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|  |
| Capstone Project Document |

KARYWELL

Project Management Plan

|  |  |  |
| --- | --- | --- |
| **KARYWELL** | | |
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| Tran Dinh Hoang Huy | SE90201 |
| Nguyen Khac Hoang | SE02564 |
| Kieu Cao Khanh | SE02960 |
| Nguyen Van Quyen | SE02884 |
| Nguyen Thi Hong Nhung | SE02437 |
| **Supervisor** | Mr. Tran Binh Duong | |
| **Project code** | KW | |

**- Hanoi, 09/2015 -**

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# 1. PROJECT OVERVIEW

## 1.1. Project description

|  |  |  |  |
| --- | --- | --- | --- |
| Project Code | KW | 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 to do their works. Beside, a server is developed to connect website and shipper’s application, save data. Therefore, 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 then processing 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 efficiently with functions: find best way , see location, pick order, confirm received code with store,….

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

* 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 13/12/2015.
* The final application covers 90% 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

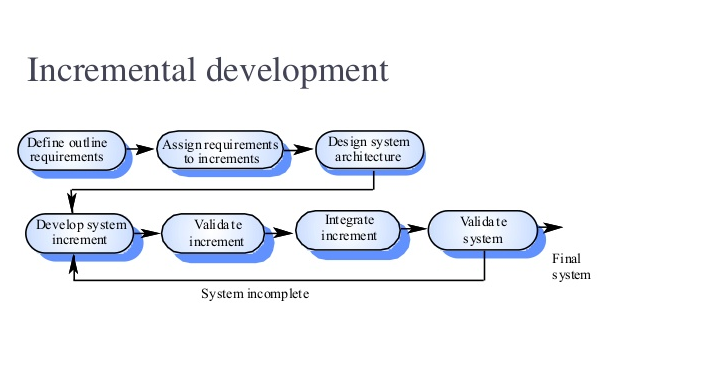
|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Task** | **Start date** | **End date** |
| 1 | Approve Project's idea | 9/9/2015 | 9/9/2015 |
| 2 | Complete introduction document | 9/13/2015 | 9/13/2015 |
| 3 | Submit report 1 to supervisor | 9/13/2015 | 9/13/2015 |
| 4 | Complete PMP document ver1.0 | 9/18/2015 | 9/18/2015 |
| 5 | Submit report 2 to supervisor | 9/20/2015 | 9/20/2015 |
| 6 | Complete SRS document | 9/28/2015 | 9/28/2015 |
| 7 | Submit report 3 to supervisor | 10/4/2015 | 10/4/2015 |
| 8 | Complete SAD document ver1.0 | 10/21/2015 | 10/21/2015 |
| 9 | Complete source code ver1.0 | 11/6/2015 | 11/6/2015 |
| 10 | Complete test plan document | 10/26/2015 | 10/26/2015 |
| 11 | Complete test report v1.0 | 11/8/2015 | 11/8/2015 |
| 12 | Submit report 4 to supervisor | 11/8/2015 | 11/8/2015 |
| 13 | Complete PMP document ver2.0 | 11/9/2015 | 11/9/2015 |
| 14 | Complete SAD document ver2.0 | 11/10/2015 | 11/10/2015 |
| 15 | Complete source code ver2.0 | 11/27/2015 | 11/27/2015 |
| 16 | Complete test plan document ver2.0 | 11/9/2015 | 11/9/2015 |
| 17 | Complete test report ver2.0 | 11/30/2015 | 11/30/2015 |
| 18 | Submit report 5 to supervisor | 11/22/2015 | 11/22/2015 |
| 19 | Complete PMP document ver3.0 | 12/2/2015 | 12/2/2015 |
| 20 | Complete final test report | 12/13/2015 | 12/13/2015 |
| 21 | Complete final source code | 12/13/2015 | 12/13/2015 |
| 22 | Complete install and user manual document | 12/9/2015 | 12/9/2015 |
| 23 | Complete final report | 12/11/2015 | 12/11/2015 |
| 24 | Submit report 6 to supervisor | 12/13/2015 | 12/13/2015 |
| 25 | Complete slide | 12/15/2015 | 12/15/2015 |
| 26 | Submit final report to FPT University | 12/16/2015 | 12/16/2015 |
| 27 | Presentation | 12/23/2015 | 12/23/2015 |

### 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*

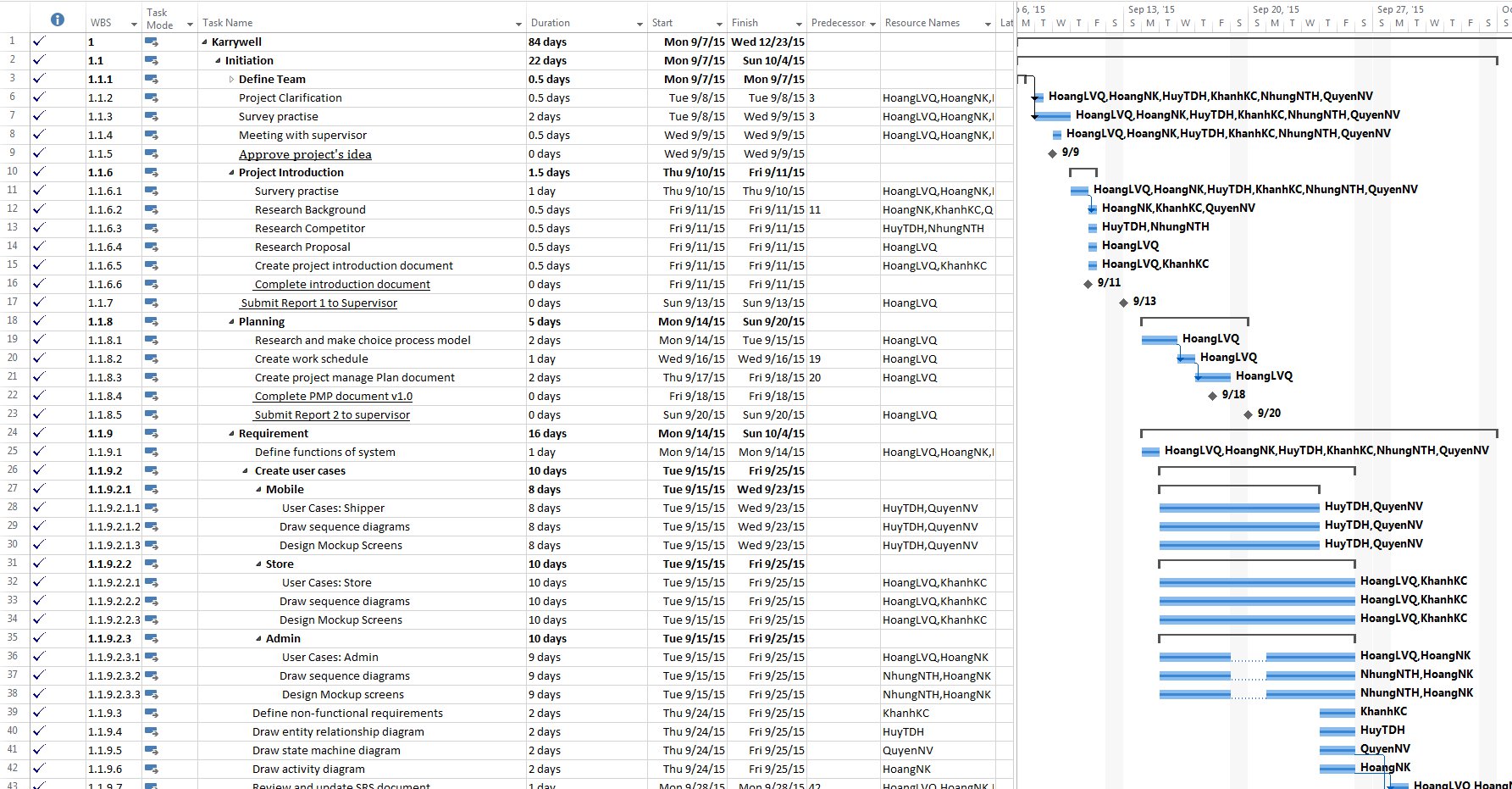
|  |  |  |  |
| --- | --- | --- | --- |
| Role | Full name | | Responsibility |
| Supervisor | Tran Binh Duong | | * Give instruction for project team * Verify deliverables * Supervise project team’s status |
| PM | Le Van Quy Hoang | | Have overall responsibility of the project   * Assign task to team 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 |

# 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



*Figure 5: A part of Schedule*

The detail project schedule is available in file “**KW\_ProjectSchedule.mpp**”.

# 5. COMMUNICATION MANAGEMENT

## 5.1. Stakeholders and Contacts

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Title** | **Role** | **Contacts** |
| Tran Binh Duong | Mr. | Supervisor | [duongtb@fpt.edu.vn](mailto:duongtb@fpt.edu.vn)  (84) 936-168-165 |
| Le Van Quy Hoang | Mr. | PM | [hoanglvqse90184fpt.edu.vn](mailto:Nhungbhse02082@fpt.edu.vn)  (84) 924-500-699 |
| Nguyen Khac Hoang | Mr. | Technical Leader | [hoangnkse02564@fpt.edu.vn](mailto:hoangnkse02564@fpt.edu.vn)  (84) 973-528-902 |
| Kieu Cao Khanh | Mr. | Developer | [khanhkcse02960@fpt.edu.vn](mailto:khanhkcse02960@fpt.edu.vn)  (84) 165-249-3444 |
| Tran Dinh Hoang Huy | Mr. | Developer | [huytdhse90201@fpt.edu.vn](mailto:huytdhse90201@fpt.edu.vn)  (84) 905-507-734 |
| Nguyen Van Quyen | Mr. | Developer | [quyennvse02884@fpt.edu.vn](mailto:quyennvse02884@fpt.edu.vn)  (84) 167-921-2683 |
| Nguyen Thi Hong Nhung | Mrs. | Test Leader | [nhungnthse02437@fpt.edu.vn](mailto: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

Tran Binh Duong

Team Member

Le Van Quy Hoang

## 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/Hangout) | 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/Hangout) | 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/Hangout) * 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/Hangout) * 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 Project:

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

Project team identify various risks. Finally, PM choose 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** | 2 | 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** | 3 | 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 be sure that the deliverable products whether meet the requirements or not | Process | Problem in product quality control | Can’t make clearly test cases for that 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. | Daily meeting to tracking work and motivate member when working performance go down | 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 Team discuss to make requirement more clearly or change it. | 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, grab 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 10seconds.

+Time delay on web application for tracking state of shipper on map is less than 5minutes.

+ 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 without any 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 is secured.

### 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 kanbanflow tool to track team members’ work([www.kanbanflow](http://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 requirement specification 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 |