MINISTRY OF EDUCATION AND TRAINING

FPT UNIVERSITY

Capstone Project Document

Augmented Reality Book

Group 4	
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Ext. Supervisor	N/A
Capstone Project code	ARB

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A.Software Project Management Plan

1. Problem Definition

1.1 Name of this Capstone Project

Augmented Reality Book (ARB)

1.2 Problem Abstract

Reading books plays an important role in daily life. It's an extremely effective way to help us learning, improving our knowledge and entertaining. Unfortunately, some people especially children couldn't have enough patient or attention for reading books because of monotony of books' paper content. To enhance reading experience, we build the application combining with mobile devices allows supporting user to read book with augmented reality using mobile combining real book. By providing additional digital content particularly audio, video, eBook, appendix… that could be updated periodically with resource contents, the reading process become easier and more interesting.

1.3 Project Overview

1.3.1 Problem Definition

Nowsaday, children have many ways to reading book, two most popular modes are reading paper-book and reading books throught internet. Acording the "Children's Media Use in America 2013" statistic by Common Sense Media (https://www.commonsensemedia.org/zero-to-eight-2013-infographic?utm_source=131029_infographic&utm_medium=email&utm_campaign=weekly) to document the media environments and behaviors of kids ages 8 and under, ¾ of all kids have accessed to a mobile devices at home. However, the purpose that most kids use their mobile device is playing game (63%). Thus, we can see the necessity of developing an application that supports education on mobile devices.

1.3.2 The Proposed System

The system is intended for use by those with a mobile device with Internet connection. The system will have the following functions:

1.3.2.1 Web Application

- Admin can manage the systems, manage account, and configure systems.
- Staff can manage content resources.
- System can timer reading schedule depend on user's license, configuration.

1.3.2.2 Mobile Application

- System can timer reading schedule depend on user's license, configuration

- System can make notification for new content, reading schedule, and license.
- System can offer suggestion or recommendation about related resource contents.
- Users can read books, search content.
- Users can make rating, suggestion or request for content.

1.3.3 Boundaries of the System

The system can be used by children with a mobile device and Internet connection.

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	XP, Vista, 7, 8	XP, Vista, 7, 8
Computer Processor	Intel® Core 2 Duo	Intel® Core(TM) i5 CPU , M 460 @ 2.53GHz
Computer Memory	1GB RAM	3GB or more

Table 1: Hardware Requirement for Server

For Mobile Application

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

Table 2: Hardware Requirement for Mobile App

1.3.4.2 Software requirements

- My SQL Server: used to create and manage the database for system.
- StarUML, Astah Professional: used to create models and diagrams.
- NetBeans IDE 6.9: used to implement website and web service.
- Eclipse Juno 4.4, Android SDK 22.0.5, ADT 22.0.5 & JDK 7u25: used to implement mobile application.
- Vuforia platform for get target from cloud.
- Dropbox SDK to store book resource.
- Google Code & TortoiseSVN: used for source control.

2. Project organization

2.1 Software Process Model

Project is developed under Agile Unified Process (AUP).

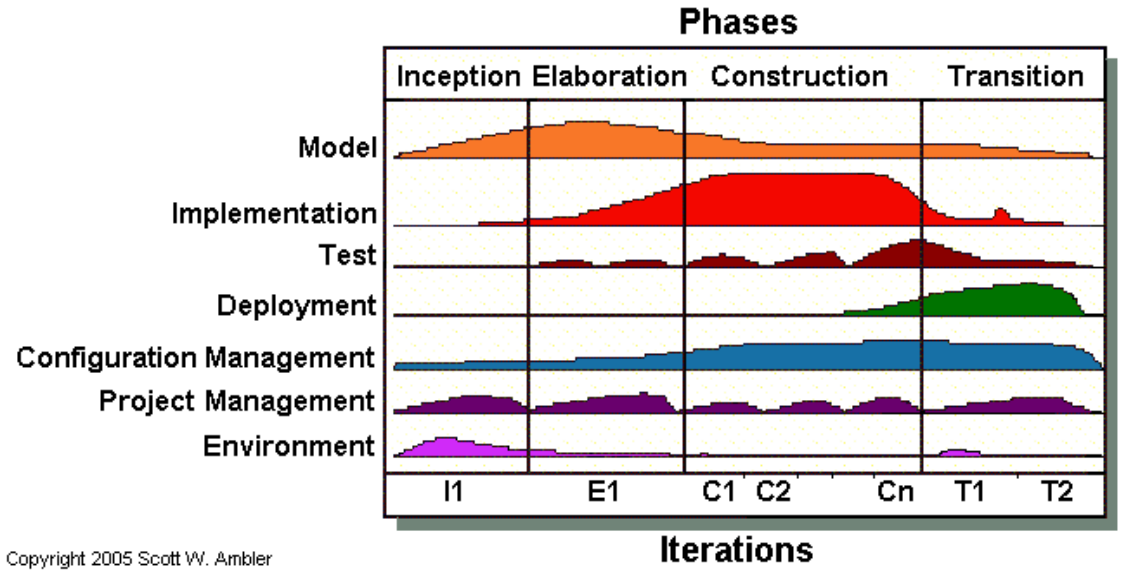

Figure 1: Agile Unidied Development Model

For more information: http://www.ambysoft.com/unifiedprocess/agileUP.html

http://en.wikipedia.org/wiki/Agile_Unified_Process

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	Pham Nguyen Bich Hien	Team Leader, BA, DEV, Tester	• Managing process • Designing database • Clarifying requirements • Prepare documents • Android layout design • Research technique • Create test plan • Coding • Testing

3	Trinh Van Vu	Team Member, BA, DEV, Tester	• Designing database on cloud • Clarifying requirements • Build up webservice • Create test plan • Coding • Testing
4	Phan Thanh Trung	Team Member, BA, DEV, Tester	• Clarifying requirements • Prepare documents • GUI Design for web • Create test plan • Coding • Testing
5	Mai Hoang Tri Anh	Team Member, BA, DEV, Tester	• Designing database • Clarifying requirements • Prepare documents • GUI Design for web • Create test plan • Coding • Testing

Table 3: Roles and Responsibility Details

2.3 Tools and Techniques

- Front-end technologies: HTML5, CSS3, JavaScript, jQuery, AJAX.
- Back-end:
  + Website: J2EE MVC.
  + Web Service: Web API RESTFUL.
  + Mobile App: Android - Java.
  + Analysis image capture: Vuforia platform.
- Web Server: Apache Tomcat 6.
- Database Management System: My SQL Server.

3. Project Management Plan

3.1 Iteration

Phase /Iteration	Description	Deliverables	Resource needed	Dependencies and Constrains	Risks
Inception Phase	- Stakeholder concurrence on scope definition and cost/schedule estimates. - Requirements understanding as evidenced by the fidelity of the primary use cases. - Credibility of the cost/schedule estimates, priorities, risks, and development process. - Depth and breadth of any architectural prototype that was developed. - Establishing a baseline by which to compare actual expenditures versus planned expenditures.	-Introduction of proposed system. -Main functions. -Project Iteration Plan.	15 man-days	N/A	Project may not be feasible for developing because lack of technologies and/or data
Elaboration Phase	- A use-case model in which the use-cases and the actors have been identified and most of the use-case descriptions are developed. The use-case model should be 80% complete. - A description of the software architecture in a software system development process. - An executable architecture that realizes architecturally significant use cases. - Business case and risk list which are revised. - A development plan for the overall project. - Prototypes that demonstrably mitigate each identified technical risk. - A preliminary user manual (optional)	- Prototype design - Software requirement specification - Data management service.	15 man-days	N/A	Poor design
Construction Phase	- The primary objective is to build the software system. In this phase, the main focus is on the development of components and other features of	- Main user's functions on web and	30 man-days	Depend on "Data management".	Lack of experience. Not have a clear

	the system. This is the phase when the bulk of the coding takes place. In larger projects, several construction iterations may be developed in an effort to divide the use cases into manageable segments that produce demonstrable prototypes. - This phase produces the first external release of the software. Its conclusion is marked by the Initial Operational Capability Milestone.	mobile. - User account management system - Suggestion services			understanding about business process.
Transition Phase	- The primary objective is to 'transit' the system from development into production, making it available to and understood by the end user. The activities of this phase include training the end users and maintainers and beta testing the system to validate it against the end users' expectations. The product is also checked against the quality level set in the Inception phase. - If all objectives are met, the Product Release Milestone is reached and the development cycle is finished.	- Test and release. - Build future plan.	20 man-days	Depends on "main functions' development".	The implemented algorithm is not the best. Lack of test data. Lack of experience on making and deploying web service.

Table 4: Iteration

3.2 Iteration Detail

3.2.1 Phase 1: Inception

Task	Description	Author
1. Identifying and studying existing systems	Find which systems currently provide similar service, their strengths and weakness.	HienPNB, VuTV, TrungPT, AnhMHT
2. Identifying and clarifying main functions.	Define which main functions system should provide.	HienPNB
3. Introduction.	Complete Introduction Report.	TrungPT, AnhMHT, HienPNB
1. Identifying Requirement and Planning	Which feature this function should have and how to implement.	HienPNB
4. Project Management Plan.	Prepare Project Management Plan.	HienPNB, TrungPT

Table 5: Phase 1: Preliminary Investigation or Analysis

3.2.2 Phase 2: Elaboration

Task	Description	Author
5. Website Prototype.	Build a prototype of proposed system (Website).	TrungPT, AnhMHT
6. Mobile Prototype.	Build a prototype of proposed system (Mobile App).	HienPNB
7. Webservice.	Build a demo webservice of proposed system.	VuTV
8. Design ER diagram.	Design ER diagram.	HienPNB, VuTV
2. Manage data on cloud	Create/Edit targets as the schema on cloud of Vuforia platform	VuTV, HienPNB
3. Build up webservice	Build a webservice that manage database on clould	VuTV
4. Build up android application	Build an application to reconigze image and get target on cloud of Vuforia.	HienPNB
4. Implement GUI	Create the interface for user.	HienPNB, AnhMHT, TrungPT
5. Testing	Test system behavior and performance Test user behavior and performance	HienPNB, VuTV, TrungPT, AnhMHT
6. Document	Adding SRS, SDD, Installation Guide, Manual Guide	HienPNB, VuTV, TrungPT, AnhMHT

Table 6: Phase 2: Data Management

3.2.3 Phase 3: Contruction

Task	System Component	Description	Author
1. Identifying Requirement and Planning		Which feature this function should have and how to implement.	HienPNB, VuTV, TrungPT, AnhMHT
2. Manage User	Webservice	Provides service for manage user	VuTV
3. Manage Book		Provides service for manage resource	
4. Manage target on cloud		Provides service for manage targets on cloud	
5. Recorgnize image and read book	Android	Allow user using camera to capture image and read book	HienPNB
6. Search books		Allow user search book to buy	
7. Load next chapter		Load next chapter when view previos chapter	
8. Keep track reading status		Record status of user (pages of reading, time of viewing) for the next reading.	
9. Schedule for parents		Allows user to set reading schedule daily.	
10. Buy license		Allow user buy/ extend license	
11. Manage user's books		Allow user manage their books	
12. Manage user	Web application	Allow admin manage user	AnhMHT, TrungPT
13. Load next chapter		Load next chapter when view previos chapter	
14. Keep track reading status		Record status of user (pages of reading, time of viewing) for the next reading.	
15. Schedule for parents		Allows user to set reading schedule daily.	
16. Manage inbox		Allow user manage their inbox	
17. Search book		Allow user search book's information	
18. Suggest book		Recommend books for user	
19. Testing	N/A	Test system behavior and	HienPNB, VuTV,

		performance Test user behavior and performance	TrungPT, AnhMHT
20. Document	N/A	Adding SRS, SDD, Installation Guide, Manual Guide	HienPNB, VuTV, TrungPT, AnhMHT

Table 7: Phase 3: Main User's Functions

3.2.4 Phase 4: Transition

Task	Description	Author
1. Identifying Requirement and Planning	Which feature this function should have and how to implement.	HienPNB, VuTV, TrungPT, AnhMHT
2. Testing	Test system behavior and performance.	HienPNB, VuTV, TrungPT, AnhMHT
3. Document	Adding SRS, SDD, Installation Guide, Manual Guide	HienPNB, VuTV, TrungPT, AnhMHT

Table 8: Phase 4: Suggestion Algorithm

3.3 All Meeting Minutes

Refer to Meeting Minutes folder.

4. Coding Convention

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