Friends Don’t Let Friends Ideate Alone

MIMS Final Thesis Project: IdeaBuilder

Alex Chung
D.H. Jung
5/4/2012

School of Information
University of California, Berkeley
Abstract
The IdeaBuilder is a mobile social-networking service that supports idea-generation via collaborative group brainstorming. Our service uses computer-mediated communication (CMC) technologies to make it easy for geographically dispersed group members to brainstorm remotely and asynchronously. Designed as a mobile application, the IdeaBuilder is also a personal information management system where users can capture rich context information such as location and image along with their notes to manage their sharing activities.

Because individuals are often limited in their vision or cognitive resources, a popular way to support creativity and innovation in organization is to brainstorm and generate ideas collaboratively\(^1\). Yet face-to-face groups may not be the optimal technique for idea-generation because of hindering factors such as evaluation apprehension, free riding, and production blocking\(^2\). The IdeaBuilder solves this problem by providing a platform to change the dynamics of group brainstorming and to support both personal and group creativity.

The IdeaBuilder mobile application will enable users to create various types of notes such as text note, image note, voice note, and geo-tagging. During the process of developing a project idea, the users can selectively share their project ideas with established connections from their social network to safeguard privacy concerns, defer judgment and prevent idea theft.

For organizations that like to develop more novel ideas, the IdeaBuilder is a mobile application for capturing and organizing new ideas that includes richer context information. Unlike other note-taking services, our product provides a social-


networking component to leverage the wisdom of collaborative group brainstorming to develop creative solutions.

Team
The IdeaBuilder was designed and developed at the UC Berkeley School of Information by Master’s students, Alex Chung and DH Jung. Alex Chung led and authored the product design and software development of the iPhone app. DH created the IdeaBuilder Server API to enable communication between devices. Professor Kimiko Ryokai advised on the design process.

How was the project idea conceived?
The original plan was to integrate our Master’s thesis project with our Microsoft Kinect project from the Human-Computer Interaction course taken in the CS Department during the Fall 2011 semester. TeleKinect incorporates the human body for online whiteboard collaboration. Body movements are captured and transmitted, allowing the body gestures to be used for communication. Because it has limited reference to information management, we felt the project was not relevant enough to the principles of the School of Information. Hence, during the winter break, we engaged in multiple brainstorming sessions that resulted in several potential project ideas. One of the project possibilities was to create a tool for users to manage their networking activities. An added twist to this tool was to potentially create it as a networking trainer, in which a networking health meter could be built to help those new to networking monitor their progress. Another idea was to create a platform for users to access online clippings between multiple devices such as mobile phone and laptop computer.

After our competitive research, we learned that there are already preexisting systems of use for the ideas mentioned above. Software applications such as Pocket (formerly ReadItLater), Diigo, Instapaper and Apple Safari Reading List consolidate

---

3 TeleKinect – Remote Collaboration Using Body Gestures
http://people.ischool.berkeley.edu/~achung/telekinect.html
online video, images, and text from various applications and synchronize them across different devices. This market is over-saturated with many well-established players. All in all, we did not want to build a “me-too” product.

**Struggle with finding a unique project idea: Our Ideation Process**

“An idea born out of desperation.” We were running out of ideas and running short on time. In the struggle to come up with an idea, Alex said he needed a tool to help him come up with ideas and so the IdeaBuilder was born.

We had several reasons for having a tool to build ideas. Firstly, user observation is a key component of gaining insights. Events and objects in the environment are all stimuli to creative ideas. When we encounter an interesting situation or come across some fascinating artifacts, we should quickly capture the moment and annotate with thoughts and comments. Secondly, while pencil and paper are some of the best tools for capturing text and drawing, they are difficult to carry around and to use in the field. Furthermore, we realized that we carry our smart phones with us all the time. It has a camera for capturing photos along with text editing capability and more.

The ability to leverage the wisdom of personal network can be a great asset when resources and time are limited. Furthermore, a group of people has more diverse knowledge and expertise. Instead of spending much effort in market research as mentioned above, we could have ask around our network of friends and colleagues about their knowledge of similar mobile applications.

The smart phone, being powerful, personal, always connected, and always with us, has become an extension of our digital self. In many ways, we are sharing large amount of information through social media network but there is not an application that help the user to capture their thoughts and to construct their ideas. By nature, phone is a communication tool. It could be used for computer-mediated collaborative practices to share information and gain knowledge from others.
**Needs Assessment**

The rationale was most graduate courses require class projects as deliverables. Students have to decide on project ideas within the first two weeks of the semester. Instead of pursuing a project idea that doesn’t excite anybody, it is more efficient if there is a pool of ideas to select from. For example, Alex always wished to have a Rolodex of project ideas from which to select for the appropriate class. Many students including us struggled with the race against time to come up with a project idea. Methods like brainstorming sessions require the group to be present in the same place at the same time, but often the sessions are usually no more than one hour because of scheduling conflicts. Moreover, the ideation process is limited to what can be drawn on the whiteboard. Based on these observations as a student in the academic community, it became increasingly apparent to Alex that more could be done with the communication channels to allow the ideation process to expand outside the group meetings.

Our user-centered study emphasizes user stories to validate customer requirements. The purpose of user-centered design is to understand if, how, and why people might want to gather and to share their ideas with whom. The stories represent small chunks of personal values that allow the designer to develop the personas that represent the targeted users. Both the user stories and personas allow the developers to discuss requirements throughout the project.

To assess the need and to identify pain points, we interviewed 12 individuals: 2 Berkeley professors, 3 PhD students, 5 Master’s students, and 2 undergraduates. The location of the interviews were very important to us, as we wanted to meet where they usually spend time reflecting on their work.

The goal is for them to tell us their stories. Hence, instead of directing the interview with questionnaires, we gave them the freedom to lead the conversation. When
both members of the project team is present, we would have one person to take notes while the other be the interview conductor.

During the conversation, we paid special attention to emotional keys such as “like”, “hate”, or “feel”, and spent time to explore why they felt that way. The interviews are about one hour long starting with introduction and the intention of conducting user research for a graduate project. Then we talked about their note taking habits and how they organize their thoughts. In the process, they would show us the artifacts and walk us through the process. We also asked them for their successful stories of using their methods of organizing ideas. Lastly, they shared what they wish to have in addition to the existing tools they are employing.

Below are questions and topics that we prepared for the interviews:

- **Personal Information Management**: How they manage their own ideas?
- **Process**: How do you currently share your ideas? What are the methods or artifacts that you use? Can you walk me through an example?
- **Sharing Practices**: With whom do you share your ideas? Everyone or a selected group? Why do you share with them?
- **Expectation**: What kind of feedback are you looking for? Can you give us some example? What kind of feedback do you give to others?
- **Pain points**: How would you improve on your current practice of idea generation? Why is it an improvement on the current practice?
- **Tools**: What tools do you use to help you generate ideas?
- **Social Network**: How do you feel about social networking? What do you use your social network for?
- **Time shifting**: How do collaborate with people in different time zone? What about people that you see everyday? Compare and contrast.
- **Contextual Information**: (What kind of contextual feedback do you received from your network?) Which medium of communication do you find more effective? And Why?
Impressions from the Interviews and Initial Hypotheses:

Our interviews yielded many interesting findings. Of note, we came to realize that in order to capture the concept, a person has to act on the idea and turn it into something concrete. Instead of formularizing the idea concept in his/her head, write it down, make a prototype, or share the idea with somebody else. We hypothesized that this mere action would then help them organize abstract ideas into something more coherent. The act of writing makes the idea more concrete including the meditation of its pros and cons. This indeed was one of the most surprisingly themes that emerged from the interviews.

The following are some of the impressions that emerged from the interviews:

1. Organization of the ideas has to make sense to the user. Everyone might have a different way of organizing his or her thoughts. Furthermore, they might also have a different way of recalling his or her memory. For example, a visual is very effective in recalling memory and one interviewee even demonstrated how he would create a flyer for each of the ideas and post them on the cubicle walls. The top half of the flyer consists of images and the bottom half contains notes and references to other resources such as academic journals. This was helpful to her because she is visually oriented and the images capture the concept of her ideas.

2. Several interviewees expressed need to consult others for feedback on their project ideas. For these people, rapport, privacy, and domain expertise are crucially important. Once a working relationship has been established, they could even work remotely together. The helper and helped are cyclical. One interviewer commented: “It takes great humility to ask for help. And it is even more wonderful for someone to agree to help.” The process of asking someone to contribute to an ideation process is relationship-based. The person knows who to ask based on what he or she knows about them.

Communication technology remotes the constraint of distance and allows
someone to reach out to those that they know best. Technology can also provide anonymity and privacy but creative thinkers desire the pride of authorship.

3. Most interviewees shared the fear of losing their ideas. While good ideas often resurface but it might not arrive at the right moment. Either in academia or entrepreneurship, people want to operate as fast as possible to seize first-mover advantage and claim first authorship. The professors we interviewed said that this was the reason why they would carry their notebooks around wherever they go. However, when we spoke with the students, we realized that the only item that they carry with them at all time is their mobile phones. They all have used the Notes app on the iPhone and nobody was happy because it is limited to text entry only. When they capture interesting events with their phone cameras, they were not able to annotate them.

**Current Tools and Methods Interviewees Use:**

In addition to personal stories, the interviewees also shared the methods they employ to record their ideas. One interviewee uses Gmail to email himself conceptualized ideas or thoughts with a prefix in the subject title such as “IDEA:” (Figure 1). It helps him easily search for the ideas with keyword search and timestamp. However, the search results could become less accurate when the volume gets too big.
Figure 1: IDEA Subject Header in Gmail

Another interviewee creates a flyer to post on her cubicle wall as a constant reminder of the projects she is working on (Figure 2). We found this interesting because the flyer consists of images and follows the same layout format. There were also room for quick thoughts and references to other resources.

Figure 2: Flyer

Another interesting concept is the use of a gardening journal to record and to track an idea development. The predefined layout affords the user side-by-side comparison of multiple ideas. Additionally, the printed layout eases the effort of organization and allows the user to focus on writing down the text.
Figure 3: Gardening Notebook

Target Audience:

From our contextual inquiry, we discovered that students often lack sufficient tools to keep pace with the massive flow of ideas that often require quick yet casual feedback. It is hard to maintain everything. There isn’t a dedicated tool available for students to manage their project ideas and engage their academic communities and personal network.

At this time, we agreed on a target user group: Undergraduate and Master's students in academia who are interested in creative thinking with others and use smartphones as their primary device for communication. We exclude PhDs and professors because they have already established their own organization schemes and would be difficult adopters. It is our hope that the design principles described
in the next section would keep us focused on the user needs during the prototyping phases.

**Use Cases:**

From the interviews, we learned how our interviewees approach the ideation process and we derived a few pain points to address with our product features described below.

**Personal Information Management (PIM): “Where did I think of that?”**

Our interviewee, “Bob”, was attending a seminar on the other side of campus, and he suddenly thought of some great ideas for his project. He didn't have pen and paper, so he quickly typed up some notes in his iPhone Note app. After the seminar, his busy schedule prevented him from getting back to elaborate on the thoughts. One thing led to another and next thing he knew, when he had a chance to go back to his notes, they were just “words” and he could no longer recall the context. He essentially lost his train of thought. However, once he was able to retrace his footsteps and remember where he took the notes, he began to mentally put himself in the seminar room again. Suddenly, it all came back to him and he was able to recall why he jotted down those notes and start building on the idea.

This use case demonstrates that complementing text with contextual information such as location, time, or people can be very useful when we need to review or recall ideas at a later time. Hence, to enhance this usability and information retrieval experience, the IdeaBuilder would need to include multimodal entry including GPS location, timestamp, tagging, and image attachment functionalities.

**Collaborative Ideation: “I love sharing ideas with others.”**

Our interviewee “Tom”, a PhD student at the I School, described the following scenario: He needs an idea for his dissertation and came across this intriguing idea about information philosophy. Unsure whether this would be a good dissertation topic, he decides to get some feedback by posting his idea on Facebook and Twitter.
The problem with posting the idea on these social websites was that the idea is diluted by a lot of noise. It was difficult for him to maintain a consistent dialog or retrieve thoughtful feedback. Still needing feedback, he recalled one of his friend’s studies philosophies on the East Coast. This person would be a perfect person to share his idea for feedback. So he emailed her a paper along with his thoughts and asked for her opinion and feedback. They have since exchanged ideas regarding the topic through email. But, suppose Tom was hoping to gain feedback from a panel of domain experts located around the US. With such asynchronous communication, time is not a constraint. It affords both parties to analyze the content of the message more carefully so the answer you give can be more meaningful because it has gone through a process of careful study of the question.

This use case demonstrates that if the ideation process requires more than two people, the IdeaBuilder could easily facilitate the communication channels to deliver a message or information to a group of collaborators. The pull communication model allows users to retrieve incoming messages at their own convenience. Overall, it allows everyone to communicate more efficiently and effectively with each other.

**Design Principles:**

From these observations summarized above, we came up with several design principles:

1. **Mobile:** The ideation process is not restrained to a specific location, as it could happen anywhere such as the commuting on a train, reading at the coffee shop, or attending a seminar in an auditorium. While the older age group from our interviewees has an established in-person networking approach to idea sharing, the younger populace loves sharing ideas with others over a computing device more than face-to-face. Hence, for the
younger populace, an app for their iPhone (most popular mobile device today) would be ideal, as iPhones are described as "being part of them".

2. **Multimodal Interaction:** There are many different methods for organizing project ideas and each method has its own application strengths. The design goal is to improve the dependability of the interaction by employing complementary information such as text, image, video, audio, and location. Generally, multimodal applications are more flexible and scalable because they enable a broader range of users to access their information in different environments. Such flexibility allows people to choose which way they prefer to organize their thoughts.

3. **Collaborative:** We want people to share their ideas and develop better innovations. So, instead of replacing the in-person brainstorming sessions, we want to extend that collaborative experience beyond the meeting room. We believe working with others outside your domain would deliver new interesting idea. Working with others guides the student’s understanding of how to refine and to articulate his or her idea with the targeted audience. Furthermore, interaction with experts outside of one’s domain can lead to new insights and potential partnership on building an innovative product.

**Prototypes**

Before we were ready to develop the software application, we began to prototype its use interface in less expensive low-fidelity media. We began with the quick and easy paper prototyping to explore the look and feel of the user interfaces. And then we used rapid interactive prototyping with Apple Keynote to verify our designs.

**Paper Prototypes**

---

4 New Owners Survey Shows iPhone 4S More Popular then its Apple Predecessor

5 http://www.cs.ccsu.edu/~stan/research/Multimodality/index.html
The goal of our paper prototyping is exploring the general organization scheme of the user interfaces. We began by structuring the application layout by the different modes of retrieving the stored data.

**PIM**

Each idea entry has complementary or redundant information such as text, image, category, and location. Users can choose the mode to look up the desired information. Most of the applications today use maps to present information rather than employing it as an information retrieval tool. We wanted to emulate the real life experience of reminiscing on past events when arrived at a location and recalling memory of past experience when looking at the photos. This approach allows the users to review the same data set from different aspects. The tap bar at the bottom of the screen changes the data presentation format (Figure 4).

---

**Figure 4:** Paper prototype for information retrieval
Data Entry

Convenience is one of the primary goals of our application. We assume that people are traveling with little time to spend on the phone. Additionally, the small screen size prevents us from using the precious space for displaying instructions. Thus the major challenge is making the user interface clean and intuitive without relying on text instructions (Figure 5).

![Figure 5: Paper prototype for entry form](image)

Overall, we adapt the strategy of adapting the flow and organization scheme of preexisting mainstream apps such as Facebook and Twitter to lower the learning curve for new users. To understand the transition between screens, we used a template with four phone screens and try to describe each feature within a single sheet of paper like a comic strip.

Interactive Prototypes
To better understand how users would truly interact with the IdeaBuilder, we created interactive prototypes using Apple’s Keynote presentation software (Figure 6). This approach offers the advantage of testing the touch interaction with the targeted device (iPhone) without the costs of writing code and having to quickly turn it around for repeat testing. We purchased the iPhone interface design template from Keynotopia.com that enabled us to wireframe the user interfaces by copy-and-pasting UI components in place.

![Interactive prototypes](image)

**Figure 6:** Interactive prototypes

Since the Keynote design template is pixel-accurate, we were faced with the challenge of fitting all the content within a given screen area. For example, the table of comments would only fit two to three rows of entries that prompted us to consider the font size and the number of characters we chose to display per row. We also discovered several challenges that we did not realize in the paper.
prototyping phase. For example, in the paper prototype and early iteration of interactive prototypes, we relied too heavily on screen transitions for each feature. It was done to reflect the comic strip styled paper prototype. However, during user testing of the interactive prototype, it was obvious that each feature requires too many manual inputs and it puts a heavy burden on the user’s memory load. We also realized that it is difficult to convey how the navigational control works for the users. At the end, we applied only the common navigation gestures such as scroll up/down and swipe left/right in the functional prototype to lessen the confusion for the users. Finally, how do the users know if there are more content off the screen when the layout size is greater than the screen size? We went back to our use cases and interview summaries to decide what features or content we could pare down in order to keep everything transparent to the users.

**Development**

The IdeaBuilder app is a multi-device collaboration tool allowing users to capture and share their ideas directly with friends. We could have chosen Facebook API or Twitter API for posting shared contents; however, user observation studies suggested that users wanted to protect their authorship and entrepreneurial ideas from prying eyes. Hence, reassurance of security and privacy of their ideas would be required before users would feel comfortable sharing their personal ideas with others.

**The IdeaBuilder Server**

We choose I School’s APM (Apache, PHP, and MySQL) environment in order to implement Web API’s enabling communication between the server and the mobile application. The rationale was because there is no significant difference between I School and other popular cloud services, such as Amazon EC2, aside from performance and scalability. When we tested a couple of APIs with the client side, using I School as a host proved satisfactory to our needs from a prototyping perspective. Furthermore, we could implement and deploy all APIs within a short period by using PHP server-side scripting language.
Generally, a Web API is a defined set of HTTP request messages along with a definition of the structure of response messages. Our API will return messages with JSON format when app users request a service. The IdeaBuilder can also access well-known binary files on the server as well as text data by using this protocol. In order to support this function, the database will only store the physical directory as a text format so that the IdeaBuilder can get a URL referencing those files.

As shown in Figure 7, the main data sources for this app are USER, NOTE, and SHARING tables. Multiple users can have multiple notes, and vice versa. Therefore, SHARING table which stores note sharing information exists between USER and NOTE tables. The other tables show one-to-many relationships. Each user can have multiple categories, and a note should be organized by CATEGORY table. Likewise, multiple files and comments can be assigned to a single note.

Figure 7: The IdeaBuilder system architecture
The IdeaBuider App

The client iOS application was built using the Apple Xcode4 Integrated Development Environment with iPhone SDK 4.3. The app uses Core Data for local data storage to ensure continuous usage without disruption. From our observation, many users take public transit such as subway system that does not guarantee cellular network connection. Therefore, it is important to have the option to save the data locally.

The app has a tab bar along the bottom with five tabs:

- **Search**: The Search tab is the search interface for users to look up idea entries that have been uploaded to the IdeaBuilder Server.
- **Ideas**: The Ideas tab is the table that lists all the personal idea entries.
- **Map**: This tab uses Map Kit to show the user’s favorite locations on a map.
- **Image**: The Image tab is the photo album of all collected images allowing users to look up an entry by its thumbnail.
- **Contacts**: The Contacts tab manages the contact information of friends who the user collaborates with.

Because some ideas are text-based while others may be visual oriented, the multimodal search methods afford the user to review the information from every angle (Figure 8).
Figure 8: Multimodal data retrieval

For data entry, the IdeaBuilder app uses the Core Location framework to obtain GPS coordinates for the user’s whereabouts and iPhone’s camera and photo library to attach photos to the idea entry (Figure 9). Users can also tag the idea by select from a list of categories. The goal is using the phone to capture all the relative information from the environment to allow the user to re-experience the “aha” moment.
Conclusion

Our initial goal was to design a mobile application that would help college students to manage their project ideas. We have sought guidance from professors who teach the creative thinking process and conducted many interviews to learn about how people organize their thoughts and ideas. Through the interviews, we learned that the ideation process could be enhanced with collaboration. Then we went through a series of prototyping and user testing at the design stages before we build an iPhone app that addresses personal information management as well as computer-mediated collaboration.

While we have devoted most of the report on the design process through the stages, the software development was just as complex. While we were performing all the user study and prototyping, we were also trying to understand how to develop with the new iOS5 platform that was released at the beginning of this semester. Programming for mobile application is especially difficult because the app has to
anticipate multiple methods of inputs from users such as touch, gestures, and other sensor inputs. Even a simple user interface requires a complex system of classes and functions to manage the user interactions behind the scenes.

The most important lesson we learned over the course of this project is that prototype designs should be quickly created and tested. This is because they were meant for understanding user’s intent and behavior more than the overall layout of the user interfaces. At the end, the design principles were the important part of the design process because it guides the design and development process. Whenever we are confused about the project direction, we would go back to the use cases and design principles.

Essentially, we wanted to move the mind mapping exercise with post-its on whiteboard into a mobile format of generating ideas. We also hope a dedicated app for idea sharing might even create a social norm where people on the platform are committed to share and to help each other to develop better ideas.

Future Plans
We plan to conduct field-testing and publish IdeaBuilder to the App Store by the end of 2012. It will be free to download. With user feedback, we wish to continue the development and to improve the user interactions. More research has to be done to understand the idea sharing and collaboration dynamics. After beta testing, the server would have to be migrated from I School Server to a commercial cloud-hosting provider. All in all, the app is designed to flexible enough for the users to discover new and interesting use cases.

Acknowledgements
We would like to thank Professor Kimiko Ryokai for her guidance during this project. We thank Haas Alumnus, Sharianne Louie, for consulting us on the project’s overall development. We would also like to thank Professor Clark Kellogg from the Haas School of Business for his guidance on creative thinking and collaboration.
Appendix A

Mind mapping
Appendix B

Stakeholders Analysis

This flow model is typical of the current idea generation processes in both educational and professional settings. The interpersonal relations between students, teachers, workers, supervisors, friends and family are central to our study of improving the sharing dynamics in personal-group idea generation process. Each line between two groups with the rectangular box represents a transaction or communication between two parties. The arrows represent the direction of the flow. The “X” markers represent the barriers or the pain points that are interpreted by Team Flow. From this diagram we see a greater number of exchanges between the idea owner and their friends or from the participation in seminars or conferences.
### Getting to Insights (2/15)

<table>
<thead>
<tr>
<th>Question</th>
<th>Feeling</th>
<th>Process</th>
<th>Tool</th>
<th>Social</th>
<th>Convergence</th>
<th>Features</th>
<th>Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>How can we ...?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we come up with more creative ideas?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we build up reputation?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we encourage more collaboration on project ideas?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we guide them through the ideation process?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we guide them to build up a real solution?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we guide them to create a prototype?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we organize all the ideas into an user-friendly format?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we remove the fear of losing their good ideas?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we encourage collaboration without being annoying?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can we change their social and/or personal behavior?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we ...?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we reduce the time required of converting idea to concrete concept?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we leverage the skills of the user’s personal network?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we integrate the user’s ability to work on multiple project ideas at the same time?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we be able to support ideation at any place at any time?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we strengthen the relationship of people within the same network?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we carry documents across different devices?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we integrate project ideas from more than one user?</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we support the capture of graphs and drawing along with text?</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we ensure all ideas are novel and applicable?</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we make them happy while using the app?</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we ...?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How might we ensure all ideas are novel and applicable?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we develop the communication service between different accounts?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we design the user interface that allows the user to concentrate on writing down their ideas?</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we design the notification rules?</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we market this product?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we release this product?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we find the right users?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we deliver this product to the customers?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we maintain the users’ loyalty?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we prevent copyright infringement?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we compete against potential competitors?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we take advantage of other existing social networks?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we explain our product to the public?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we integrate with existing collaboration tools?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we download the stored information from the app to personal computer?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we archive this information?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we remember the ideas we have input that was recorded a long time ago?</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we split the profit?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In what ways might we ensure on-time delivery of our project?</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>