DoorStep:
We provide service at your door

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Abstract
In this paper, we present an application which connects customers with the service providers. Our primary goal was to create a platform to help customers hire trusted professionals who can provide the required service at the customer's place. The DoorStep application removes the burden of travelling to find the service professional and thus users can get the required service at their homes instead.

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Introduction
DoorStep is a mobile platform that aims to facilitate the business of service providing. A user who is willing to find a service, which can be delivered at user's home, can choose, browse, and contact a service provider through a mobile application.

The target users of the application are students. A major problem faced by most of the students is to find out time to go out and locate the service providers who are skilled and experienced. The root cause of this problem is the 'lack of resources'. For an instance, a student who has just joined the University may face a few challenges like – lack of knowledge about the whereabouts, no vehicle to go around places to locate a service, fear of getting lost due to lack of awareness of the surroundings, or just the lack of time to go and find a service provider. DoorStep is an application that helps students hire local professionals at the convenience of their home. Thus, saving their time and efforts, helping them find the best professional based on the user ratings, reviews, etc.

From the first concept to the existing prototype, user centered design guided our research. Multiple students were interviewed to get their opinions on the services they would require the most. Keeping the user experience goals in mind, DoorStep platform is developed which delivers what is required with great efficiency.

In the following report, we discuss our approach to design the application, which includes personas and scenarios, a cognitive walkthrough of the prototype, and usability testing results.

Literature Review

Throughout the development of the DoorStep application system, we gained insight related to the building of a two-sided online marketplace which connects buyers to sellers or, to be precise, users to service providers.

While deciding upon the workflow of our application, we went through different applications which favor small business. A list of 7 customer service applications is provided in an article by Rieva Lesonsky [3].

The major challenge was to find the professionals who would agree to provide the services and this is when the work by Tanvi Jindal on how to find local experts using Yelp dataset helped us [4].

We collected all the required information from the user interviews like – which is a better medium – a mobile application or a desktop website, and what are the most frequent service requirements. After we decided to build a mobile platform, we tried and implemented the core concepts of designing an application as learnt in the coursework 'Human Centric Design'**.**

Just after we decided to build upon our idea, we realized that we needed to drill down on the options we would make available to our users through DoorStep. We decided to 'tighten our focus' and 'focus on our most passionate users'. [1].

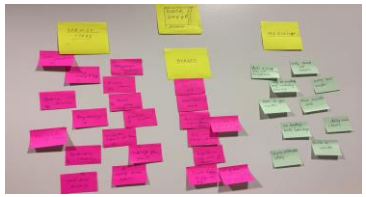
In developing an interface containing all user-friendly essentials, we relied on the design principles as provided by Dmitri Fadeyev [5] and Suzanne Martin [6].

When people download an application, the usually look for things such as design, functionality, and efficiency. These fine qualities are never more present than in the app's interface. We kept in mind a few ground rules while designing the interface of our application. These little tricks were found in an article written by Marcela De Vivo [2].

Investigative Research: Methods & Analysis

In the initial phase of our research, we developed a research plan focusing on major areas we wish to investigate upon. We were more interested in knowing if the target users think that they will be benefitted from our application, which will help us in getting a clear picture regarding the feasibility and need of the application. Also, we wanted to know about the services our target users will be interested in so that we can restrict our domain to particular services only. Another research objective was to collect information for the interface requirements and design.

As per our research objectives, we conducted semi-structured interviews where we prepared a list of 13 important questions. The questions were divided into four categories: Demographic questions, background information, information specific to the application and feedback.



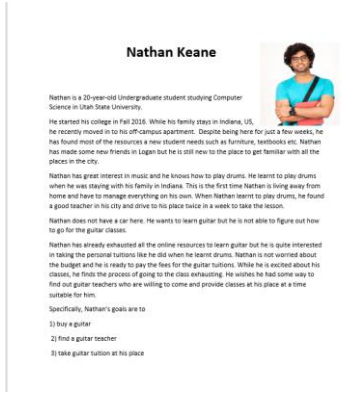


Figure 1. **Affinity Diagrams**
Figure 2. Primary Persona

The interview guide included below questions in each of the categories. We had three demographic questions:

- What major and degree are you pursuing at USU?
- How long have you been at USU?
- Where do you live? (Campus housing, apartment, house, etc.)

The background information related questions were:

- How many courses are you taking this semester?
- How much time do you usually spend per week on your coursework and assignments?
- Do you work? If so, where do you work and for how many hours per week?
- Have you ever missed class, work, or an important task so you could get some service, like getting your computer repaired? If so, please explain.

The question specific to the application Doorstep were:

- What services do you most frequently require?
- How do you usually find these services?
- Would receiving these services at your doorstep save you time? If so, how?
- If you were to pick the three most important services that could be provided at your doorstep, what would those three be?

Would you be willing to pay a little extra to have a service provided at your home?

And, lastly we asked for Feedback:

- Would you be willing to provide feedback at a later time on our prototype for providing services to your doorstep?

Six students in total were interviewed from varied backgrounds to make sure the collected data will not be biased. One student was from China and was and undergrad from CS department. We interviewed one PhD student from India, and one of the students was an undergrad from Washington, USA. Similarly, the rest of the students were also from different countries and different programs. Each interview lasted for around 40 minutes and was held at Taggart Student Center.

Transcriptions of each participant's interview were coded and modeled into affinity diagram, which helped us to analyze the results of the interviews. We organized interview responses into three main categories: the type of services, budget and frequency of service requirement. We observed that most of the students were interested in computer repair, guitar class and laundry services. The frequency of service requirement had very diverse answers so we decided to keep it as a search criteria and leave it to the users to select as per their requirements. While interviewing students it became pretty evident that students think mobile applications are easily accessible than desktop ones and were more interested in using mobile applications.

Personas & Scenarios

We reviewed the interview transcripts and identified findings from them to capture the user sentiments towards getting services at the convenience of their doorstep. Since providing a lot of services was not possible during the course duration, we decided to stick with just 3 services for the project. We wanted to identify the three most desired services for the students, because students represent the group of people that our solution would be targeted at. The intent was to design a system that would fit the needs

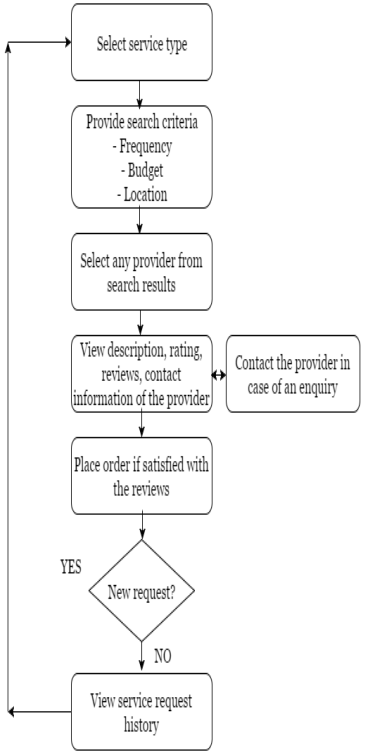
of our participants, and support the values derived from our research and provide a quick and easy access of services to the students. We have designed our system to be intuitive and easy to use so that users do not have to spend their time trying to learn it. It has also designed to be user-friendly and quick to use. We wanted to enable our users to also be able to provide ratings and reviews and not just view description of the providers for the services used by them. The main idea behind this functionality was to build a social network for services where experiences of all users with specific services would be of help to others.

When analyzing the interview transcripts for answers, it was not easy to categorize the findings by just going through the transcripts. So, we created an affinity diagram using that information. The activity took place at the Taggard Student Center cafeteria using some pens, post-it notes and the transcript printouts. In the affinity diagram, the answers to various question were categorized into various categories on the basis of the questions that we had in the beginning as the pre-research problem statement. We created 3 personas on the basis of the affinity diagram. Our personas were an approximate representation of the goals and behavior of the hypothesized group of students that would be the target of our system. Different behavior patterns, goals, skills, attitudes and environmental information, along with a few fictional personal details were used to make the personas most realistic. The primary persona used for design specifications was Nathan Keane, who is a 20-year-old undergraduate student from United States. He's a Computer Science student and is fond of mobile applications. He's also a great drummer and music enthusiast.

For each persona, a scenario was created to capture the essence of how the application would be used in the daily lives of the students. Scenarios are narratives of foreseeable interactions between the users represented by the personas and the technical system, which usually includes computer hardware and software. The acted scenarios were used to discover requirement related answers in the pre-research statement.

Prototyping

A prototype is an early sample, model, or release of a product built to test a concept or process or to act as a thing to be replicated or learned from. We wanted to ensure that every student was able to use and understand the features present in our application. We also wanted to ensure that the application was user-friendly. To get an idea of how the application would work and be able to perform usability testing, we started working on prototyping the application. As was clear from our user study, we needed to create prototypes for a mobile application. So, we started with paper prototyping and created 16 paper prototypes. A team meeting was then held and the prototypes were reviewed and findings were noted down. All the plus points from the different prototypes were incorporated into the initial working mobile application prototype.



Workflow of the application

A flowchart of the functioning of the prototype can be seen on the left pane. The initial prototype was designed to allow users to select a service first and then choose service-specific search criteria. A list with all the service providers matching the criteria were presented to the user. Every result was a link to the page of the respective service provider. The description, location, contact information, reviews and ratings for each service provider were present on the pages. Users has the option to either place the request straight away or contact the provider on their own. There was also an option to view request history.

The initial working prototype was used for the think aloud sessions with users for the usability testing. The findings from the usability testing helped us fine-tune our prototype to a better state than the initial prototype.

Usability Testing

We conducted usability testing using Think Aloud protocol with five of the six interviewees as participants.

Touch-screen laptops and mobile phones were used for the testing of our application. Testing was conducted for around 30minutes with each participant at TSC cafeteria, Library, and Old Main 4th floor lounge.

Before conducting the testing, we handed a task-sheet to the participants demonstrating a list of below actions that we needed them to perform:
1. Access the prototype at https://share.proto.io/IYQLGE/
2. Now choose a username and create an account on the application
3. Try signing in to the application using your Facebook account
4. Now let's say that you are looking for a bimonthly laundry service and you'll only be available on Friday, Saturday or Sunday. Search for such a service and place a request with one provider
5. Next, search for a weekend guitar class which is within the 10$/class budget. Just check the contact details of the provider of your choice without placing the request
6. Search the app for details of the bimonthly service requested by you in Task # 4
7. Without going through the service list again, can you tell me how many services do you think are present on the application?

We categorized the findings from tests as per severities as Low, Medium, and High. The results of our testing revealed a number of problems with our application, some were functionality related and some were interface related.

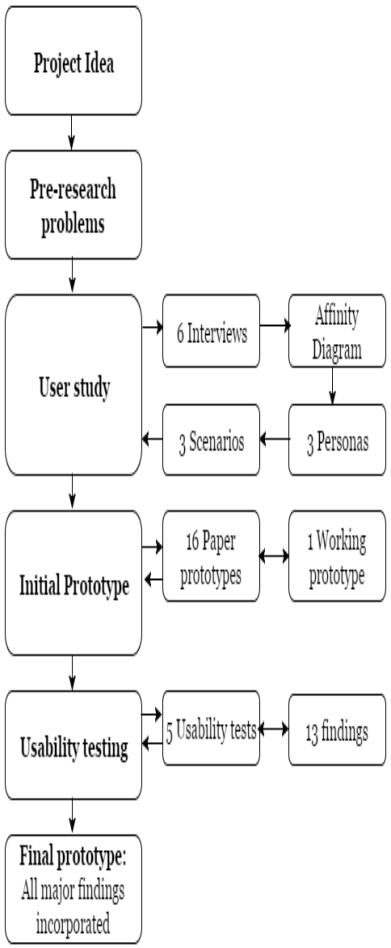
Notable major issues included:

The users were unable to select the three services because our application had a scroll-down view for every service and they couldn't decide where to go to select other services as there was only one service displayed per page initially.

The functionality of 'back' button wasn't working fine on few pages. And, sometimes the 'back' button directed the users to home screen rather than the previous screen.

The major flaw that we noticed was that users had no option to sign out from the application. There was no Sign-Out functionality included in the application.

Project workflow



Users found the GUI for the filter page bit less user-friendly. The users had to scroll down to check all the options for "frequency" selection.

Few low severity issues included:

The see details link on each services screen was a bit confusing for users as they couldn't identify what it means.

The functionality of sign-up for new users from Facebook, Twitter and Google was included on "Sign-up" page but there was no such functionality on "Sign-in" page for existing users.

The workflow through the application was often unclear. Screens were not clearly presenting the user with their action choices. There was no functionality like providing new users with on-screen instructions and context-sensitive help area.

The final prototype incorporates adaptations to address these issues along with improved GUI for better user experience. We removed the sign-up with Facebook, Twitter and Google from "Sign-Up" screen as well so the user now can sign-up as well as sign-in from email-id and password only.

We included all services on one-screen and removed the scroll-down view on "Services" page to avoid confusion.

The major enhancement that we added to the final prototype was to add a Left-Pane on each screen in which "Logout" and "services" functionalities were included.

Likewise, for better user experience we removed the roll-down view of "frequency" selection so that the options are easily visible to the user.

Conclusions

Small business runs though mobile applications these days. People find it handy to make a banking transaction, shop online, or pay bills using their mobile phones. The other side of this practice is that nobody in today's world wants to take out time separately to perform these activities. Everyone wants to get the job done in the easiest possible way while staying at home. However, few things still need the user to leave his/her comfort zone and move to a dedicated place to get the service. DoorStep brings three such services to the user's home.

DoorStep is an outcome of the efforts of all the team members and the interviewees who gave their incredible inputs during the user study as well as the usability testing.

Now, every student struggling through the mazes of service providers and yelp results, can use DoorStep to get lightning fast results and services.

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