

**Capstone Project Report**

**Report 1 – Project Introduction**

– Hanoi, August 2019 –

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# I. Record of Changes

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| Date | A\* M, D | In charge | Change Description |
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\*A - Added M - Modified D - Deleted

# II. Project Introduction

## 1. Overview

### 1.1 Project Information

* Project name: Learner Management and 3D Simulation System for Crane Training Center
* Project code: FA25SE097
* Group name: LSSCTC Group
* Software type: Web App, Desktop App

### 1.2 Project Team

|  |  |  |  |
| --- | --- | --- | --- |
| **Full Name** | **Role** | **Email** | **Mobile** |
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| Duong Minh Nhat | Leader | [nhatdmse182236@fpt.edu.vn](mailto:Nhatdmse182236@fpt.edu.vn) | 0704585671 |
| Le Nhat Quang | Member | quanglnse170415@fpt.edu.vn | 0862008529 |
| Dao Trong Duc | Member | [ducdtse180110@fpt.edu.vn](mailto:ducdtse180110@fpt.edu.vn) | 0987039122 |
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## 2. Product Background

Crane operation training requires a combination of theoretical understanding and significant practical experience. Traditional training methods that rely exclusively on real cranes present several major challenges. These include high operational costs (fuel, maintenance, instructor time), limited availability of physical equipment for trainees, and most importantly, significant safety risks for beginners operating heavy machinery.

Training centers often struggle with the logistics of managing training schedules, effectively tracking the progress of numerous trainees, and ensuring a consistent quality of instruction. Furthermore, without modern simulation tools, trainees may lack sufficient and safe preparation before they are required to operate real, high-risk equipment. This situation leads to a demand for an integrated system that can streamline training center management while also providing a safe, realistic, and cost-effective 3D simulation environment to enhance learning efficiency and reduce operational risks.

## 3. Existing Systems

*[Add the system which might help solving the problems you listed above or the systems in which you can learn/refer the features for your system design]*

### 3.1 System name1

*[Write the brief descriptions of the system, the link, the system actors, features, pros, cons, etc.]*

### 3.2 System name2

…

## 4. Business Opportunity

*[Describe the market opportunity that exists or the business problem that is being solved. Describe the market in which a commercial product will be competing or the environment in which an information system will be used. This may include a brief comparative evaluation of existing products and potential solutions, indicating why the proposed product is attractive. Identify the problems that cannot currently be solved without the product, and how the product fits in with market trends or corporate strategic directions]*

<<Sample: Many employees have requested a system that would permit a cafeteria user to order meals (defined as a set of one or more food items selected from the cafeteria menu) on line, to be picked up at the cafeteria or delivered to a company location at a specified time and date. Such a system would save employees time, and it would increase the chance of their getting the items they prefer. Knowing what food items customers want in advance would reduce wastage in the cafeteria and would improve the efficiency of cafeteria staff. The future ability for employees to order meals for delivery from local restaurants would make a wide range of choices available to employees and provide the possibility of cost savings through volume discount agreements with the restaurants.>>

## 5. Software Product Vision

*[Write a concise vision statement that summarizes the purpose and intent of the new product and describes what the world will be like when it includes the product. The vision statement should reflect a balanced view that will satisfy the needs of diverse customers as well as those of the developing organization. It may be somewhat idealistic, but it should be grounded in the realities of existing or anticipated customer markets, enterprise architectures, organizational strategic directions, and cost and resource limitations]*

<<Sample: For employees who want to order meals from the company cafeteria or from local restaurants on-line, the Cafeteria Ordering System is an Internet-based and smartphone-enabled application that will accept individual or group meal orders, process payments, and trigger delivery of the prepared meals to a designated location on the Process Impact campus. Unlike the current telephone and manual ordering processes, employees who use the Cafeteria Ordering System will not have to go to the cafeteria to get their meals, which will save them time and will increase the food choices available to them.>>

## 6. Project Scope & Limitations

*[The project scope defines the concept and range of the proposed solution. It’s also important to define what will not be included in the product. Clarifying the scope and limitations helps to establish realistic expectations of the many stakeholders. It also provides a reference frame against which proposed features and requirements changes can be evaluated. Proposed requirements that are out of scope for the envisioned product must be rejected, unless they are so beneficial that the scope should be enlarged to accommodate them (with accompanying changes in budget, schedule, and/or resources)]*

### 6.1 Major Features

6.1.1 Web Application for Admin

FE-01: Login/Logout.

FE-02: Manage personal profile: view profile, update profile, change password.

FE-03: Manage user account: view user account, add user account, deactivate user account.

FE-04: Manage program: view program, add new program, update program, assign course for program.

FE-05: Manage course: view course, add new course, update course.

FE-07: Manage class: view class, add new class for specific course, update class, assign instructor.

6.1.2 Web Application for Simulation Manager

FE-08: Login/Logout.

FE-09: Manage personal profile: view profile, update profile, change password.

FE-10: Manage simulation component: view component, add new component, update component.

FE-11: Manage simulation action: view action, add new action, update action.

FE-12: Manage simulation practice: view practice, add new practice, update practice.

FE-13: Manage practice step: view practice step, add new practice step, update practice step.

FE-14: Manage practice warning: view warning, add new warning, update warning.

FE-15: Manage simulation timeslot: view slot, add new slot, update slot, assign practice to slot.

6.1.3 Web Application for Instructor

FE-16: Login/Logout.

FE-17: Manage personal profile: view profile, update profile, change password.

FE-18: Manage class member: view member, add new member.

FE-19: Manage class section: view section, add new section, update section.

FE-20: Manage learning material: view material, add new material, update material, assign material to section.

FE-21: Manage quiz: view quiz, add new quiz, update quiz, assign quiz to section.

FE-22: View list practices, and can assign practices to class section.

FE-23: View trainee result on quizzes and practices, and can provide direct feedback.

FE-24: View trainee overall performance in class, and can confirm pass or fail result for each trainee in class.

6.1.4 Web Application for Trainee

FE-25: Login/Logout.

FE-26: Manage personal profile: view profile, update profile, change password.

FE-27: View available programs, courses, classes, and can make enrollment.

FE-28: View class syllabus and sections.

FE-29: View learning material assigned to class section, and can access or download material.

FE-30: View quizzes assigned to class section, and can make attempt or view recorded results.

FE-31: View practices assigned to class section, and can view recorded results.

6.1.5 3D Simulation Application for Trainee (Desktop)

SI-01: Login/Logout.

SI-02: View list practices in which trainee is assigned to, and can select a practice to make new attempt.

SI-03: View simulation guides and settings.

SI-04: View practice steps and step details (including target components, target actions, expected outcome).

SI-05: View simulation components, and can make action (inspect definition, lift, rotate).

SI-06: View step result and warning message when committing an error.

SI-07: View post-practice result (time, completion status).

### 6.2 Limitations & Exclusions

Limitations:

LI-01: Simulation Platform: The 3D Simulation Application (6.1.5) is a dekstop-only application (Windows/Linux/macOS) and is not accessible via web brower or mobile device.

LI-02: Simulation Scope: The simulation practice does not perfectly represent real-world crane models and physics.

LI-03: Content Management: The system provides feature to manage program content and simulation settings, but it does not include creating core assets and scripts inside simulation environment.

Exclusions:

EX-01: Payment and Billing: The system does not support any payment processing or billing features.

EX-02: Communication: The system does not support comments, live chat or discussion forum. Feedback feature is private.

EX-03: Physical Records: The system does not manage a trainee’s physical

EX-03: Course Certificate: The system issues Certificate of Training / Certificate of Completion to validate that a trainee has finished a course within the online sections. The issuance does not connect to, or submit result to, any government and regulatory body.