Design Driven User Study Workshop for Chinese Startup Innovation

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Abstract

The paper illustrates a serial user study workshop designed for startups seeking disruptive innovation and business opportunities based on the lean process from the point view of user-centered design approach. In the Chinese market, business process moves fast. The product development cycle is relatively short which makes it easy to be interrupted and changed. Making sure the product is targeting the right marketing segment is the key to business success. Therefore, innovation has to be created on the true needs of the accurate end users. User-centered design approaches have the natural advantage to forge innovation by defining the problems of the existing products usage for the users and creating the solution that seamlessly meets the potential demands of the product users. This capability of user-centered design is extremely suitable for the early stage of the startup innovation process especially in the customer identification, market positioning, and business model generation. User study is located in the core of this user-centered innovation process. Performing a good user study ensures the product is aimed at users' needs, which guarantees once the product is given birth it is already well-positioned in the market sharing. This is the key to the success of startup business. In this paper, a serial workshop covers the topics from what are the user study methods suitable for the lean startup innovation, how to conduct an effective interview, and how to synthesize users' insights and find new business opportunities. By doing the workshop we try to answer the following questions which ultimately influence the nurturing process in the incubator about how design thinking can intervene to create radical innovation in startup teams: why the design driven user study is so important to the startup business? What is design thinking in the non-design background startuper's mind and how can they incorporate the mindset in the business operation? What Chinese business environment impacts in the innovation process and how could the startups position the empathy for the users as the key for the product success?

user-centered design; user study; workshop; startup innovation

Influenced by the world trend of starting up with fresh idea and lean executive team by the inspiration of infotainment and the rapid improvement of manufacture, China is moving in and becoming an experiment field for startups. Growing in the world's biggest manufactory the Chinese startups have the natural characteristic for integrating the industry chains and finding the solution from the technology duplication and slight modification. Chinese startups have a lack of mindset and methods to turn technology into an innovative service model. The major reason for this problem is the lack of knowledge of user-centered design. Without considering user's needs, technology is hardly transformed into popular product and business profit. It can end up with public attention for a short period but will soon be forgotten. One good example is Sony's Betamax videotape format which only focuses on high technical quality but neglects the user's real need for long hour recording capacity. We conduct an attempt study on nurturing the startup teams in the early stage of innovation by using design driven user study methods. These teams are all from a Chinese university based startup incubator, Tsinghua x-lab, in which the major background of the startup teams are technology, engineering, science, and business. TMT (Technology, Media, and Telecommunication) is the biggest focus area in the startup teams. It is also the major focus in the invested business across China for the past few years, the most successful ones are Alibaba, Baidu, and Mi.

The study is made based on three observations on the startup teams in this incubator. First, user-centered design is constantly missing while the teams tend to think more about business model and product functions by skipping the user's true needs. Second, most of the startup projects are in the very beginning of ideation process, meaning they need to make the implementation in a short period of time. Third, the startup projects need the innovation methods that suit to lean operation under the pressure of limited funding. A serial workshop is designed for the startup teams in order to fulfill one aim: get the startupers to walk outside of the box and start talking about the product from the user's point of view. There are three challenges in doing the workshop: first, how can we make the user study methods easy to learn for individuals without a design background? Second, how can we influence the startup team core members to change the mindset from considering only the technical side to generating the product that meets the user's demands? Third, which kinds of user study methods can save cost, move quickly, and perform an accurate future envisioning? Questionnaires were distributed after each workshop. Participants were asked to rate on the content difficulty level, manipulation level, mastery level, and mentor elaboration. Some findings are summarized in the last part of the paper.

Related research

The fierce market competition in recent decades forced an increasing number of business organizations to put design at a higher position within their organization. In Design In Tech Report recently published by Kleiner Perkins Caufield & Byers (John, 2015), they report that nine creative firms have been atypically acquired by companies known for tech like Facebook, Flextronics, Google, and GlobalLogic; also Accenture and Capital One. One piece of research published in McKinsey Quarterly (Barsh, 2008) illustrates how more than 70 percent of senior executives globally rated innovation as one of the top three drivers of growth for their companies within three to five years, which indicates a pervasive awareness of the importance of innovation. Moreover, 20%

of the top cumulative-funded VC-backed ventures that have raised additional capital since 2013 have designer co-founders (John, 2015). European Commission's research report Commission Staff Working Document shows that design-driven companies are more innovative than others' (Commission of The European Communities, 2009).

In consequence, in the past few years, we have noticed more and more demand for design thinking in business innovation. Tim Brown, CEO and president of IDEO, argues that design thinking is a 'methodology that imbues the full spectrum of innovation activities with a human-centered design ethos' (Brown, 2008). That is, design thinking uses systematic, thorough, and direct observations to match people's needs with what is technologically sustainable. While Howaldt argues that the term innovation refers to seeking competitive advantages and defending strategic positions by detecting opportunities; consisting of not only opening new markets, but also new ways to serve established and mature markets, either through manufactured goods and property, plant and equipment as well as by intangibles spheres such as services and experiences (Howaldt, 2010). To integrate design thinking with innovation process, Verganti proposes a model called "design driven innovation" (Verganti, 2003). It is "a strategy that aims at radically changing the emotional and symbolic content of products, i.e. their meanings and languages, through a profound understanding of broader changes in society, culture and technology" (Verganti, 2008). In industry, Procter & Gamble, Research In Motion (RIM), Siemens and Alessi are amongst a handful of companies that apply design thinking as a source of inspiration to produce breakthrough innovations (Martin, 2009 and). In addition, research by the UK Design Council on the performance of firms and the impact of design on firms' performance finds that over a ten-year period of analysis, the benefits of effective use of design include an improved share price performance and therefore greater shareholder returns (UK Design Council, 2004).

In order to make business innovation integrated with design thinking, Samir reveals that the core of design thinking is grounded on a human-centered approach to design (Samir and Khanjan, 2013). Furthermore, Verganti argues that design driven innovation is pushed by a deep understanding of customer meaning and value (Verganti, 2008). While Trott believes most new products fail in the market because consumer needs and wants are not satisfied (Trott, 2001). Witell, Kristensson, Gustafsson and Löfgren explain "in order for companies to meet the demands of mass communication, they must engage in an interactive dialog with customers" (Witell et al, 2011). As customers play an important role in the development of products and services, they must not be seen as a source of information but as a contributor with knowledge and skills (Witell et al, 2011). Therefore, in the world of design-led product innovation, pursuit of empathy is the key to success (Jon, 2014). In the meantime, Goffin, Varnes, Van der Hoven and Koners believe the importance of integrating the voice of the customer into new product development is universally accepted (Goffin et al, 2012). Indeed, Jeffrey believes that the design driven executives all over the world produce uncommon business ideas by scrutinizing common phenomena, particularly the behavior of potential customers (Jeffrey et al, 2009).

As described above, User-Centered Design (UCD) plays a critical role in product development (Chen, 2008). Dunne argues that today's business people don't (just) need to understand designers better. They need to become designers (Dunne, 2006). However, it is not easy to learn and master the human-centered approach. First, it should be diving deeper and questioning a customer's why,

while inviting the customer to interact rather than simply react to questions and instructions (Zaltman, 2003). Second, the research methods can be particularly "intimidating" to most small to medium size enterprises, due to limited budgets or lack of expertise in-house (Sen, 2009). But Jon Kolko is optimistic about these challenges that he argues that so complete empathy is impossible, but the pursuit of empathy is not, and it's this pursuit that can be methodically taught and learned (Jon, 2014). At the same time, governments in many countries have encouraged, developed or financed business programs to improve the entrepreneurial and innovation capacities and business performance of small and medium enterprises (Storey, 2003).

Design approach literature and business innovation literature has introduced their own definition, methodologies and advantages which has established the holistic view of these two fields. However, the overlapping area of these two topics has been paid less attention before in previous literature. Furthermore, there is lack of literature or research that focused on how startupers learn and implement the design thinking and approach. This paper extends existing literature on design thinking in business innovation, especially in the perspective for startupers. By doing so, we hope to answer the questions we raise in last section.

Workshop Design

It's a three - afternoon serial workshop designed for startupers who either have an official job and work on their own startup project in the spare time or the ones who work full time on their startup project. From the previous experience full day workshops occupy too much time and are not able to make the audience stay focused for long especially for the busy startupers. As Nicolas Yunes and Joey Shapiro Key (2014) indicate, workshops usually have a goal to bring together a smaller number of people in a specific field or related fields to encourage collaboration, creativity, and progress during and following the workshop. Because of this, workshops are usually ample time for discussion. While long workshops with the same participants throughout are usually less successful because one runs the risks of "burning the participants out". Furthermore, he suggests that one must strike a balance between a very short meeting (1 day) versus a meeting that is too long (4 days or longer). The sweet spot seems to be around 2 or 3 days. Workshops of this duration are long enough to incite discussion and allow for new ideas to emerge, while short enough to not exhaust participants and to fit in with busy schedules.

We deliver the workshops in three weeks, with each one in one afternoon. The workshop requires at least 2 core team members to participate. It's not designed for the designers. The three workshops are cohesive and each one follows the previous topic. Design differentiates the user study from psychology and sociology because of the incorporation of visualization and imagination. In order to influence the startupers to change their mindset we decide to leverage visual elements and body movements as the main tools in the workshops. The first workshop introduces the general user study methods that can be easily manipulated by the non-professional user observer and the key capability of putting self in the user's shoes: empathy. The second workshop picks up the most important user study skill for the startups to elaborate: interview. The third workshop follows up the second one to analyze and sensitize the collected user's insights from the interview in order to envision business opportunities. The advantage of design is to

innovate things by perceiving users' experience, summarizing users' demands, and integrating all of the elements for generating the final product. Design has the capability to foresee the new opportunities that have not been revealed in the existing market. So that design thinking must be embedded in the early stage of business development in order to trigger innovative competitiveness. In this sense, we design the serial workshop in the order of turning the mindset from logical thinking to experiential thinking, learning the skills of experiential thinking, and finally collecting the facts by looking, feeling, and exploring business opportunities on top of the facts.

Visualization and imagination as a key in the user study

We observed the startupers participating in the events in the university incubator where they are used to thinking in a non-image logic and expressing by using logic tools such as table and bullet point leading sentences. Logic thinking does not help for immersing in the user's world. It leads the startupers to think in a logical way to hypothesize what the user would do. On the contrary, visualization based on image and body movement invites the observer to walk into the user's world by looking at the detailed facts and playing the role as the user is. In order to help the startupers change the mindset and start to look at the product development by considering the user's demands, we decide to employ the user journey map and body storming in the workshop 1. In this way, we hope to open a window for the startupers to visualize user's experience both from drawing and acting in order to stimulate the transformation in the mindset.

In terms of the participants' background, we don't use a lot of complicated image tools that designers usually apply for high-class analysis. We pick up the basic version of user journey map, ask the participants to draw the product user experience journey and indicate the positive, negative, and neutral feelings (see figure 1). For the body storming part, we prepare an example about a user using computer checking the online shopping website for the participants to follow the way of thinking. (see figure 2).

Most of the workshop participants are not familiar with the design driven user study. Or they don't realize how important the user study means to the business development. Some of them know about user study, but from the physical or sociological perspective. In this circumstance, we have to raise the significance of the user study, make the participants understand why design driven user study brings more benefit to the startup business. Therefore, what are the improvements in design driven user study, why design driven user study is more powerful in the real business other than the user study in psychology and sociology should be stressed. We name some successful examples that make use of design driven user study to start the business and grow into the successful business or service model (see table 1). Then we talk about sympathy, which is extremely important for the start up team members to think about the business by considering end user's demands. After they accept this type of thinking, we move on to the user journey map and body storming. By this arrangement, we make sure that the participants prepare to transform their mindset step by step.
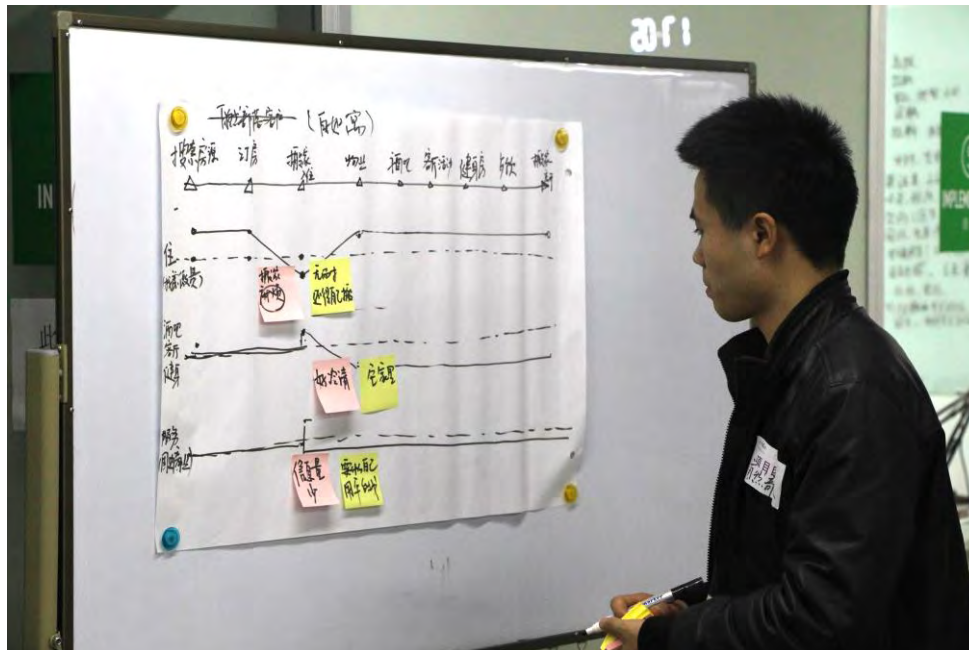
Figure 1: Startup participant is working on the user journey map

Figure 2: Startup participant takes post-it as a mouse during body storming

Table 1: Content Organization of Workshop I

Topic	Section 1	Section 2	Section 3	Section 4
What user study can help? Why is it so important for the startup business?	Successful Example 1: how car sharing invented from the user's true needs	Successful Example 2: how Bank of America starts the "Change Case" from the study of the users	Successful Example 3: how Airbnb creates the new value for the potential users	
Brief Introduction about user study methods: usage, scenario, and instructions	Questionnaire	Shadowing	Interview	Focus group
Empathy exercise	What is empathy	Practical exercise (eye contact, listen, and ask)	Empathy and user study	
User study practical exercise	How to define the target user? - what's the biggest problem in the product development ? - the aim of user study - the criteria to filter the lead user/ early adopter	How to understand the user's lifestyle or behavior? - user journey map - body storming	Take each team's project as example to practice the user study process previously mentioned	

Easy to learn and ready to implement in the startup team

Making the user study easy to learn and ready to implement in the business process is our ultimate goal in the workshop. We promise the participants that they will take away some practical knowledge that can be instantly applied in product development. In the workshop 1, we generally talk about the frequent used user study methods and summarize the adapted/un-adapted scenarios and difficulty levels. From the previous observation in startup teams, the authors found that the most frequently asked questions on the topic of user study is: which user study tools should we use in this stage? And when asked about whether they have done any user study the startup team members always say they don't have so much time to make a sophisticated user study for the time being. According to this feedback, we pick up the easy to learn and ready to implement user study methods so that the startups can apply in any period of the business development with cost saving and flexible implementation (see table 2). In addition, we tell the startupers that user study should not be a long period work; it can be done in a short time regarding the purpose of the user study in the business development process with effective approach. Compared to traditional user research phase which researchers can potentially spend weeks trawling data, conducting interviews or running user testing in order to ultimately identify valuable insights, Christopher (2014) proposes the Guerrilla Research Tactics. He argues that it's even more important to keep the research

directed, quick, and low-budget. Once we've set our research questions we can then select the cheapest and most effective tools for providing an answer. User study can be really lean and flexible in the startup innovation compare to the traditional concept of user study. The lean user study serviced to the startup business should be able to start from the micro view of the business target and solve the present problem.

In the workshop 2, we specifically talk about the interview skills because the interview is the most effective user study tool in the startup innovation. For the startup business, the priority for the product development is to create the needs for the lead users and early adopters (Peter Koen, 2015). Lead user is a special group that needs really careful filtering and close observation to target. Questionnaires cannot position the lead user in the majority of cases. The interview can gather the closest information about the user's needs and the most important is it's easy to learn and implement. Shadowing is also a suitable tool to probe the user's needs but it requires more professional knowledge and harder to implement in the startup teams. We try to cover the most frequent mistakes that observer makes in the interview, about the types of questions, responses to the answers, the rhythm of the interview, note-taking, and so on (see table 3).

Table 2: user study methods instructions

	Adapt to	Not adapt to	Difficulty level of implementing (1 stands for very easy; 5 stands for very difficult.)
Questionnaire	Get to know the market; no idea about the existing products; with clear expectations to the questions; functional feedbacks during the product development; filter the interviewees.	Solve all the user study problems; investigate the needs deeply.	2
Shadowing	Unobtrusive observation of user behavior model; No need to communicate and interact with target users.	Need to understand user viewpoints and attitudes.	3
Interview	Deeply understand user needs, lifestyle and attitudes; get feedback from user in any stage of the product development process.	The special groups including seniors, children and dysfluency.	4
Focus group	Observe the communication and interaction among different users; Get findings during user discussion.	Investigate the needs deeply; involve more than 10 users per session.	5

Table 3: Content Organization of Workshop II

Topic	Section 1	Section 2	Section 3	Section 4	Section 5
Interview skills and instructions	What is (not) interview?	Typical steps	Interview can be user in which scenarios of the business development and focus on what problems?	Ask the right questions - how to respond the answers? - non-verbal cues	
Practical exercise 1: skill practice	Warm-up: Five whys	Draft interview outline	How to use different types of questions?	Pay attention to the way of asking questions	
Practical exercise 2: strategy practice	Summary the biggest problem your target user is suffering	Hypothesize the reasons that lead the problem	List out the questions you want to ask in terms of the hypotheses	Find a closet target user in the group to ask the questions	Illustration and correction from mentors
Note-taking	Types & examples				
Interview process illustration	Preparation - tools, study outline, venue set up, note taker	During the interview - hosting - camera shooting - note taking	After the interview - data collection		
Homework	Conduct a interview in terms of the ongoing project	Collect the interview data	Categorize the interview data		

Table 4: Content Organization of Workshop III

Topic	Section 1	Section 2	Section 3	Section 4	Section 5
General introduction about user study collected data analysis	How to analyze the different types of data and form the insights about user				
Example demonstration of how to synthesize the useful user data and create the innovation	List out the user data on a white board	Categorize the data	Cluster the similar data	Pay attention to the facts that surprises you	Try to hypothesize the reasons about the stand-out facts, find the solution
Practical exercise	Analyze the user data - categorize the user data	Look for themes	Create insight statements	Create "how might we" questions	Come up with new thinkings

Mindset transformation

Most startups shape the product from a business or technology perspective, which leads to product failure. Transforming their mindset into user driven thinking is the key to influence the startup innovation at the root. For seeking this solution, we emphasize empathy in each workshop by introducing the way of making empathy, repeating the function of empathy in the interview skills, and categorizing the user data in terms of saying, feeling, thinking, and doing. Therefore, the participants learn how to embody empathy at different levels.

The most important and difficult part for transforming the mindset is in workshop 3, when participants organize the user interview data and try to envision innovation opportunities. In this process, the participants have to avoid logical thinking but thinking from looking. The key in this exercise is to let the evidences lead observer's thinking, never think from "my" experience. When the participant walks out of the box, they will find the new solution.

For the sake of making the mindset transformation easy to accept we make the workshop 2 and workshop 3 connected. In the end of the workshop 2 we require the participants to come back with an interview data preliminary organized by several categories. For example, which data is about the preference of existing product usage, which data is about the pain-points of a specific product using, which data is about expectation, which data is about value in the user's view, and so on. Workshop 3 begins from letting participants organize the data on a big white board so that their perception of the user becomes closer and closer by visualizing the data on a big space.
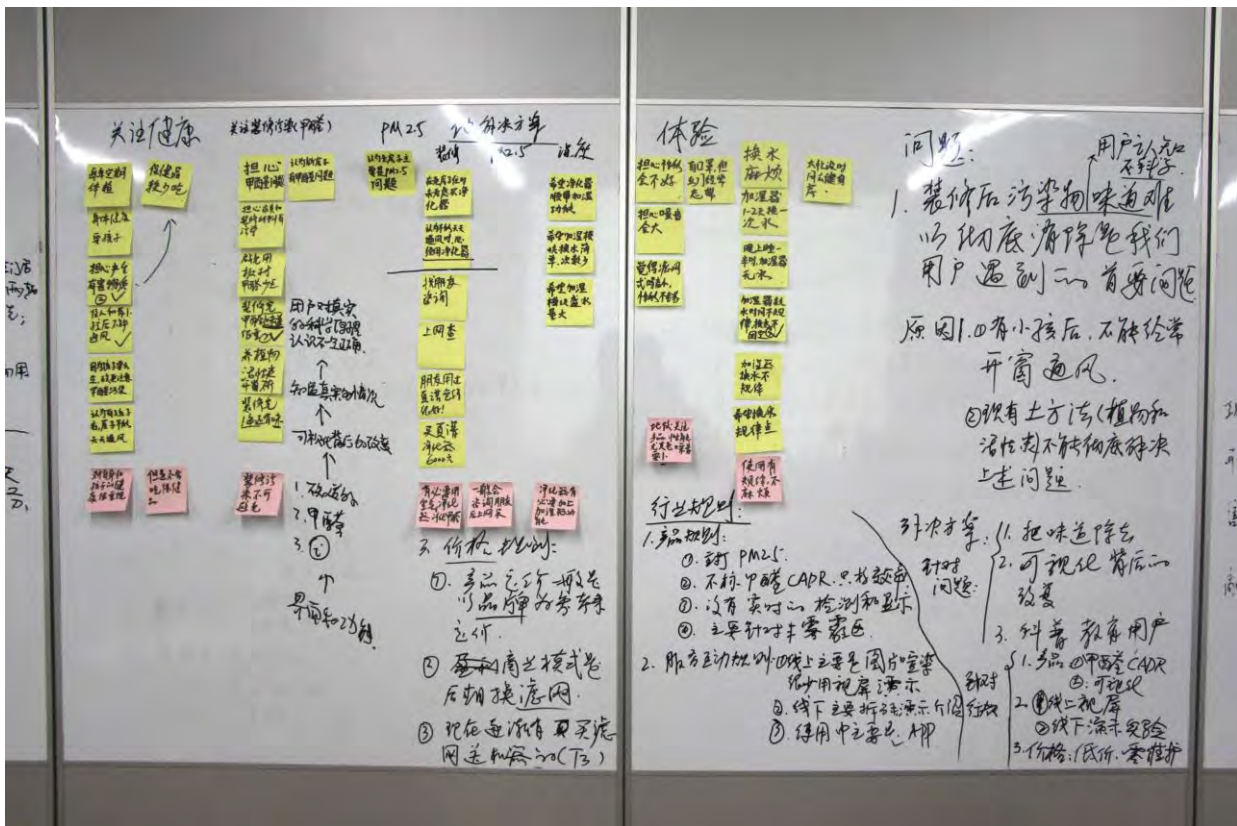

Figure 3: Startup team is organizing the user interview data in order to find the innovation opportunities

Discussion

By reflecting the feedbacks of the participants in all 3 workshops, we found that there is a high demand for innovation skills to seek the new business opportunities. For the technology-initiated business, the majority of the startup teams in Tsinghua x-lab, lots of them need the innovation skills to look for the market to place their original technology, material, or application. A normal situation for the startupers is, they have a cutting-edge technology but don't know how to apply it in the market and what can the products to be by incorporating the technology. Design thinking skills would play an important role in this kind of entrepreneurs by seeking the appropriate market position and producing user demanded products. By concluding this paper, we list several observations and lessons learned to discuss in the following paragraphs:

The significance of the user-centered design methodology in the startup innovation reflects in the following points.

1. User-centered design transforms the product development focus from the business and technology pursuing to the user driven innovation. User driven innovation is the fundamental key to the business success for it creates the user demanded products which promise the actual market once it is born.

2. User study ensures startup team stand in the user's position to develop the business and product. And it further guarantees the right direction to foresee the future business opportunity and innovation possibility.

3. Startup will obtain tremendous benefit in the market positioning, target user definition, product development, and even business model exploration if it employs the user-centered design in the beginning of the business set up.

4. User-center design fosters the innovation thinking in the very early stage within the startup team, which ensures the business head to the market with less competition and more profit maintenance.

Questionnaires were distributed after each workshop. Participants were asked to rate on the content difficulty level, manipulation level, mastery level, and mentor elaboration. Some findings are summarized in below.

1. The most impressive part or the most the participants learned through all three workshops is Sympathy Exercise and User journey map.

2. When the participants are asked about which part needs to be improved, quite a few of them mentioned the successful startup innovation example with detailed strategy should be elaborated.

3. Over the three workshops, the third one for analyzing the user data and exploring innovation turns out the most difficult on learning, practicing, and implementing.

4. The general participation is really good. People actively participated in the exercises. This indicates that Chinese startupers are open to any kind of innovation methods as they are hungry to the radical business innovation.

Last but not the least, we summarize some lessons learned.

- The startup teams need more exhaustive mentoring in each session because their project requires deep intervene from user-centered design perspective. They are eager to incorporate the innovative approaches into their business practice as soon as possible.
- Mentor facilitation is very important. We realize that in some of the exercises, such as User Journey Map, Five Whys, and the new opportunity exploration in the workshop III, the startupers sometimes get a bit lost. They need delicate mentoring during the hands-on exercises.
- The methodology of user study for startup innovation will be highly valued for the large-scale enterprises as well, especially for the enterprises that are seeking for business transformation or new project exploration.

Acknowledgements

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