TRƯỜNG ĐẠI HỌC FPT

Capstone Project Document

SUPER SHIPPER SYSTEM
Project Management Plan

Super Shipper System		
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Project code	3S	

- Hanoi, 09/2015 -

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1. PROJECT OVERVIEW

1.1. Project description

Project Code	3S	Contract Type	None
Customer	None	2nd Customer	None
Project Level	Group	Project Rank	None
Application Type	Website, Application	Project Manager	Le Van Quy Hoang
Project Category	Development	Business Domain	Delivery Service

This project will support for managing delivery service. Store which wants to use delivery service will go to website developed by us and use our service such as creating order, tracking order,...We also develop a website for admin to manage shipper, store, issue and a mobile application for shipper to support them do their works. Beside, a server is developed to connect website and shipper's application, save data. So our system will provide stores the most convenient service, fastest service and safest service in their business.

1.2. Scope and purpose

The scope of project will contain all processes, from planning, requirement specification, analysis and design, development, to test.

We develop this project for supporting and managing delivery service. This project will contain:

- A system service: The server will receive request from website and application, process the request and return response through API. Besides, it can save information about exchange history, shipper's information, store's information and send message to admin when any issue occurs.
- 2 web-app:
    - A web-app for Admin to manage stores, shippers and issue in system.
    - A web-app for store to use system's functions such as creating order, tracking order, finding shipper, view history of exchange, rate, feedback shipper,..
- An mobile-app: The mobile application was built on Android, IOS for shipper to help them work more efficient with functions: find best way , see location, pick order, confirm received code with store,....

Beside, the system has to adapt conditions of non-functional requirement:

- Time delay from sending request to receiving response must be optimized.
- GUI has to be clear, good looking and simple to use.

1.3. Standard Objectives

- This project started from 7/9/2015 and must be finished no later than 6/12/2015.
- The final Application covers 100% of requirements.
- The 6 team members must give the best effort and work based on schedule that team defined.

1.4. Milestones and Deliverables

1.4.1. Milestones

No	Task	Start date	End date
1	Approve Project's idea	9/9/2015	9/9/2015
2	Complete introduction document	9/13/2015	9/13/2015
3	Submit report 1: introduction document	9/13/2015	9/13/2015
4	Complete PMP document ver1.0	9/20/2015	9/20/2015
5	Submit report 2: Project Manage Plan Document	9/20/2015	9/20/2015
6	Complete SRS document	10/4/2015	10/4/2015
7	Submit report 3: SRS document	10/4/2015	10/4/2015
8	Complete SAD ver1.0	10/11/2015	10/11/2015
9	Complete source code ver1.0	11/8/2015	11/8/2015
10	Complete Test Plan Document ver1.0	11/8/2015	11/8/2015
11	Submit Report 4: Software Architecture Document	11/8/2015	11/8/2015
12	Complete PMP document ver2.0	11/9/2015	11/9/2015
13	Complete SAD ver2.0	11/16/2015	11/16/2015
14	Complete source code ver2.0	11/22/2015	11/22/2015
15	Complete Test Plan Document ver2.0	11/16/2015	11/16/2015
16	Submit Report 5: Source Code & Test Document to Supervisor	11/22/2015	11/22/2015
17	Complete PMP document ver3.0	11/23/2015	11/23/2015
18	Complete Final SAD Document	11/23/2015	11/23/2015

19	Complete Final Source Code	11/29/2015	11/29/2015
20	Complete Test Plan Document ver3.0	11/24/2015	11/24/2015
21	Submit Report 6: source code final to supervisor	11/29/2015	11/29/2015
22	Complete Final PMP document	12/1/2015	12/1/2015
23	Complete User Manual	12/2/2015	12/2/2015
24	Complete final report of testing	12/4/2015	12/4/2015
25	Complete Final Report	12/5/2015	12/5/2015
26	Get supervisor's approve on final report	12/5/2015	12/5/2015
27	Submit final report to FPT University	12/6/2015	12/6/2015

1.4.2. Deliverables

No	Deliverables	Format	Delivery date	Verified by	Deliver Medium
1	Introduction Document	.pdf	09/13/2015	Supervisor	Email
2	Meeting minute_09092015	.pdf	09/13/2015	Supervisor	Email
3	Progress Report_09132015	.pdf	09/13/2015	Supervisor	Email
4	Communication matrix ver1.0	.xls	09/20/2015	Supervisor	Email
5	Risk register ver1.0	.xls	09/20/2015	Supervisor	Email
6	Work schedule	.mpp	09/20/2015	Supervisor	Email
7	Project Management plan document ver1.0	.pdf	09/20/2015	Supervisor	Email
8	Meeting minute_09162015	.pdf	09/20/2015	Supervisor	Email
9	Progress Report_09202015	.pdf	09/20/2015	Supervisor	Email

10	Software Requirement Specification Document	.pdf		10/04/2015	Supervisor	Email
11	Meeting minute_09232015	.pdf		10/04/2015	Supervisor	Email
12	Progress Report_10042015	.pdf		10/04/2015	Supervisor	Email
13	Software Architecture Document ver1.0	.pdf		11/08/2015	Supervisor	Email
14	Meeting minute_09302015	.pdf		11/08/2015	Supervisor	Email
15	Progress Report_11082015	.pdf		11/08/2015	Supervisor	Email
16	Test Plan Document ver2.0	.pdf		11/22/2015	Supervisor	Email
17	Source code	.zip		11/22/2015	Supervisor	Email
18	Meeting minute_11282015	.pdf		11/22/2015	Supervisor	Email
19	Progress Report_11222015	.pdf		11/22/2015	Supervisor	Email
20	Source code final	.zip		11/29/2015	Supervisor	Email
21	Meeting minute_11252015	.pdf		11/29/2015	Supervisor	Email
22	Progress Report_11292015	.pdf		11/29/2015	Supervisor	Email
23	Final report document	.pdf	Hard copy	12/06/2015	FPT University	Direct

2. PROJECT ORGANIZATION

2.1 Software Process Model

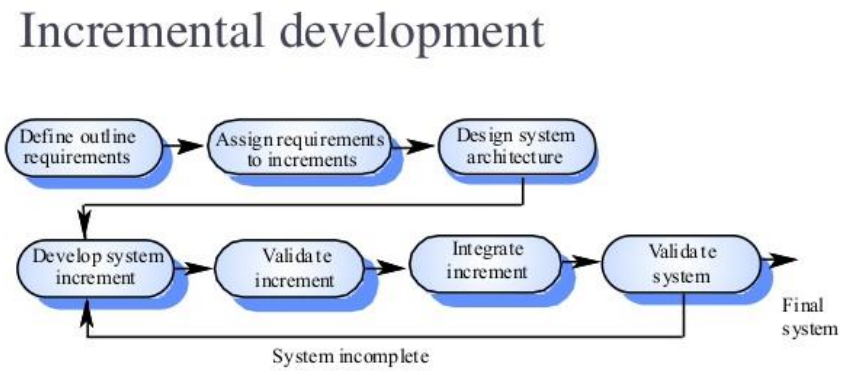


Figure 3: Incremental Model

In this project, we apply Incremental model as development process model because this model has these useful advantages:

- Some main functions can be developed early & quickly
- More flexible - Easy & less costly to change if having.
- Testing and debugging during smaller iteration is easy
- Iterations may be run simultaneously. A design team starts the next iteration while the current one is under test
- The project team learns from first iterations and may use best practices and experiences in next iterations
- Easier to manage risk because risky pieces are identified and handled during its iteration.

2.2 Project Lifecycle

This project is divided into 5 phases: Initiation, Increment 1, Increment 2, Increment 3, Increment 4, Closing. Each Increment will goes through Project Plan, System Architecture Design, Implementation, Testing and Evaluation. We will iterate Increment phase until we meet requirement. In each Incremental, we bases on result of the previous Increment to plan for next Increment and update for system. Project manager monitors and controls the progress of project team follow this process.

2.3 Roles and Responsibilities

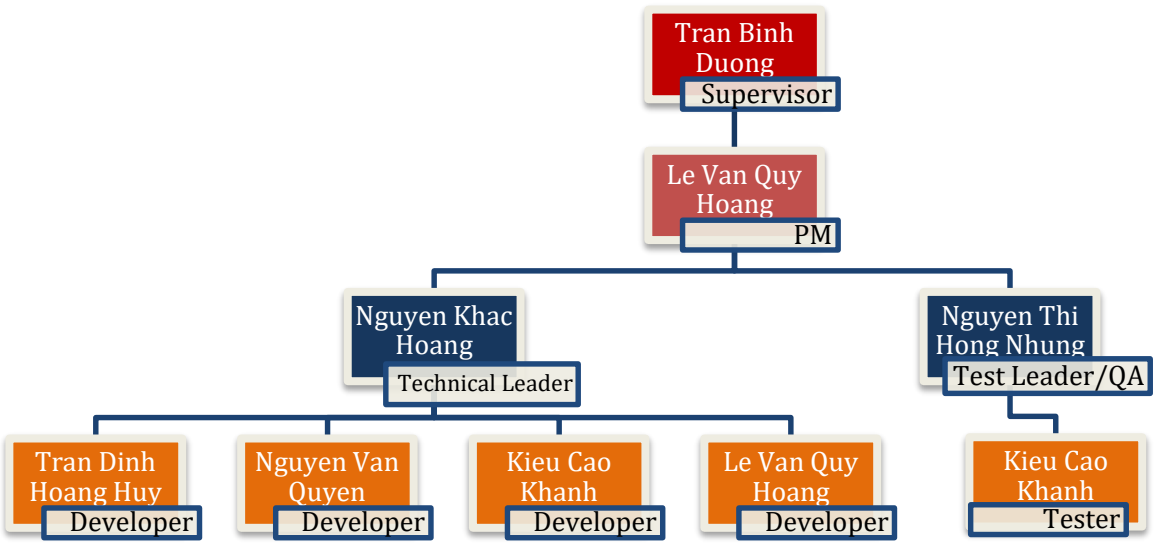


Figure 4: Organization structure

Role	Full name	Responsibility
Supervisor	Tran Binh Duong	- Give instruction for project team - Verify deliverables - Supervise project team's status
PM	Le Van Quy Hoang	Have overall responsibility of the project - Assign task to team members - Tracking team member's work - Plan schedule for project team - Review documents and source code
❖ **Development team**		
Technical Leader	Nguyen Khac Hoang	- Create coding convention - Decide technique and tools to be used - Code server and admin's website
Developer #1	Tran Dinh Hoang Huy	- Study Ionic framework and code mobile app
Developer #2	Nguyen Van Quyen	- Study Ionic framework and code mobile app
Developer #3	Le Van Quy Hoang	- Design website's interface - Create coding convertion - Create skeleton for system - Coding server and store's website
Developer #4	Kieu Cao Khanh	- Design website's interface - Coding admin's website

❖ **Test team**		
Test leader	Nguyen Thi Hong Nhung	- Create test plan - Create test cases - Execute text cases - Report test result
Tester #1	Kieu Cao Khanh	- Support create test cases - Execute test case

3. TOOLS AND INFRASTRUCTURES

Item	Description	Note
Development Environment		
Operating System	Window 8.1 (32 bit, 64 bit)	
	Android(4.2 or more)	
	IOS(7.1 or more)	
Browser	Chrome, Firefox (all version)	
Development language	AngularJS	Web app
	NodeJS	Web service
Database	PostGresSQL	
Technique		
Framework	Ionic	Mobile app
Test Environment		
Operating System	Window 8.1 (32 bit, 64 bit)	
	Android(4.2 and more)	
	iOS(7.1 and more)	
Browser	Chrome50.0	
	Firefox 40.0	
Equipment & Tools		
Source code management tool	GitHub.com	
	Source Tree	
Development tool	WebStorm 10.0.0.4	

Design tool	Astah 6.8	
	Adobe Photoshop CS6	
	www.lucidchart.com	
Office tool	Microsoft Word 2013	
	Microsoft Excel 2013	
	Microsoft PowerPoint 2013	
Management tool	Microsoft Project 2010	
	Kanbanflow.com	

4. SCHEDULES

4.1. Detail Schedules

	WBS	Task Mode	Task Name	Duration	Start	Finish	Predec	Resource Names
1	**1**		**Super Shipper System**	**89 days**	**Mon 07-09-15**	**Mon 21-12-15**		
2	**1.1**		**Initiation**	**25 days**	**Mon 07-09-15**	**Sun 04-10-15**		
3	1.1.1		Form up team roles	1 day	Mon 07-09-15	Mon 07-09-15		TEAM
4	1.1.2		Uniform idea meeting	1 day	Mon 07-09-15	Mon 07-09-15		TEAM
5	**1.1.3**		**Project Clarification**	**2 days**	**Tue 08-09-15**	**Wed 09-09-15**		
6	1.1.3.1		Clarify project scope	0.5 days	Tue 08-09-15	Tue 08-09-15		TEAM
7	1.1.3.2		Clarify techinical requirements	0.5 days	Tue 08-09-15	Tue 08-09-15		TEAM
8	1.1.3.3		Clarify rules in Team	0.5 days	Tue 08-09-15	Tue 08-09-15		TEAM
9	1.1.3.4		Clarify working enviroments	0.5 days	Tue 08-09-15	Tue 08-09-15		TEAM
10	1.1.3.5		Survey practise	2 days	Tue 08-09-15	Wed 09-09-15		TEAM
11	**1.1.4**		**Meeting with supervisor**	**0.5 days**	**Wed 09-09-15**	**Wed 09-09-15**		
12	1.1.4.1		Review project's idea	0.5 days	Wed 09-09-15	Wed 09-09-15		TEAM
13	1.1.4.2		Appprove Project's idea	0 days	Wed 09-09-15	Wed 09-09-15		
14	1.1.4.3		Discuss on technique to be used	0.5 days	Wed 09-09-15	Wed 09-09-15		TEAM
15	1.1.4.4		Uniform meeting schedule & project's deliverables	0.5 days	Wed 09-09-15	Wed 09-09-15		TEAM
16	1.1.4.5		Clarify the tasks on each report	0.5 days	Wed 09-09-15	Wed 09-09-15		TEAM
17	**1.1.5**		**Project Introduction**	**4 days**	**Thu 10-09-15**	**Sun 13-09-15**		
18	1.1.5.1		Survery practise	1 day	Thu 10-09-15	Thu 10-09-15		TEAM
19	1.1.5.2		Research Background	1 day	Fri 11-09-15	Fri 11-09-15		KhanhKC,HoangNK,Quyer
20	1.1.5.3		Research Competitor	1 day	Fri 11-09-15	Fri 11-09-15		HuyTDH,NhungNTH
21	1.1.5.4		Research Proposal	1 day	Fri 11-09-15	Fri 11-09-15		HoangLVQ
22	1.1.5.5		Create project introduction document	2 days	Sat 12-09-15	Sun 13-09-15	21	HoangLVQ,KhanhKC
23	1.1.5.6		Complete introduction document	0 days	Sun 13-09-15	Sun 13-09-15	24	
24	1.1.5.7		Submit introduction document to supervisor	0 days	Sun 13-09-15	Sun 13-09-15		HoangLVQ

Figure 5: A part of Schedule

The detail project schedule is available in file "**3S_ProjectSchedule.mpp**".

5. COMMUNICATION MANAGEMENT

5.1. Stakeholders and Contacts

Name	Title	Role	Contacts
Tran Binh Duong	Mr.	Supervisor	duongtb@fpt.edu.vn (84) 936-168-165
Le Van Quy Hoang	Mr.	PM	hoanglvqse90184fpt.edu.vn (84) 924-500-699
Nguyen Khac Hoang	Mr.	Technical Leader	hoangnkse02564@fpt.edu.vn (84) 973-528-902
Kieu Cao Khanh	Mr.	Developer	khanhkcse02960@fpt.edu.vn (84) 165-249-3444
Tran Dinh Hoang Huy	Mr.	Developer	huytdhse90201@fpt.edu.vn (84) 905-507-734
Nguyen Van Quyen	Mr.	Developer	quyennvse02884@fpt.edu.vn (84) 167-921-2683
Nguyen Thi Hong Nhung	Mrs.	Test Leader	nhungnthse02437@fpt.edu.vn (84) 169-495-1497

5.2. Communication Management Approach

Project team communicate frequently to ensure the progress of each member's work. PM reports to the Supervisor frequently and honestly so that the Supervisor can track the team's work and give support/advice as need.

All request for change or proposal of new ideal must be discussed in team. If project team agree to change, project team must discuss with the Supervisor. Once the change is approved, PM will update the plan and notify to project team and Supervisor.

When any members have issue they have to immediately notify to PM for resolves soon as possible

The communications requirements are documented in the Communications Matrix of this document. The Communications matrix will be used as guide for what/when/how/who/whom to communicate throughout the project.

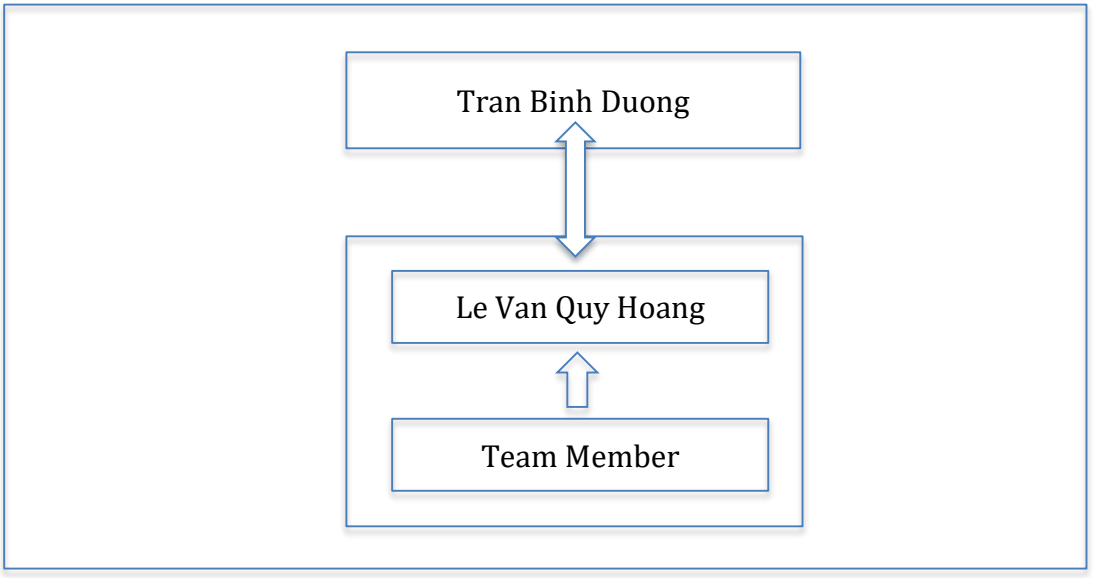
The PM will communicate with the Supervisor in order to determine his preferred frequency and time of communication.

As all project team members still take part in classes while doing project, PM should communicate to understand their schedule, and therefore specify appropriate communication plan for the team.

5.3. Communication Method and Technologies

- Create a Facebook private group for team member to discuss and share informal information and activity. This would be a place for member to communicate freely, and therefore would help in strengthen relationship between members.
- Use Github to manage documents and source code. Public source code, documents and task reports in Github to keep them tidy, save and easy to manage.
- Use Google Sheets to manage bugs.
- Use website www.KanbanFlow.com to assign and tracking tasks. This will help PM in tracking work of team members, and also help team member understand progress of the others.
- Creating a document that contains a revision history log. When changes occur, the document's revision history log will reflect an updated version number as well as the date, the owner making the change, and change description will be recorded in the revision history log of the document.

5.4. Escalation procedures for resolving issues



5.5 Communication Matrix

Communication Type	Objective	Medium	Frequency	Audience	Owner	Deliverable	Format
Project Meeting							
Kickoff Meeting	- Supervisor meet Project Team - Discuss and agree on project objective, and scope	- Face to face	Once (At the start of the project)	- Supervisor - Project Team	PM	- Meeting Minutes	- Soft copies on Microsoft Word
Project Team Meeting	- Motivate Project Team - Review status of the project. - Discuss solutions for any raised issues.	- Face to face - Conversation (Skype/Hang out)	6 times per week.	- Project Team	PM	- Progress report	- Soft copies on Microsoft Word
GUI Design Meeting	Discuss, contribute and review GUI Design	- Face to face	As needed	- Project Team	Technical Leader	- Meeting Minutes - GUI Design - Document	- Soft copies on Microsoft Word - GUI Design on Photoshop
Architecture Design Meeting	Review prototype Discuss, contribute and review System Architecture Design	- Face to face	As needed	- Project Team	Technical Leader	- Meeting Minutes - System Architecture Design Document	- Soft copies on Microsoft Word - System Architecture Design on Astah
Project Plan Meeting	Discuss and planning project process	- Face to face - Conversation (Skype/Hang out)	As needed	- Project Team	PM	- Meeting Minutes - Project Management Plan	- Soft copies on Microsoft Word - WBS on Microsoft Project

Database Design Meeting	Discuss, contribute and review Database Design	- Face to face	As needed	- Project Team	Technical Leader	- Meeting Minutes - Database Design	- Soft copies on Microsoft Word
Test Plan Meeting	Discuss, and review Test Plan	- Face to face	As needed	- Project Team	Technical Leader	- Meeting Minutes - Test Plan	- Soft copies on Microsoft Word
Meeting with Supervisor	Report project status of team's work to Supervisor Get advices for project from Supervisor	- Face to face - Conversation (Skype/Hang out) - Email	Every Wednesday	- Supervisor - Project Team	PM	- Meeting Minutes - Team Weekly Report	- Soft copies on Microsoft Word
Project tasks assign							
Task schedule	Plan schedule for project	- Face to face	As needed	- Project Team	PM	- Project schedule	- Project schedule on Microsoft Project
Task assign	Assign task for each member on Project Team	- Face to face - KanbanFlow	As needed	- Project team	PM	- Assigned tasks	- Assigned tasks on KanbanFlow
Project Report							
Bug Report	Report found bugs to team members and assign fix tasks	- Face to face - Github - Email - Google Sheets	As needed	- Project Team	Test Leader	- Bug Report	- Soft copies on Microsoft Excel, Google Sheets
Personal Weekly Report	Report task status (what is done, what will be done next week, any issue) of personal work	- Google Sheets - Github	Every Friday	- Project team	PM	- Personal Weekly Report	- Soft copies on Microsoft Excel, Google Sheets

Project team weekly report	Report task status (what is done, what will be done next week, any issue)	- Email	Every Sunday	- Supervisor	PM	- Weekly report	- Soft copies on Microsoft word
Unexpected Issue	Find a solution for any unexpected raised issues.	- Face to face - Conversation (Skype/Hang out) - Facebook private group	As needed	- Supervisor - Project Team	PM	- Meeting Minutes	- Soft copies on Microsoft Word

6. RISK MANAGEMENT

6.1. Risk Management Approach

The project manager working with the project team and ensure that risks are actively identified, analyzed, and managed throughout the life of the project. Risks will be identified as early as possible in the project so as to minimize their impact. The steps for accomplishing this are outlined in the following sections. The PM will serve as the Risk Manager for this project.

6.2. Risk Identification

The following methods were used to assist in the identification of risks associated with Super Shipper System Application:

- Brainstorming
- SWOT (Strengths, Weaknesses, Opportunities and Threats)

Project team identify various risks. Finally, PM chose top risks with high impact or most likely to happen.

6.3. Risk Monitoring

Risk monitoring will be a continuous process throughout the project. Avoidance plan should be taken carefully from start of the project. In case a risk is about to happen, PM will apply contingency plan to prevent risk. If risk is already happen, PM apply fall back plan to minimize impact.

6.4. Risk Register

6.4.1. Risk description

No	Rank	Risk	Description	Category	Root Cause	Triggers	Probability	Impact
R1	3	Lack of team member	The number of members decreases and not enough for work	People	Member out team	Dissatisfied with other members, have unexpected trouble	Low	High
R2	1	Conflict among team members	Team member disagree with others and refuse to work or work below their ability	People	Unclear requirement specification. Team members do not unify on solutions	Has issue inside team	Medium	High
R3	2	Lack of skill and knowledge for a specified work	Team member don't have enough skill, knowledge to do their task. Example: can't control new technologies in project	People	Member don't have enough time to learn/improve needed skills	Member inform that they don't know how to do. Low productivity.	Medium	High

R4	4	Requirement change	The scope may change, some requirements may be added	Requirement	SRS not good (not realistic, not feasibility, not meet customer needs)	Project team cannot develop the system as description in SRS.	High	Medium
R5	5	Team member distraction	Team members don't pay enough time for working in the project, productivity is low	People	Undisciplined and habit of team member, loose management	Team members does not spend time for work and tasks are not completed on time	Medium	Medium
R6	7	Inability to verify/validate products with requirements.	Can't verify/validate the deliverable products whether meet the requirements or not	Process	Problem in product quality control	Inability to verify/validate products against requirements.	Medium	Low
R7	6	Can’t commit work because internet connection	Internet connection is down and team members can't submit work, merge code, ...	Technology	Can’t connect to the git repository server	Internet connection is down	Low	Medium

R8	8	Product doesn't meet requirement	Some functions doesn't satisfy the requirement in SRS	Process	Team member not understand requirement	Function doesn't meet the requirement	Medium	Low

6.5.2. Probability – Impact matrix

Probability	**High**		R3, R4	
	Medium	R6, R8	R5	R2,
	Low		R7	R1,
		Low	**Medium**	**High**
	Impact			

6.5.3. Risk response plan& Risk status

No	Risk	Avoidance plan	Contingency plan	Fallback plan	Risk owner	Status
R1	Lack of team member	PM need to have a meeting with this member and suggest him/her still be there.	Resolve the problems inside team. For example: PM has some methods to motivate members	reduce scope	HoangLVQ	Not yet active
R2	Conflict among team members	Plan some team building to improve teammate	Have a meeting to solve conflict problem	Team create meeting to secret vote for choices	HuyTDH	Activated / Solved
R3	Lack of skill and knowledge for a specified work	Have detail training plan. All members must know what skills and what kinds of knowledge they must have.	Team members help each other improve skill and ability	Working over time	HoangNK	Activated / Solved

R4	Requirement change	Requirement should be paid a lot of attention. SRS should be peer reviewed, reviewed carefully by PM and the supervisor.	With each requirement changes, the project team should have a meeting to analysis the change requests and take actions.	Re-estimate and update plan.	HoangLVQ	Not yet active
R5	Team member distraction	Setting rule and minus of do not meet the deadline: punish money and named at meeting minute.	Punish the member do not meet the deadline.	Working over time	HoangLVQ	Activated / Solved
R6	Inability to verify/validate products with requirements.	Create detail testing plan. Research to find out suitable test method	Print out the result to check by eyes. Debug into code to see how the code is running	Ask for help from supervisors	NhungNTH	Not yet active
R7	Can't commit work because internet connection	Have a backup local repository	Manage resource via local repository while can't connect to the internet one.	Copy resource by using USB	HuyTDH	Not yet active
R8	Delivery project doesn't meet requirement	PTL have to review source code and follow requirement	Fix bugs	Assign other members doing those functions	HoangNK	Not yet active

7. QUALITY MANAGEMENT

7.1. Quality Management Overview

7.1.1. Organization, Responsibilities, and Interfaces

Name	Role	Responsibilities
Tran Binh Duong	Supervisor	- Helps define product quality expectations. - Determines final acceptance of product's quality.
Le Van Quy Hoang	PM	- Creates quality plan - Facilitates resolution of quality issues, escalating as needed
Nguyen Thi Hong Nhung	Test leader	- Provides test and test management
Team members: - Le Van Quy Hoang - Tran Dinh Hoang Huy - Nguyen Van Quyen - Nguyen Khac Hoang - Kieu Cao Khanh	Developer	- Provides feedback on quality plan, help determine metrics and criteria for this project - Be a part of quality reviews and provide feedback on deliverables

7.1.2. Tools, Environment, and Interfaces

Tool	Description
Cause-and-effect diagram	Used to analyze the causes and effect of a problem. Used to find the root cause problem when there are a complaint about quality problems.
Control chart	Used of control charts is to prevent defects. Apply Seven Run Rule.
Flowchart	Used to analyze how problems occur and how processes can be improved

7.2. Quality Planning

7.2.1. Define Project Quality

- ***System output:***
  + A Web application to support admin manages entity ship system.
  + A Web application to support store manages own orders fast and convenient.
  + An Android application to support shipper's business (find the best way of transfer, grad order...)

- ***Functionality:***
  + Web application:
    - ✧ For Admin: allow admin to login, add/ block/ update shipper or orders and analyze and export reports.
    - ✧ For Store: allow login to system, create order, tracking state of shipper, feedback for each shipper and view reports.
  + Android application has main functions: The system can find best way to go to target location, shipper can pick order and view report about delivered history.

- ***Performance:***
  + Time delay for find shipper who nearest with place of delivery is less than 10s.
  + Time delay on web application for tracking state of shipper on map is less than 5m.
  + Server can handle least 2000 clients concurrently.
  +Other functions of server perform well while have many order running on application.

- ***Reliability:***
  + The application is available 24/7.
  + Find the way to go to places of receive and place of delivery are at least 90%.

- ***Maintainability:***
  + Web application is easily to maintain withoutany crashes. Source code is readability, organized into groups of skeleton(modules) and complies with coding convention.
  +Android application is easily to be updated and synchronize with Web application without any crashes.Source code is readability, complies with coding convention.
  + System's architecture has to be design to be easy to extend.

- ***Security:***
  + Information of admin/ root admin / data on server is secured.
  +Information of store and shipper on server issecured.

7.2.2. Measure Project Quality

Metric	Goal
Accurate	- Find the way to go to places of receive and place of delivery are at least 90%. - Display the current position of shipper on map exactly.
Response of web application	- Time delay for find shipper <= 10s
Bugs/Lines of Code	- UT: 8 – 9 bugs / KLOC - ST: 2 – 4 bugs / KLOC *(based on Fsoft norms)*
Maximum deep of loops	<= 4
Android Program Size	<= 100 MB
Algorithm complexity	<= O(n^2)
Android version support	Support Android version 4.4.2 Kitkat to 5.0.1 Lollipop
Android screen support	Multiscreen Must be tested on 320x480, 768x1024, 768x1336,1080x1920 screens
Website support browser	Support Chrome version 41.0.xxx, Firefox version 36.0 or later.

7.3. Quality Assurance

7.3.1. Analyze Project Quality

Milestone	Deliverables	Goal	Review and Approved
10/04/2015	Final Software Requirement Specification Document	- Have content right with actual research process.	HoangLVQ
11/29/2015	Final Interface design	- Good looking & easy-to-use. - Cover all functions specified in SRS.	HoangLVQ

11/23/2015	Final Software architecture design document	- Design to be easy to extend. - Cover all functions in SRS document	Supervisor
11/29/2015	Web application	- Information of admins / root admins and shopkeeper on server are secured. - Provide information of order and push notification for mobile application. - Time delay for searching a order <=3s.	HoangLVQ. Supervisor
11/29/2015	Mobile application	- Tracking road and received order. - - Notify to system when have issue on delivered process.	HoangLVQ, Supervisor
12/4/2015	Integration test report	- 30 – 34 test cases / KLOC - 2 – 4 bugs / KLOC	NhungNTH
12/4/2015	System test report	- 30 – 34 test cases / KLOC - 2 – 4 bugs / KLOC	NhungNTH

7.3.2. Improve Project Quality

Issue	Action
Difficult to track project's progress	- Submit weekly report to supervisor - Meeting up team member everyday (work 6 days / week). Sometime extending the last days to keep deadline and fix bugs. - Using kanbanflowtool to track team members' work(www.kanbanflow) - Using GIThub to manage source of project (documents, source code)
Coding application does not match with User Requirement	- Team has to define clearly requirementspecification and Software Architecture Design. - Develop Team must study about the document and comply with the content of document.

	- Any changes in process have to approve of PM
Maintainability	- Specify coding conventions document - Spend a lot of time to research architecture design. Then, decide the most appropriate architecture for maintaining easily.
Low quality code	- Create and execute types of test (unit test, integration test, system test). - Peer review, peer coding among developers. - Using Open Source and Framework to improve the quality code: NodeJS, AngularJS, Ionic framework. - Developers have to comply with the coding convention document.
Technology	- Predict and list the problems of technologies that are the bottleneck of project. Then, organize research to find solution from the beginning. - Have knowledge-training schedule for members.
Reward and discipline	- Teambuilding to increase communication ability between project's members - Have punishment rules when: + Member comes late or Miss meeting + Make mistake in member document writing. Reviewed by Supervisor. + Submit terrible code (which causes to re-coding more than 10%) + Miss deadline
Acceptance of users	Do survey to discovery what features user want from this projects. Do it before design progress.

7.4. Quality Control

Deliverables	Goal	Quality control activity	Frequency / Interval
Interface design	- Good looking &easy-to-use: don't using many button, don't many minor detail. - Cover all functions specified in SRS	Designer has to: - Ask for advice of some other designer - Take comment from friends on completed work - Have approve from SRS leader	Each time design a new screen
Software architecture design	Design to be easy to extend	Have review and judgment from Supervisor	On completion
Web application	- Information of admins / root admins and shopkeeper on server are secured. - Provide information of order and push notification for mobile application. - Time delay for searching a order <=3s.	Testers execute security test and system test	On completion
Mobile application	- Tracking road and received order. - Notify to system when have issue on delivered process.	Testers execute system test	On completion
Integration test report	30 – 34 test cases / KLOC 2 – 4 bugs / KLOC	PM requires testers to report on work	Weekly
System test report	30 – 34 test cases / KLOC 2 – 4 bugs / KLOC	PM requires testers to report on work	Weekly

7.5. Action Plan

What	Who	When	How	Output
Define coding convention	HoangLVQ, HuyTDH	25/09/2015	- Read standard coding convention of NodeJS - Extract and modify to reuse it	Coding Convention Document
Training kanbanflow	All team	16/09/2015 to 17/09/2015	- Hoang LVQ guides team members how to use kanbanflow	Understand how to use kanban tool and use this tool in processes.
Market research	All team	9/10/2015 to 9/13/2015	- Enjoy survey in practice - Analytics and evaluate market depend on survey document.	Survey summary
Training NodeJS, AngularJS,	HoangLVQ	10/12/2015 to 10/13/2015	- Read AngularJS documents - Find out how to set up and complete 'Hello World' tutorial. - Try some core class and functions for image processing.	Guide & tutorial document
Training design UI	HoangLVQ, KhanhKC	10/12/2015 to 10/13/2015	- Guide developers understand how to design and use design tool	Guide & tutorial document
Training for Ionic frame work	HuyTDH QuyenNV	10/12/2015 to 10/13/2015	- Read Ionic frame work document. - Routing in ionic frame work - Find how to setup Ionic using plugin of cordova: geolocation, device.	Guide & tutorial document

Training Unit Test	NhungNTH	10/12/2015 to 10/13/2015	- Training how to create and perform Unit Test	Understand the types of test, how to use in project
Create a specific WBS	HoangLVQ	9/20/2015	- List all tasks in each process. - Define larger tasks to smaller tasks for individual and add into MS Project. - Assign tasks for suit member	- Tasks are assigned to suitable member. - All team members know about their tasks and can complete it on time - PM can manage tasks via WBS in MS Project