



Capstone Project 2

CMU-SE 451

Proposal

Version 1.1

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SENIOR PROJECT MANAGEMENT SYSTEM FOR INTERNATIONAL SCHOOL

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PROJECT INFORMATION

| | | | |
|--|--|--------------------------|-------------|
| Project acronym | Senior Project Management System for International School | | |
| Project Title | SPMS | | |
| Start Date | 18 Feb 2022 | End Date | 15 May 2022 |
| Lead Institution | International School, Duy Tan University | | |
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REVISION HISTORY

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1. Introduction

1.1. Purpose of document

- Define the business needs and problems in detail.
- Provide solutions for business needs.
- Provide an overview of resources, schedule, solution, and budget for the project.

The proposal merely introduces the project to the student development teams and provides the up-front information necessary for the team to develop a specification.

1.2. Project goal

During the current epidemic, organizing students to do projects has become difficult when all jobs have to be done online. It is difficult for students to access the project implementation process and the scientific council is also very difficult to organize for students to carry out the project. To solve this problem, the team decided to create SPMS to help organize and manage graduation projects for students easily. Students easily understand the implementation program and implement the management process. The Scientific Council easily manages students to carry out projects, view progress, evaluate or update notifications for students of timely changes, helping to reduce risks and capacity.

2. Problem definition

Currently, it becomes difficult for students to manage project implementation and students find it difficult to grasp and understand the process. The faculty uses google forms to collect student information and uses excel to store student information, mentors, registered topics, and timelines for projects. The implementation of changes or plans via email by each student also presents some risks as some students do not receive emails due to the wrong email supply or the dean is not able to send all students. To solve this problem, the team came up with an idea for a web-app capstone management system. It will help students easily register to participate and implement the project. The Faculty of International Studies will easily collect student information quickly and save time. Faculty will easily divide groups, mentors, and topics for students. After having a mentor, students will easily connect with group members and mentors instead of spending time sharing social media accounts. The website allows the Dean and team to control the student

project implementation process by stage, easily control the quality of each student group's work, and make timely adjustments. The Dean will easily divide the schedule for the project defense sessions and the council to attend that defense session. Students can easily receive the schedule in each stage and notify about their project defense session.

2.1. User needs

- Student

- Easily register and execute projects.
- Easy to understand the process and how to implement the project to be able to plan the work properly.
- Easy to manage task of project.
- Present and receive an assessment of the project at each stage to find a timely solution.
- Receive notifications about adjustments and plans from the faculty quickly so you can be well prepared for the project.

- Mentor

- Easily get the work schedule.
- Easily share topics for students.
- Easily manage the implementation process and evaluate the quality of students' work through each stage.

- Evaluator

- Easily score capstone project protection.

- Moderator

- Easily manage students registered to do projects and mentors.
- Easily create defenses.
- Perform group division and mentoring quickly by requirements.
- Easily create a notification.

- **Admin**

- Manage account.
- Manage template document.

2.2. Non-functional requirements

Below are the non-functional requirements that are being offered for the system:

- Portability and compatibility: The system is operated on a web-based platform and can run on any web browser.
- Usability: The system has a friendly and flexible user interface and a Filename great user experience.
- Reliability: The system has accurate and transparent data, functions that do exactly their jobs.

2.3. Functional requirements

Below are the functional requirements that are being offered for the system, which are the backbone of the project:

- **Admin**

- Manage account.
- Manage a document template.

- **Student**

- Register and execute projects.
- Register topic.
- Manage project implementation process.
- View information of group.
- View information of defense.
- Work schedule management.

- **Mentor**

- Submit topic template.
- View information of groups.
- Evaluate the work quality of team members.
- Manage project implementation process.

- **Moderator**
 - Manage group.
 - Manage defenses.
 - Manage mentor.
 - Notify plans and changes.
- **Evaluator**
 - Manage score.

3. Current status of art

Up to now, many schools are still implementing the same management method and there are not many websites to support the management. In some student projects such as Management project graduation project of students of some universities such as Da Nang Polytechnic University.

Table 3: Compare SPMS with other the project.

| Feature | SPMS | Capstone Management Project |
|--|------|-----------------------------|
| Manage students | x | x |
| Manage mentors | x | x |
| Manage topics | x | x |
| Manage document of project | x | |
| Manage a performance of project each stage | x | |
| Register and execute project | x | |
| Manage a schedule | x | |
| Manage a document template | x | |
| Manage a score | x | x |
| Evaluate and compare the level of labor | x | |
| Notify plans and changes. | x | |
| Work schedule management | x | |

4. Engineering approach

4.1. Context diagram

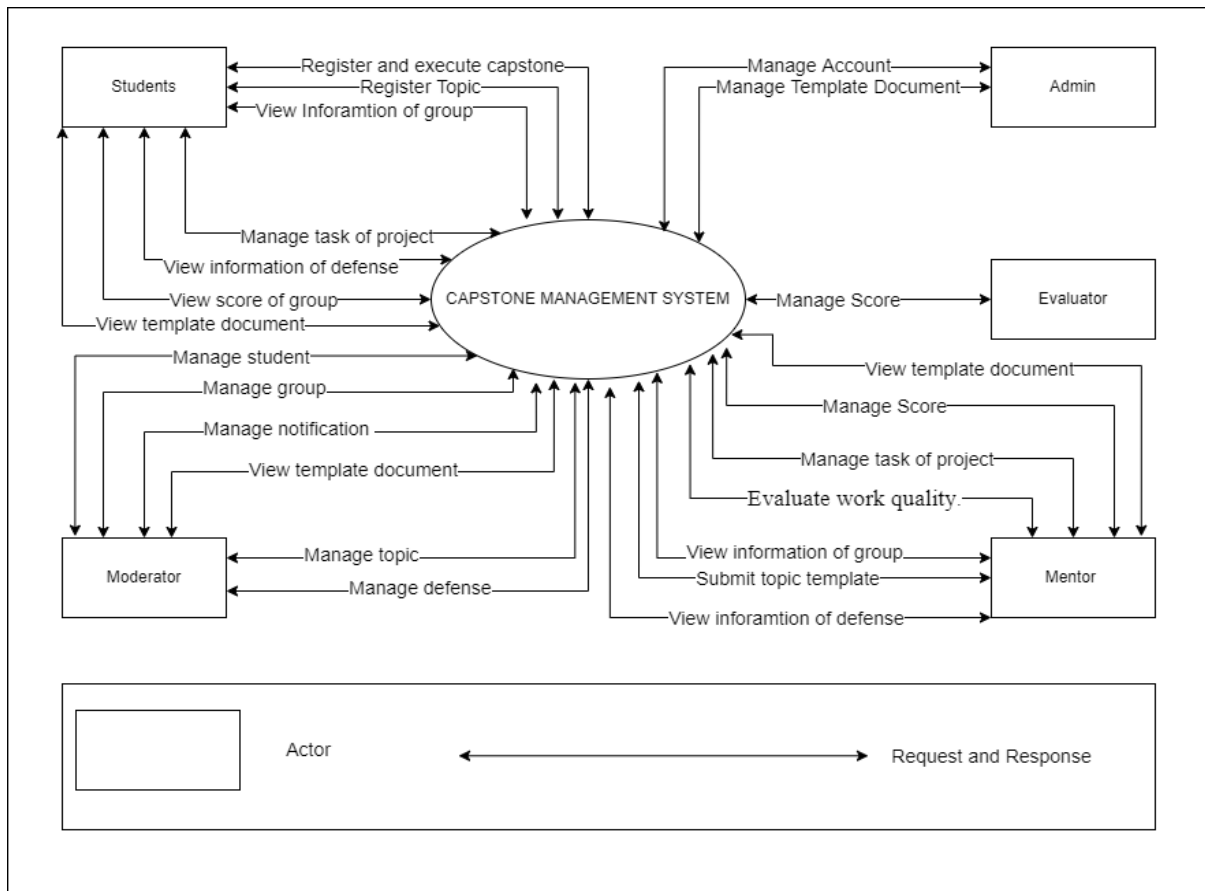


Figure 4.1: Context diagram.

- **Manage Account**
 - Admin can add, update, delete account of user.
- **Manage template topic**
 - Admin can upload, delete template document.
 - Student can view and download template document.
- **Register and execute capstone**
 - Student can fill in form information and submit it to register execute capstone.
 - Student will wait to moderator approve and system will send account to mail of student.

- **Register topic**
 - Student can fill in form register topic and submit it to register topic for project.
 - Student can choose topic template of mentor in topic template list.
 - Moderator will approve and student can use it for capstone project.
- **Manage task for project**
 - Student can create stage for project.
 - In each stage student can create task and assign it for members.
 - In each task member can comment issue and report task done or late.
 - Mentor can see stage and comment in each task of project.
- **Manage student**
 - Moderator can add, update, delete student.
 - Moderator can approve for student can execute project and system will send account for student.
- **Manage group**
 - Moderator can create group and divide student and mentor for each group.
 - Moderator can update, delete and export file excel group list.
- **Manage defense**
 - Moderator can divide defense and assign positions to each person.
 - Moderator can update, delete and export file excel defense list.
- **Manage topic**
 - Moderator can view topic template list and topic of student list.
 - Moderator can approve for topic of student.
- **Manage notification**
 - Moderator can create, update, delete notification.
- **Submit topic template**
 - Mentor can upload file topic template or fill in form topic template for student.
- **Manage score**
 - Mentor and Evaluator can input score of each member of group.
 - Evaluator can export file summary score.

- **Evaluate work quality**

- The system will aggregate the percentage of each member's contribution and sum it up.
- Mentor can see and evaluate work quality of each member.

4.2. Technical to develop system

- **Database:**

- Postgres SQL.

- **Back-end:**

- Programming Language: JavaScript.
- Framework: Express (NodeJS), Nodemon, sequenlize.

- **Front-end:**

- Programming language: HTML, CSS, JavaScript.
- Framework: React, Redux, Material-UI.

- **Client:**

- Operating System: Windows.
- Web Browser: Chrome.

5. Tasks and deliverables

5.1. Tasks

Table 5.1: *Task schedule.*

| No. | Task name | Description |
|-----|--------------------------|--|
| 1 | Startup | |
| 1.1 | Project kick off meeting | Encountering the developer team and stakeholders to clear out the goal, defining the base elements for the project, and other project planning activities. |
| 1.2 | Discuss Project | Brighten up the current ideal to both the developer team and stakeholder. |
| 1.3 | Create Document | Release the artifacts or schematics relate to the project to the product owner, including proposal, user story, Product backlog, Project Plan.... |

| | | |
|-----|--------------------------|---|
| 2 | Development | |
| 2.1 | Sprint Planning | A Sprint begins with a sprint planning session that sets goals and plans details for the work to be done. |
| 2.2 | Sprint 1 | Design Database Design UI Code function Moderator and Student Data connection with application Integration API Testing |
| 2.3 | Sprint 2 | Code function for Mentor Update function to Student Data connection with the application Integration API Testing |
| 2.4 | Sprint 3 | Code function for Evaluator Update function to Mentor Data connection with the application Integration API Testing |
| 2.4 | Sprint 4 | Code function for Admin Update function to Evaluator Data connection with the application Integration API Testing |
| 3 | Project's meeting | A private meeting between members to make a plan what will be presented to the customer in the final release. |
| 4 | Final Release | Release the final version to product owner with complete function. |

5.2. Deliverables

Table 5.2: *Deliverable document.*

| No. | Activities | Deliverables |
|-----|---------------------------------|---------------------------------|
| 1 | Project Proposal | Project Proposal Document |
| 2 | Project Plan | Project Plan Document |
| 3 | Product Backlog | Product Backlog Document |
| 4 | Architecture Document | Architecture Document |
| 5 | Database Design | Database Design Document |
| 6 | Interface Design | Interface Design Document |
| 7 | Test Plan | Test Plan Document |
| 8 | Test Case | Test Case Document |
| 9 | Acceptance Criteria | Acceptance Criteria |
| 10 | Sprint Backlog & Burndown Chart | Sprint Backlog & Burndown Chart |
| 11 | Team Reflection | Team Reflection |
| 12 | Technologies Stack | Technologies Stack Document |

6. Project management

6.1. About Scrum

Scrum is an agile method, so it follows the principles of the Agile Manifesto (see also Agile Manifesto). In addition, Scrum operates on three core values, also known as Scrip Scripps, including Scrutiny, Inspection, and Adaptation.

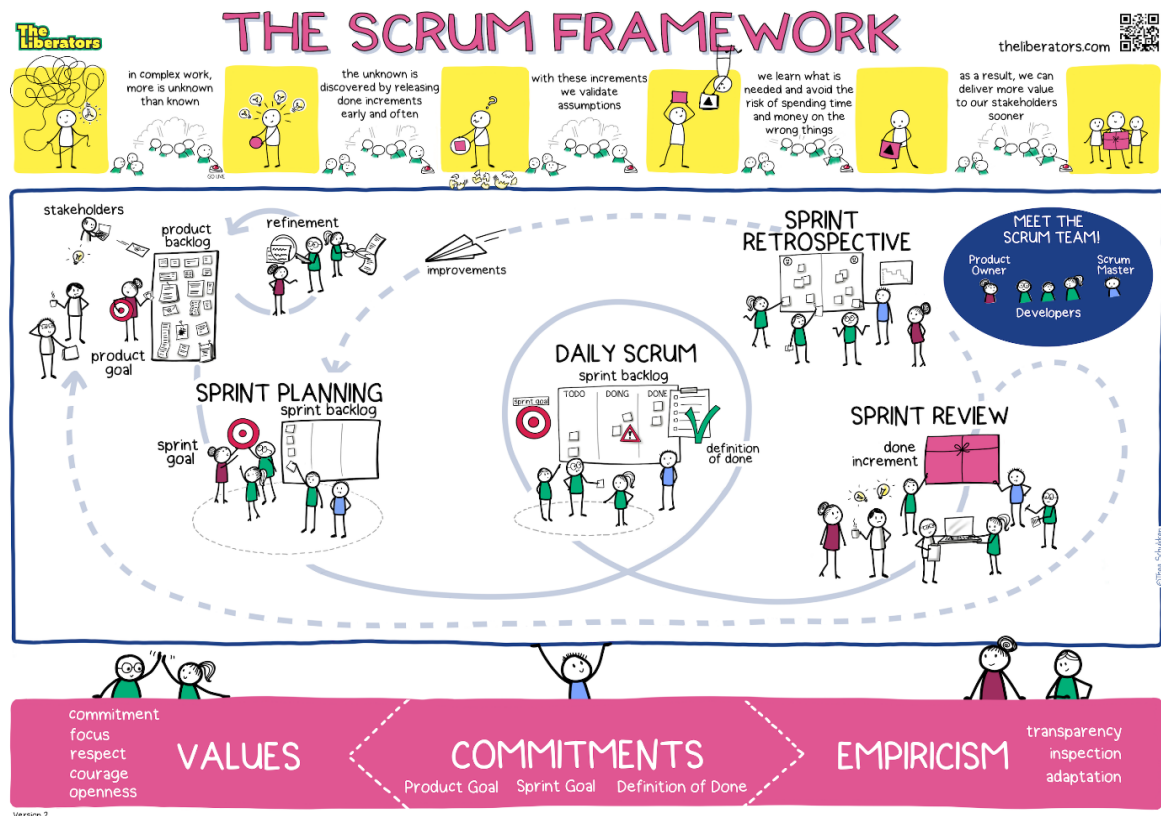


Figure 6.1: *Scrum process.*

Based on the empirical process control theory, Scrum uses iterative and incremental algorithms to optimize efficiency and control risk. Scrum is simple, easy to learn, and has wide applicability. To be able to use Scrum, we need to understand and apply the elements that makeup Scrum include the core values (also known as the “three legs”, or the three pillars of Scrum), roles, Events, and Scrum-specific artifacts.

6.2. Why Scrum

- Our team has 4 people.
- The project will be continuously horizontally scaled up.
- There is only a short amount of time to finish the project.

So based on those constraints, we decided to choose SCRUM as the project lifecycle.

6.3. Cost person/hours

Table 6.3.: *Cost person/hour.*

| Resource Name | Type | Max. Units | Std. Rate | Ovt. Rate |
|-------------------|------|------------|-----------|-----------|
| Tien, Nguyen Van | Work | 100% | \$2.00/hr | \$3.00/hr |
| Phuoc, Ha Duc | Work | 100% | \$2.00/hr | \$3.00/hr |
| Huy, Truong Dong | Work | 100% | \$2.00/hr | \$3.00/hr |
| Dat, Nguyen Thanh | Work | 100% | \$2.00/hr | \$3.00/hr |

6.4. Total cost estimate

Table 6.4.1: *Details of the teamwork.*

| Description | Amount | Unit |
|------------------------------|--------|--------|
| Number of members | 4 | Person |
| Number of working per day | 4 | Hours |
| The cost per hour per number | 2 | USD |
| The number of working days | 90 | Days |

Table 6.4.2: *Total cost estimate of the project.*

| No. | Criteria | Price(USD) | Total (USD) |
|--------------------|---------------|------------|---|
| 1 | Working hours | 2 | Number of members * Number of working per day * The cost per hour per number * The number of working days = $4*4*2*90 = 2880$ |
| 2 | Other costs | 200 | Other cost * Number of members = $200 * 4 = 800$ |
| Total (USD) | | | Working hours + Other costs = $2880 + 800 = 3680$ |

6.5. Detail of task assignment

Table 6.5: *Schedule description.*

| No. | Task name | Duration (days) | Start | Finish |
|----------|-------------------------------------|--------------------|--------------------|--------------------|
| | SPMS | 90 | 15 Feb 2022 | 15 May 2022 |
| 1 | Initial and plan | 14 | 15 Feb 2022 | 28 Feb 2022 |
| 1.1 | Project's kick-off meeting | 3 | 15 Feb 2022 | 17 Feb 2022 |
| 1.2 | Discuss a project idea | 1 | 18 Feb 2022 | 18 Feb 2022 |
| 1.3 | Create proposal document | 1 | 19 Feb 2022 | 19 Feb 2022 |
| 1.4 | Present proposal & approval project | 1 | 20 Feb 2022 | 20 Feb 2022 |
| 1.5 | Create user story | 2 | 21 Feb 2022 | 22 Feb 2022 |
| 1.6 | Create product backlog | 1 | 23 Feb 2022 | 23 Feb 2022 |
| 1.7 | Create project plan | 2 | 24 Feb 2022 | 25 Feb 2022 |
| 1.8 | Create architecture document | 1 | 26 Feb 2022 | 26 Feb 2022 |
| 1.9 | Create database document | 1 | 27 Feb 2022 | 27 Feb 2022 |
| 1.10 | Create user interface | 1 | 28 Feb 2022 | 28 Feb 2022 |
| 2 | Development | 72 | 01 Mar 2022 | 11 May 2022 |
| 2.1 | Sprint 1 | 18 | 01 Mar 2022 | 18 Mar 2022 |
| 2.2 | Sprint 2 | 26 | 19 Mar 2022 | 13 Apr 2022 |
| 2.3 | Sprint 3 | 18 | 14 Apr 2022 | 01 Apr 2022 |
| 2.4 | Sprint 4 | 10 | 02 May 2022 | 11 May 2022 |

| | | | | |
|-----|------------------|---|-------------|-------------|
| 3 | Closing | 4 | 12 May 2022 | 15 May 2022 |
| 3.1 | Release | 1 | 12 May 2022 | 12 May 2022 |
| 3.1 | Project meeting | 2 | 13 May 2022 | 14 May 2022 |
| 3.2 | Final submission | 1 | 15 May 2022 | 15 May 2022 |

7. Project constraints

Table 7: *A table describing the constraints affecting the project.*

| Constraint | Constraints Description | Guidelines for Acceptance |
|---|---|--|
| Economic | Because most of the topics are for students to do, the project currently has no funding. | Elements for consideration are design costs, production costs, maintenance costs, operating costs, and sales price. |
| Environmental | Due to the impact of the epidemic, everyone works online, so the performance may be lower but all is to the best of everyone's ability. | The impact of the design on the environment as well as the impact of the environment (e.g. temperature range, humidity, vibration, electromagnetic interference immunity, and shock) on the design should be considered. Design for recycling and design to use recycled materials should also be considered |
| Ethical | None | Ethical considerations can be broad. Areas that are typically addressed include intellectual property, reverse-engineering, privacy, security, and the conflict between cost and safety. |
| Public health, safety, and welfare | None | Includes safety standards as well as the impact of the design on users (for |

| | | |
|--------------------------|---|---|
| | | example, electrical or physical hazards). |
| Social and Global | The system was created to support students in the Department of International Studies of DTU. | Addresses aspects such as benefits, risks, the man-machine interface, the acceptance of products by the intended user or by society at large, global and socially responsible engineering. |
| Cultural | None | Which cultural characteristics could influence the approach? How does the design from different cultures differ? |
| Sustainability | None | Refers to the sustainability of resources, including material, energy, supplies, manufacturing techniques, personnel, operation, and the need for additional infrastructure, as well as the sustainability of the design including reliability, lifetime, durability, reusability, maintainability. |

8. Conclusion

It is expected that the company will complete it in 90 days and divide it into 4 sprint. Through the process of implementing the project, the group has synthesized the knowledge during their time at the school. In the future, the center will handle projects, support the management and implementation of projects of the International Faculty and support students to easily implement. Security is easy to use, reducing time and risk for students and faculty. This is a special product in the field of learning where online techniques do not respond.

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