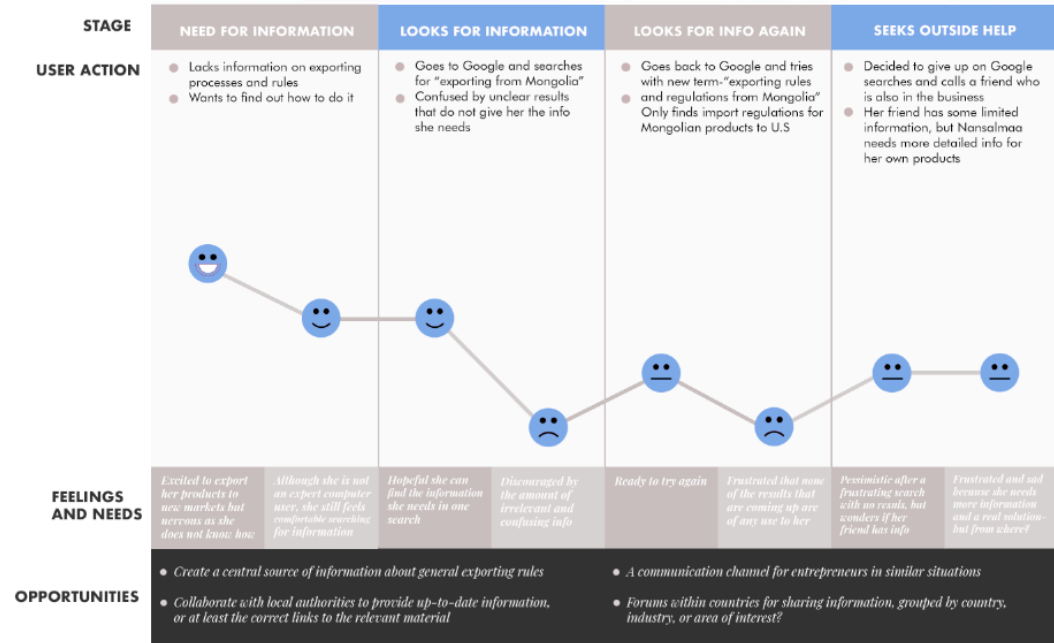


Figure 5: User Journey Map (Artisan)

As part of her job as the Marketing Director of a sustainability consultancy, Charlotte has to arrange collaborations between artisans and brands for a recently launched global initiative. Charlotte needs to assist a European brand to get in touch with artisans in Ghana, however she is having a difficult time tracking down suitable artisans.



## User Journey Map

Communicating with artisans in emerging economies

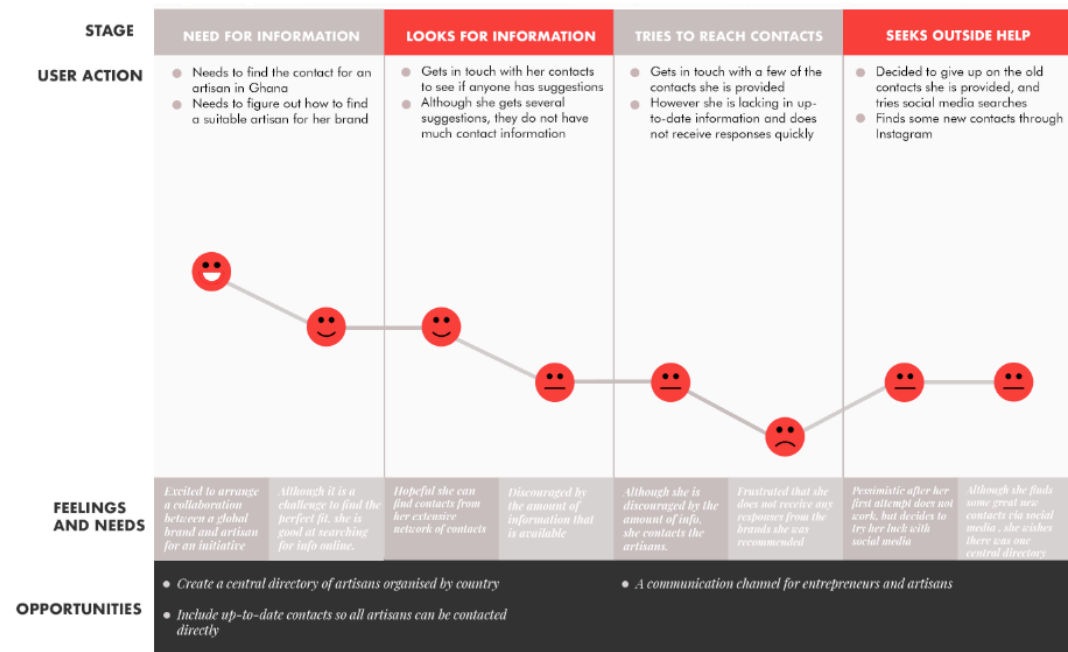


Figure 6: User Journey Map (Mentor)

She finds that they are extremely hard to get in touch with due to lack of connectivity, or lack of suitable communication channels. Charlotte wishes there was a channel or platform through which she could discover, identify and communicate with local artisans around the world more easily. Charlotte's User Journey is illustrated above in Figure 6.

### 3.10 Affinity Diagram

Affinity diagramming is a usability method in the user-centered design process, which allows researchers to group data gathered from users into groups, based on common themes or relationships. The affinity diagramming process allows connections to be drawn between ideas, thoughts and recurring terms, and requirements to be prioritized. (Interaction Design Foundation 2018.)

After completing the user research for the business mentor and artisan user groups, key concepts, opinions and terms were gathered from the qualitative data in the form of interviews and questionnaires. These concepts were grouped around the three initial business areas provided by the sponsor- communication, training and education- as well as the main challenges faced by artisans. A final affinity diagram, as shown in Figure 7, was created to show these key areas.

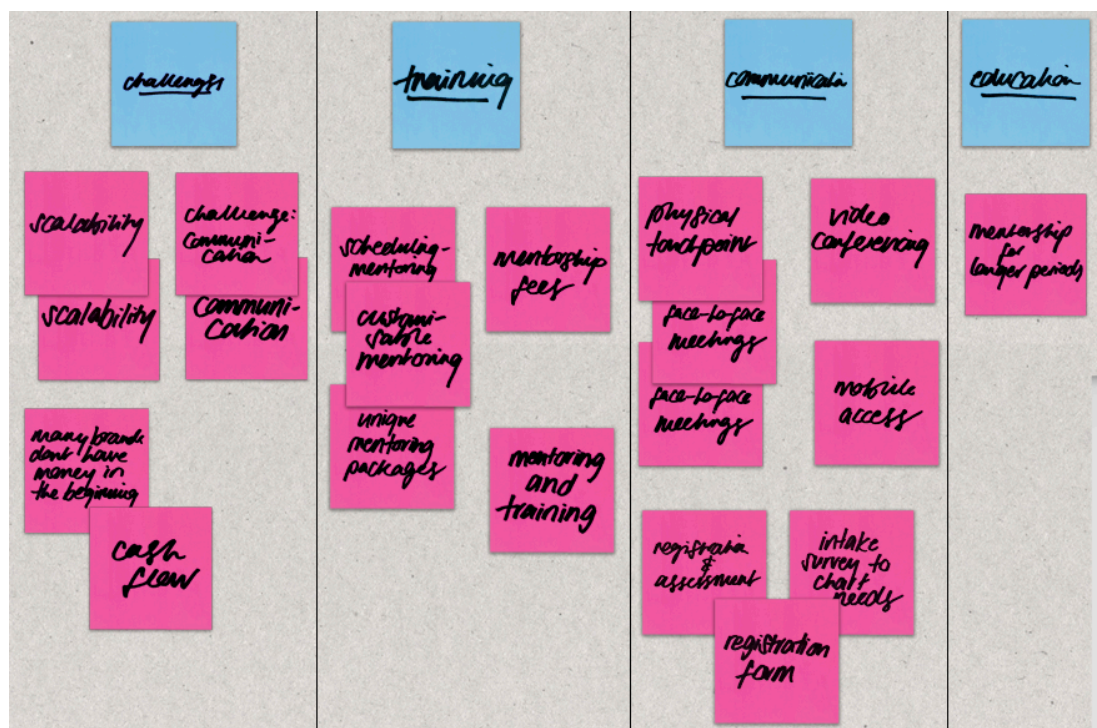


Figure 7: Affinity Diagram

### **3.10.1 Communication**

Within the area of communication, three key requirements emerged through the gathering of data:

- The importance of physical touch points and face-to-face meetings
- Creating connections between artisans and other fashion professionals
- A thorough registration process and intake survey

Through the affinity diagram, a key feature- the registration process- was added to the list of required features, and provides the business stakeholders with a thorough way to assess, and gain the required information about the users from the very beginning.

### **3.10.2 Training**

The main concept that came through in discussions regarding the mentoring and training process is the customisability of the mentoring. As Richard Mkoloma notes, a “one size fits all” approach to mentoring is not a viable approach, so mentoring packages or programmes must be unique, customisable and tailored to each participant.

### **3.10.3 Education**

Throughout the interviews and discussion, the concept of training mentors appeared often, and is an extremely relevant concept, however, it was discussed further in terms of training rather than education. In regards to the educational section of the application, however, the longevity of the education available was an important point- or, in other words- how to keep the training going on an ongoing basis, rather than just a one off opportunity.

### **3.10.4 Challenges**

In regards to the challenges most commonly faced by artisans and entrepreneurs, there were three clear issues, which came up throughout the data. The challenge of communication was the most prominent, with all business mentors noting the organisation and scheduling of communication as a key area that they often face.

### **3.11 Task Analysis**

For the task analysis, three tasks were chosen to map out the journey that the user would take to complete these tasks. Each task was broken down into several subtasks, and helped understand the process the user would take to complete specific actions. This included the goals the users are attempting to achieve, what steps they would take to complete these and their thinking model when they perform these tasks.

#### **3.11.1 Choosing a courier to export products**

- Access web browser through mobile phone
- Go to search engine
- Type in “shipping courier from Mongolia”
- Browse search results for different shipping providers
- Search for pricing and tariffs on web page
- If tariffs are not available, search for contact details to get a direct quote
- Send email to ask for direct quote
- Shipping courier provides a quote, or price list
- The best option can be chosen

#### **3.11.2 Finding a business mentor to undertake financial mentoring**

- Access web browser through mobile phone
- Go to search engine
- Search for local business mentoring associations
- Choose most appropriate result
- Search for contact details on website
- Send enquiry to local mentoring association
- Receive contact details
- Contact business mentor

## **4 User Interface Design & Development**

After completing the research and analysis stages of the user-centered design process, the next stage was to create a design, which fulfilled all the requirements gathered in the user study stage. This stage involved the wireframing of the application, low and high fidelity prototypes, as well as the branding process, which involved the creation of a logo, colour scheme, application name and graphic guidelines.

### **4.1 Trends**

In the rapidly developing digital environment, it is important to develop and adapt user interface designs in order to stay current and keep users engaged. With an increasing amount of applications on the market, users are more fickle, and can be discouraged by the smallest of errors. According to research, 21% of users now abandon an app after one use (Localytics 2018), which is mostly down to poor user interface design. In order to stay on trend, the following user interface designs should be considered.

With a large number of apps on the market, it is important to stand out with bold, bright colours that catch the eye. After many years of tone-on-tone colour schemes, the market is already saturated with muted shades. In addition to bright colours, gradients provide depth and richness, and are also a major trend in 2018.

With smart phones shifting from rectangular, angular shapes to more smooth products with curved edges, the shift to flowing curved lines is apparent in user interface design trends as well. Simple curves, geometrics and buttons, laid out in fresh, modern ways, without the restriction of the traditional box, are major trends for the year.

Unnecessary, distracting elements can ruin the usability of an interface, and sometimes less is more. Minimalistic design is one of 2018's trends that not only improves interface design, but the user experience as well.

For the user interface application design proposal, several of these elements were utilised within the design, including a minimalistic design, accents of bright colours, as well as gradient overlays.



## 4.2 Wireframing

Wireframing, according to Invision, one of the leading prototyping platforms on the market, is defined as a low-fidelity design layout that helps you plan the layout and interaction patterns of your users without distracting details like colours or copy. (Invision 2018.)

Wireframing aims to present the required information that will be laid out on the application page, provide a rough structure, and show the key features of the user interface. This middle step between initial sketch and high fidelity prototype serves an important function—to map out the functionality of the layout, rather than the aesthetic elements. Essentially, they are the blueprints of every page of the site. (Pratt & Nunes 2012, 134.)

Whilst designing the first proposal of the Weave wireframe, there were several key factors to bear in mind when designing the layout of the application:

- Since many of the target users are potentially not as advanced technologically, and have not experimented with a range of applications and layouts, it is important for the structure to have a recognisable, familiar feel. This will give users who have less experience browsing applications the confidence to use the application.
- When working with users of multiple different cultures, the layout on the main pages should be simplified, and as visual as possible, in order not to overwhelm the user.
- A feeling of a “constant” is important, in order to provide a cohesive layout across all pages, which does not change dramatically from page to page. A home bar, or side bar can allow users to return to their initial state if they get lost.

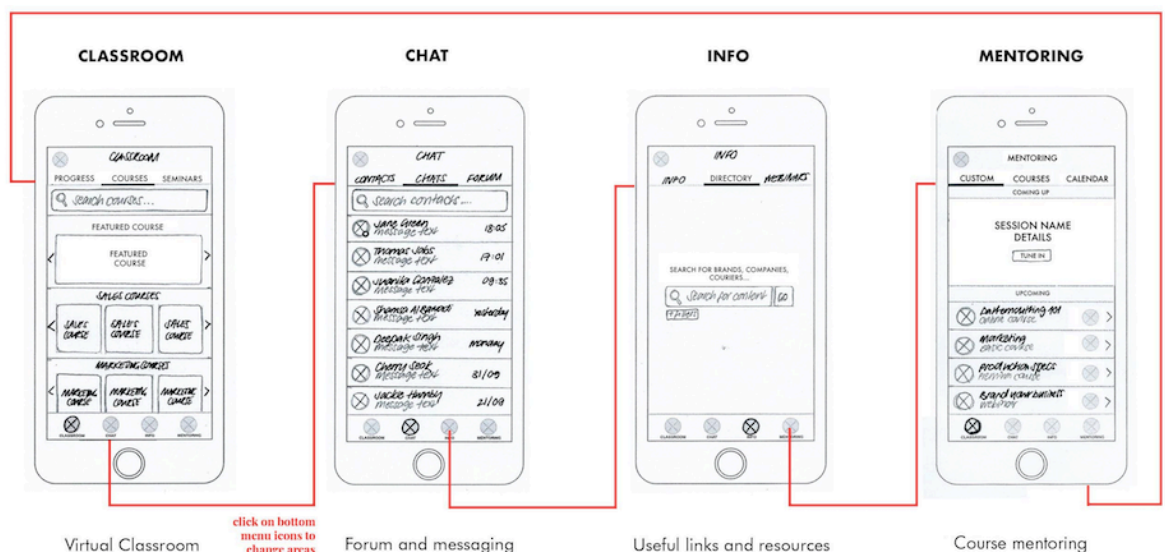


Figure 8: Main menu wireframe

After experimenting with various layouts and mapping out the user flow, a basic structure was established for the first proposal of the application, as seen in Figure 8, which runs through most of the application and provides a constant for the user.

A static panel at the bottom of the menu, as seen in Figure 9, provides the user with a menu with the four main areas of the application- classroom, chat, info and mentoring. This menu will appear on the screen at all times with the current choice highlighted, providing a sense of safety for the user so they can return home, whenever they feel like they need to.

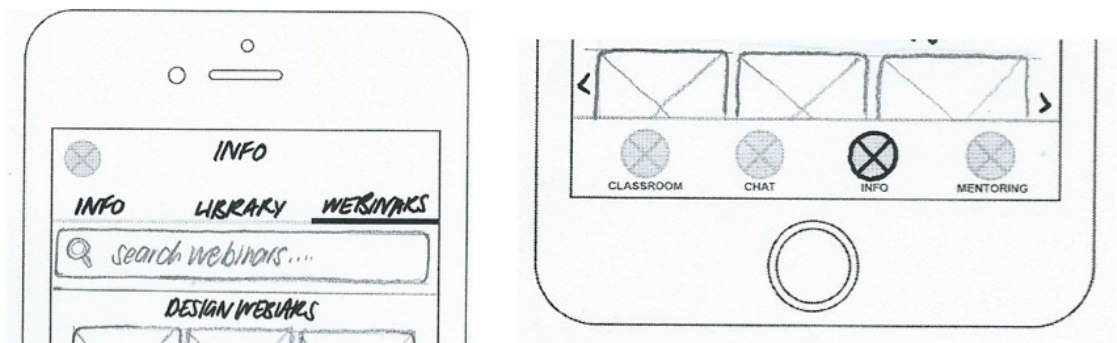


Figure 9: Sub-menu (left) and menu (right) wireframes

A sliding sub-menu, shown above in Figure 9, appears on the top of the application screen, showing three different sub-areas for each main area. As a different area of the main menu is selected, the sub sections change too to reflect the specific section.

A sliding panel allows users to slide easily from sub-area to sub-area, using a swipe motion. The current area is always underlined in red, to ensure the user knows where they are at all times.

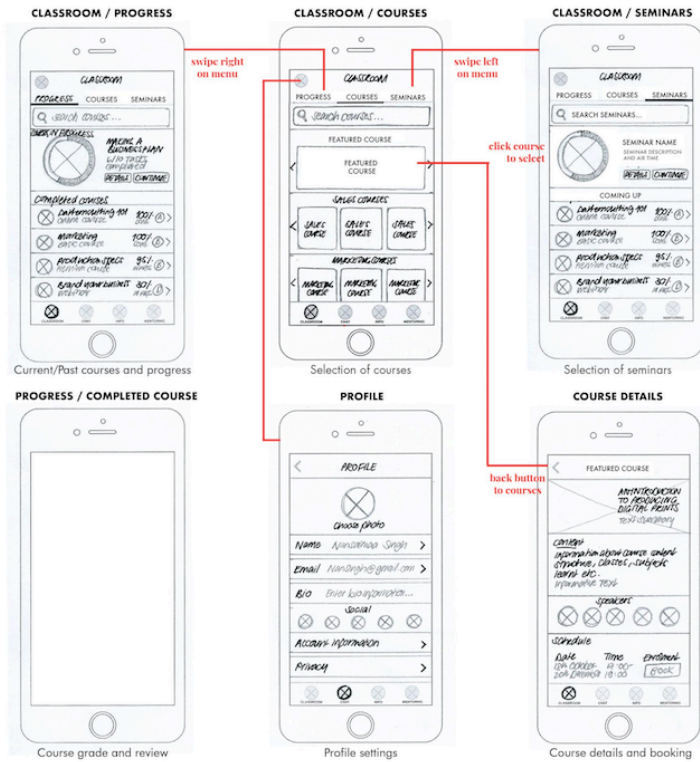


Figure 10: Classroom wireframe

Wireframes were created for each page of the application, and mapped out in order to show a rough visual layout for further high fidelity prototyping, the user flow of the applications with marked actions, as well as a rough structure of the application. The Classroom and Mentoring wireframes are displayed in Figures 10 and 11 respectively.

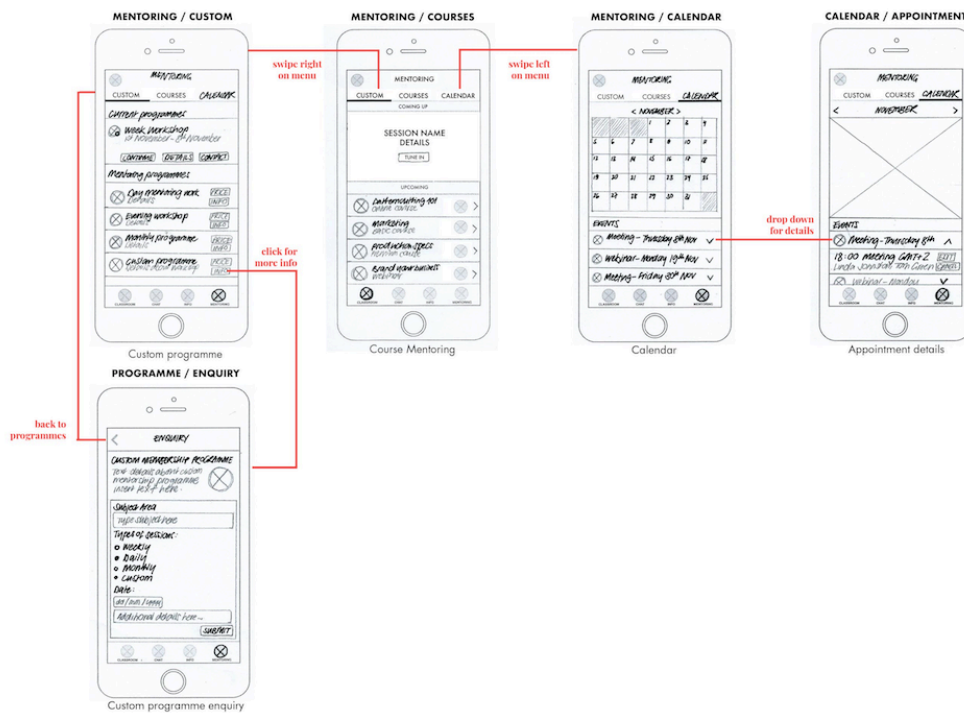


Figure 11: Mentoring wireframe

The key observation made through the wireframing process of the application was to split the initial three business areas- information, classroom and communication- into four areas: information, classroom, communication and mentoring. This allows the information to be split in a much more clear way, and allows these functions to be separated so the user does not get confused between the virtual classroom function and the mentoring function.

This wireframe was the initial starting point for the application layout to present to the sponsor for further evaluation, and went through further rounds of iteration to produce the final prototype.

See Appendices 2-7 for the full application wireframe.

### **4.3 Branding**

Branding, according to Nunes and Pratt (2012, 152) is used to describe the emotional connection an consumer makes with a product or company, and is a combination of the content communicated by the site- what the brand has to say- as well as the colours, fonts, images and design of the site- how the brand says it.

The Weave brand aims to promote the artisan crafts made by entrepreneurs all around the world, weave together a global community of forward thinkers, and come together to support each other. Since the content shared by the application aims to reflect this sense of forward-thinking, proactive, community, both the brand message, as well as the design decisions, have been chosen to convey this message.

The Weave brand aims to educate, guide and inspire in a modern way- clear, thoughtfully designed, relevant content that is truly useful and inspirational for the user. Like the Scandinavian point of inspiration for the logo, Weave encompasses the Scandinavian direct, honest approach to work- in other words, straight to the point. The Weave brand aims to be educational and trustworthy- but in a fresh, forward thinking way that aims to inspire, energize and support the users.

#### 4.4 Colour

Colour psychology is an important aspect of human interaction design, and creates a direct connection between the user and the brand image. Although there are many various factors that affect the user experience, such as gender, brand image, and industry, there are general colour associations that can help build the brand imagery.

After analysing the colour schemes of various mentoring associations and partners, the findings varied greatly. Nest Artisan Guild uses a compound colour scheme of a feminine, creative deep purple and muted yet optimistic mustard yellow, with accents of muted orange for energy, and tranquil teal. Eco-Age, in turn, utilizes a monochrome palette of white and grey, with dynamic feminine pink as an accent colour. SheTrades, reflecting its more corporate image, uses a triadic colour scheme of sophisticated navy and controlled but ambitious burgundy. Local Hands Mauritius, a collective of women, uses an analogous colour scheme of trustworthy browns, creams and greys.

In the process of creating a colour scheme for the Weave mentoring application, it was important to consider the values that the application wants to communicate. In addition to an educational, entrepreneurial outlook, the branding must also convey growth and passion, channelled through a clear, calm, trusted voice.

In order to create a stable, clear, business-like base for the application colour palette, a graphic combination of a dark navy and white was used in collaboration with some accent colours. Dark navy was chosen instead of black to add a hint of softness and decrease the contrast, as well as to add a calm, authoritative feeling that blue shades can create. According to Forge and Smith, dependability, intelligence, trust, safety, and security are closely associated with the colour blue (Forge and Smith 2018). To instil this dependability and promote learning in a safe environment, sky blue was chosen as an accent for the colour palette, as well as a neutral greige.

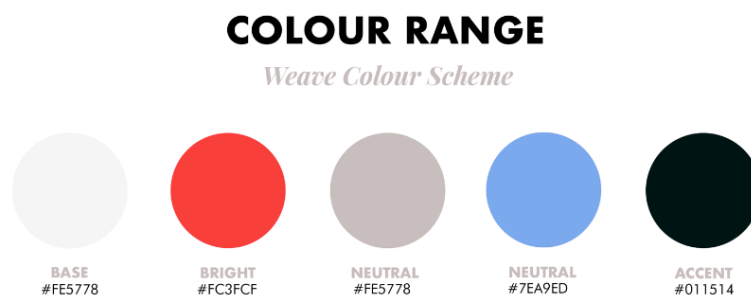


Figure 12: Weave colour scheme

In addition to a minimalist colour palette with stable, calming, business-like tones, an accent colour was required to inspire passion, energy and ambition. To create this mood, a vivid coral red was chosen to provide both an accent colour, as well as a visual stimulant within the application to inspire action. Figure 12 illustrates the final Weave application colour scheme.

#### 4.5 Application name

For the starting point of the application name, it was important to come up with a name, which encompasses the core values of the initiative- handcraft, building businesses, as well as a global, communal feeling which expresses the coming of individuals together.

Since the fashion and textile industry is one of the main employers of women in emerging economies, the inspiration for the application name begun from terms often used in the industry. After brainstorming ideas and studying fashion terminology, the options were narrowed down to four ideas: Stitch, Weave, Thread and Seam.

After discussing the final options with the sponsor, the sponsor immediately felt drawn to weave, as it describes the process of hundreds of individual threads being woven together to create a stronger product, and Weave was chosen as the final proposed name for the application, as illustrated in Figure 13, the cover used for the Weave presentation to the sponsor.



Figure 13: Application name

For business purposes, the name may potentially require some additional consideration or a second word in order to avoid competition with other brands or terms, however, as the initial proposal, the sponsor felt happy to proceed.

#### 4.6 Logo and branding

The Weave brand aims to promote the artisan crafts made by entrepreneurs all around the world, weave together a global community of forward thinkers, and come together to support each other. The Weave logo, as shown below in Figure 14, is inspired by the artisan crafts, a weaving of communities, and a Scandinavian term, “The red thread”, an element of a narrative, which continues through a story and ties it together.



Figure 14: Weave logo

#### 4.7 Icons

As part of the graphic guidelines, a set of icons were chosen for the application to indicate the main areas of the application, as well as call-to-action buttons, such as the back button. Due to the time restraints in the development in the application, there was not sufficient time to design the icons from scratch, however, for future development, a new set of icons will be re-designed in order to reflect the Weave branding guidelines and image.

#### 4.8 Font

The two fonts chosen for the application were chosen to highlight a clear, professional, business-like feeling, but with a friendly tone in order not to discourage business owners

who may be at an initial stage of their business development. Both a serif, and a sans-serif font, as shown in Figures 16 and 17 below, was chosen as a pair to emphasize both characteristics.

**A B C D E F G H I J K L M**  
**N O P Q R S T U V W X Y Z**

Futura Bold

a b c d e f g h i j k l m  
n o p q r s t u v w x y z

Futura Book

Figure 15: Sans-serif font

The sans-serif font chosen for the application was Futura for its simple yet modern look, with both Futura Bold and Futura Book being used for different purposes. Futura Bold was used for headings, whereas Futura Book was used for longer passages of text.

*a b c d e f g h i j k l m*  
*n o p q r s t u v w x y z*

Playfair Display Bold Italic

**a b c d e f g h i j k l m**  
**n o p q r s t u v w x y z**

Playfair Display Bold

Figure 16: Serif font

Playfair Display was chosen for the serif font due to its old-school academic feeling, and rounded, friendly mood. Playfair Display Bold Italic was used for sub-headings, where as Playfair Display Bold was used for headings.

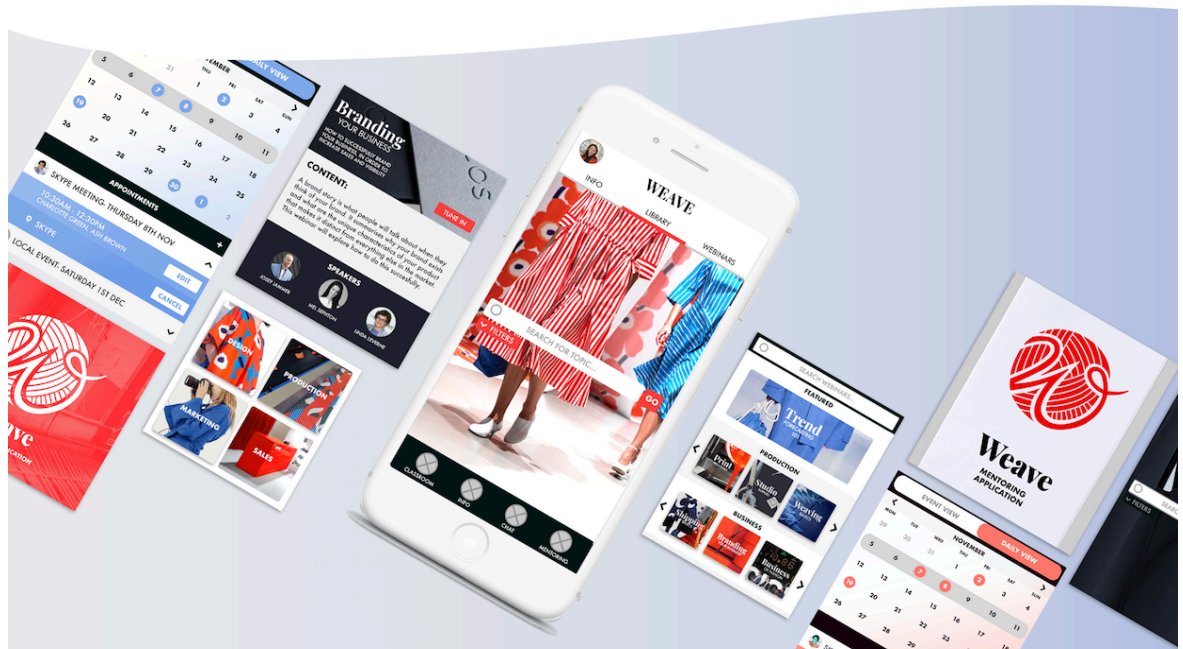


## 4.9 High-fidelity prototype

As one of the final stages in the user-centered design process, a first proposal of the high-fidelity prototype was created to provide an accurate visualisation of the proposed application. According to Usability.gov:

High-fidelity prototypes are computer-based, and usually allow realistic (mouse-keyboard) user interactions. High-fidelity prototypes take you as close as possible to a true representation of the user interface. High-fidelity prototypes are assumed to be much more effective in collecting true human performance data (e.g., time to complete a task), and in demonstrating actual products to clients, management, and others (Usability.gov 2018).

The high fidelity prototype was created with the use of Adobe Photoshop, and later transferred to Marvel's prototyping tool in order to allow human-computer interaction.



### USER INTERFACE *Weave Guidelines*

Figure 17: High fidelity prototype moodboard

When creating the high fidelity prototype, it was important to create a clear, minimalistic layout, with an inspiring mood that inspires users to take action and explore the application. The use of colours was extremely important, as the coral red chosen to inspire action had to be placed strategically in order to inspire energy and a call-to-action in the right place. A moodboard of the initial high-fidelity prototype is shown in Figure 17.

The coral red was thus placed in various locations, as illustrated in Figure 18, including the slider in the sub-menu to alert the user to their current location, and make it visible, as well as any call-to-action buttons such as "Go" or "Tune in". In addition to these details, red was used throughout the visuals to emphasize the concept of the red string, which is woven throughout the narrative of the concept.

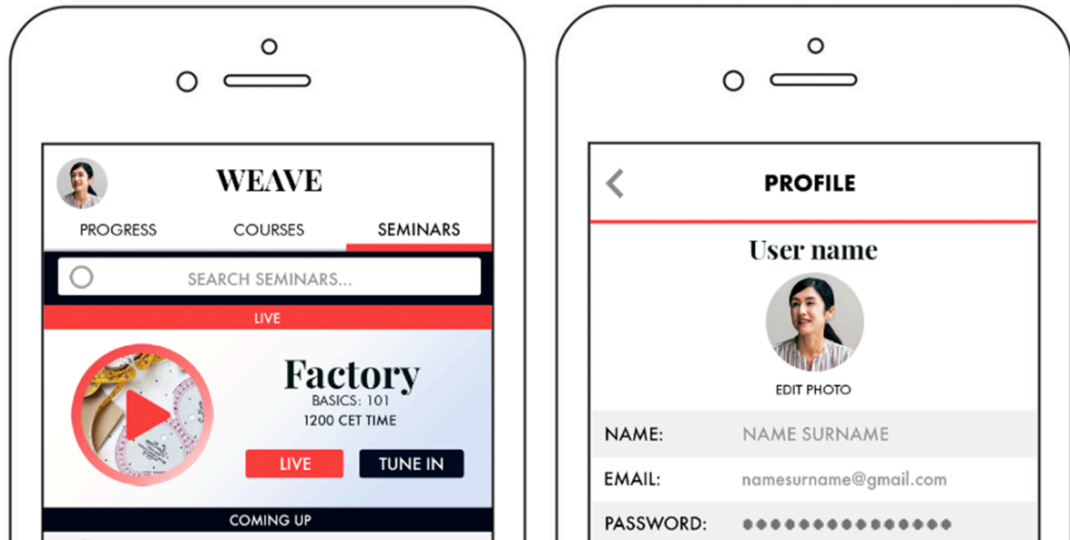


Figure 18: Colour placement of red in application

The figure below, Figure 19, demonstrates the visual layout of the application, which is used throughout as the basic structure. A user profile button is used in the top left hand corner, using the user's own profile image in order to make them feel that it is their personalized space.

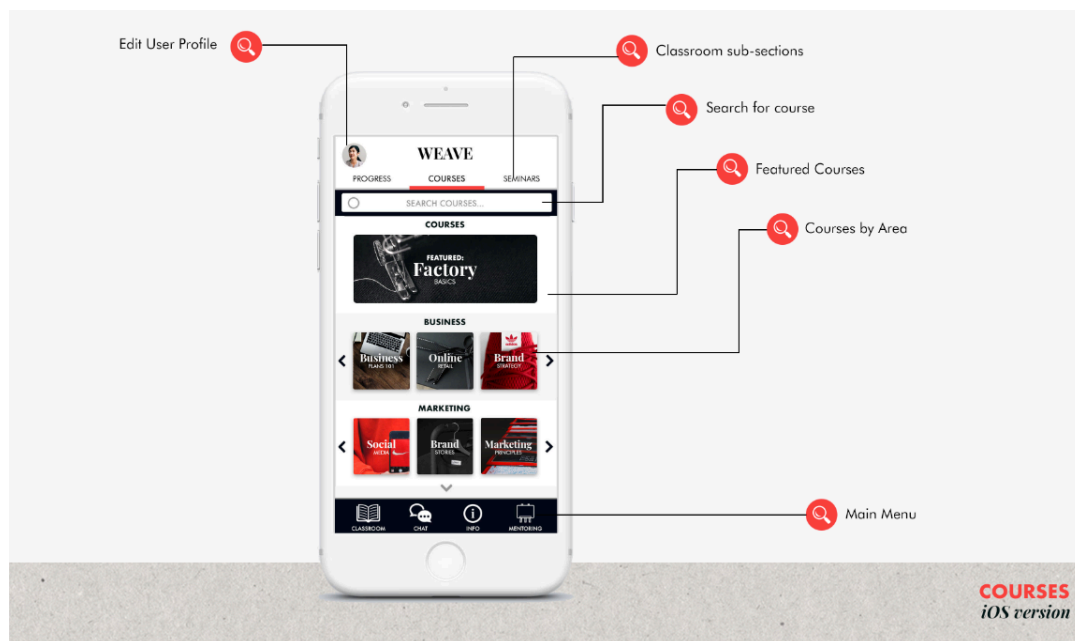


Figure 19: High fidelity prototyping- Webinars

The background is also provided subtle structure by using panels of bright white, and off-white, in order to inspire a feeling of structure and clarity, without the need for more restrictive lines to organise the space. The bottom menu is filled with a dark navy to provide that visual anchor point at the bottom, and a clear point to return to when the user wants to go home. Direction arrows are also coloured in dark navy to give the user clear instructions where to go to, for example, in the webinar carousel where the user has to scroll through the options sideways.

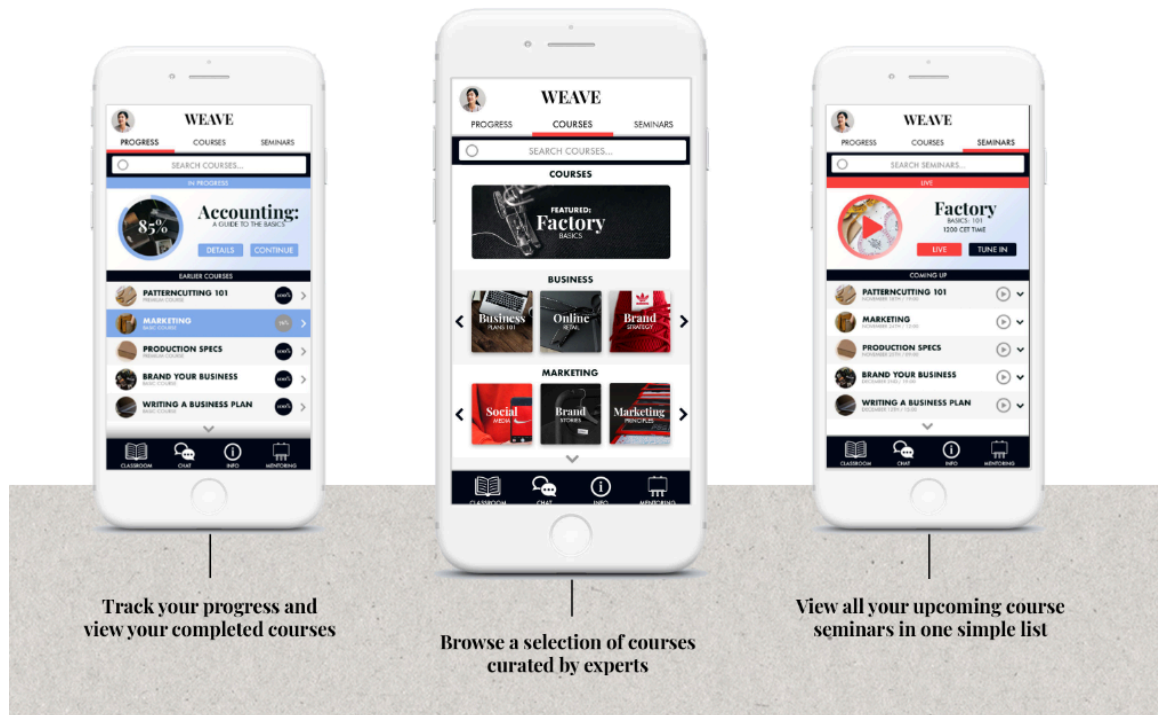


Figure 20: First proposal of the high fidelity prototype

As shown in Figure 20, the background also provides subtle structure by using panels of bright white, and off-white, in order to inspire a feeling of structure and clarity, without the need for more restrictive lines to organise the space. The bottom menu was filled with a dark navy to provide that visual anchor point at the bottom, and a clear point to return to when the user wants to go home. Direction arrows are also coloured in dark navy to give the user clear instructions where to go to, for example, in the webinar carousel where the user has to scroll through the options sideways.

Other key features of the application, such as the Calendar feature as seen below in Figure 21, utilise key trends such as curved lines and gradients to add depth and visual interest to the design of the application. The key points of information, such as the scheduled

appointments and current week are highlighted to make this information more visible to the user.

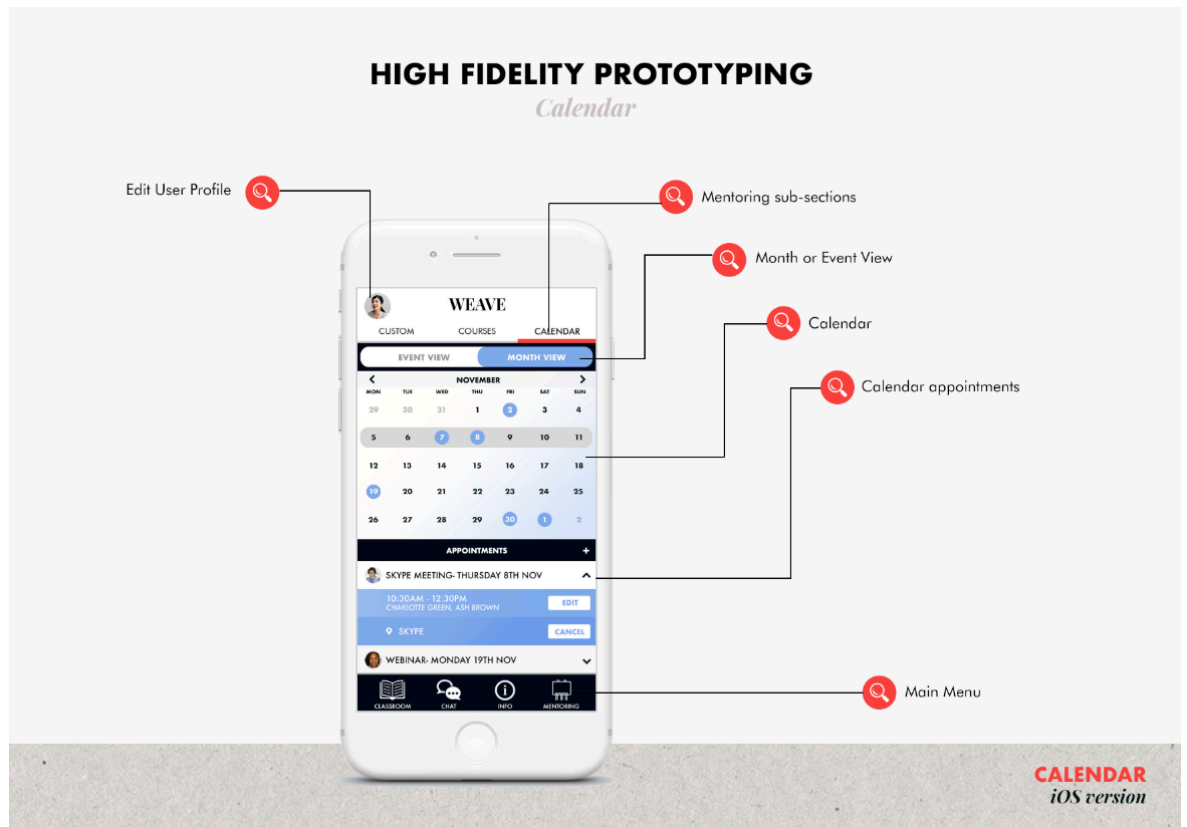


Figure 21: Calendar feature

The link to an interactive version of the high-fidelity prototype is available at: <https://marvelapp.com/63ah83f/screen/50414647>

The aim of this high-fidelity prototype was to illustrate the key features of the application, the visual guidelines, and the structure of the application. Although the application does not show every single page of the application due to time restrictions, as well as the need for further development in some pages, the application is a representation of the user interface design and layout of the concept to be developed.

This first version of the high-fidelity prototype was created to show the sponsor the initial idea for the application, and to evaluate the layout, features and design for the second iteration of design, presented in the following chapter.

## **5 Prototype Design Evaluation**

After completing the first stage of design and development, it was crucial to speak to the sponsor to discuss the findings observed through research and to evaluate the first proposal of the application. A sponsor meeting was arranged in London in order to review the thesis, as well as the high-fidelity prototype.

This chapter explores the feedback, discussion and edits to the current proposal, as well as future development of both the application and business case. As a result of this review, an updated version of the wireframe and high-fidelity prototype was created.

### **5.1 Sponsor Evaluation**

The sponsor evaluation of the thesis was held at the office of Avis Charles Associations on the 7<sup>th</sup> and 8<sup>th</sup> November 2018. The pre-arranged agenda included a review of the written thesis, as well as a walk-through of the wireframe and high-fidelity prototype in order to review the research, development and future development of the project.

Overall, the sponsor was extremely pleased with the progress so far, as well as the proposed solution. Although the sponsor was satisfied that all the requirements had been fulfilled and the design was well executed, there were several changes to the concept. Several areas were discussed during this meeting, including the evaluation of the current features, the addition of further features, and the business considerations, which relate to the development of the application.

### **5.2 Edits made to application requirements**

During the sponsor evaluation, there were key changes made to several of the sections provided in the application. The biggest changes were made to the Classroom section and Mentoring section, with minor edits made to the Information section. The following sub-chapters will explore each section and the changes to the requirements.

#### **5.2.1 Monetization**

During the initial discussion held at the beginning of the project regarding the application requirements, the sponsor stated that the application should offer both basic (free) courses, as well as premium (paid) courses. One of the key considerations made during

the follow-up thesis meeting was the need to monetize all courses offered within the application, in order to strengthen the business case of the application project.

Monetization is a crucial aspect to the development of the application, in order to be able to produce high-quality content, hire professional mentors and advisors to create course content, educational material and live seminars for the application, and provide resources for future development, marketing and management of the application. Although the information provided in the General Information area is free, and accessible by anyone, any premium content (education, webinars, seminars) should require payment.

Since not all entrepreneurs will have additional budget for premium content, collaborations with organisations and institutions such as the International Trade Centre will serve as a way to allow access to this content. Entrepreneurs who are currently part of a mentoring or development programme will be provided a unique sponsored code in order to be able to allow this content without charge.

### **5.2.2 User enrolment**

One of the considerations discussed at the sponsor meeting was the number of the participants allowed to enrol for courses each of the courses at any given time. Although the initiative aims to provide as many entrepreneurs as possible with an opportunity to develop their businesses, it is, however, important to keep the groups smaller in order to be able to provide a better service, with enough support for each individual, so they do not feel like they are being limited. The ideal group size for a course would be 10, however, the maximum limit for enrolments should be set at 50.

### **5.2.3 Mentoring**

After further discussion with the sponsor, it was decided that the mentoring programmes included in the application should run in parallel with the educational courses, and should go hand in hand with the content provided to offer participants a deeper level of support and teaching whilst they are completing the courses. The course content author should also be the contact person for the feedback and seminars, in order to provide a cohesive course content.

The course seminars should be offered at 3 times each day to cater to different time zones- for example, at Central European Time, Eastern Standard Time and China Stan-

standard Time. If a participant is not able to participate in a particular session, a custom session can be scheduled later at an additional cost.

During a live teaching session, the users are able to submit live questions to the teacher or mentor. These submitted questions, however, would only be visible to the mentor in their own interface, in order to avoid multiple questions being displayed in a communal chat box, distracting from the content being presented. The mentor can then address individual questions one by one during the live session. The mentor interface of the application should also include the progress of each of the participants, so they can be monitored.

### 5.3 User Interface: Development

After reviewing the application with the sponsor, the current features were evaluated, and changes were made to each section, either to make edits to the existing ones, or to add new ones to the selection. A new user interface proposal was created in order to accommodate these changes, and a new set of wireframes, presented in Appendices 2-7.

#### 5.3.1 Registration

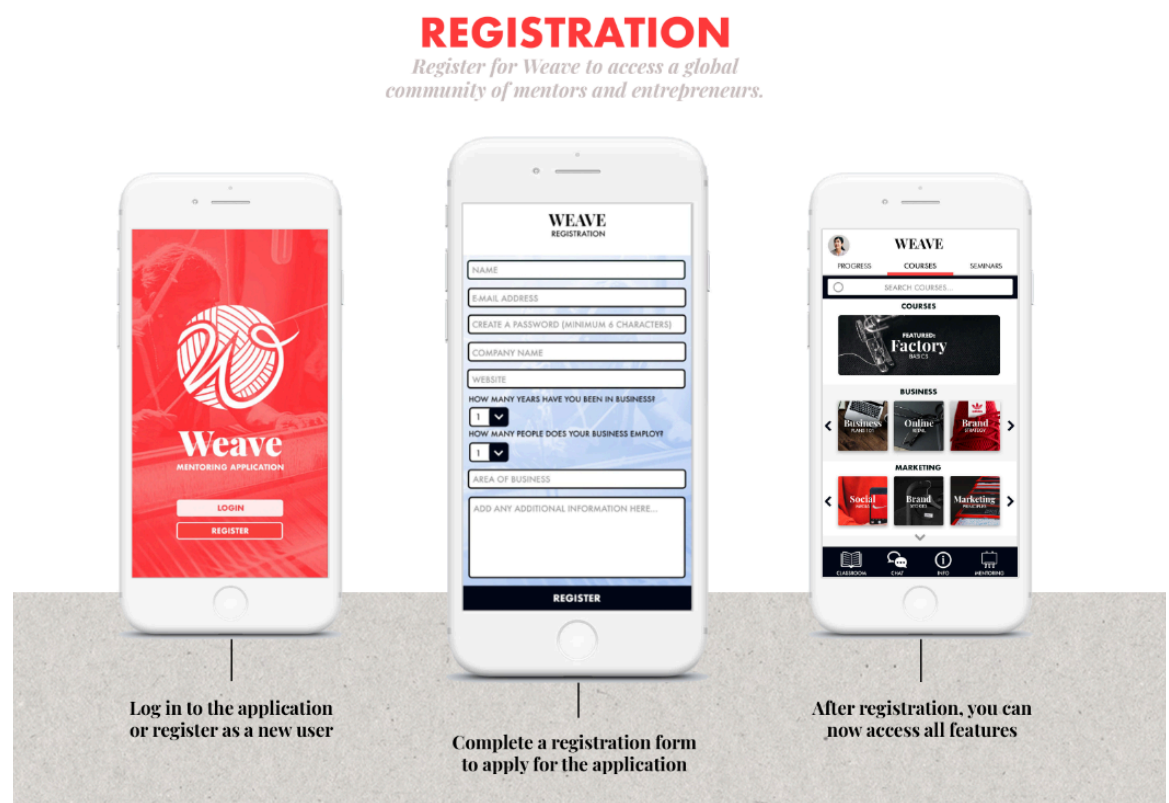


Figure 22: Registration Process

There were no visual changes to the current user interface of the registration process, shown in Figure 22, however, in regard to the application introduction, the sponsor wanted to include a short text introduction when the user downloads the application, in order to provide them with a clear understanding of what benefits the application can provide to the users.

### 5.3.2 Classroom

One of the major changes made to the classroom section of the application was the removal of the basic course section. Instead of basic (free) and premium (paid) courses, a range of premium courses will be offered, with a trial version of each course.

In the second iteration of the design, the three sub-sections of the Classroom section were changed from Progress, Basic Courses and Premium Courses, to instead provide a Progress section, Courses section, as well as a Seminar section, as illustrated in Figure 23 below.

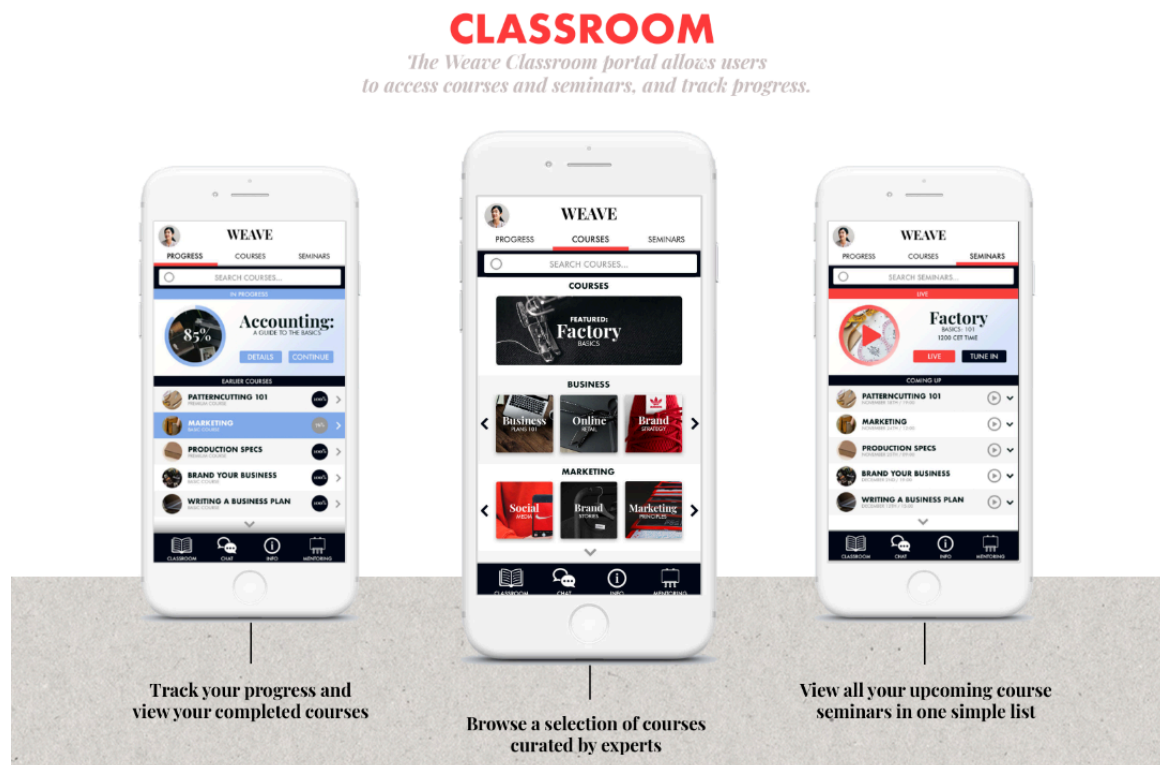


Figure 23: Classroom Section

The Progress section allows users to see their current courses and completed courses, and review the course materials and grades, if applicable. The Course section allows



users to browse through a curated selection of courses, organised by areas of interest, such as Design, Production, Finance or Shipping, and provides the user with options to learn more about the course, and enrol to available courses. The third sub-section, Seminars, now shows all the upcoming seminars that are related to the courses that the user has already enrolled to.

In order to address the sponsor's requirements, each course now provides the user with an access to preview the course material without committing to the course. The trial version of the full course offers a short introduction, which allows users to get a comprehensive insight into the content of the course, before making a purchasing decision. The course also includes a short introduction video in the course description in the form of a three-minute version of the full course video. Figure 24 illustrates the Course Detail UI.

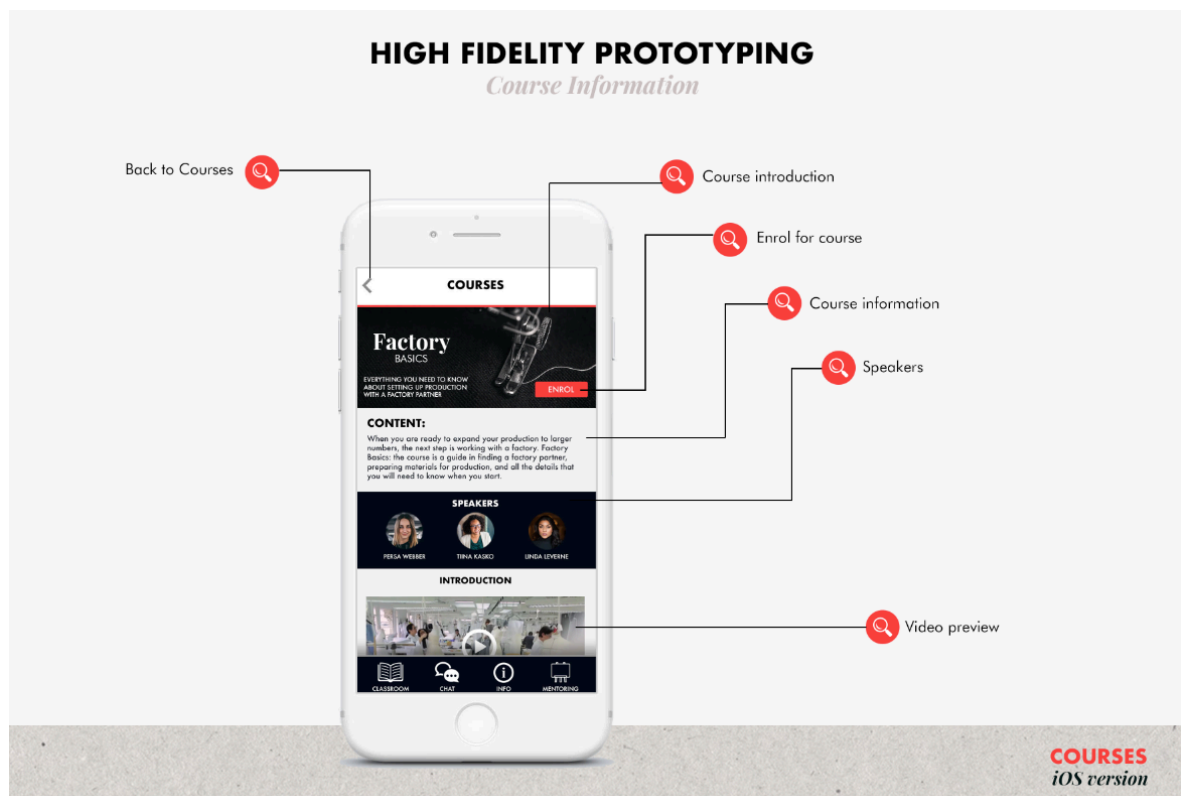


Figure 24: Course Information

Some courses, which include more detailed information, such as patterncutting, will also have a web version available in order to improve usability and allow users to see the content on a larger screen.

In terms of accessibility, the content of the course should be accessible 24/7, however, the live mentoring seminars, which run in parallel to the course, would only be aired at specific times.

### 5.3.3 Information

Whilst reviewing the information section, the sponsor felt although the Information section and Webinars were extremely useful features, she felt that the Library section would be too complicated to implement, as it would require constant updates and content curation. Instead of a Library feature, the sponsor suggested a Directory section, which would provide contact details for a range of companies, publications or useful contacts.

Instead of the three original sub-sections, Info, Library and Webinars, the three new sub-sections of the Information section will now be Info, Directory and Webinars, as illustrated in Figure 25 below.

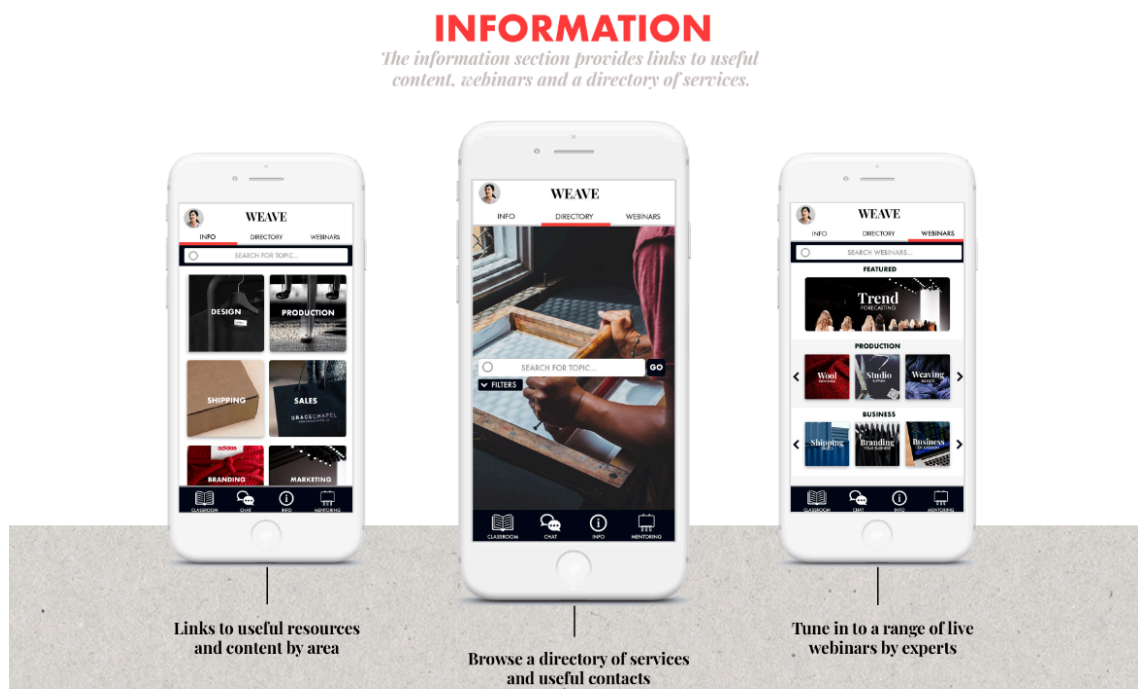


Figure 25: Information Section

One of the key points of discussion in regards to the Info section was the content that would be available for free to all users for the application, such as a fashion glossary, shipping guidelines, or sewing terms. Although the content will be something that will be added later in the development process, the sponsor suggested further examples of content that could be included in this section. Another example of the type of content that could be provided in this section would be a directory of shipping partners and guidelines, as shown in Figure 26.

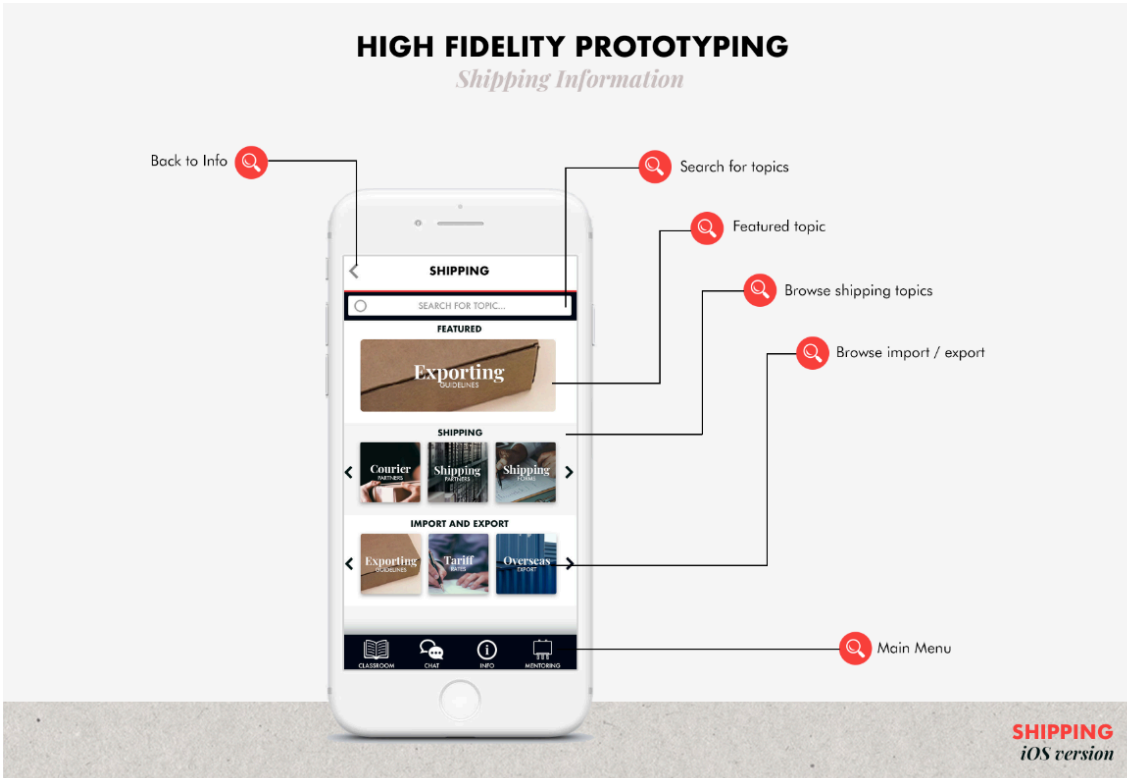


Figure 26: Shipping section

Through the main information area, the user can access further sub-sections, such as Design, Production or Shipping. Each sub-section would then include specialized information such as shipping partners, regulations, or exporting guidelines, as shown in Figure 27 below as an example.

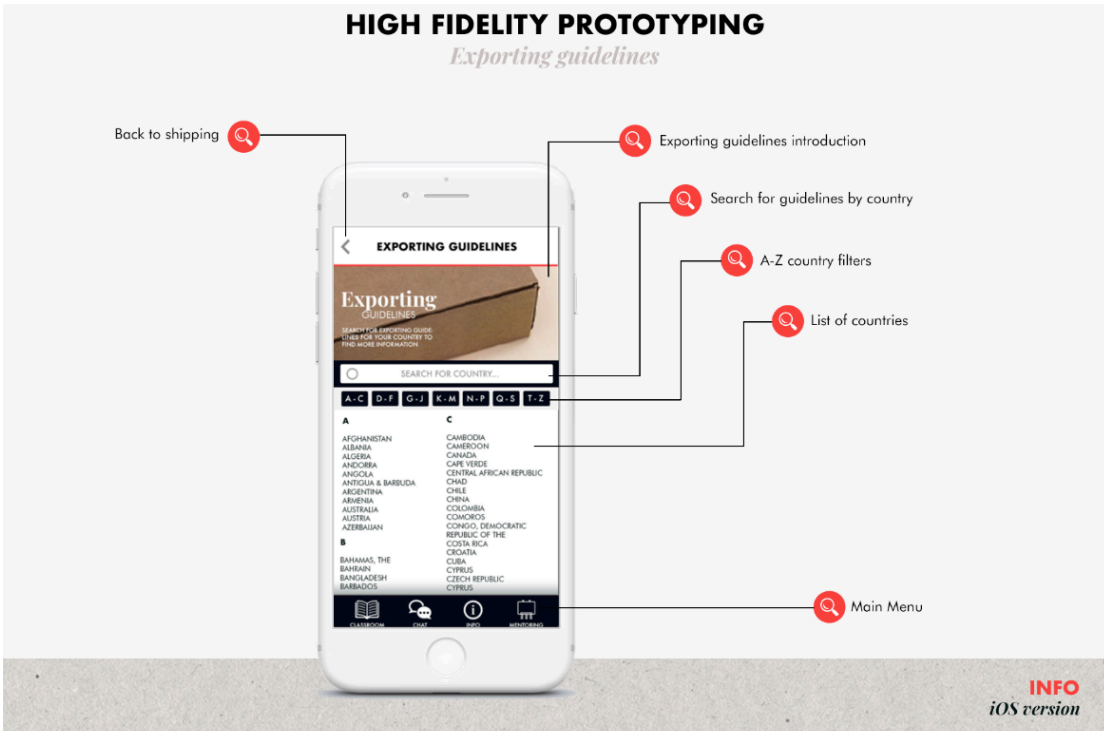


Figure 27: Exporting Guidelines

By providing a list of exporting guidelines, or shipping partners, this will allow entrepreneurs to streamline their shipping processes, or choose the right shipping partner according to their business and geographical location. By partnering with shipping partners, this also provides a prospective revenue stream. In addition to the market leaders, such as DHL and UPS, smaller shipping partners such as Royale Int'l, and regional couriers can be added to provide more economical options.

### 5.3.4 Communication

After reviewing the application, the sponsor felt that there were no changes needed to the initial proposal of the communication section. The three sub-sections, Contacts, Chat Logs and Forum, as seen in Figure 28, were kept the same, and provided all the required features required for the communication needs of both the mentors and entrepreneurs.



Figure 28: Chat section

### 5.3.5 Mentoring

The current sub-sections in the mentoring section include Directory, Programme and Calendar. Since the mentoring programmes are now to be directly linked with the courses, the three sub-sections now include Custom, Courses and Calendar to cater for course mentoring, custom mentoring programmes and the calendar section to show all the booked appointments. Figure 29 illustrates the new sections of the mentoring section.



Figure 29: Mentoring section

The new Courses section allows users to enter the live mentoring sessions, which go hand-in-hand with the courses via a session portal, which shows the upcoming timings, subjects and course instructors. Users can then tune in quickly through this page and be transported to the live mentoring, and chat area where they can communicate with the mentor directly.

### 5.4 Further development

After discussing the current state of the mentoring application with the sponsor, further areas of development were identified both in terms of future application design and development, as well as the business requirements for future development of the concept.

The application design proposal would require further design iterations, as well as rounds of usability testing in order to validate the proposed design before going into later software development stages. Additionally, the business concept of the application also requires extensive research and collaboration with content providers and researchers in order to both determine the nature of the content, as well as the logistics of mentoring and coaching. This section explores the concepts to be developed further in future stages.

#### **5.4.1 Business Development**

In terms of business development, one of the key issues that must be considered when planning the future development of the application, is the need for resources- both financial, as well as human.

Future development of the application will require third party assistance from business mentors, educational institutes and researches in order to produce content for existing information within the application, as well as content for courses and the corresponding live mentoring sessions. Other examples of required content include translated content in different languages, to cater for users from different countries.

Further resources are required for the marketing and sales of the application, to attract brand partners, sponsors and collaborators- and to promote, grow, and maintain the global community of mentors and entrepreneurs, which are central to the business concept.

#### **5.4.2 Application: Light Version**

In addition to the proposed application design, which provides a range of visual content, with access to webinars, videos and imagery, there should be an accompanying Light version, which provides a lighter version of the application, to users who are limited in terms of connectivity, in order to minimize download size as much as possible.

Since there may be a number of users who are operating on sub-3G networks, or pay-per-megabyte contracts, it is important to provide a light version of the application in order to cater to all users. This light version focuses on providing a simplified version of the content that can be “easily processed by slower mobile web subscriptions” (ICS 2016.) and has been optimized to reduce data size. Since text is a cheaper form of data, the Light version should provide more text content, rather than imagery, unless required.

### **5.4.3 Application: Mentor Interface**

The first design iteration presents a proposal for the artisan interface of the application, which aims to provide the users with the tools, education and mentoring to advance their learning. Since the application is designed for two sets of user groups- the entrepreneur, and the mentor- an additional mentor interface, with an altered interface of the application would also need to be designed and developed in order to provide the appropriate features for mentoring and teaching purposes.

The selection of features currently provided by the application would need to be edited in order to focus on the mentoring approach. Although the communication section could be kept identical to the current interface, the mentoring, classroom and information sections would need to be altered in order to provide features, which allow content creation, progress supervision, and teaching capabilities.

Further user research would also be carried out with target mentor users, as well as usability testing with the target users to refine the mentor feature requirements.

## **5.5 Usability Evaluation**

Due to the limitations set out in the scope, usability testing was not included as part of this study. Although the initial plan for the study set out to create a usability test plan, and carry out usability testing to validate the user interface design, this was unfortunately not possible due to the amount of development required to refine and determine the final requirements, interface design and content.

Usability testing, however, is one of the key steps moving forward in this study. In order to verify whether a product satisfies the user, it is important to complete the final stage of the user-centered design process- the testing stage. Usability testing is a crucial part of any product design cycle, as it is important to know if the product is functional for a wide range of users who do not have previous knowledge of the product. As Jakob Nielsen comments, "Your best guess is not good enough" (Nielsen 1993.) when referring to usability engineering.

### **5.5.1 Usability Test Plan**

A future usability plan will aim to create a test plan in order to choose the most appropriate method of testing, define a suitable group of test subjects, as well as prepare a set of

tasks and materials to provide to the users of the usability test to complete. The user test will be performed, documented and analysed after completion, producing a report which presents primary information on each participant's navigational choices, task completion rates, overall satisfaction ratings, questions and feedback, so that the product can then iteratively be improved.

With such a wide variety of mobile applications on the market, more experienced users in regions such as Europe and Northern America may experience less issues when navigating applications, due to the familiarity and experience using multiple different applications. When designing for users in emerging markets, however, this process is a lengthier one, which must consider cultural nuances, as well as technological ability.

In order to test the Weave application, it is crucial to test the application with various sets of users, of different technological skills, in order to truly be able to provide a service, which caters to even the least technologically familiar users. Three main sets of user groups can already be defined at this early stage:

- Mentor user group
- More technologically advanced artisans and entrepreneurs
- Less technologically advanced artisans and entrepreneurs

The usability test of the Weave application will be task-oriented, and will aim to provide qualitative and quantitative data in order to understand how easily users are able to find required information within the application, and whether the user can complete specific tasks that reflect real issues that the target users may face as mentors or entrepreneurs within their business. This usability testing stage will allow the application to be evaluated, re-tested in further iterations to smooth out any issues, and refined to create a final product.

### **5.5.2 Heuristic Evaluation**

Although it was not possible to complete a usability test of the prototype, a brief heuristic evaluation was performed to assess the initial usability of the proposal, using Nielsen's usability heuristics for interface design.

Visibility of System Status refers to the provision of feedback given to the user about the status of the system, as well as recently completed actions. Although the design prototype has been designed as an interactive prototype, the proposal is a representation of the



visual design, rather than the functionality of the system. Status bars have been utilized, however, in certain pages, such as in the Progress bar and Calendar shown in Figure 30, to indicate the user's progress.

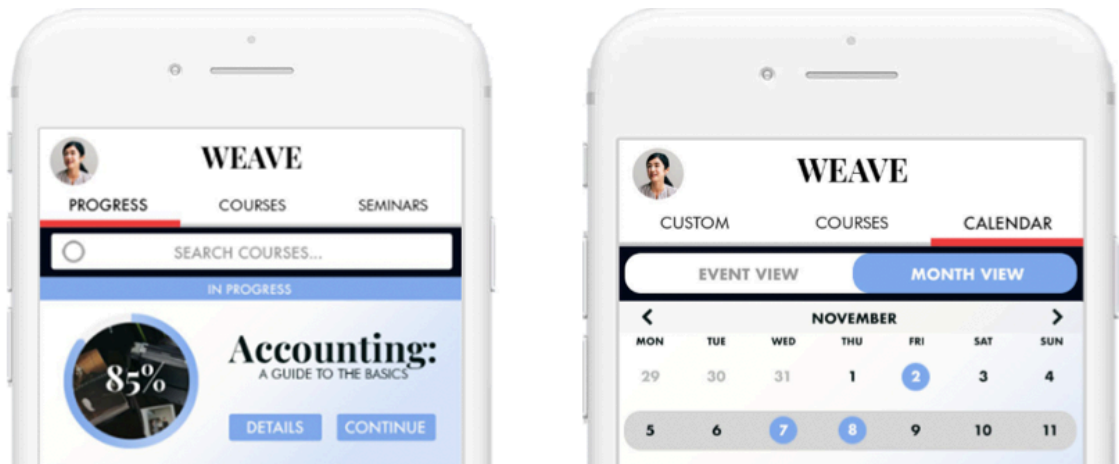


Figure 30: Interface system status

As seen in Figure 30, the system status can also be seen in the sub-section navigation bar at the top of the application. When the user explores the various main areas, a sliding navigation bar indicates to the user which sub-section they are currently in, allowing the user to navigate quickly and easily, and see their status at all times.

Match between the system and the real world assesses the familiarity of the system, how logical the information is, and how well the users can relate to the system by utilizing past experiences. Although the system uses terminology, which is more specific to the fashion and textile industry, this is appropriate for the target users of the application.

The Weave interface utilizes certain elements that are familiar from other popular applications, such as Whatsapp, as seen in Figure 31 below, to ensure that less technologically experienced users who only have limited experience with applications feel comfortable using the application. Since many of the target users are familiar with certain applications, this should increase the learnability of the application interface, decreasing the time taken to become proficient in its use. Overall, the application provides a clear, familiar layout, and appropriate terminology for the users.

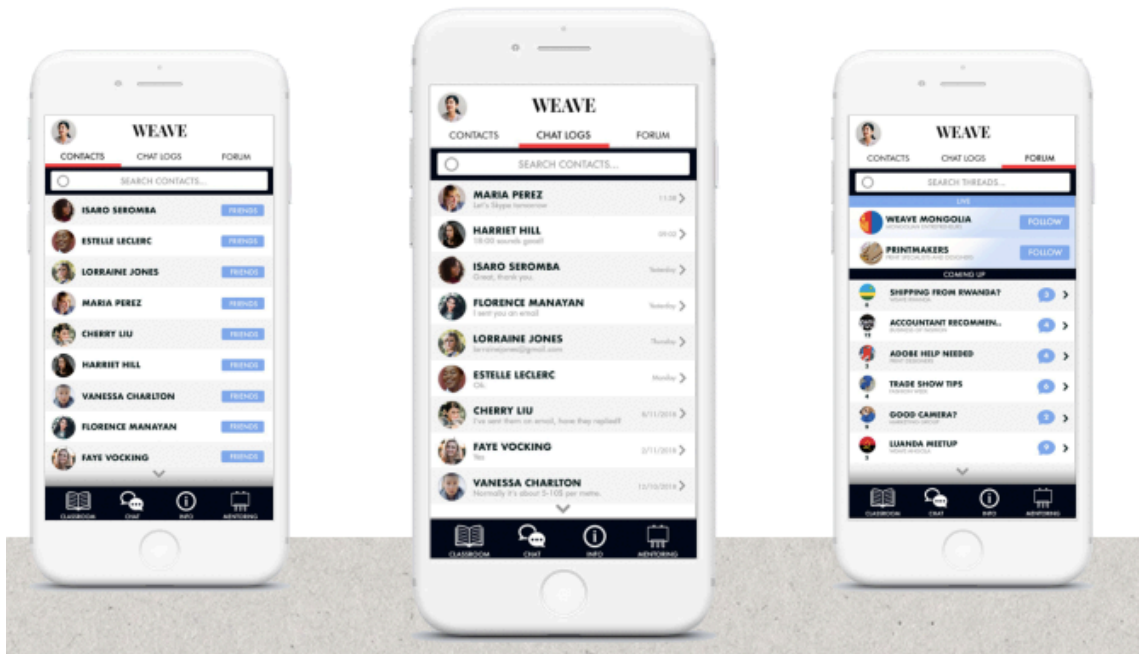


Figure 31: Communication features

User Control and Freedom refers to the control provided to recover from any mistakes and leave unwanted pages. The Weave application utilizes back buttons whenever possible, for example, when entering a sub-section of a particular page. This allows the user to feel that they can return home whenever needed.

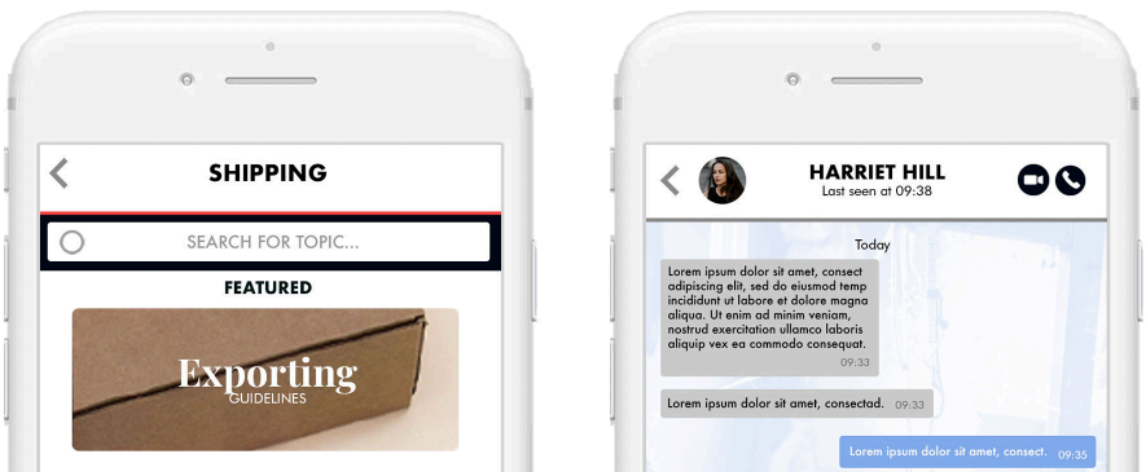


Figure 32: Interface control and freedom

In order not to confuse users, applications must provide Consistency and Standards. This means using consistent terminology, icons and error messages that are in line with industry standards.

Error prevention, according to Nielsen, aims to eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action. (Nielsen Norman Group 1993.) Since the design proposal is a representation of the visual design, rather than the functionality of the system, the design proposal does not yet include error or confirmation messages. These need to be developed in further stages of the project.

Recognition rather than recall aims to minimize the amount of effort required by the user by making objects, actions and options visible, and easy to locate. The user should not be required to remember information from one page to another, and thus, it is important to provide users with shortcuts, frequently used words and preferences- in other words, accelerators.

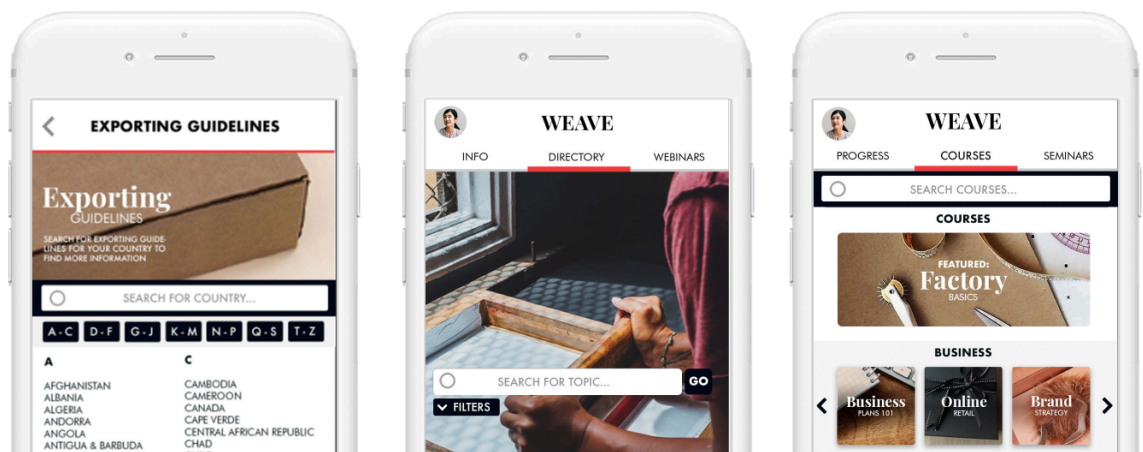


Figure 33: Search options

Although any auto-fill features or personal preferences will be introduced at a later stage of the project, the application does aim to make information easily accessible, using search bars in several pages, as seen in Figure 33 above, in order to decrease time spent searching, and provide a shortcut to the information.

One of Nielsen's key usability heuristics for the interface design of a product is aesthetic and minimalist design. User interfaces should be simplified as much as possible, and according to Nielsen, interfaces should match the users' task in as natural a way as possible, such that the mapping between computer concepts and user concepts becomes as simple as possible. (1993, 115.) This means that interface pages should only display the most relevant information possible, objects should be logically grouped, and the most relevant information for the task required should be highlighted, or displayed in a way that it is clear to the user.

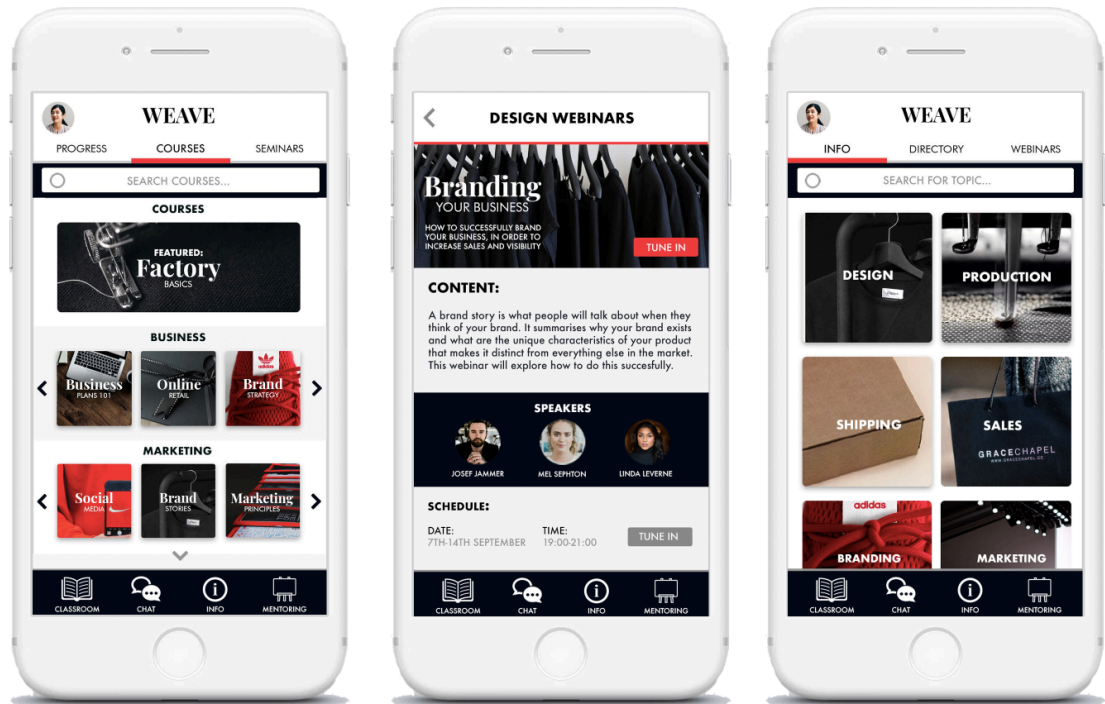


Figure 34: Interface grouping and highlighted information

In order to provide the user with a logical layout, all items are grouped clearly within areas of interest, topics, or functionalities. As seen in Figure 34 above, the courses are clearly grouped by topic, and visually arranged in groups, key information such as navigational cues and call-to-action buttons are highlighted in accent colours, and a clear, consistent layout is maintained for all of the pages.

Good error messages are also important to the usability of the application. As Nielsen explains, they represent situations where the user is in trouble and potentially will be unable to use the system to achieve the desired goal. (Nielsen 1993, 142.) They also present opportunities for helping the user understand the system better, diagnose and recover from errors and receive constructive feedback and solutions. Although the design prototype does not currently include error messages, these are a point of further development in further stages of the project. Help topics will also be included in further versions of the application to provide further user assistance.

## 5.6 Further development

In addition to resources dedicated to the business development and content creation of the application, front and back-end software developers with a knowledge of data struc-

tures, and understanding of the business logic of the data, are required to build the application once the final design has been finalized.

These developers must be able to define what data is saved, what data is retrieved, and if data needs to be deleted at a certain point- all in all, how data is handled. Due to the significant amount of development required to build the application from scratch, the user research and usability testing stages are absolutely crucial to ensure that major changes will not need to be made at further late stages of the application lifecycle.

## **6 Conclusions**

The development of an application, which aims to serve multiple user groups, educate entrepreneurs, and create a community with a global reach, is an extremely large and demanding project, even in terms of concept creation and development. This chapter explores the challenges faced during the completion of this study, evaluation of the process, as well as the sponsor feedback provided.

### **6.1 Challenges**

Due to the large size of the scope involved in the initial planning stages of this study, it was important to narrow the scope down significantly to ensure that the study was able to explore certain subjects more in-depth, instead of attempting to cover many various parts of the project in less detail. Although this study serves as a first proposal for development and merely skims the surface of a much larger future development project, it was still important to conduct the user research and user-centered design and development processes with the aim of establishing a core set of user requirements for further development.

In addition to the refinement of the scope, there were many additional challenges that were faced during the project timeline. One of the most significant issues faced in the user research stage was the gathering of primary data, due to privacy issues and response rates. Although the process of arranging interviews with business mentors and mentoring associations was a much more simple process, sending questionnaires to target users was a much more problematic process.

Due to privacy regulations, many business mentors were not able to forward questionnaires to target entrepreneur users in the database, and thus, only a limited amount of responses was received despite sending the questionnaires to a much larger target group. Some business mentors were also not able to participate in the interview stage, due to brand policies regarding the mentoring services they provide. These challenges made the user research process a very lengthy one, as well as the response rates and scheduling of interviews with busy participants during the summer period.

Creating a user study is an extensive process in itself, with several stages required in order to ensure that the user study can create an accurate profile, which reflects the needs, personas and journeys of the target user of the product. A product with such a large scope, however, introduced new challenges to this process.

In order to create a user study which takes into consideration various cultures, different levels of technological capability, multiple user groups, connectivity issues and subsequently, usability issues in order to ensure every user has access to the information provided, is an extremely broad task. In addition, creating a product, which aims to serve a global community of entrepreneurs, will require a significant amount of further research in order to ensure that the concept is refined before any product development is commenced.

The process, however, was an extremely interesting task due to the amount of variables involved, and the key concept, which became apparent at every stage of this project, was the importance of planning and research. Every single variable that was introduced throughout the scope of the project added a new element to the concept, which then affected the design and development of the requirements, layout and design of the application. Therefore, an extremely thorough approach to the planning, research and groundwork of the project was absolutely crucial.

Some stages of the project, in turn, required a large amount of flexibility. Since the scheduling of the project relied heavily upon the target users to provide primary user data, the gathering of data had to be scheduled- or rescheduled- according to the users' needs. In addition, the topics discussed in the interview often shifted a structured interview into a semi-structured interview, due to the amount of new data gained. This also required an ability to create a new set of interview questions on the spot, as new facts were brought up during the conversation. Although this was initially extremely challenging, this process became easier as more research was done, and a deeper understanding was gained of the potential factors and challenges involved.

The user research stage produced a lot of new considerations, in regards to the product design stage, and designing the wireframe of the application required a lot of alterations in order to produce a cohesive, clear layout, and accompanying design proposal.

## **6.2 Sponsor feedback**

Upon reviewing the product, however, the sponsor was very pleased with the progress made with the user research, as well as the initial design proposal made. Although the sponsor evaluation meeting brought up a lot of edits and further considerations for future development, the first proposal of the application was received well, and provided a solid base for future stages.

In terms of the user research, the sponsor was satisfied with the progress made so far, and was able to gain new insights from the interviews and questionnaires conducted with the two sets of target users. The User Study in particular also brought up many new issues to consider, which had not previously been considered, and identified various areas of development for further stages.

Although the application content required a considerable amount of further development, the general structure of the application was successful. Further edits may be required in terms of the features and content provided, as the user research and requirements are refined even further, but the layout of the application received positive feedback.

The branding, graphic guidelines and design concept also received a positive response from the sponsor. The sponsor felt that the logo, branding and name also reflected the concept well, and encapsulated the core values of the brand.

### **6.3 Evaluation and Recommendations**

Overall, a project of this size, which requires constant maintenance and curation of content, involvement of several researchers, developers and mentors, as well as an extremely in-depth research process prior to the initiation of the development phase, is an extremely long and complicated project to undertake.

Although this study only explores a part of this extensive project, the information gained through research has been extremely valuable, and has provided clear development points to guide the next stages of the process. The sponsor was pleased with the final outcome of the study, and provided positive feedback in the evaluation session. Having the opportunity to put skills learnt at university into practice with a real business case has also been an incredibly valuable learning experience, and has allowed experiences with previous projects to be adapted to a much more logistically challenging project.

In terms of recommendations for the future development of the Weave mobile application, it is crucial to extend the user research, particularly within the entrepreneur user group, to other geographical areas and demographic groups, in order to get a wider range of responses with more variety. Further user interviews should be done with business mentors, associations, and most importantly, the entrepreneurs themselves, to gain a deeper understanding of the user needs and requirements.



In order for the application to provide the most valuable experience to the target users, several other factors must be considered as well, such as desired content, cultural nuances and differences between target user groups globally.

Building a global community of entrepreneurs and mentors requires a large amount of user research, as well as marketing, to determine not only the general needs of the entrepreneurs, but what the ultimate benefits or tools would be that differentiate this application from other programmes or initiatives they have been a part of before.

The user research, user study and requirements phases are such crucial stages of this process, since any changes made in later stage of the process will have a knock-on effect on all future stages of the process, including wireframing, prototyping, usability testing, and software development, which require a significant amount of resources. Due to the importance of this stage, the key recommendation of this study would be to focus heavily on the user research stage, in order to understand all target user groups inside out, and to create a thorough base of information from which to continue all future development.

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# Appendices

## Appendix 1: User Questionnaire Results

What is your gender?

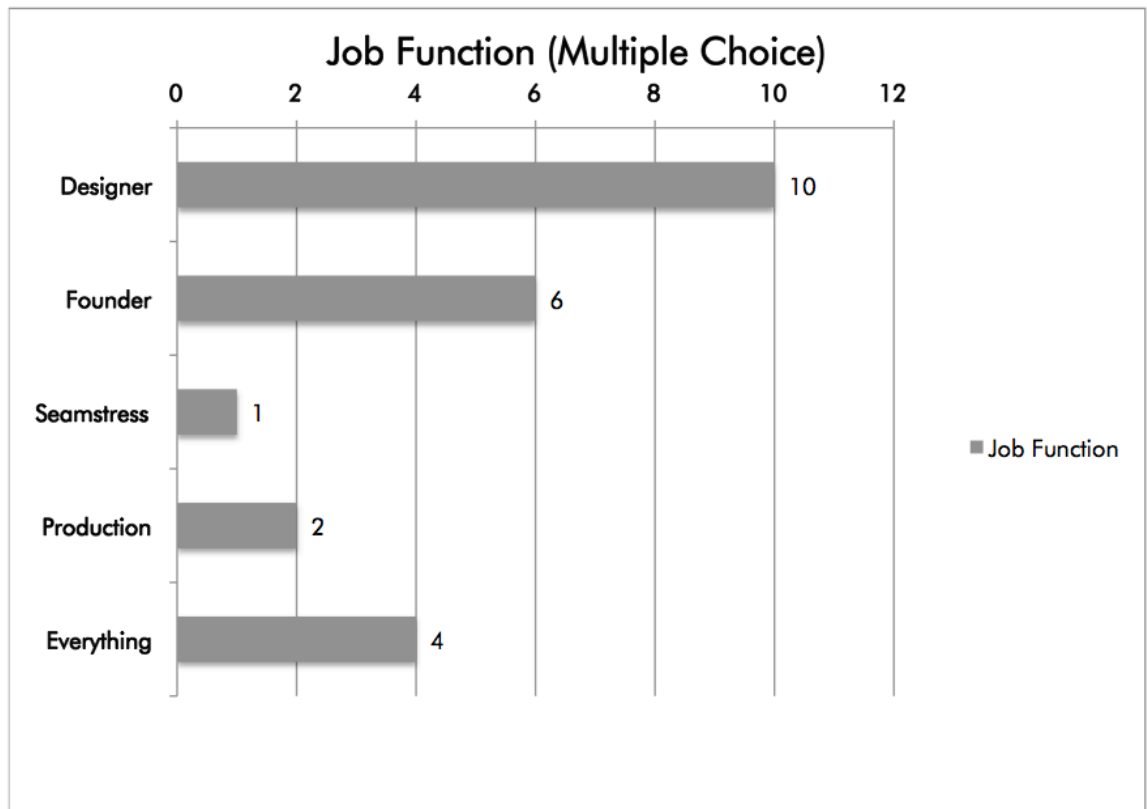
17 out of 17 people answered this question

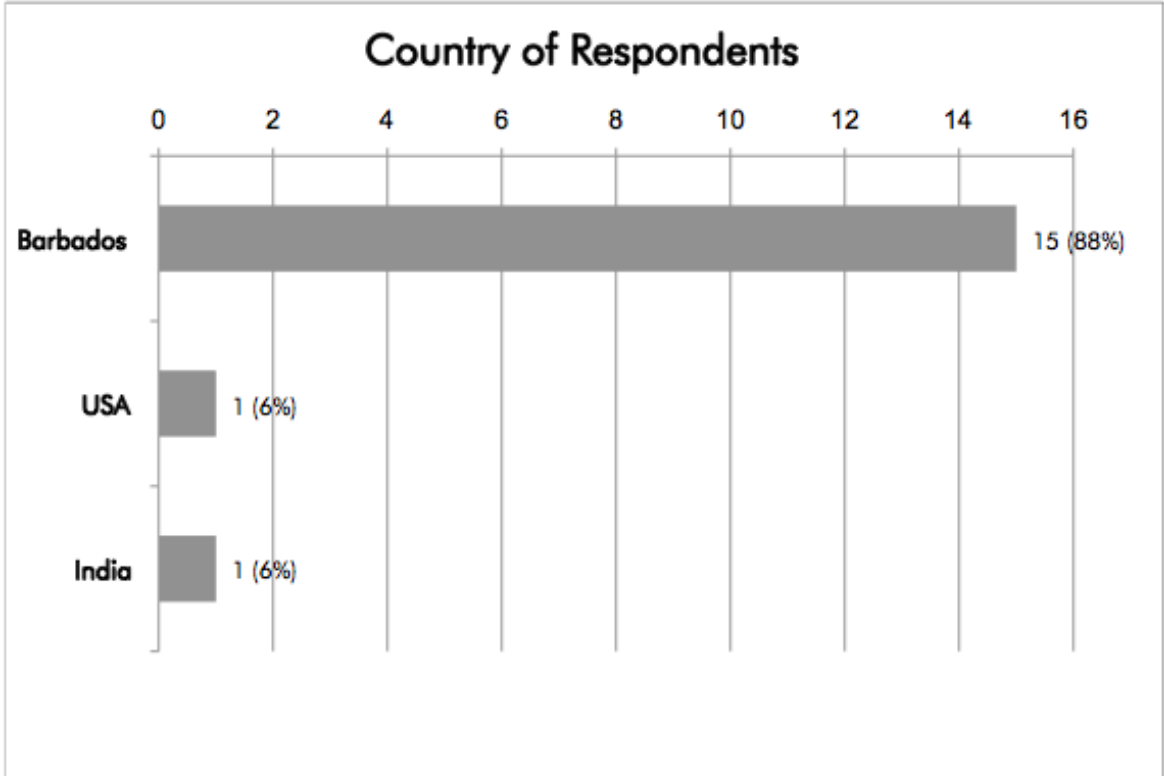
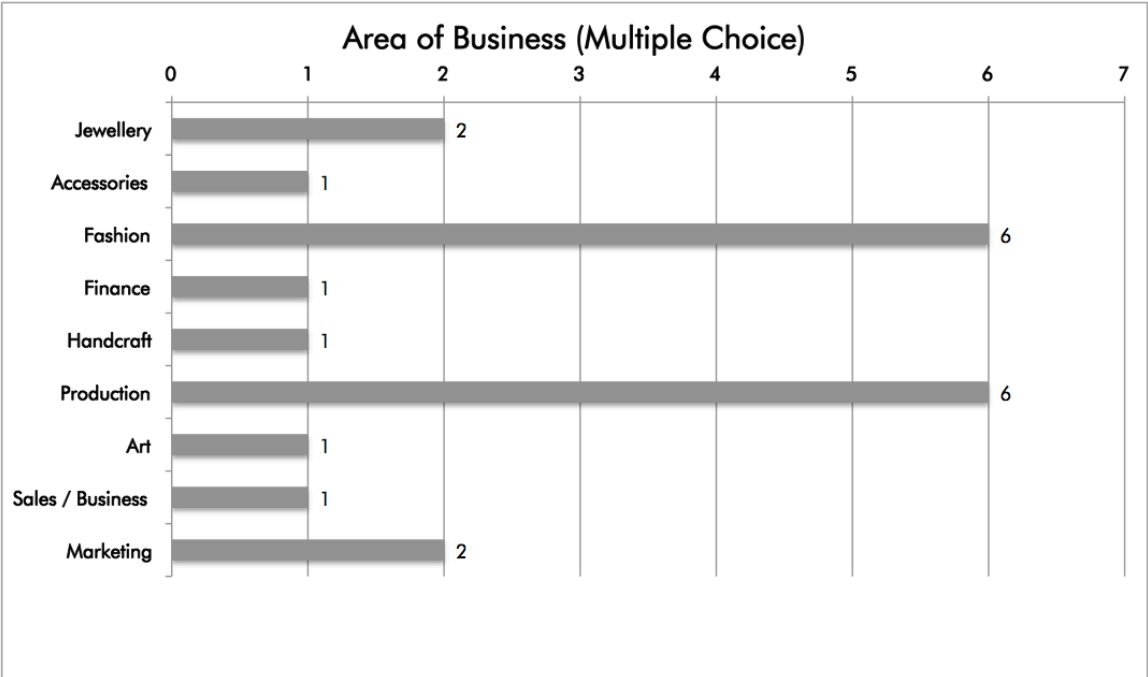
1	Female	17 / 100%
2	Male	0 / 0%
3	Other	0 / 0%

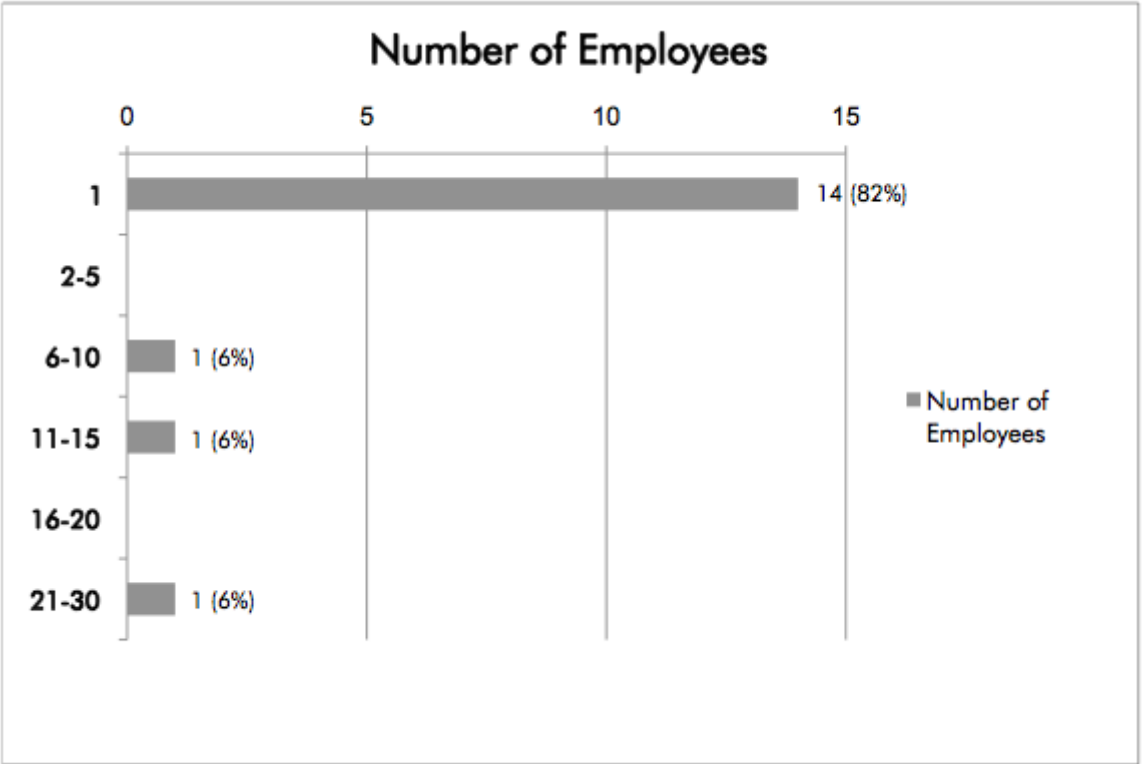
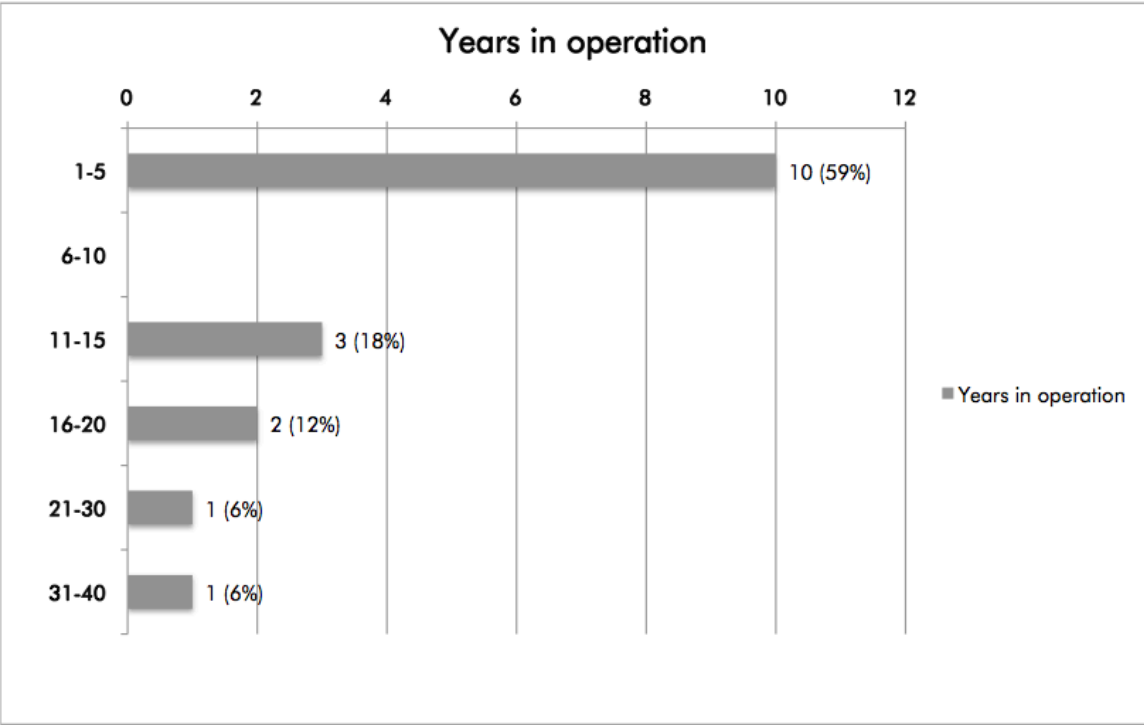
What is your age group?

17 out of 17 people answered this question

1	25-34	7 / 41%
2	45-54	5 / 29%
3	55-64	3 / 18%
4	18-24	1 / 6%
5	35-44	1 / 6%
6	65+	0 / 0%







Do you operate as a private business, or as part of a collective?

17 out of 17 people answered this question

1	Private business	17 / 100%
2	Collective	2 / 12%
3	Other	0 / 0%



**Do you currently work with any business mentors?**

17 out of 17 people answered this question



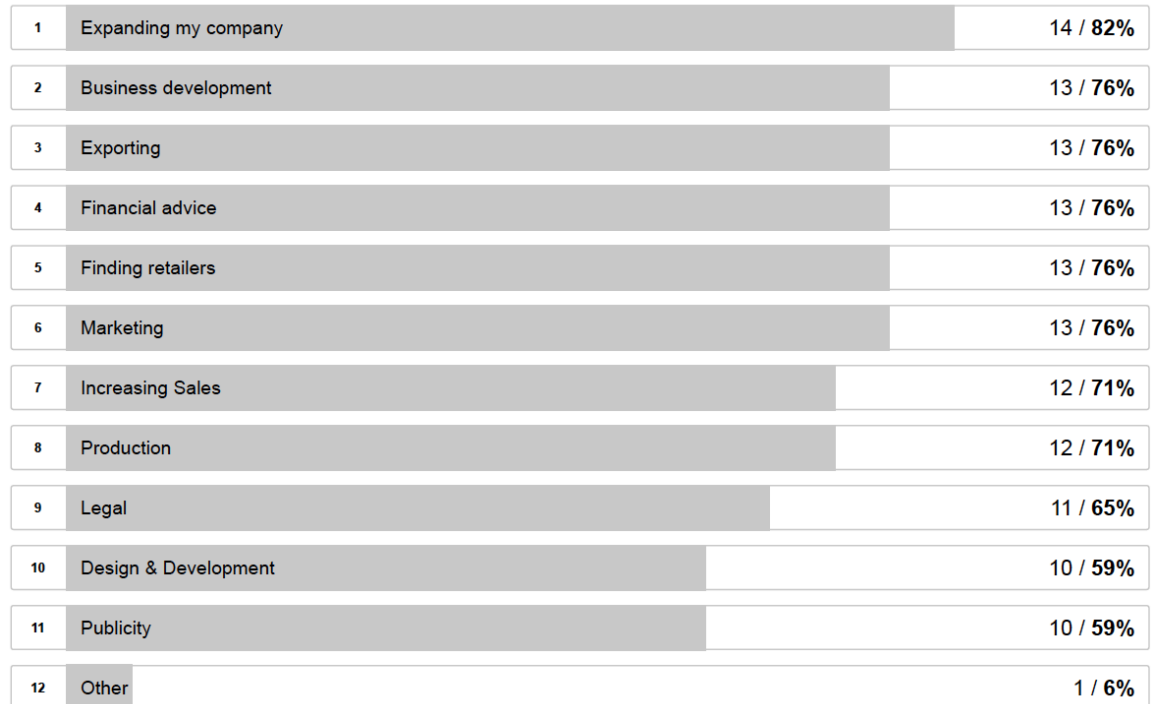
**Have you taken part in any business mentoring programmes?**

17 out of 17 people answered this question



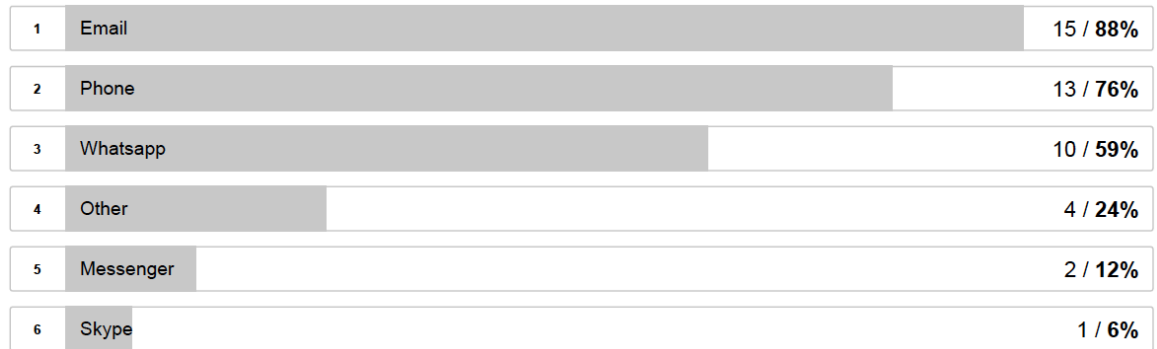
**Are there any areas you would like help in developing your business?**

17 out of 17 people answered this question



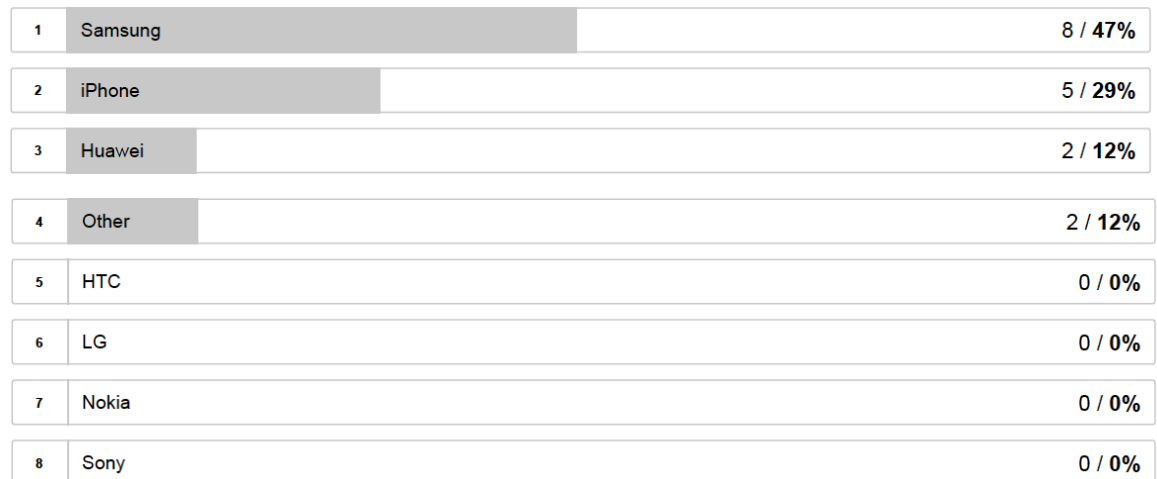
### How do you normally communicate with any suppliers, retailers or mentors?

17 out of 17 people answered this question



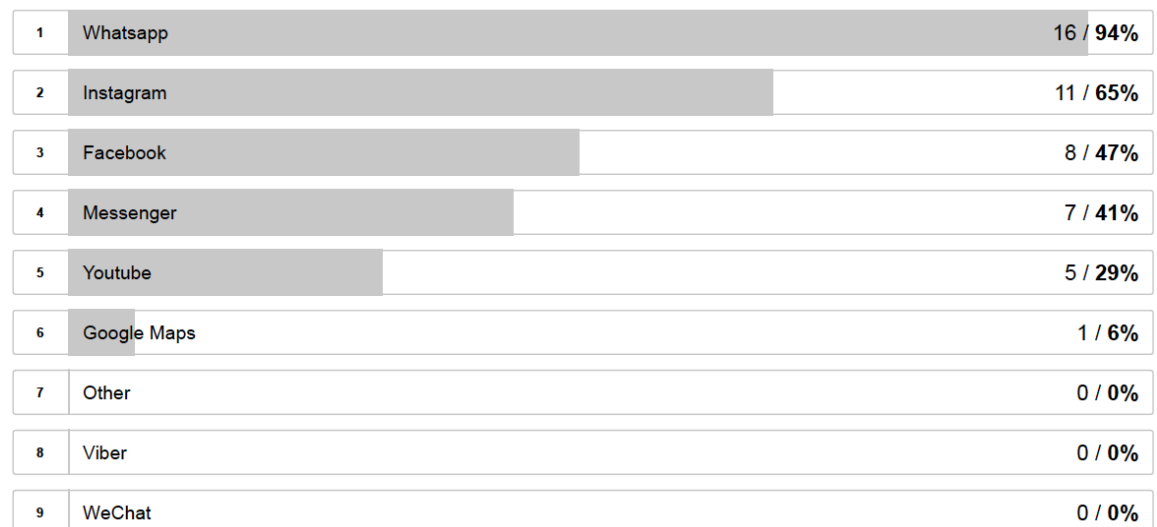
### What kind of mobile phone do you use?

17 out of 17 people answered this question



### Which applications do you use the most?

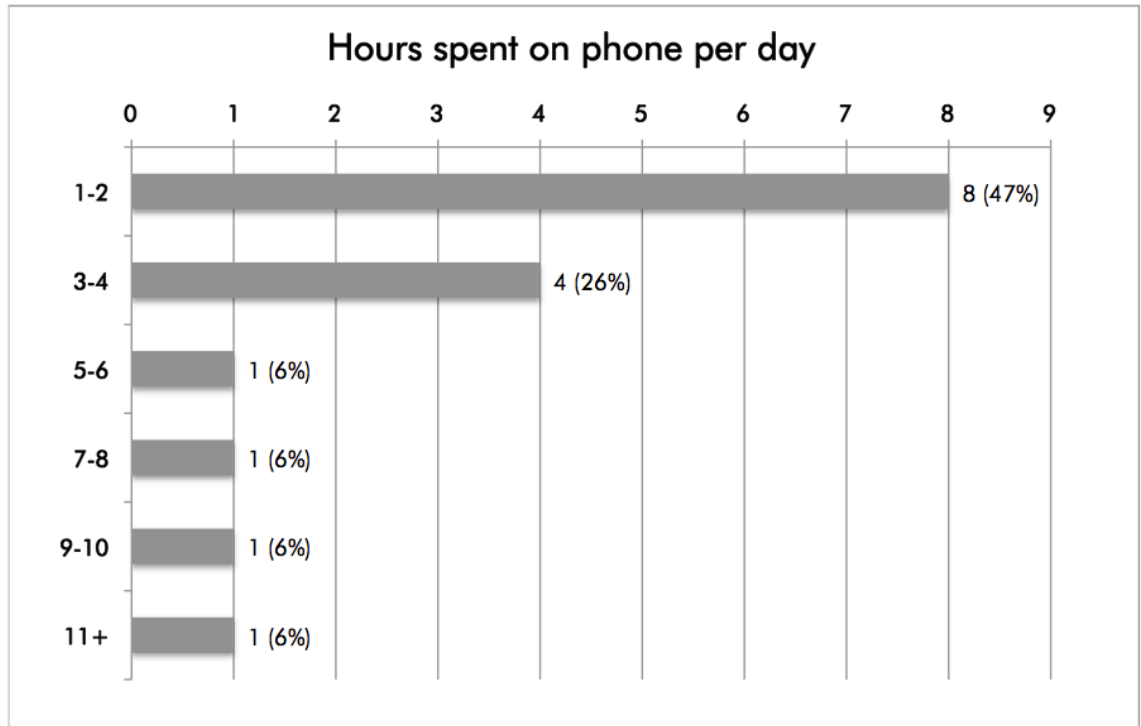
17 out of 17 people answered this question



In a typical day, do you use your mobile most often for work, personal, or an equal amount of both?

17 out of 17 people answered this question

1	Same amounts	8 / 47%
2	More for personal	5 / 29%
3	More for work	4 / 24%



What other technology do you use on a daily basis?

17 out of 17 people answered this question

1	Laptop	16 / 94%
2	Tablet	7 / 41%
3	Desktop Computer	5 / 29%
4	None of the above	0 / 0%
5	Other	0 / 0%
6	Smartwatch	0 / 0%

Do you ever experience any of the following issues when arranging communication with other businesses, suppliers, mentors etc?

17 out of 17 people answered this question

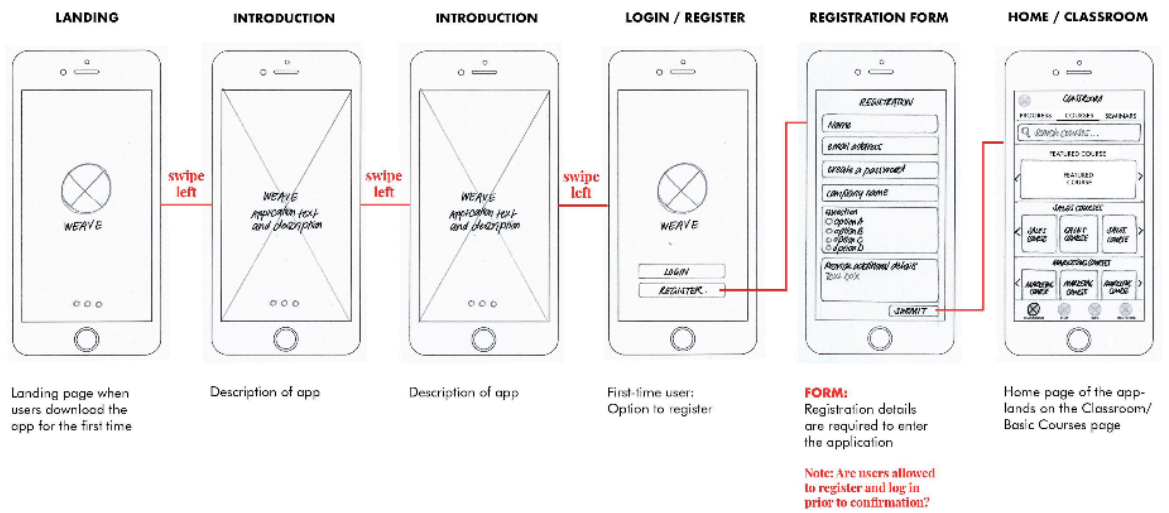
1	Scheduling	10 / 59%
2	No, I don't experience any problems	4 / 24%
3	Connectivity	3 / 18%
4	Time zones	3 / 18%
5	Other	0 / 0%

What kind of network coverage do you have?

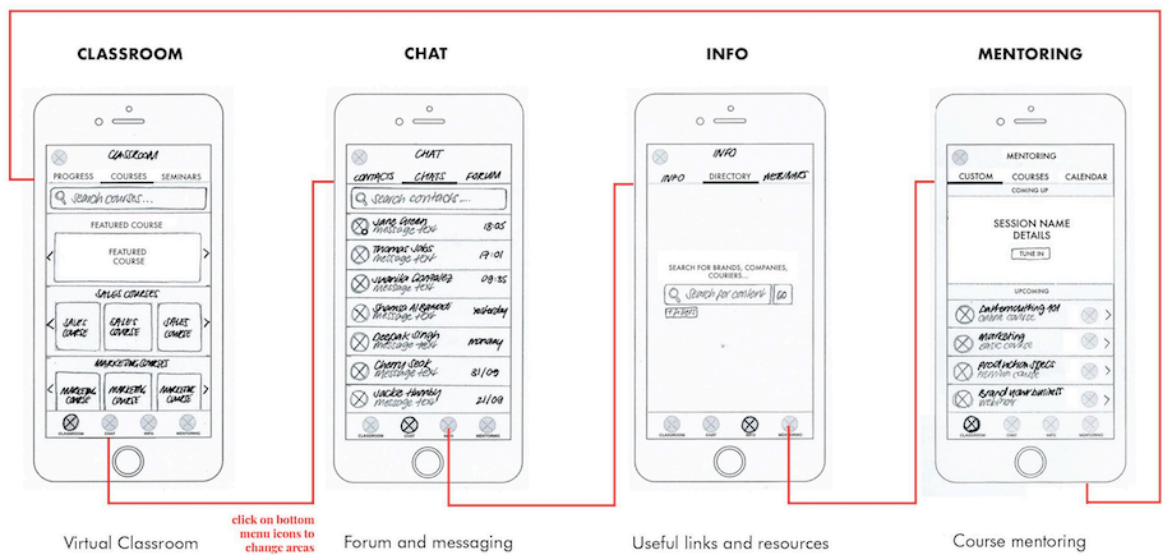
17 out of 17 people answered this question

1	4G	12 / 71%
2	3G	4 / 24%
3	5G	1 / 6%
4	2G	0 / 0%

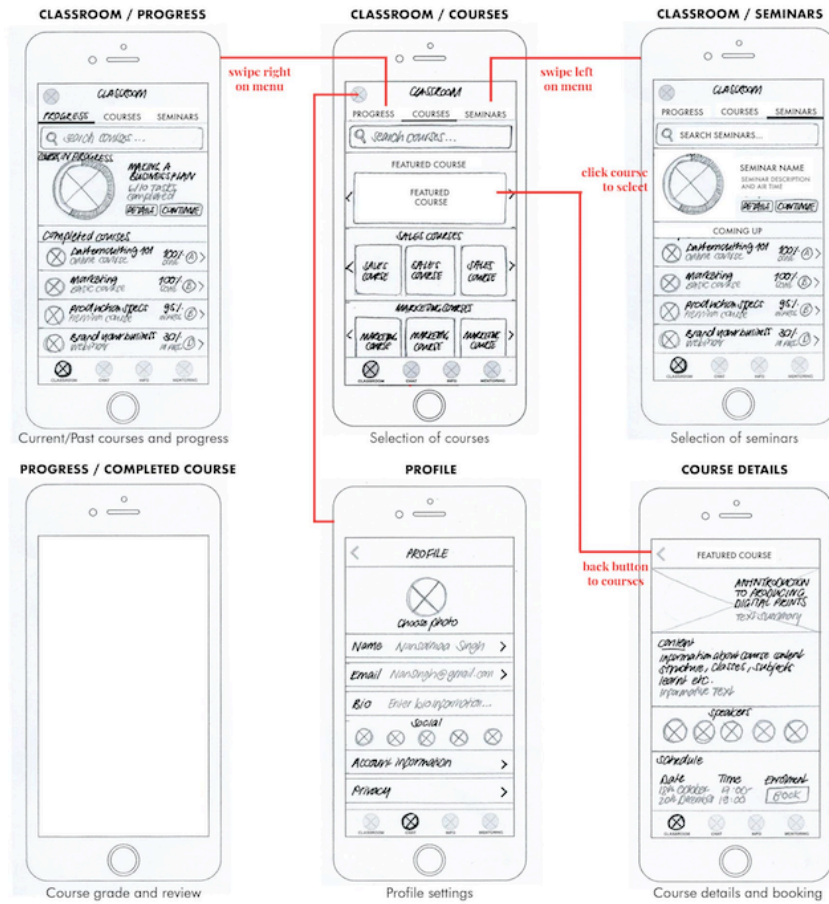
## Appendix 2: Application Wireframe (Registration)



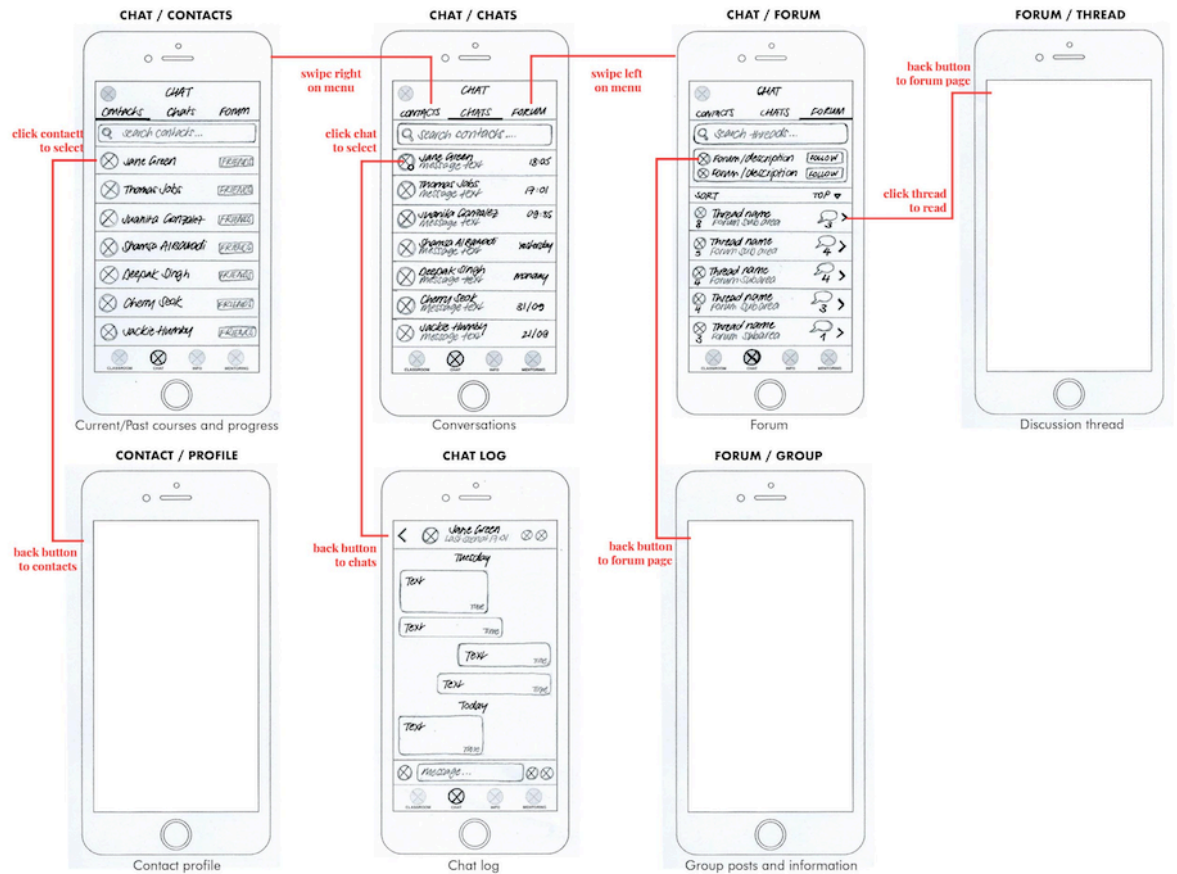
## Appendix 3: Application Wireframe (Main menu)



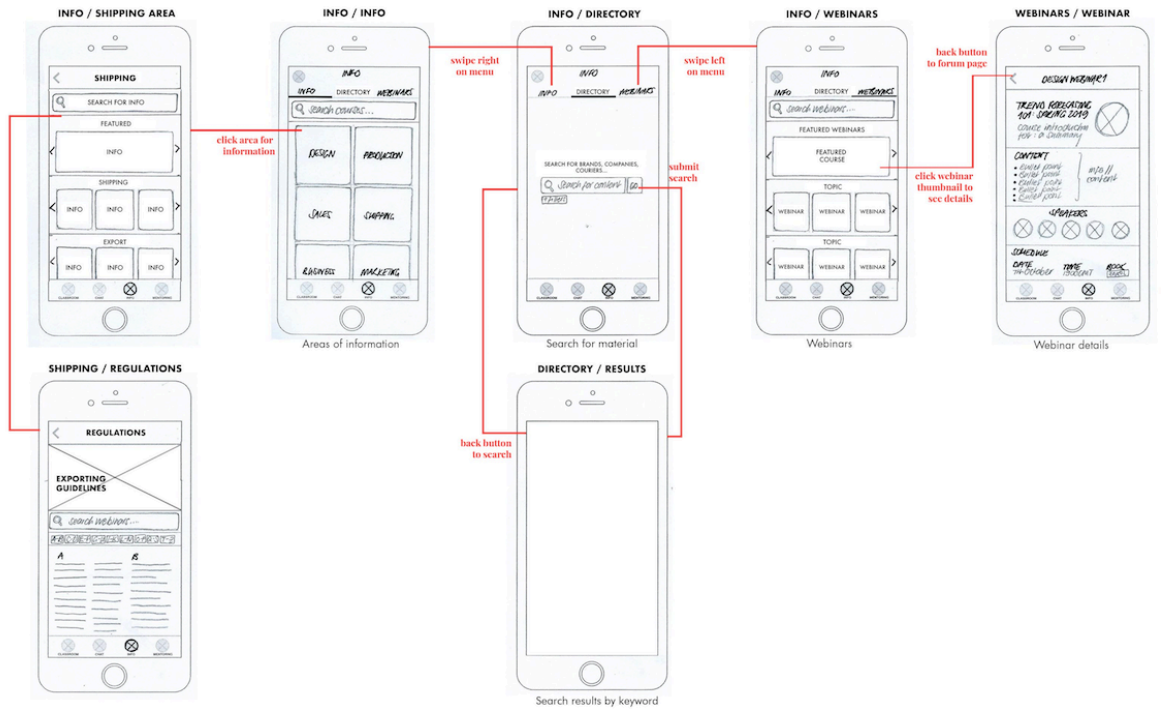
## Appendix 4: Application Wireframe (Classroom)



## Appendix 5: Application Wireframe (Chat)



## Appendix 6: Application Wireframe (Info)



## Appendix 7: Application Wireframe (Mentoring)

