

Utilizing Feedback-Oriented Design Thinking Approach for Designing Mentoring Mobile App

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Abstract

Mentoring plays a fundamental role in the education and career life of people. The advent of technology has changed the nature of mentoring and led to the creation of a new approach in education that is called Electronic Mentoring (e-mentoring). The presented project involves developing a mobile application design phase that enables mentees to communicate, match, and carry out a mentoring process. The design thinking approach was employed to uncover stakeholders' needs and pain points; the survey and individual interviews were used to gather information about end users' requirements and expectations for the app. Through the implementation of the design thinking approach, this study chose and prototyped a mobile app-aided mentoring platform that aimed to ease the mentoring process for the end users, and improves user experience and usability simultaneously. Generally, the results yielded from the usability test and User Experience Questionnaire (UEQ) were positive and satisfying. Feedback from users illustrated that the platform has the potential to improve key aspects of the user experience, such as pragmatic and hedonic qualities. Regarding the UEQ scales, the values of all 6 user experience aspects are more than 0.8 which represents a positive evaluation. Also, the values from the benchmark data set show that the app has placed above average when it comes to Attractiveness, Perspicuity, Efficiency, and Novelty. It is, thus, hoped that the findings of this paper will be taken into account by policymakers and stakeholders, in the foreseeable future.

Keywords

E-Mentoring, Design Thinking, Mobile App-Aided Platform, Online Mentoring.

Introduction

Mentoring is a close relationship between a senior mentor and a less experienced mentee with the intention of enhancing the latter's own knowledge or asking for guidance. Supporting one's academic or professional success and personal psychosocial development are among the advantages of mentoring (Kang et al., 2012). A strategy based on face-to-face mentoring is a good way to help mentees learn the skills they need to complete academic tasks, but there is always room for improvement (Williams & Kim, 2011). The most recent addition to mentoring is E-mentoring, which helps a mentee to develop skills and accelerate progress using online platforms (Singh & Kumar, 2019). E-mentoring, as a learning method, encourages the student to learn independently, allowing them to acquire knowledge and comprehend how to learn in a variety of contexts (Tinoco-Giraldo et al., 2020). E-mentoring has become increasingly popular in professional development and education (York-Barr & Duke, 2004). It is necessary for purposeful learning over time with the primary objective of assisting mentees in acquiring essential skills (Pfund et al., 2016). When a mentee is guided by a mentor, professional goals, expectations of the mentor and the mentee, career development, constructive feedback, enthusiasm for the learning opportunity, motivational spirit and career plans can all be shaped appropriately. The mentor and mentee can learn from one another and benefit from being connected to a network (Iqbal, 2020).

Some of the advantages of using mobile applications in mentoring strategies are as follows;

1. They are ideal for students who are looking for information while they are on the go
2. They are suitable for viewing both online and offline
3. They are extremely popular with Millennial
4. They facilitate a stronger connection with mentors
5. They provide access to information that is accurate and just-in-time
6. They are ideal for performance support (Drouin et al., 2015).

In this scenario, users play a crucial role in the process of developing an innovative solution because the user-centric approach helps define the right problem so that the right solution can be developed. Design Thinking (DT) is a well-known and widely used process that must be implemented to enhance the user experience. It contains five iterative phases: empathize, define, ideate, prototype, and test. Empathy with the user experience is an integral part of DT. There are a variety of design thinking models advocated by various authors in the literature; however, for the purpose of this study, the researcher followed the Hasso Plattner model (Deitte & Omary, 2019).

This study contributes to research on how to apply DT in a mentoring app, focusing on meeting the needs of mentors and mentees alike. Firstly, in the methodology section, the DT method was used to discover the needs and frustrations of stakeholders, and prototype potential solutions. To try to find strategies and solutions, DT is a methodical and iterative approach to comprehending the users, challenging assumptions, and redefining issues. The design thinking approach is discussed in greater depth in the context of this study in the Methodology section. Both mentors' and mentees' interests were investigated using the design thinking methodology, and a mobile app-aided digital approach was proposed to address their concerns. Finally, further feedback evaluation of this mobile app-aided digital method from stakeholders was obtained and discussed.

Methodology

In this study, design thinking methodology was used. DT is a method for solving problems that places the needs of the user first and then looks for new ways to solve the problems that have been found (Brown, 2008). DT also involves several iterations in which the design team either broadens or narrows the options, concepts, and potential solutions. These iterations are referred to as *diverge* and *converge*.

Because DT is based on rapid prototyping and testing of ideas and solutions, the design team can test a variety of ideas and accept viable options while excluding nonviable ones (Lewrick et al., 2018). The Hasso-Plattner Institute of Design at Stanford (d.school) proposed the five-step design thinking model which includes the steps of empathy, defining the problem, brainstorming, creating a prototype, and testing. The phases of DT include multidisciplinary teamwork to provide multiple perspectives on an issue, ideation and qualitative research to generate potential solutions, iterative testing of solutions to improve them, and prototype creation and testing (Brown, 2008).

Empathize Stage

1. Concept

The empathy phase, which serves as the foundation of design thinking and establishes the problem statement for the subsequent stages, is the first stage of the design thinking process. Empathy is essential because it ensures that the generated solution solves a real problem rather than being designed based on assumptions. The empathy phase is centered on user research because it provides important information directly from users (Bohemia et al., 2012). Surveys, focus groups, field studies, competitive audits and interviews are some of the tools to gather useful information about users' needs (Baxter et al., 2015).

2. Study Activity

Since the user experience is at the heart of our product design, Understanding and empathizing with users is the best way to create great user experiences. In order to gather crucial insights about the user's point of view on the mentorship service and analyze the market, we took advantage of different research methods (interview, survey, and competitive audit). The target user group includes students who want to learn a practical skill aged 18-22, young unqualified workers aged 22-35, and experts wishing to help juniors.

3. Interview

A guided conversation in which one person seeks information from another is an interview (Baxter et al., 2015). In the current study, both one-on-one and indirect interview (through the phone) were preferred. Four people, listed in Table 1, participated in the interview to understand problems in depth from different perspectives. The goals of the interview were to learn more about the challenges people experience while trying to learn a new skill, as well as some frustrations they experience while finding an experienced mentor.

Table 1: Demographic data of participants (Interview).

Name	Age	Gender	Job Title	Geographic Location
Reza Ahmadi	27	Male	Back-End developer	Iran-Isfahan
Baran Moheb	24	Female	Graphic artist	Iran-Tehran
Sara Shahkarami	26	Female	Student in master of science	Iran-Tehran
Niloufar Nadi	22	Female	UX designer	Iran-Mashhad

Some certain participant characteristics were: age 18-35, people who have learned a skill recently, Include participants of different genders. The goals established at the beginning of the process served as the basis for the writing of interview questions. These open-ended questions were designed to encourage in-depth discussion.

- When was the last time you decided to learn a new skill by yourself?
- What methods did you use to learn your skills?
- What problems did you face over your learning path?
- Did you consult with anyone when problems arose? Did someone guide you?
- How did you contact him/her?
- How was your experience with that person?
- Could you describe a great mentor?

4. Survey

Individuals' attitudes, thoughts, and interests in mentoring services were investigated through the survey. The target group was selected from people who were between the ages 18 and 35 as they are the generations that are responsible for leading countries, organizations, and businesses. 123 respondents were recruited in this survey, and they were mainly employed.

The ultimate goals of conducting the survey in this study were:

- Identifying people's current learning path
- The learning method that they use
- The best platform to find a mentor
- The best way to communicate with a mentor
- The Characteristics of their chosen mentor

The survey's questions set through team ideation are closely aligned with our mentioned goals and interview questions. It is important to note that the questions of the questionnaire were designed with the overlap of the primary characteristics of good UX in mind. In order to evaluate the *Usefulness feature*, below questions were created:

- Which way do you prefer to learn a new skill?
- What do you do when encountering a problem in your learning path?
- When was the last time you got help from someone to learn or improve a new skill?
- To what extent do you agree with this statement? *A mentor can make the learning path much simpler for us.*

Another set of questions was set with the intention of fostering empathy and comprehending users' needs as well as their current habits and behaviors; the outcomes of this section are crucial for determining the application's features in subsequent update versions.

- What is your current job status?
- What is your most important goal in learning a new skill?
- What skill are you currently learning?
- What way do you prefer to communicate with your mentor?
- Which option do you prefer to select your appropriate mentor?
- Are you willing to pay in exchange for getting advice from a mentor?

We used Google Forms to create the online survey and analyze the results; the survey was sent to 123 potential candidates with different social statuses and career groups through WhatsApp, Telegram, and Instagram.

5. Competitor Analysis

In this step, we performed a Competitor Analysis to find out the ins and outs of how our opponents work and identify potential opportunities where we can outperform them. Six different mentorship apps were determined as our direct and indirect competitors (Table 2). Afterward, selected competitors were compared from different angles: business, development, and functionality.

Table 2: List of competitors.

Competitor list	URL	Active since	Notes	Device
ADPList	https://adplist.org/	1949	Direct	Web
Superpeer	https://superpeer.com/	2017	Direct	Web
BetterUp	https://www.betterup.com/	2013	Direct	App
ementor	https://www.ementorprogram.org/	2016	Indirect	Web/App
LinkedIn	https://www.linkedin.com/	2002	Indirect	Web/App
Mentorcam	https://mentor.cam/	2019	Direct	Web/App



Define Stage

1. Concept

In the Define stage, themes are found by combining findings and insights from the empathy stage. The goal of the define mode is to create a point of view (POV), which is a meaningful and actionable problem statement. This should be a guiding statement that concentrates on the insights and requirements of a specific user or composite character (Luchs, 2015).

2. Study Activity

In this phase, the large volume of mixed information and data collected from the Empathize stage were clustered in an organized manner. Synthesizing the observations of users helped us to draw a comprehensive definition of the problem statement that abled us to form the ideation process (third stage) in the right direction. The collected divergent data from the previous step is categorized by creating an Affinity Diagram (Figure 1). A persona is a fictional character type that represents real participant needs, feelings, and common behavioral patterns. Two persona profiles — mentee and mentor— were created after reviewing the information gathered from the research stage and the competitive analysis to specifically identify the participants and potential users of the application. We made use of Figma as a tool for this stage. Figure 2 shows profiles of personas. In the next stage, two User Journey Maps were created to visualize the users’ pain points and find opportunities to intervene (Figure 3). For this step, we used Photoshop and Figma.

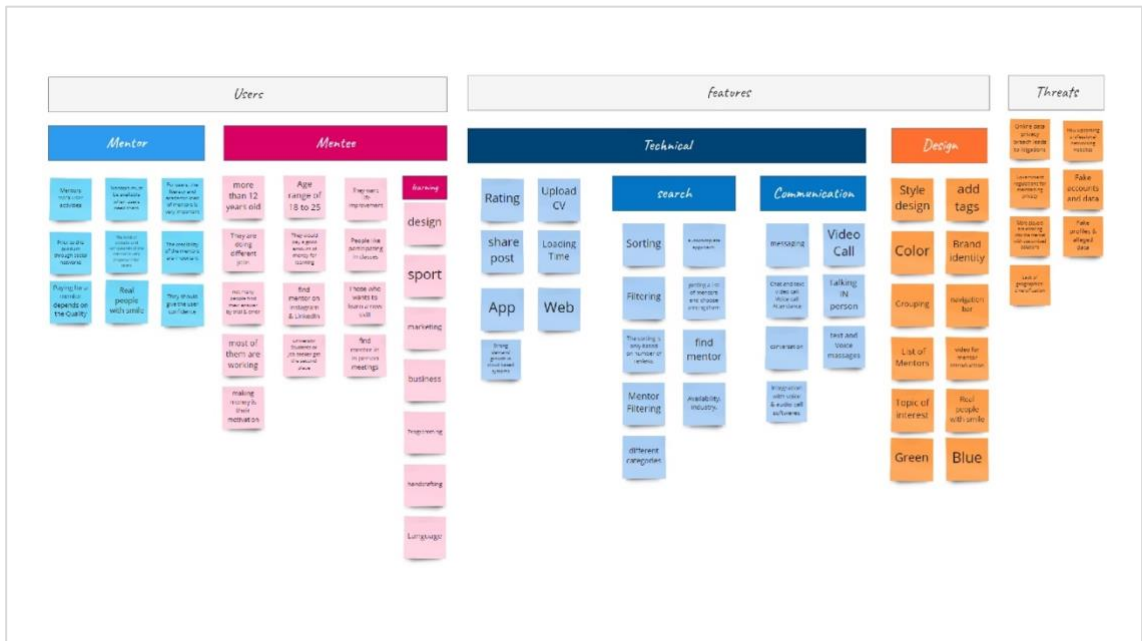


Figure 1: Creating the Affinity Diagram.

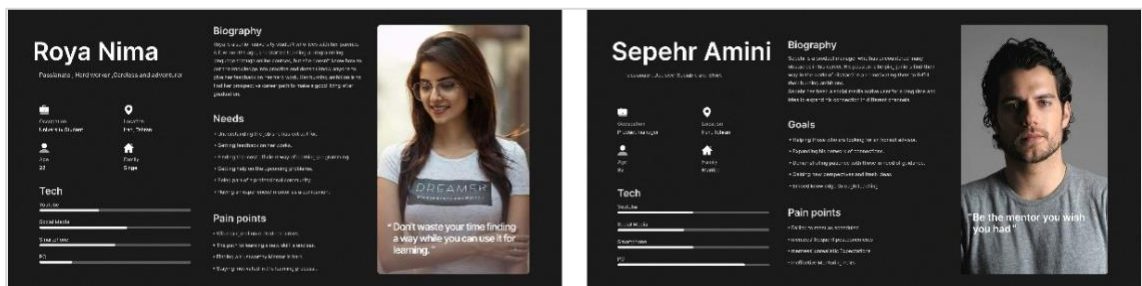


Figure 2: Persona profiles.



Figure 3: Mentor's journey map experience.

The next step was writing the User Stories based on what had been found in the research to help the project remain focused on the essential requirements of users (Figure 4).

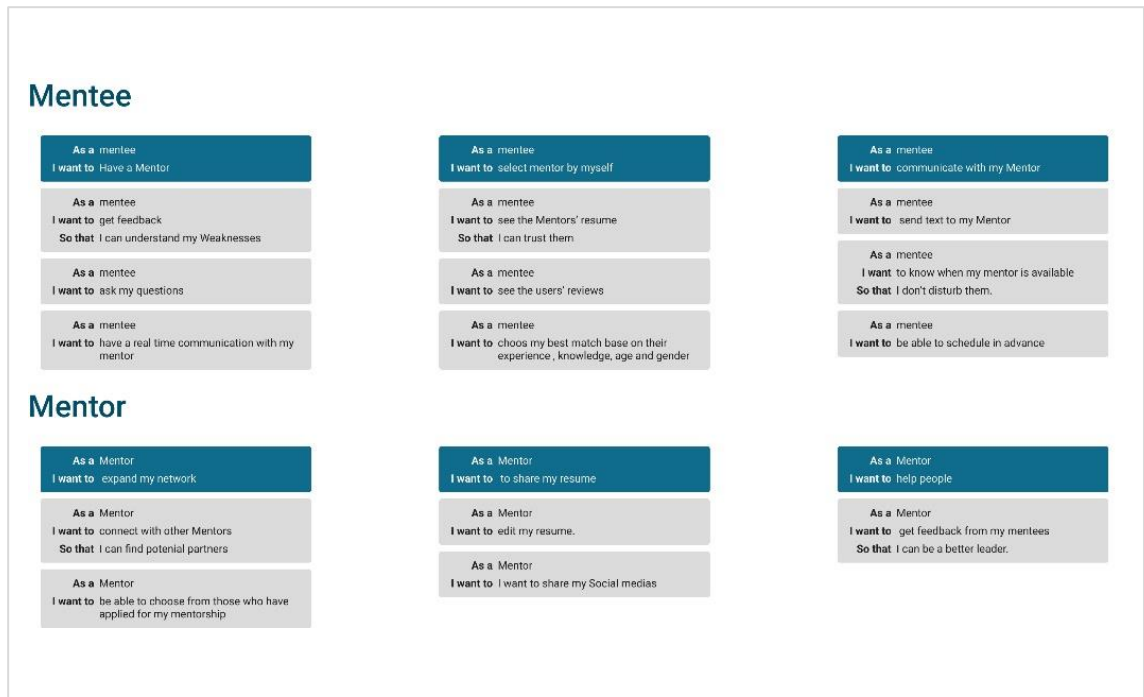


Figure 4: The User Stories of mentors and mentees.

Finally, we created a POV and four essential How-Might-We (HMW) questions through user stories that we anticipated would have answers in the subsequent steps (Figure 5).

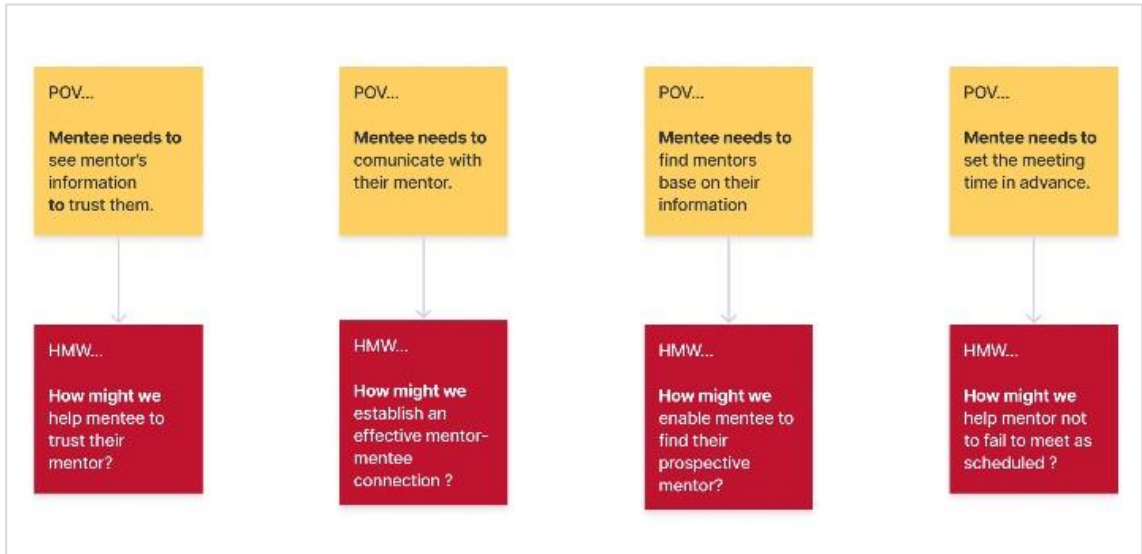


Figure 5: Crating POVs and HMWs.

Ideate Stage

1. Concept

Ideation is the stage where various ideas are generated. In design thinking, a common approach is to first *go wide* in terms of the number and variety of ideas. The next step is convergence and focusing on the idea with the greatest potential for prototyping (Luchs, 2015). There are a wide variety of ideation techniques such as Brainstorming, Crazy Eights, six thinking hats, and Bad ideas that can be used.

2. Study Activity

In the Ideate mode, we used the crazy-eight technique to warm up our brains and boost our creativity for the first round of ideation (Figure 6). Then, an array of ideas was generated to solve problems in a free-thinking environment, and it was followed by talking about each idea using the Six Thinking Hats methodology (Figure 7).



Figure 6: Crazy Eights ideation technique.

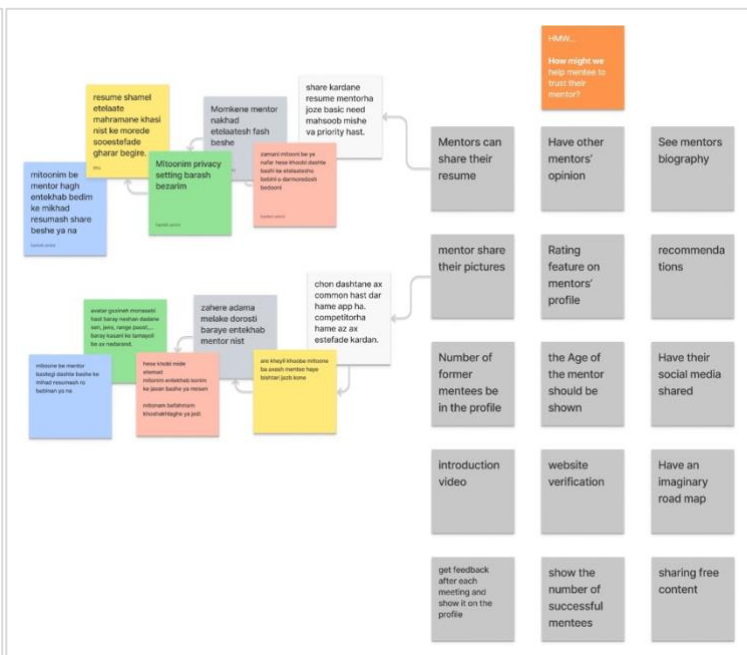


Figure 7: Brain storming technique.

Prototype Stage

1. Concept

The Prototype mode is the iterative creation of artifacts intended to provide answers to questions that bring you closer to your final solution (Luchs, 2015). Prototyping is a way to learn from user interactions to test functionality, get a better understanding, and come up with effective solutions. Products and business models need to be tested early because it is common for designers and innovators to deal with situations where there isn't enough information (Pombo & Tschimmel, 2005).

2. Study Activity

A flow chart detailing the steps required to search for mentoring information, sign in and sign up, and create a user profile was drawn to provide a clear understanding of how the user (mentee) can use the app. Then, we sketched screens to visualize the user flow identified earlier (Figure 8). The Wireframes had a low visual fidelity because they were only used to represent the interface and didn't spend a lot of time on the design's appearance or aesthetics. We created this wireframe through Figma. Figure 9, illustrates some of the E-mentoring app's wireframes.

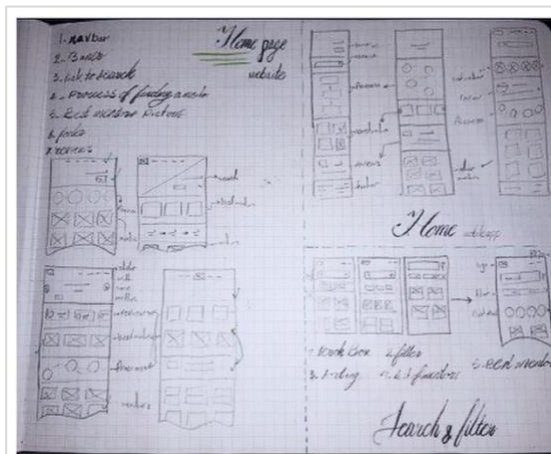


Figure 8: The Sketches.

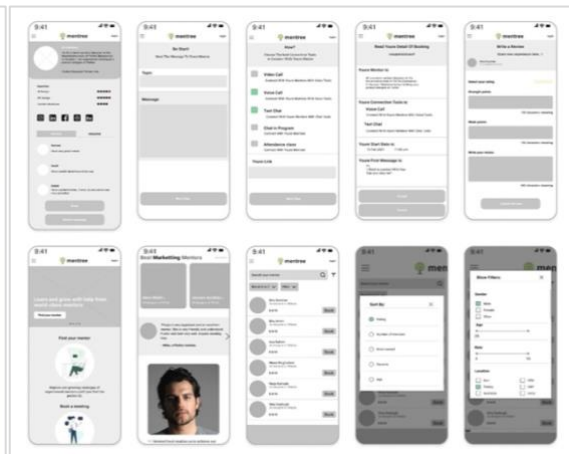


Figure 9: The low-fidelity wireframes.

The last step of Prototype phase was, creating the User Interface (UI) design of the mentoring app. UI was designed based on the guidelines of Material Design System (Figure 10). In order to design, mockup, and prototype the app, we used Figma.

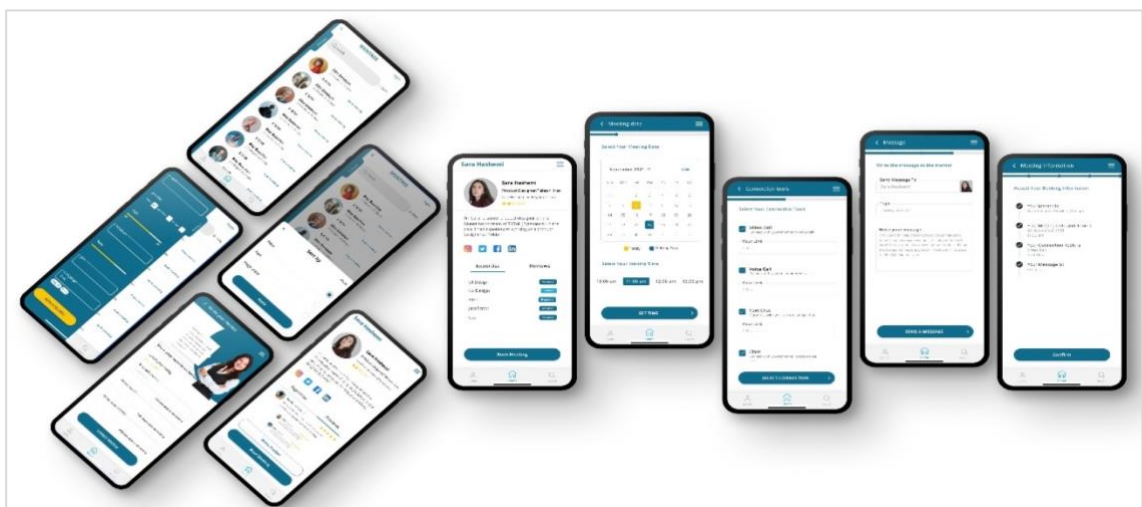


Figure 10: The UI of the mentoring mobile app.

Test Stage

1. Concept

In the Test mode, you can get feedback from your users about your prototypes and have another chance to gain empathy for the people you are designing for (Luchs, 2015).

2. Study Activity

To evaluate the created prototype of the mentoring app, we took advantage of the Moderated Usability Test method. This method provided facilitators with an opportunity to interact with participants in person and help them to understand a task. The test was conducted after completing the hi-fi prototype phase because the result gave us insight into what needs to be revised or added before launching the product. We selected five participants who were representative of the product's target users and aligned with the personas that were created earlier in the design process (Table 3). The participants were invited to a quiet public area and after a warm greeting, the final version of the prototype was shared among them through the Figma mirror app. The facilitator gave the task sheet to the participant and asked them to perform it.

Some tasks from the usability test are as follows:

1. Please sign up for the Mentree app as a mentor/mentee.
2. You forgot your password, what do you do?
3. How do you find your favorite mentor through the Mentree app?
4. Create an account on the app as a mentor/mentee.
5. As a mentor, check your booking list and send a note to one of your mentees.
6. Edit your account profile and add your Instagram account to your social media list.
7. As a mentee, book a meeting, then send a message to your mentor.
8. As a mentee, filter the mentors who are between 28 and 40 years old and live in Tehran.

We paid attention to both the users' performance and their feeling about the product. An audio recorder was used during the test, and the recordings were transcribed. Spreadsheet note-taking was used as a method for remembering specific details (Table 4).

Table 3: Demographic data of participants (Usability test).

Name	Age	Gender	Job Title	Geographic Location	Familiarity with Tech	Use similar product
Reza Ahmadi	28	Male	SEO specialist	Tehran	Normal	No
Ramin Hosseini	32	Male	Front-end developer	Tehran	Tech geek	Yes
Ana Hedayati	21	Female	Student	Tehran	Techno phobia	No
Mana Hashemi	27	Female	UX writer	Tehran	Technophile	Yes
Sasan Atri	23	Male	Student	Tehran	Normal	Yes

To ensure the accuracy of the content, the transcripts were sent to each participant via email. Then a questionnaire (UEQ Test) was sent to the participants to measure the user experience of the app. The scales of the questionnaire covered a comprehensive impression of user experience. Both classical usability aspects (efficiency, perspicuity, and dependability) and user experience aspects (originality and stimulation) were measured.

Table 4: Creating the Note-taking spreadsheet.

<i>Participant's Name: Ramin Hosseiny (Front-End Developer)</i>				
Task	Click path	Observation	Quotes	Task completion
Prompt 1: Please sign up for the Mentree app as a mentor.	open home page > as a mentor or mentee > mentee registration > Inter Info > add a photo > open photo gallery > select a photo > crop the photo > set available time > press Next button > success notification and open mentee profile > check the Info	Participant could not use the keyboard when Persian language was selected. Participant seemed comfortable and confident	<i>Why I can't type anything! What's the problem?</i>	2
Prompt 2: You forgot your password, what do you do?	Open home page > click on log in > press Forgot pass button > enter email > open email > change password > open confirm button > open app again > press the reamer new pass button	Participant quickly did the task.	N/A	1
Prompt 3: How do you find your favorite mentor through the Mentree app?	Go back to the home page > scroll sidebar > view the top mentors > search the name of skill > filter based on city and gender > select one mentor > select More button > enter the mentor's profile > press Review button > press Back > press BOOK > set time > open calendar > select date and time > write a message > press confirm > review the detail > press Next > go to his own profile	Participant couldn't find his favorite mentor based on filtering the name. Participant expressed frustration when searching. Participant went through many steps to accomplish the task.	<i>Ugh, filtering is honestly is a little confusing.</i>	2

To ensure the accuracy of the content, the transcripts were sent to each participant via email. Then a questionnaire (UEQ Test) was sent to the participants to measure the user experience of the app. The scales of the questionnaire covered a comprehensive impression of user experience. Both classical usability aspects (efficiency, perspicuity, and dependability) and user experience aspects (originality and stimulation) were measured.

Results

Empathy Stage Feedbacks

1. Feedbacks of Interview

The following is a summary of the insights obtained from the empathy stage interview:

- Mentees use different methods to learn a new skill, such as self-study and enrolling in virtual courses.
- The difficulties that learners had been faced within their learning path are:
 - Losing motivation over the learning process
 - Being confused with the numerous resources and different learning paths
 - Lack of commitment to the learning process
 - The need for an expert to ask specialized questions
- The ways of communication between mentors and mentees are: message text, video call, face-to-face contact, and social media like WhatsApp and Instagram.

4. Potential mentees verify the knowledge and skill of mentors based on:
 - Checking resumes and portfolios of mentors
 - The answers that the mentee gives to simple and trivial questions
5. The obstacles that mentees faced when communicating with mentors are:
 - Setting up a time for a mentoring session
 - Being concerned about causing disturbance to the mentors
 - Mentors may not always be available when an urgent need arises

2. Feedbacks of the Survey

The figures below depict the survey results. [Figure 11](#) shows information regarding different methods that participants use to take in a new skill. As can be seen, a greater number of learners would like to learn a new skill through the self-study method (just 68 people out of 119 participants). While 51 learners preferred to enroll in educational courses. [Figure 12](#) illustrates the data about the kind of solution implemented by learners when facing a problem over their learning path. It is obvious that the greatest number of participants (62 people) would like to ask for help from an experienced Person, whereas 56 learners handle their difficulties through the Q/A platforms. The figures for books/articles and trials are 35 and 27 people, respectively.

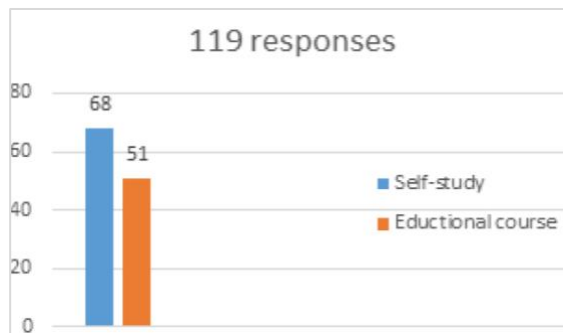


Figure 11: Learning methods.

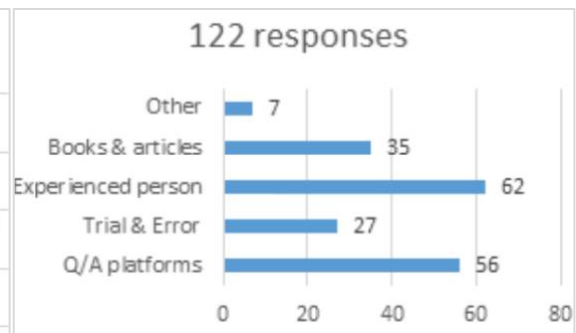


Figure 12: Solving problems methods.

[Figure 13](#) shows the number of people who adopt different ways to choose their appropriate mentor. It is interesting to note that most learners (70 people) would like to find their mentors through Instagram, while 45 people want to choose their mentors in face-to-face meetings like congresses and conferences. The number of participants who select their mentors through LinkedIn and Telegram is very few. According to [Figure 14](#), face-to-face meeting is the most popular way of communication between mentors and mentees (selected by 72 people out of 122 responses). The next most popular communication ways among learners are text and voice messages.

Also, it could be noticed that about 80% of participants show a tendency to pay the cost for their self-development. And 72% of learners prefer to view the mentors' resumes before selecting them.

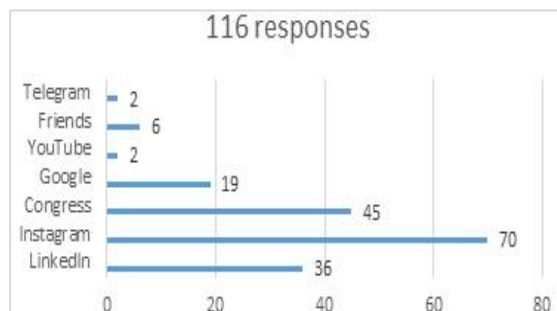


Figure 13: Ways of finding mentors.

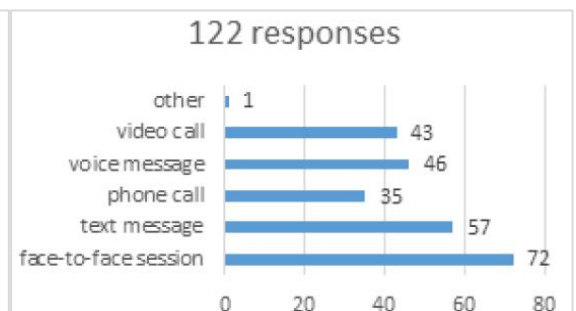


Figure 14: Ways of Communication.

3. Feedbacks of Competitive Analysis

According to the Business comparison table (Table 5), our competitors have considered different ways to do memorable marketing such as offering personalized one-on-one advice, adding job-search features, and providing a private community. The income model of competitors is premium (subscription payment) and users receive access to the software by paying a subscription fee monthly/annually. Regarding the Develop comparison table (Table 6), LinkedIn and ADP List have incorporated more development factors in their applications that cause a better user experience for the end users.

Among our competitors, ADP List is by far the most popular when it comes to fulfilling functional features like grouping, filtering, and creating mentors' lists (Table 7).

Table 5: Business comparison between competitors.

Business	ADP List	LinkedIn	eMentor	Mentorcam
Business motto	Learn from the best in the world	Establishing relationship between people who represent real-world professional relationship	Progress of the military in personal & professional life	Well done is better than well said
Strength	Market leader in HR services A large portfolio of HR products & services for all types of industries Strong year and year growth of revenue in both	Stablished membership base Platform to promote brands Powerful tool for job searching	Created profound & positive effects on the lives of coaches and their organizations	Personalized advice Different areas of mentoring Communicate privately via video call
Income model		Premium subscription fee Marketing solutions	From civilians	Mentors charge 20\$-30\$ to answer questions

Table 6: Develop comparison between competitors.

Development Parameters	ADP List	Better up	eMentor	LinkedIn
Search	10/10 Mentors can be found based on name, industry and company.	3/10 Coaches can be found based on a 150-question questionnaire; it was dissatisfying	7/10 Users can find the best mentor based on name, expertise, and job	10/10 A brilliant search engine based on name, job, expertise, group
Sort	4/10 Sorting is only based on number of reviews which is not helpful	0/10 No sorting method	0/10 No sorting method	10/10 method sorting based on different parameters
Filter	8/10 It has a powerful sorting based on availability, industry,	1/10 No filtering method The app itself suggests mentors	4/10 It filters the search results based on different parameters	10/10 The best possible filtering method based on a lot of elements
Loading	9/10 Fast	10/10 Very fast	8/10 Satisfying	10/10 Very fast

Table 7: Functional comparison between competitors.

Development Parameters	ADP List	Superpeer	Better Up	eMentor
List of mentoring	Ok	No	Ok	Ok
Grouping	Ok	No	No	No
Rating	No	No	No	No
Upload CV	No	No	No	No
Mentor filtering	Ok	No	No	No

Ideate and Prototype Stage

In order to prioritize the ideas achieved from different methods of ideation, a simple task management matrix was created. As you can see, the lower-left quadrant of the matrix (Figure 16) includes the items that should be incorporated in the Minimum Viable Product (MVP) version of the mentoring app because they are both urgent and important. The items placed in the upper-right quadrant should be deleted because not only is their cost high, but also, they are not urgent. As the features of the upper-left quadrant are essential, but they are not urgent, and therefore don't require immediate action. After recognizing the urgent features through the Cost-Need matrix, a visual representation was made to show the path that our users (mentors and mentees) will take in the mentoring app to complete a task. User flows helped us to determine how many screens were needed, what order they had to appear in, and what components needed to be present.

Test Stage Feedbacks

Patterns that were pulled directly from the Usability test are:

- It was observed that three out of five subjects had trouble with the filter feature; this means that filtering the data is not simple.
- It was observed that two out of five subjects had a hard time knowing which mentor is reliable for selection. This means that for most users, it is not immediately possible to trust mentors' information.
- It was observed that two out of five subjects were confused by the word *Mentee* when signing up for the app. This means that not everyone is familiar with the word *Mentee*.
- It was observed that one out of five subjects had trouble changing the Photo of their profile. This means that most users were unsure how to select a new photo.

The UEQ contains six scales with 26 items:

- Attractiveness: Overall impression of the product. Do users like or dislike the product?
- Perspicuity: Is it easy to get familiar with the product?
- Efficiency: Can users solve their tasks without unnecessary effort?
- Dependability: Does the user feel in control of the interaction?
- Stimulation: Is it exciting and motivating to use the product?
- Novelty: Is the product innovative and creative?

Attractiveness is a pure valence dimension. Perspicuity, Efficiency, and Dependability are pragmatic quality aspects (goal-directed), while Stimulation and Novelty are hedonic quality aspects (not goal-directed). Values between -0.8 and 0.8 represent a more or less neutral evaluation of the corresponding scale, values > 0.8 represent a positive evaluation, and values < -0.8 represent a negative evaluation. The range of the scales is between -3 (horribly bad) and +3 (extremely good).

Table 8 illustrates data about six different aspects of usability and user experience alike. It is completely vivid that the outcome of features related to pragmatic quality was positive, while the result of two items related to Novelty was neutral; so, in the next iteration, it should be taken into account.

The Figure 17 clearly shows values from the benchmark data set. We can see that the Mentree app has placed in above average when it comes to Attractiveness, Perspicuity, Efficiency, and Novelty. The mentoring app reached to the good level compared to others. It should be mentioned that the measured scale means are set in relation to existing values from a benchmark data set. This data set contains data from 21,175 persons from 468 studies concerning different products (business software, web pages, web shops, social networks).

Table 8: The evolution of UEQ test.

Item	Mean	Variance	Strd. Dev.	No.	Left	Right	Scale
1	1.6	0.3	0.5	5	annoying	enjoyable	Attractiveness
2	1.6	0.3	0.5	5	not understandable	understandable	Perspiciuity
3	1.6	0.3	0.5	5	creative	dull	Novelty
4	1.4	0.3	0.5	5	easy to learn	difficult to learn	Perspiciuity
5	1.6	0.3	0.5	5	valuable	inferior	Stimulation
6	1.8	0.2	0.4	5	boring	exciting	Stimulation
7	1.6	0.3	0.5	5	not interesting	interesting	Stimulation
8	1.6	0.3	0.5	5	unpredictable	predictable	Dependability
9	0.8	0.7	0.8	5	fast	slow	Efficiency
10	0.6	0.3	0.5	5	inventive	conventional	Novelty
11	1.4	0.3	0.5	5	obstructive	supportive	Dependability
12	1.8	0.2	0.4	5	good	bad	Attractiveness
13	1.6	0.3	0.5	5	complicated	easy	Perspiciuity
14	0.8	0.7	0.8	5	unlikable	pleasing	Attractiveness
15	0.4	0.3	0.5	5	usual	leading edge	Novelty
16	1.6	0.3	0.5	5	unpleasant	pleasant	Attractiveness
17	1.6	0.3	0.5	5	secure	not secure	Dependability
18	2.0	0.5	0.7	5	motivating	demotivating	Stimulation
19	1.4	0.3	0.5	5	meets expectation	Does not meet expectation	Dependability
20	1.2	0.2	0.4	5	inefficient	efficient	Efficiency
21	1.8	0.2	0.4	5	clear	confusing	Perspiciuity
22	1.6	0.3	0.5	5	impractical	practical	Efficiency
23	1.6	0.3	0.5	5	organized	cluttered	Efficiency
24	1.8	0.2	0.4	5	attractive	unattractive	Attractiveness
25	1.0	0.5	0.7	5	friendly	unfriendly	Attractiveness
26	1.6	0.3	0.5	5	conservative	innovative	Novelty

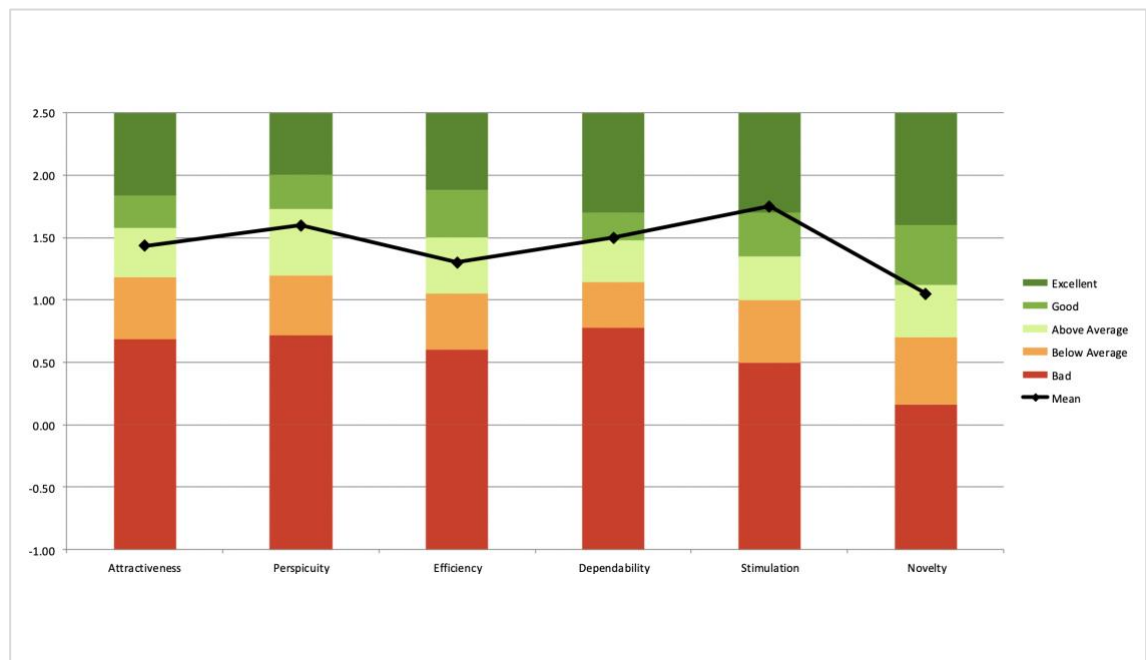


Figure 17: Creating the benchmark chart.

Conclusion

As shown in this paper, The Mentree app was designed to facilitate the relationship between mentors and mentees, to improve the usability and user experience. In order to recognize the needs and pain points of users, the Design Thinking approach was used. Gaining a deep understanding of users' wants and needs leads to proposing desirable and feasible solutions. In addition, DT ensures that assumptions are challenged, and insights are gained prior to the ideation or prototyping phase.

Through the implementation of the DT approach, this study built and explored a C2C mentoring app. By installing this mobile app, mentees are able to obtain knowledge directly from mentors; Mentree provides direct access to accomplished leaders to help mentees overcome anything that held them back. During the qualitative (moderate usability test) and quantitative (UEQ test) tests, the app demonstrated that it has achieved its objective. As shown by the quantitative feedback from individuals, the platform can help improve key factors including making and fostering E-mentoring system, pragmatic and hedonic qualities, and enabling such practices by providing a better user experience. These aspects are also supported by qualitative evaluations from mentors and mentees alike. According to Table 9, the values of all 6 user experience aspects are more than 0.8 which represents a positive evaluation; in the next iteration, improving the novelty should be taken into consideration.

Therefore, according to the process described in the paper, it is also possible to conclude that one can successfully adopt the Design Thinking process to create a platform meeting the real needs of users, thus enhancing the user experience.

For future studies, more features for the online platform could be added and tested. Regarding the results of the survey, some examples could be:

1. The addition of a text function to ease the connection between mentors and mentees to provide feedback, ask and answer questions, and immediate follow-up
2. The addition of a resume option to the mentors' profiles to develop trust and authenticity
3. Taking advantage of guidelines to design mobile responsive version
4. Offering an appropriate pricing model (Freemium/Premium).

Table 9: UEQ scales.

UEQ Scales (Mean and Variance)		
Attractiveness	1.433	0.12
Perspicuity	1.600	0.08
Efficiency	1.300	0.04
Dependability	1.500	0.03
Stimulation	1.750	0.06
Novelty	1.050	0.04

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