



CAPSTONE PROJECT 1

CMU-SE-450 / CMU-IS-450 / CMU-CS-450

PROJECT PLAN

Version 1.1

Date: 12 - Aug - 2020

SMART DASHBOARD APPLICATION

Submitted by

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Approved by

Capstone Project 1 - Mentor:

Name

Signature

Date

Binh, Thanh Nguyen _____

A handwritten signature in blue ink, appearing to be 'Binh, Thanh Nguyen', written over a horizontal line.

_____14 - Dec- 2020

Name

Signature

Date

Huy, Truong Dinh _____

PROJECT INFORMATION			
Project Acronym	SDA		
Project Title	Smart Dashboard Application		
Project Web URL	https://sda-research.ml/		
Start Date	12 - Aug - 2020		
End Date:	07 - Dec - 2020		
Lead Institution	International School, Duy Tan University		
Project Mentor	PhD Binh, Nguyen Thanh; MSc Huy, Truong Dinh		
Scrum Master	Hoa, Vo	hoavo.dng@gmail.com	0935.193.182
Team Members	Tin, Pham Van	tinphamvan123@gmail.com	0932.535.175
	Dong, Ky Huu	kyhuudong@gmail.com	0898.246.980
	Kieu, Tran Thanh	thanhkieutran391@gmail.com	0358.583.251

DOCUMENT INFORMATION			
Document Title	Project Plan		
Author(s)	Team C1SE.06		
Role	[SDA] Project Plan_v1.1		
Date	16 - Nov - 2020	File name	[SDA] Project Plan_v1.1
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Access	Project and CMU Program		

REVISION HISTORY

Version	Person(s)	Date	Description
Draft	Hoa, Vo	31 - Aug - 2020	Initiate document
1.0	All members	22 - Sep - 2020	Finish content of document
1.1	Tin, Pham	16 - Nov - 2020	Update task schedule

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1. INTRODUCTION

1.1. PROJECT NAME

The project's name is: **"Smart Dashboard Application"**

Team members:

- | | |
|---------------------|--------------|
| 1. Hoa, Vo Van | Scrum Master |
| 2. Tin, Pham Van | Team Member |
| 3. Dong, Ky Huu | Team Member |
| 4. Kieu, Tran Thanh | Team Member |

1.2. PROJECT DURATION

- Project will be started on: 12 - Aug - 2020
- Project will be finished on: 14 - Dec - 2020

1.3. GOAL OF PROJECT

Smart Dashboard Application - SDA - means that a dashboard that is convenient for users to analyze and review data. It will include several hundred datasets about real-time information of the environment, historical aerial photographs, measurement data of air pollutants... SDA will connect and analyze data from multiple sources in ways you've never imagined. Then reveal the insights you've been missing...in just a matter of minutes.

With smart suggestions and an intuitive visual interface, SDA makes it easy for any user to combine data and discover hidden insights in one place...without the usual scripting, coding, and IT hand-holding. With this dashboard, individuals or any subjects can take advantage of environmental data to be able to decide the best relevant policies.

1.4. PROJECT SCOPE

In this project scope, we just implement these features about Forest, Atmosphere, Climate, Population, Industry

- View list of data cubes (DCs)
- Select 1 DC, drag to active page of SDB
- Visualise active DC in different type (charts, maps, data tables)
- Select a new DC to active page

- Link 2 DCs in SDB
- Creating new DC based on the 2 linked DCs
- Visualize new DC
- Continue with increase active DCs

Language:

- English
- Vietnamese

Duration: 17 weeks.

2. TEAM ORGANIZE

2.1. SCRUM TEAM INFORMATION

Full Name	Email	Phone number	Role
Hoa, Vo	hoavo.dng@gmail.com	0935.193.182	Scrum master
Tin, Pham Van	tinphamvan123@gmail.com	0932.535.175	Team member
Dong, Ky Huu	kyhuudong@gmail.com	0898.246.980	Team member
Kieu, Tran Thanh	thanhkieuTRAN391@gmail.com	0358.583.251	Team member

2.2. ROLES AND RESPONSIBILITY

Role	Responsibility	Name
Product Owner	Understand the user and customers with their needs. Collaborate with the development team. Manage the stakeholders. Describe the user experience and product features. Provides detailed user stories.	PhD Binh Thanh Nguyen
Scrum Master	Communicate the value of Scrum Teach the organization on Scrum to maximize business value Facilitate Sprint Planning, Daily Scrums, Sprint Reviews and Retrospective Meetings Create the Task Board and Sprint Burndown Chart at the start of every Sprint Attend all Scrum meetings Preserve the integrity and spirit of the Scrum framework Maintain the focus of the Team	Hoa, Vo Van

	Make the Team aware of impediments and facilitate efforts to resolve them Serve as a coach and mentor to members of the Team Respectfully hold the Team, Product Owner and Stakeholders accountable for their commitments Continually work with the Team and business to find and implement improvements	
Secretary	Record the content of group meetings and activities of the member	Kieu, Tran Thanh
Reviewer	Analysis of the functions and requirements of the product. Review documents related to the project	Tin,Pham Van
Team member	Frontend Developer: Dashboard	Tin,Pham Van
Team member	Back-end Dev: RDF Data Cubes Dev	Hoa, Vo
Team member	Back-end Dev: Database Dev	Dong, Ky Huu
Team member	Front-end Dev: Homepage Tester, Secretary	Kieu, Thanh Tran

3. SCHEDULES

3.1. OVERALL SCHEDULES

No	Phase	Iteration	Start Day	End Day
1	Development	SPR1	Aug 12, 2020	Sep 10, 2020
		SPR2	Sep 11, 2020	Oct 10, 2020
		SPR3	Oct 11, 2020	Nov 9, 2020
		SPR4	Nov 10, 2020	Dec 12, 2020

3.2. DETAIL SCHEDULES

WBS	Task	Task owner	Start	End	Days
	Sprint 1		Aug 12, 2020	Sep 10, 2020	30
1	Data Modeling	Dong, Hoa			
2	Physical Database Design	Hoa			
3	Set up database	Dong			

4	Build UI	Tin, Kieu			
5	Testing	Kieu			
	Sprint 2		Sep 11, 2020	Oct 10, 2020	30
1	Finding Data	Dong			
2	Data processing	Dong			
3	Data Warehouse Designing	Hoa			
4	ETL Process Validating	Hoa			
5	Building UI	Tin			
6	Testing	Kieu			
	Sprint 3		Oct 11, 2020	Nov 9, 2020	30
1	Expanding database	Dong			
2	Crawl data	Dong			
3	RDF Data Cubes Designing	Hoa			
4	Setting up DW to RDF Process Tool & Environment	Hoa			
5	Implementing DW2RDF Process	Hoa			
6	Setting up RDF Data Cubes Storing & SPARQL Endpoint	Hoa			
7	Building UI	Tin			
8	Testing	Kieu			
	Sprint 4		Nov 10, 2020	Dec 12, 2020	30
1	Documents	All members			
2	Building a history data source	Dong			
3	Validating RDF Data Cubes	Dong, Hoa			
4	Building SPARQL-REST API	Hoa			
5	Building UI	Tin			
6	Integrate	Hoa, Tin			
7	Testing	All members			
8	Deploy	All members			
9	Release	All members			

4. COST

4.1. RESOURCES

Full Name	Role	Salary Rate (USD / Hour)
Hoa Vo	Scrum Master	2.0
Tin Pham	Team Member	2.0
Dong Ky	Team Member	2.0
Thanh Kieu	Team member	2.0

4.2. TOTAL COST ESTIMATE

Sprint	Duration(hours)	Cost (\$)
1	376	\$752
2	356	\$712
3	387	\$774
4	498	\$996
Total	1617	\$3234

5. DEVELOPMENT PROCESS

PRINCIPLE AND DIFFERENT STAGES

The SCRUM methodology relies on the incremental development of a software application while maintaining a completely transparent list of upgrade or correction demands to be implemented (backlog). It involves frequent deliveries, usually every four weeks, and the client receives a perfectly operational application that includes more and more features every time. This is why the method relies on iterative developments at a constant rhythm of 2-4 weeks. Upgrades can therefore be more easily integrated than when using a V-cycle.

This method requires four types of meetings:

- Daily meetings: the entire team meets for approximately 15 minutes every day in order to answer the following three questions, usually while standing: what did I

do yesterday? What am I going to do today? Is there a cumbersome impediment today?

- Planning meetings: the entire team gathers to decide on the features that will make up the following sprint
- Work review meetings: during this meeting, every member presents what he has done during the sprint. They organize a demonstration of the new features or a presentation of the architecture. This is an informal meeting lasting for approximately 2 hours which is attended by the entire team.
- Retrospective meetings: at the end of each sprint, the team analyzes both successful and unsuccessful elements of their activity. During this meeting lasting between 15 and 30 minutes where everyone is invited and speaks on their own behalf, a vote of confidence is organized in order to decide on the improvements to be made.

The advantage of this method consists in reducing the documentation to the minimum in order to gain productivity. The idea is to write only the minimum documentation which allows to save the history of the decisions taken on the project and to easily perform interventions on the software when it goes into the maintenance phase.

AGILE - SCRUM ORGANISATION

The SCRUM methodology involves the following three main players:

- Product owner: In most projects, the product owner is the leader of the client's project team. He is the one who will define and prioritize the product features and choose the date and content of each sprint based on values (workloads) that the team communicates to him.
- Scrum Master: He is a genuine facilitator on the project as he makes sure that everyone works at their full potential by eliminating impediments and protecting the team from external interference. Moreover, he pays particular attention to the respect of the different SCRUM phases.
- Team: A team is typically made up of 4-10 people and groups together all the IT specialists who are necessary on a project, i.e. an architect, a designer, a developer, a tester etc. The team is self-organizing and remains unchanged during an entire sprint.

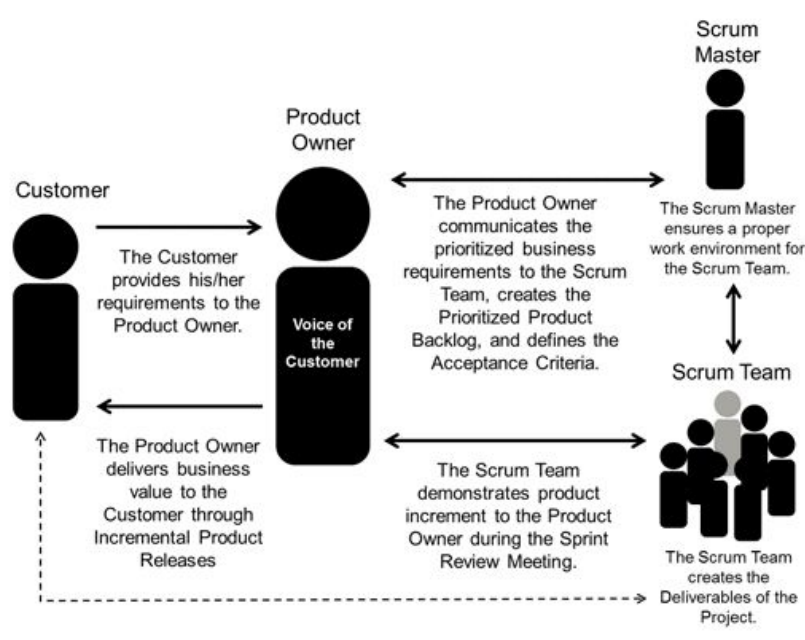


Figure 4.2: Scrum team members

AGILE - SCRUM ADVANTAGES

Scrum differs from other development methods through its advantages which turn it into a pragmatic response to product owners' current needs:

Iterative and incremental method: this allows to avoid the "tunnel effect", i.e. the fact of seeing the result only at the final delivery, and nothing or almost nothing during the entire development phase, which is so frequent with V-cycle developments.

Maximum adaptability for product and application development: the sequential composition of the sprint content allows to add a modification or a feature which was not initially planned. This is precisely what renders this method "agile".

- **Participatory method:** every team member is asked to express his opinions and can contribute to all the decisions taken on the project. He is therefore more involved and motivated.
- **Enhancing communication:** by working in the same development room or being connected through different communication means, the team can easily communicate and exchange opinions on the impediments in order to eliminate them as early as possible.
- **Maximizing cooperation:** daily communication between the client and the team enables them to collaborate more closely.
- **Increasing productivity:** as it removes certain "constraints" of the classical methods, such as documentation or exaggerated formalization, SCRUM allows for increased team productivity. By adding to this the qualification of each module which allows to determine an estimation, everyone can compare their performance to the average team productivity.

RISKS AND SOLUTIONS

The SCRUM methodology does not offer a universal answer to all the problems that are inherent to software development. Teams need to pay attention to the risks below, which, nevertheless, offer a systematic answer based on extrapolating the method:

- Team size: team size is typically limited to 7 or 10 people and can become an impediment if it exceeds these recommendations. In the latter case, the organization of meetings becomes impossible and the very foundations of the method are affected. The solution is to set up a Scrum of Scrums. This consists in dividing the project into teams of appropriate sizes and adding an instance of a higher level which groups together the Scrum Master of each Scrum.
- Multiple requests: Requests may be transmitted through several channels on a project and can sometimes be difficult to manage due to their contradictory aspects. These contradictions can slow down the delivery validation process. In order to solve this problem, it is vital to use a single request management tool, which is a standard option with projects.
- Development quality: The more the number of teams increases, the more difficult it becomes to deal with quality. This rule is all the more true when the project is distributed among several centers. The main risks are related to code quality and the number of bugs identified during integration. This is why it is important to have a rigorous quality policy and a project quality plan which precisely defines the rules of the project. Frequent code audits and the implementation of indicators that measure the developers' performance allow minimizing this risk.

6. DEVELOPMENT ENVIRONMENT

Component	Development Environment
Operating system	<ul style="list-style-type: none"> - Windows - Linux
Development Tools	<ul style="list-style-type: none"> - Visual Studio Code - Pgadmin4 - Fluent Editor
Data Warehouses	<ul style="list-style-type: none"> - PostgreSQL
Data Cubes	<ul style="list-style-type: none"> - RDF Graph - OpenRefine - CubiQL - Jena
Client dependencies	<ul style="list-style-type: none"> - NodeJS: 14.5 - NPM: 6+

	<ul style="list-style-type: none"> - React: 16.13.1 - Redux
Server dependencies	<ul style="list-style-type: none"> - ExpressJS - Node-Postgres
Third-party dependencies	<ul style="list-style-type: none"> - Source Code Version Control: Github. - Gcloud services: Compute Engine, Firebase. - Server Endpoint: GraphDB - Material-UI, react-dnd, redux-toolkit, highcharts,...

7. COMMUNICATION & REPORTING

7.1. REPORTING METHODOLOGY

Audience/ Attendees	Topic/ Deliverable	Frequency	Method
- Product Owner - Scrum Master - Team Members	Project Progress Review	Weekly	Email, Skype or Zoom
- Product Owner - Scrum Master - Team Members	Explicit Requirement	When needed	Email, Skype or Zoom
- Mentor - Scrum master - Team members	Milestone review	End of each Milestone	Skype, Zoom
- Scrum master - Team members	Daily tasks	Each day	Slack, Discord, Messenger

7.2. COMMUNICATION METHODOLOGY

Type of Communication	Communication Schedule	Communication way	Who Initiates	Recipient
Status Report (Daily meeting)	Daily	Slack, Discord	Scrum Master	Scrum Team
Schedule and Effort Tracking	Daily	Face to face or GSheets	Scrum Master	Scrum Team
Work Review	Daily	Face to face	Scrum Master	Scrum Team
Work Report	Every Wednesday, Sunday	Face to face or Discord	Scrum Master	Scrum Team
Project Review, ask problems	Every Wednesday, Sunday (flexible)	Face to face, Discord or Zoom	Scrum Master	Scrum Team, Mentor
Ask & Review problems	Anytime	Face to face, Slack, Discord, Zoom	Scrum's Member	Mentor and Scrum Team

8. RISKS

In this part of the document, it contains several risks that could happen to the development team in the future. It also includes probability, severity and mitigation strategy for each risk.

Risk	Definition	Probability	Severity	Mitigation Strategy
Lack of coding experiences	No one in team member work with Python, React, Express, Data Warehouses, Data Cubes, Crawl data	H	M	Each team member has to learn and help the other to learn quickly.
Source Code conflict	Problems while merging code between members to master branch	H	H	Each team member must resolve conflicts by using git merge CLI before merging to master branch.
Member conflict	Team member maybe conflict with each other while discussing	H	M	Team building, playing board games to get everyone together.
Less equipment	No machine or hosting for deploying the server.	L	M	Try free hosting for deployment.
Time management	Every member has to go to work or school.	H	H	Overtime
Language barrier	Most of documents the are in English, sometimes it hard to understand clearly the articles and the informations	H	H	Improve the individual English skills in meanwhile doing the project. Asking the mentor technology for specific

Probability		Severity	
L	Rarely happened.	L	Low damaged
M	Sometime happened	M	Medium damaged
H	Usually happened	H	Serious damaged

9. DELIVERABLES

No	Activities	Deliverables
1	Project Proposal	Project Proposal Document 1.2
2	Project Plan	Project Plan Document 1.1
3	Product Backlog	Product Backlog Document v1.1
4	Architecture Document	Architecture Document v1.2
5	Database Design	Database Design Document v1.2
6	Interface Design	Interface Design Document v1.2
7	Test Plan	Test Plan Document v.1.2
8	Test Case	Test Case Document v1.3.1
9	Acceptance Criteria	Acceptance Criteria v1.0
10	Sprint Backlog & Burndown Chart	Sprint Backlog & Burndown Chart v1.4
11	Team Reflection	Team Reflection v1.0
12	Technologies Stack	Technologies Stack Document v1.2

10. CONFIGURATION MANAGEMENT

No	Tool	Content
1	Google Sheet	Track member activities. At the end of each day, team members will post on time log and scrum master will check.
2	Google Document	Track the changing of documents & manage versions of documents.
3	Github	Repositories for source code version management.
4	Weekly Meeting	Hold a meeting every week to assign tasks to each member. If there are some emergencies but we cannot sit together then we can use Discord to discuss online.
5	Document	All meetings must be documented and pictured.
7	Slack	Store document resources and designed components
8	Discord	Discuss online, stream and share problems

11. REFERENCE

- [SDA]Proposal: <https://docs.google.com/document/d/1tQOYTQQ053oVq-IgPckF-CdjePMqiaZQ1QnrVysQJ8U/edit?usp=sharing>
- What is Scrum: <https://www.scrum.org/resources/what-is-scrum>