MINISTRY OF EDUCATION AND TRAINING

FPT UNIVERSITY

Capstone Project Document

Reasonable Spending Suggestion

Group 1	
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Ext. Supervisor	N/A
Capstone Project code	RSSuggestion

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B. Software Project Management Plan

1. Problem definition

1.1 Name of this Capstone Project

Reasonable Spending Suggestion

1.2 Problem Abstract

People have a list of things that they need to buy such as TVs, refrigerators, motorbikes, etc. They absolutely know about their income, as well as plan to spend money for every month. They want to buy their favorite items as soon as possible but they do not know how to saving or cutting spending in monthly and balance their finance in next month. Our application will help them. By showing some suggestions like cutting some spending in monthly plan. These suggestions also help them balance their finance in monthly.

In addition, the application has the ability to synchronize data on the web when after using application offline on the smart phones. It means that user can use online application (website) and offline application (application on smart phone). They do not worry about missing data. Besides that, the application supports multiple users, as members in a family, which includes one primary account and some supplementary accounts. They can use simultaneously on different devices at the same time, and without bothering about synchronize data problems.

1.3 Project overview

1.3.1 Problem definition

The problem arises when people want to manage their money, but they do not know how to save reasonably for buying their expected things and not lose the balance of finance.

- If they calculate manually, they spend a lot of time. Sometimes it would be wrong.
- **http://vmoney.vn** is a website allow users input their income and expense, then computing their residual income. This website doesn't have reasonable spending, balance finance, advices or suggestions to users. Besides, the website just send notification through email that is very inconvenient if the users do not often check mail.
- **MoneyMe** is an application allow users control their income, expense, debts. It supports on Windows PC application and Android devices. It does not support users use online on website.

1.3.2 The proposed system

The system is intended for use by those with a smart phone or a laptop/computer with Internet connection. The system will have the following functions:

1.3.2.1 Web Application

1.3.2.1.1 Admin

- Admins can manage accounts in the system.
- Admins can configure some value of system and algorithms to apply default to all new users' accounts.

1.3.2.1.2 Users

- Users can create and manage some supplementary accounts for their family.
- Users can input their salary, spending in monthly, expected things, …
- Users can modify some value of system to appropriate with their finance.

1.3.2.1.3 System

- System can give suggestions about buying users expected things by spending reasonably.

1.3.2.2 Mobile Application

1.3.2.2.1 Users

- Users can input their salary, spending in monthly.

1.3.2.2.2 System

- After using offline, system can synchronize data on server when mobile can connect Internet.

1.3.3 Boundaries of the System

-The system can be used by every people with a smart phone or a laptop/computer with Internet connection.

-The system is **not intended** for managing these aspects:

+ Managing bank account and interest.
+ Managing debts.
+ Managing capital investment.

-The language of the system is Vietnamese.

-The complete product includes:

+ The website for admin and users.
+ Mobile application for users.
+ All the process document involved.

1.3.4 Development Environment

1.3.4.1 Hardware requirements

For server

Windows	**Minimum Requirements**	**Recommended**
Internet Connection	Cable, Wifi (4 Mbps)	Cable, Wifi (8 Mbps)
Operating System	Windows 7, Windows 8	Windows 7, Windows 8
Computer Processor	Core(TM) i3 CPU , M 350 @ 2.27GHz	Core(TM) i5 CPU , M 460 @ 2.53GHz
Computer Memory	2GB RAM	4GB RAM or more

Table 1 Hardware Requirement for Server

For Mobile Application

Mobile	**Minimum Requirements**	**Recommended**
Internet Connection	Wifi (2 Mbps)	Wifi (4 Mbps)
Operating System	Android 4.2	Android 4.5
Hardware	Touchscreen	Touchscreen
Memory	512 MB	1GB or more

Table 2 Hardware Requirement for Mobile App

1.3.4.2 Software requirements

- Microsoft Windows 7 Ultimate: operating system and platform for development.
- SQL Server 2008 R2 Express: used to create and manage the database for system.
- StarUML: used to create models and diagrams.
- Skype: used for communication and meeting.
- Visual Studio 2012: used to implement website and web service.
- Eclipse Indigo 3.7.0, Android SDK 16, ADT 22.0.5 & JDK 7u51: used to implement mobile application.
- Google Code & TortoiseSVN: used for source control.

2. Project organization

2.1 Software Process Model

Project is developed under waterfall model.

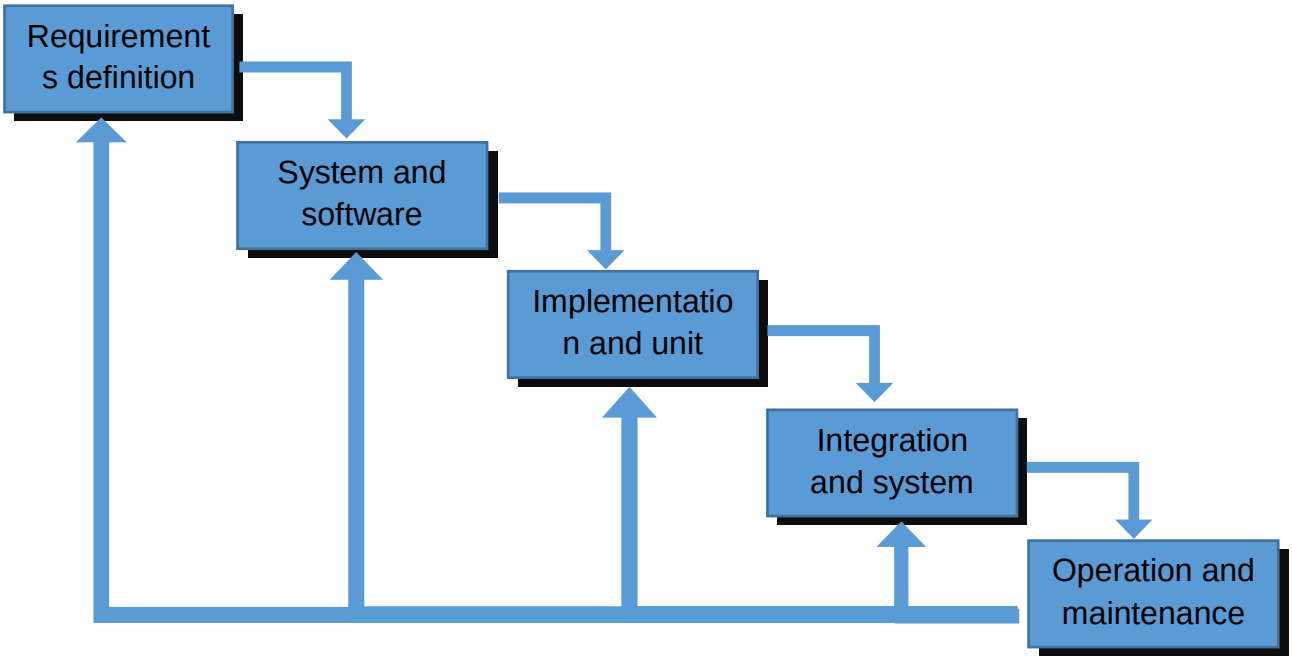

Figure 1 Waterfall Development Model

For more information: Chapter 4 – Software processes in book Software Engineering 8th – Ivan Sommerville.

2.2 Roles and responsibilities

No	Full name	Role in group	Responsibilities
1	Kieu Trong Khanh	Project manager	• Specify user requirement • Control the development process • Give out technique and business analysis support
2	Nguyen Phan Anh	Team leader, BA, DEV, Tester	• Managing process • Designing database • Clarifying requirements • Prepare documents • GUI design • Create test plan

			• Coding • Testing
3	Tran Do Phong	Team member, BA, DEV, Tester	• Designing database • Clarifying requirements • Prepare documents • GUI design • Create test plan • Coding • Test
4	Nguyen Van Hon	Team member, BA, DEV, Tester	• Designing database • Clarifying requirements • Prepare documents • GUI design • Create test plan • Coding • Test
5	Phan Vo Lan Phuong	Team member, BA, DEV, Tester	• Designing database • Clarifying requirements • Prepare documents • GUI design • Create test plan • Coding • Test

Table 3 Roles and Responsibility details

2.3 Tools and techniques

- Front – end technologies: HTML5, CSS3, JavaScript, jQuery, AJAX.
- Back – end:
  + Website: ASP.NET MVC3 + Entity Framework 5.
  + Web Service: WCF REST services.
  + Mobile App: Android – Java.
- Web Server: Microsoft IIS.
- Database Management System: MS SQL Server 2008 R2 Express.

3. Project Management Plan

3.1 Tasks

Phase	Description	Deliverables	Resource needed	Dependencies and Constrains	Risks
Requirements Definition	- Collect requirements from customer - Identify and clarify requirements for the system in general	- Introduction of proposed system. - Main functions.	20 man-days	N/A	Misunderstand the requirements. Unclear scope of project
System and Software Design	- Choose the software development model - Research technology needed for project - Design main structure of system	- Project management plan. - Demo technology - Use case - ERD - SRS	20 man-days	Depend on “Requirements Definition”	Lack of experience. Technology is difficult to use Not cover all use case of project
Implementation and Unit Testing	- Coding core functions first - Coding other functions - Update user interface - Unit test	- System design description - Main user’s functions on web and mobile - Suggestion of system - Test case	50 man-days	Depend on “System and Software Design”	Lack of experience. Not found suitable suggestion algorithm Web interface not friendly
Integration and System Testing	- Integration test - System test	- Test case	20 man-days	Depend on “Implementation and Unit Testing”	Lack of experience. Test case not cover all situation.
Operation and Maintenance	- Deploy on server and mobile	- Installation Guide - User’s Guide	10 man-day	Depend on all previous phase	Lack of experience.

Table 4 Tasks

3.2 Task sheet

3.2.1 Phase 1: Requirements Definition

Task	Description	Author
1. Collect requirements	Collect requirements from customer. Identify main functions	AnhNP, PhongTD, HonNV, PhuongPVL
2. Introduction	Complete Introduction Report	AnhNP

Table 5 Phase 1: Requirements Definition

3.2.2 Phase 2: System and Software Design

Task	Description	Author
1. Project management plan	Prepare project management plan	AnhNP
2. Website prototype	Build prototype of proposed system (website).	PhongTD,AnhNP
3. Mobile prototype	Build prototype of proposed system (mobile).	PhuongPVL,HonNV
4. Use case diagram	Design Use case diagram	AnhNP, PhongTD, HonNV, PhuongPVL
5. ERD	Design ER diagram	AnhNP, PhongTD, HonNV, PhuongPVL

Table 6 Phase 2: System and Software Design

3.2.3 Phase 3: Implementation and Unit Testing

Task	Description	Author
1. Website functions	Design frontend for website	PhongTD, HonNV
	Design backend for website	AnhNP, PhongTD
2. Mobile functions	Design mobile application	PhuongPVL
	Design web services	AnhNP
3. Suggestion algorithms	Research algorithms to suggestion	AnhNP, PhongTD
	Implement algorithms component	AnhNP
4. Synchronize	Synchronize data from mobile on server when using offline	HonNV
	Synchronize data from multiple users input at the same time	HonNV
5. Unit testing	Write test case and testing for website	PhongTD
	Write test case and testing for mobile	PhuongPVL
	Write test case and testing for algorithms	AnhNP
	Write test case and testing for synchronization	HonNV

Table 7 Phase 3: Implementation and Unit Testing

3.2.4 Phase 4: Integration and System Testing

Task	Description	Author
1. Integration testing	Write test case and testing for integrate functions	AnhNP, PhongTD, HonNV, PhuongPVL
2. System testing	Write test case and testing for all system	AnhNP, PhongTD, HonNV, PhuongPVL

Table 8 Phase 4: Integration and System Testing

3.2.5 Phase 5: Operation and Maintenance

Task	Description	Author
1. Installation guide	Complete installation guide	AnhNP
2. User's guide	Complete user's guide	PhongTD

Table 9 Phase 5: Operation and Maintenance

3.3 All Meeting Minutes

Refer to **Meeting Minutes** folder.

4. Coding Convention

Java: Using to develop Android App.

Summary:

- Naming Convention.
  + Use camel case for both variable and function name.
  + Use Pascal case for class name.
- Indentation.
  + Four spaces should be used as the unit of indentation. The exact construction of the indentation (spaces vs. tabs) is unspecified. Tabs must be set exactly every 8 spaces (not 4).
  + Avoid lines longer than 80 characters, since they're not handled well by many terminals and tools.
- Declaration.
  + One declaration per line is recommended since it encourages commenting.
  + In absolutely no case should variables and functions be declared on the same line.
  + Do not put different types on the same line.
- Code Examples

  Follow "Code Conventions for the Java TM Programming Language, by Sun Microsystems, rev April 20, 1999".

  http://www.oracle.com/technetwork/java/codeconventions-150003.pdf

C#: Using to develop website and web service.

Summary:

- Naming Convention:
  + For variable's name, use camel case. Eg: minValue, maxValue…
  + For function name, class name, use Pascal case. Eg: AddIncome, AddExpense…

- Layout Convention:
  + Write only one statement/declaration per line.
  + Indent continuation one tab stop (four spaces).
  + Add at least one blank line between method definitions and property definitions.
  + Use parentheses to make clauses in an expression apparent.
- Commenting Convention:
  + Place the comment on a separate line, not at the end of a line of code.
  + Begin comment text with an uppercase letter.
  + End comment text with a period.
  + Insert one space between the comment delimiter (///) and the comment text.
  + Do not create formatted blocks of asterisks around comments.
- Language Guidelines:

Using C# Code Convention From:

http://msdn.microsoft.com/en-us/library/vstudio/ff926074.aspx