Feasibility Evidence Description (FED)

SnapValet

Team 03

Team members

Brain Vanover:	**Project Manager, Feasibility Analyst**
Abhinandan Patni:	**Operations Concept Engineer, Prototyper**
Xiaoting Bi:	**Feasibility Analyst, Prototyper**
Ditong Ding:	**System Architect, UML Modeler**
Ridhima Manjrekar:	**Requirements Engineer, Prototyper**
Saikarthik Desiraju:	**Life Cycle Planner, Prototyper**
Molly Karcher:	**IIV&V, Quality Focal Point**

10/11/14

Version History

Date	Author	Version	Changes made	Rationale
09/28/14	Xiaoting Bi	1.0	• Original template v1.0	• Initial draft of Feasibility Evidence Description (FED)
10/11/14	Xiaoting Bi	2.0	• Draft FC Package	• All sections till section 5 are updated.

Table of Contents

Table of Tables

Table of Figures

1. Introduction

1.1 Purpose of the FED Document

The document provides necessary feasibility analysis for the SnapValet project. It reports the evidence of project feasibility in term of business case analysis and risk assessment.

1.2 Status of the FED Document

- This version corresponds to the Draft FC Package.
- The propose and status of FED have been added.
- Cost analysis, benefits analysis and Return-on-Investment analysis are performed and added.

2. Business Case Analysis

<table>
<tr><td colspan="4">Assumptions
• Users/Drivers prefer using mobile payment over a cash transaction.
• People trust mobile payment systems.
• Valet companies prefer mobile payments over cash transactions.
• There isn’t already a similar competitive functionality in other existing applications.
• SnapValet indeed speeds up facilitation of valet service.
• A noteworthy amount of customers often do not carry cash for valet.
• Our users would rather prefer using an android phone over other platforms.</td></tr>
<tr><td>Stakeholders</td><td>Initiatives</td><td>Value Propositions</td><td>Beneficiaries</td></tr>
<tr><td>• SnapValet
• Developers</td><td>• Develop system
• Direct sales
• Network
Conference / trade shows
• Market campaign
End user: social media</td><td>• To speed up the process of valet
• Improve cashless valet experience for customers.
• Expand potential customer base for valet.
• Better valet account / transaction management.
• Enable direct advertising.
• Increase revenue / profits.</td><td>• Drivers / users
• SnapValet clients
• Valet companies
Restaurants
Hotels
• Sponsors/investors</td></tr>
<tr><td colspan="2">Cost
• Time.
• Marketing Costs.
• Maintenance Costs.
• Team building.
• Infrastructure:
Web server,
Third party transaction management.</td><td colspan="2">Benefits
• A faster, more convenient way to valet park.
• Increase market share to include non cash-carrying customers.
• 3% revenue / transaction.
• Prestige for developing a successful, popular mobile app.
• A reputable grade in CSCI 577a.
• Experience developing mobile apps.
• Experience working with a highly diverse, interdisciplinary team.</td></tr>
</table>

2.1 Cost Analysis

2.1.1 Personnel Costs

Table 1: Personnel Costs

Activities	Time Spent (Hours)
Development Period (12 weeks)	
Valuation and Foundations Phases: Time Invested (6 weeks)	
Client: Meeting via email, phone, and other channels [2 hrs/week * 6 weeks * 2 people]	24
Group: Meeting via email, phone, and other channels [3 hrs/week *6 weeks * 7 people]	126
Architecture Review Boards [1.5 hrs * 2 times * 2 people]	6
Development and Operation Phases: Time Invested (6 weeks)	
Client: Meeting via email, phone, and other channels [2 hrs/week * 6 weeks * 2 people]	24
Maintainer: Meeting via email, phone, and other channels [3 hrs/week * 6 weeks * 2 people]	36
Architecture Review Boards and Core Capability Drive-through session [1.5 hrs * 6 weeks * 2 people]	6
Group: Meeting via email, phone, and other channels [3 hrs/week *6 weeks * 7 people]	126
Deployment of system in operation phase and training - Installation & Deployment [1 hrs * 1 times * 2 people] - Training & Support [1 hrs * 2 times * 2 people]	6
Total	354
Maintenance Period (1 year)	
Maintenance [2 hr/week * 52 weeks * 1 people]	104

2.1.2 Hardware and Software Costs

Table 2: Hardware and Software Costs

Type	Cost	Rationale
Hardware – Server	$3,000	A new machine is needed to act as a web server for the system.

2.2 Benefit Analysis

Table 3: Benefits of xxx System

Current activities & resources used	% Reduce	Time Saved (Hours/Year)
Giving a car to a valet operator		
Driver (60 times * 30 mins/time = 1800mins)	83.3	25
Picking a car		

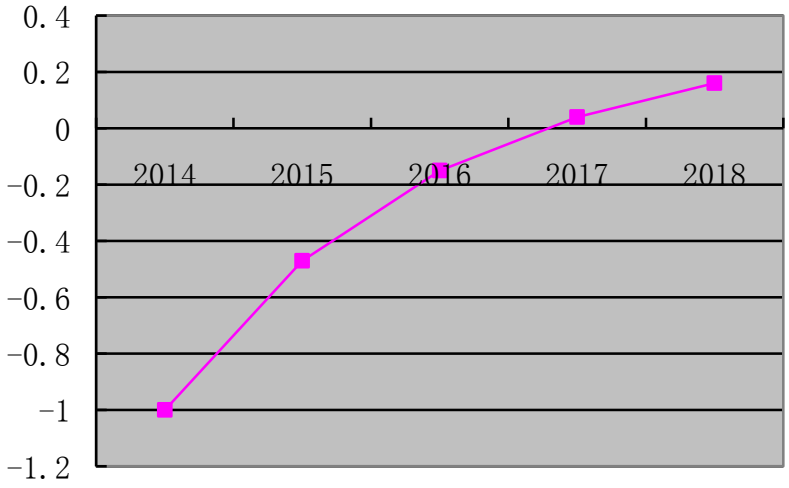
Driver (60 times * 20 mins/time = 1200mins)	75	15
Payment		
Valet operator (3 mins/time * 5000 times = 15000 mins)	66.7	200
Driver (3 mins/time * 60 times = 300 mins)	66.7	3
Total		**243**

2.3 ROI Analysis

Table 4: ROI Analysis

Year	Cost	Benefit (Effort Saved)	Cumulative Cost	Cumulative Benefit	ROI
2014	354	0	354	0	-1
2015	104	243	458	243	-0.47
2016	114	243	572	486	-0.15
2017	126	243	698	729	0.04
2018	139	243	837	972	0.16

Figure 1: ROI Analysis Graph



3. Architecture Feasibility

3.1 Level of Service Feasibility

Table 5: Level of Service Feasibility

Level of Service Requirement	Product Satisfaction
LOS-1: Usability	Product Strategies: Develop a simple user interface.
	Process Strategies: Test the usability by prototyping and user involvement.
	Analysis: By prototyping and user involvement, we can make sure the interface is simple and easy to use for drivers.
LOS-2: Payment Security	Product Strategies: Usage of third party online money transaction system — Stripe.
	Process Strategies: Thorough testing of all use cases through the usage of Stripe.
	Analysis: Stripe provides a set of APIs and tools that enables businesses to accept and manage online payments.

3.2 Capability Feasibility

Table 6: Capability Requirements and Their Feasibility Evidence

Capability Requirement	Product Satisfaction
CR-1: Check in location	Software/Technology used: Google Map API
	Feasibility Evidence: Location check-in is prototyped. User is able to choose a location and check in on Google Map
	Referred use case diagram: UC-2: Valet Process
CR-2: Request a car	Software/Technology used: MySQL
	Feasibility Evidence: Requesting is prototyped. There is a car retrieval queue and when a driver requests a car, this request will be added to the request queue.
	Referred use case diagram: UC-2: Valet Process
CR-3: Payment via mobile phone	Software/Technology used: Stripe API, MySQL
	Feasibility Evidence: The transaction will be implemented via Stripe API and all the transaction details will be stored in the MySQL database.
	Referred use case diagram: UC-2: Valet Process
CR-4: Register	Software/Technology used: MySQL
	Feasibility Evidence: Register is prototyped.

	Referred use case diagram: UC-4: Register
CR-5: Login	Software/Technology used: MySQL
	Feasibility Evidence: Login is prototyped.
	Referred use case diagram: UC-3: Log in

3.3 Evolutionary Feasibility

Table 7: Evolutionary Requirements and Their Feasibility Evidence

Evolutionary Requirement	Product Satisfaction
ER-1: Valet operator check-in	Software/Technology used: Google Map API, MySQL
	Feasibility Evidence: Valet operator check-in is prototyped. The first valet operator is able to choose a location and check in on Google Map. And other operators can be added to this location.
	Referred use case diagram: UC-1: Valet operator check in

4. Process Feasibility

Table 8: Rationales for Selecting Architected Agile Model

Criteria	Importance	Project Status	Rationales
30 % of NDI/NCS features	3	4	Using Stripe API and Google Map API which is an important part of the whole project.
Single NDI/NCS	1	0	There is no single NDI/NCS solution that satisfies a complete solution.
Unique/ inflexible business process	2	2	The business process is not very unique.
Need control over upgrade / maintenance	3	4	The project may need to add new functions in the future.
Rapid deployment	3	3	The valet parking industry is a great opportunity to the first movers.
Critical on compatibility	3	3	Our project should be compatible with Google Map and Stripe.
Internet connection independence	3	3	Our project is web based.
Need high level of services / performance	1	1	Our system does not need high performance.
Need high security	3	4	High security is required in the system while making transactions.
Asynchronous communication	2	2	System asynchronous communication does have nominal value
Be accessed from anywhere	1	2	This system is needed to be accessed from mobile phone.
Critical on mass schedule constraints	2	2	The system is developed according to ICSM schedule
Lack of personnel capability	1	1	Most team members do not have experience in android development.
Require little upfront costs	2	2	The major cost is the cost of server.
Require low total cost of ownership	1	1	This feature does not affect the system
Not-so-powerful local machines	1	1	System does not need high performance computers

5. Risk Assessment

Table 9: Risk Assessment

Risks	Risk Exposure			Risk Mitigations
	Potential Magnitude	Probability Loss	Risk Exposure	
Inexperience with mobile development may hinder system development (Personnel Shortfalls)	10	1	10	Each developer will complete the Android tutorials at http://www.developer.android.com/training/index.html
Developers schedules may prevent developers from completing Android training in a reasonable time (Inflated Expectations)	10	1	10	The team will take advantage of group development sessions such as team meetings and hack nights to complete the android tutorials
Geolocation APIs may charge for their services which may cause the budget to be exceeded and/or disrupt the program model (NDI Conflict)	3	2	6	The team will thoroughly investigate various geolocation APIs to determine their pricing models.
Chosen APIs may not be compatible with development platform (NDI Conflict)	5	1	5	The team will focus on well documented geolocation APIs such as Google Places and Yelp. The team will additionally prototype a chosen API in the Android development environment
The new workflow may be too complex such that the valet companies do not want to use the system (Underdefined Plans and Requirements)	8	5	40	The client and project manager will conduct user interviews of valet companies and operators. The team will develop various workflow solutions and discuss these with the users.
Uncertainties surrounding profile management may cause the interface to be too complex/confusing (Human-System Integration Shortfalls)	7	5	35	Information gathered from user interviews will be used in conjunction with interface and profile architecture prototyping
Client uncertainties and changes regarding system workflow requirements i.e. admin console and/or web application may cause the project to expand out of scope (Underdefined Plans and Requirements)	4	4	16	The team will conduct multiple rounds of win negotiations to ensure that both clients and developers are satisfied with the agreed deliverables and system requirements
There is uncertainty surrounding the selection of a transaction management NDI/COTS which may lead to selection of an improper or mobile incompatible product (NDI Conflicts)	5	2	10	The team will evaluate various mobile transaction management NDIs and choose two that will be prototyped in parallel in a mobile development environment.
Mobile transactions may create an	6	2	12	The team will learn and apply best

insecure environment and foster the breach of sensitive data (Value Conflict)				practices for securing the application.
Unclear full understandings of the current process model for valet parking may cause developers and acquirers to fall out of sync with user win conditions (SCS Lack of Involvement)	8	6	48	The client and project manager will conduct user interviews of valet companies and operators. The team will develop various workflow solutions and discuss these with the users.
Valet operations at unofficial events/venues such as concerts/football games or large house parties may not be locatable by geolocation APIs (NDI Conflict)	1	9	9	The team will apply risk avoidance pending client approval.
Current valet business process regarding transaction management may be incompatible with proposed SnapValet transaction management solutions (SCS Lack of Involvement / Value Conflict)	8	5	40	The client and project manager will discuss current transaction management practices with two large, Los Angeles-based valet companies.

6. NDI/NCS Interoperability Analysis

6.1 Introduction

<< Identify the Non-Developmental Item (NDI) and Net-Centric Services (NCS) including open source software or libraries that you are using/ plan to use in your project and analyze their interoperability. >>

6.1.1 COTS / GOTS / ROTS / Open Source / NCS

<< Identify all candidate commercial off-the-shelf, government-off-the-shelf, research-off-the-shelf, open source software, libraries, and net-centric services component that you are using/ plan to use. Also identify the purpose of each component. >>

Table 10: NDI Products Listing

NDI/NCS Products	Purposes

6.1.2 Connectors

<< Identify the connector, for example

- "In this project, we use PHP/MySQL Connector to enable the PHP web application to retrieve and query data from the database". >>

6.1.3 Legacy System

<< Identify the connector, for example

- "In this project, the development system has to be able to interoperate and works well with "BusinessWorks" version 5.2, which is a software system that the client is currently using." >>

6.2 Evaluation Summary

<< Summarize the final selection of your interoperable NDI/NCS, its usage and its comment. Example can be found in ICSM EPG> Task: Analyze NDI Interoperability for NDI / NCS project. >>

Table 11: NDI Evaluation

NDI	Usages	Comments