



Capstone Project 1

CMU-SE 450/CMU-IS 450

Date: 20/12/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by

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PhD. Man, Nguyen Duc

22/12/2022



Capstone Project 1

CMU-SE 450/CMU-IS 450

Project Proposal

Version 1.2
Date: 12/12/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
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Name	Signature	Date
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12/12/2022

Capstone Project 1- Mentor:

Name	Signature	Date
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PhD. Man, Nguyen Duc

12/12/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	TRACKING EMPLOYEE SYSTEM		
Start Date	15 Aug 2022	End Date	16 Dec 2022
Lead Institution	International School, Duy Tan University		
Project Mentor	PhD. Man, Nguyen Duc		
Scrum master / Project Leader & contact details	H Na Ri, Mlo Email: narimlo2001@gmail.com Tel: 0886 912 935		
Partner Organization	Duy Tan University		
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REVISION HISTORY

Version	Date	Comments	Author	Approval
Draft	17/08/2022	Initiate Document	H Na Ri, Mlo	
1.0	22/08/2022	Initial Release	H Na Ri, Mlo	
1.1	25/08/2022	Update System Context Diagram	H Na Ri, Mlo	
1.2	12/12/2022	Update Technical Proposed	H Na Ri, Mlo	

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1. Introduction

Human resource management in enterprises and organizations with more than 200 employees faces numerous difficulties, especially timekeeping management, which is a tough problem that businesses need to solve.

Currently, most businesses still perform timekeeping using old methods such as using paper, excel, magnetic cards, fingerprints or even having supervisors come to each room to check punctuality. The crowded, long staff queues waiting for the check-in and check-out affect the employees time as well as work performance; also, the timekeeping is also not clear and transparent. Especially for employees whose work has to move between a lot of different locations in one day, it will be very hard to control.

A question arises: "How to optimize timekeeping management"? With the innovative spirit of businesses today, comprehensive digitization is an indispensable solution for businesses, especially with the Government's digital transformation policy in recent years. We discussed it together and came up with the solution **TES-TRACKING EMPLOYEE SYSTEM**.

TES-TRACKING EMPLOYEE SYSTEM is an intelligent timekeeping system. The system applies facial recognition technology and QR Code to confirm employee attendance. In addition, the system also integrates GPS to record the travel schedule of employees when traveling on business trips and other features such as: Check in/Check out between rooms, managing employees, rooms committees, statistical reports, requirements management,etc. Our system makes management faster, simpler and easier.

2. Problem Definition

2.1 Business Problem:

- Fingerprint timekeeping still has many hidden corners, employees can enter timekeeping and leave the workplace at any time if desired, fingerprints are sweaty, the device will not be recognized.
- The timekeeping by fingerprint and card scanner is difficult for personnel to move the timekeeper and takes a lot of time if the company has many employees...
- It takes a lot of effort and cost when investing in equipment.
- Time-consuming if the company has many employees.
- Current software cannot solve the problem of tracking employees in different departments.
- Takes a lot of paperwork to store
- Statistics take time
- Unable to track statistics
- Can't control whether employees really go on business or not?

2.2 Business Need:

- Smart timekeeping software can track employees
- Timekeeping by QR code
- Check in according to different departments
- Tracking employee location by GPS
- Data statistics report
- Manage employee requests
- Automatic timesheet of employees
- Time attendance by facial recognition on the phone to save machine costs.
- Can manage branches and departments.

3. Current Status of Art

Currently, the world has appeared attendance software that uses new technologies such as SCORO, Acheckin, Base Checkin, Hellotracks, Tanca, Timely, etc. But these systems are very complex, including installing many devices such as fingerprint machines, timekeepers, magnetic cards, etc. Besides, these systems have an extremely high cost and are still not popular.

But with TES, users will be provided with an account and can use that account to log in to the website or app to perform advanced functions such as attendance on the phone, check-in/check-out room, tracking GPS, view timesheets, etc.

Let's compare this system with the Timely, Base Checkin system on the market to know its advantages:

Table 1. Compare TES with another systems

		Timely	Base Checkin	TES
	Installment cost	High	High	Low
Function	Check in/ Check out by phone	No	No	Yes
	Face Recognition	No	Yes	Yes
	Statistics/ report (timesheets , user, request form)	Yes	Yes	Yes
	GPS tracking	No	No	Yes
	Room tracking	No	No	Yes
	Financial analysis	Yes	Yes	No
	Sent request form	Yes	Yes	Yes
	Management Employees Information	Yes	Yes	Yes
	View timesheet personal	Yes	No	Yes

4. Engineering Approach (including solution alternatives)

4.1 System Context Diagram

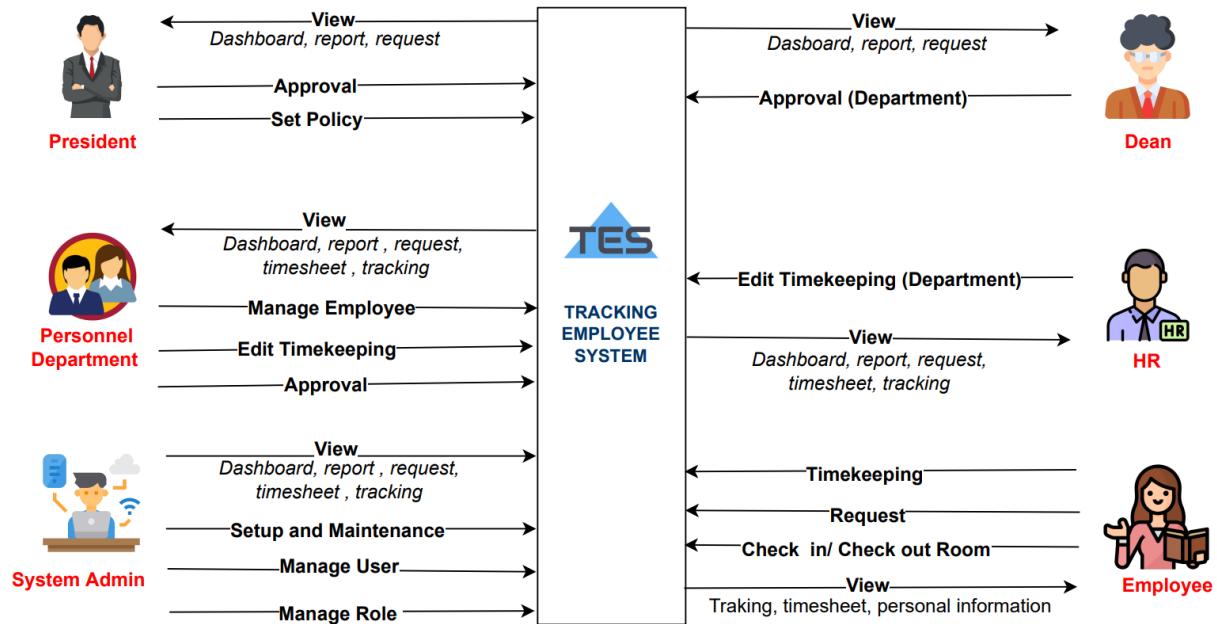


Figure 1. System Context Diagram

4.2 System Context Description

4.2.1 System Admin

- Manage User: Create, Edit, Delete account for all department
- Manage Campus: Create, Edit, Delete, Add manual Location of Campus
- Manage Department: Create, Edit, Delete Department
- Manage Room: Create, Edit, Delete Room
- Manage request device: View and approval request device
- View Dashboard
- View Statistics Report: View report timesheet in web and export file excel
- View GPS Tracking by day, week, month.
- View room Tracking by user, date.
- System Configuration: Setting location, wifi address and time in/ time out

4.2.2 President

President is the head of the organization has the highest authority, has the right to manage all employees of the company.

- Approval, Reject form policies, requirements, and petition.
- View Statistics Report: View report timesheet in web and export file excel
- View Dashboard
- Set Policy.

4.2.3 Personnel Department

The Personnel Department has the role of managing all employees in the organization including the Dean.

4.2.3.1 Head of Personnel Department

- Approval, reject request (apply for manual timekeeping, special leave, special request, etc.) submitted from the HR of Personnel Department.
- View organizational statistics reports.
- View Dashboard.
- View Statistics Report: View report timesheet in web and export file excel

4.2.3.2 Staff of Personnel Department

- Manage Employee in organizational.
- Edit Timekeeping: Manual timekeeping when have a problems.
- View, receive the request of all employees in department.
- View Timesheet of all employees in department.
- View Tracking Rooms of organizational.
- View GPS information of all employees in the department.
- View, Export Timesheet of department.
- View Statistics Report: View report timesheet in web and export file excel
- Send notification to all employees.

4.2.4 Dean

Dean: the head of the department has the right to manage all employees of that department. An organization has many departments, so there will be many Deans.

- Approval, reject request (apply for manual timekeeping, special leave, special request, etc.) submitted from the HR Department.
- View organizational statistics reports, dashboard.
- View Tracking Rooms of department.
- View GPS information of the department.
- View, Export Timesheet of department.

4.2.5 HR of Department

- Manage Employee in organizational.
- Edit Timekeeping: Manual timekeeping when have a problems.
- View, receive the request of all employees in organizational.
- View Timesheet of all employees in organizational.
- View organizational statistics reports.
- View Tracking Rooms of department.

- View GPS information of all employees in the department.
- View, Export Timesheet of department.
- Send notification to all employees in the department.

4.2.6 Employee

Employees will use TES on mobile application.

- Timekeeping by Face Recognition and QR Code.
- Check in and check out rooms: Check in when coming to work in another room and automatically check out the old room if the employee checks in another room.
- Send Request about manual timekeeping when have a problems, overtime, special leave, business trip, etc.
- View GPS information by day, week.
- View timekeeping information
- View, edit personal information.
- Get notifications.

4.3 Technical Proposed

Table 2. Technical Proposed

Programming Language	JavaScript
Frameworks/Libraries	Frontend: ReactJS, Redux, React Leaflet (OpenStreetMap), Ant Design, styled components Backend: NodeJS (ExpressJS) Mobile: React Native, Expo, NativeBase (for styling)
Database	MySQL, Firebase (Firestore), AWS S3 Bucket
Another	QR Code, face-api

5. Tasks and Deliverables

5.1 Task Progress Implementation:

Table 3. Task Progress Implementation

Task	Sub-task	Activities
Task 1 – Project Initiation and Planning	Sub-task 1 – Project Initiation and Management Plan	<ul style="list-style-type: none"> – Project Initiation – Project Initiation Planning – Project Kick Off – Presentation – Project Management Plan – Project Scope – Risk Analysis and Management – Project Work Plan and Schedule
	Sub-task 2 – Regular Project Status Reporting	At least 2 times a week
	Sub-task 3 – System Design and Development Strategy	<ul style="list-style-type: none"> – System Design – Methodology – System Design and Development – Strategy
	Sub-task 4 – System Implementation Strategy	System Implementation Strategy
	Sub-task 5 – Master Testing Strategy	Testing Strategy
Task 2 – System, Interface and Data Design	Sub-task 7 – Functional Design Document	Functional Design Document
	Sub-task 8 – Develop Data Plan	Database Design Document
	Sub-task 9 – Develop Interface Specifications and Design Document	Develop Interface Specifications and Design Document
	Sub-task 10 – System Architecture and Technical Design	System Architecture and Technical Design

Task 3 – System Development	Sub-task 11 – System Implementation Plan	<ul style="list-style-type: none"> – System Development – Methodology – Software Configuration Management
	Sub-task 12 – Data Conversion, Synchronization	<ul style="list-style-type: none"> – Data Load – Testing Conversion
	Sub-task 13 – System Maintenance, Support and Transition Plan	System Maintenance, Support and Transition Plan
Task 4 – System Testing	Sub-task 14 – Detailed Test Plans	<ul style="list-style-type: none"> – Usability Testing – Functional Testing – Load Testing
	Sub-task 15 – Test Scenarios, Test Cases, Test Scripts	Test Scenarios, Test Cases, Test Scripts
	Sub-task 16 – Document System Test Results	Document System Test Results
Task 5 – Release And Training	Sub-task 17 - Release Readiness Evaluations and Reports	<ul style="list-style-type: none"> – TES Readiness – Release Readiness Evaluation and Report
	Sub-task 23 – Complete Detailed Requirements, Design & Specifications	Complete Detailed Requirements, Design & Specifications
	Sub-task 24 – Training and User manual	Training and guiding for actor

5.2 Deliverables

Table 4. *Deliverables*

No	Activities	Deliverables
1	Project Proposal	C1SE.02-Proposal-TES
2	Project Plan	C1SE.02-ProjectPlan-TES
3	Product Backlog	C1SE.02-ProductBacklog-TES
4	Architecture Document	C1SE.02-Architecture-TES
5	Database Design	C1SE.02-DatabaseDesign-TES
6	Interface Design	C1SE.02-InterfaceDesign-TES
7	Test Plan	C1SE.02-TestPlan-TES
8	Test Case	C1SE.02-TestCase-TES
9	Sprint Backlog	C1SE.02-SprintBacklog -TES
10	Team Reflection	C1SE.02-Reflection-TES
11	Technical Report	C1SE.02-TechnicalReport-TES
12	Source Code	

6. Project Management

6.1. Cost/Budget for Project

Table 5. *Cost of Project*

No.	Criteria	Price (USD)	Amount	Total (USD)
1	Working hour	2	1440	2880
2	Management cost	20%		576
			Total	3456

Table 6. Cost Description

Description	Amount	Unit
Number of members	4	Person
Number of working-day per week	5	Day
Number of working-hour per week	20	Hour
The cost per member per week	80	USD
The duration of the project	18	Week
The number of working days	90	Day

Explain:

- Amount of working hours = 4 members * 20 hours * 18 weeks.
- Management cost = total * 20%

Table 7. Cost Detail

Item	Total Budget (\$)	% Budget	Budget in Period				Note
			SPRINT 1	SPRINT 2	SPRINT 3	SPRINT 4	
Purchases (COTS)	3456	100%	864	864	864	864	
Team building	0	0	0	0	0	0	
Tools	0	0	0	0	0	0	
Travel costs	0	0	0	0	0	0	
Training	0	0	0	0	0	0	
Review activities	0	0	0	0	0	0	
Other	0	0	0	0	0	0	
Total	3456	100	0	0	0	0	

6.2. Tentative Schedule

6.2.1 Human Resources

Table 8. Human Resources

Full Name	Tel	Email	Position
Hoang, Nguyen Duc	0778 727 300	hoang922001@gmail.com	Back End Developer
Hung, Le Van	0823 474 409	88levanhung@gmail.com	Web Developer
H Na Ri, Mlo	0886 912 935	narimlo2001@gmail.com	Scrum Master, Business Analyst, Quality Assurance.
Phong, Bui Duy	0906 547 932	buiduyphong921@gmail.com	Mobile Developer, Product Owner

6.2.2 Scrum

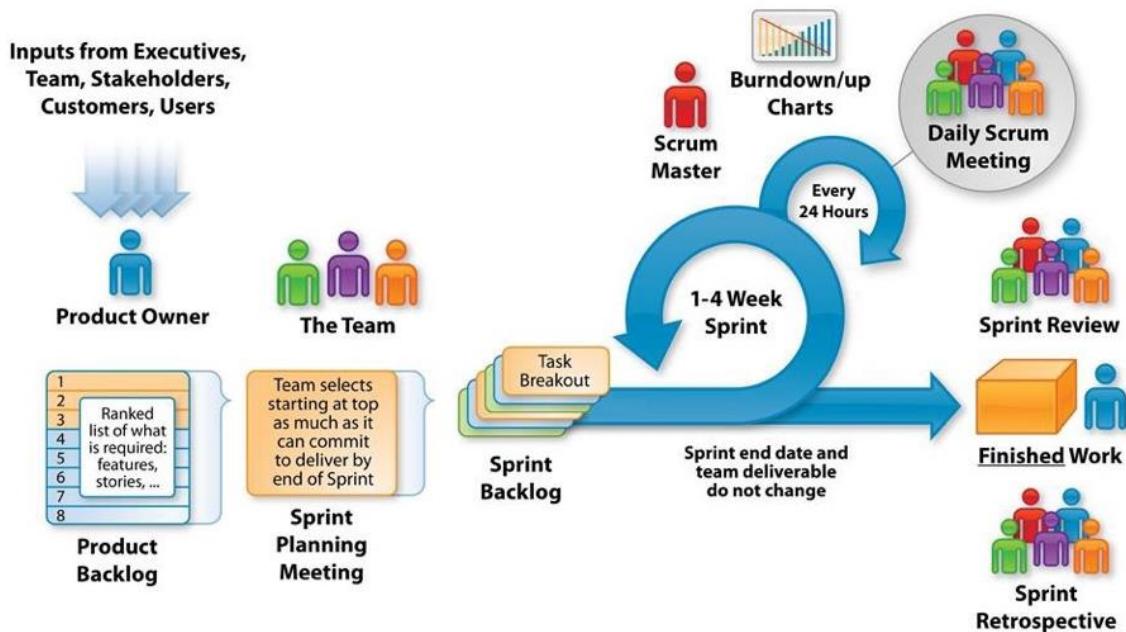


Figure 2. Scrum Framework

- Scrum is an iterative and incremental agile software development framework for managing software projects and product or application development.

- Scrum focuses on project management institutions where it is difficult to plan ahead.
- Mechanisms of empirical process control, where feedback loops that constitute the core management technique are used as opposed to traditional command-and-control management.
- Its approach to planning and managing projects is by bringing decision-making authority to the level of operation properties and certainties.
- A Scrum team grows with the following 3 roles: Product Owner, Scrum Master and Development Team.

Why did we choose Agile Scrum Methodology to develop the system?

To keep up with today's increasingly changing technology trends, we want a flexible and easy project development model to adapt to that change. Our project will develop more new features in the future. We will continuously update and apply new technologies that increase the attractiveness and intelligence of the application.

Therefore, Applying the Agile Scrum model will help us to solve these problems, and bring a lot of experience and the best performance for project development.

6.2.3 Master Plan

Table 9. Master Plan

No.	Task Name	Duration (days)	Start	Finish
1.	Initial	15	15/08/2022	31/08/2022
1.1	Project's Kick-off Meeting	1	15/08/2022	15/08/2022
1.2	Collect and analyze requirements	4	16/08/2022	19/08/2022
1.3	Research technical	5	22/08/2022	26/08/2022
1.4	Setup Development Environment	3	29/08/2022	31/08/2022
2	Development	60	05/09/2022	27/11/2022
2.1	Sprint 1	15	05/09/2022	25/09/2022
2.2	Sprint 2	15	26/09/2022	16/10/2022
2.3	Sprint 3	15	17/10/2022	06/11/2022
2.4	Sprint 4	15	07/11/2022	27/11/2022
3	Close project	15	28/11/2022	16/12/2022
Total		90		

6.2.4 Task Assignment

Table 10. *Task Assignment*

Assign	Main Task
H Na Ri, Mlo	Create Document: Project Plan, Proposal, Sprint Backlog, Test Plan and Test Case. Design UI, UX for System. Test Product Research: ReactJS, GPS
Hoang, Nguyen Duc	Create Document: Database Design, Test Case. Design Database Research: API, QR Code
Hung, Le Van	Create Document: Product Backlog, Architecture Design Design Front End Research: Android, GPS, QR Code
Phong, Bui Duy	Create Document: Database Design, Architecture Design, Design Database Research: Android, face-api, QR Code, GPS

7. Project Constraints

Table 11. *Project Constraints*

Constraint	Constraints Description	Guidelines for Acceptance
Economic	Helping businesses save more costs instead of having to install cameras, fingerprint machines, card scanners	Elements for consideration are design costs, production costs, maintenance costs, operating costs, and sales price
Environmental	Reduce the amount of waste when using paper to time attendance, printing to synthesize reports, store data, ...	Impact of the design on the environment as well as 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	Anyone who wants to try it out can download and experience it first, of course, will be limited in functionality. The system does not exploit the user's information at all.	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	Reduce the risk of transmitting hand-borne diseases.	Includes safety standards as well as impact of the design on users (for example, electrical or physical hazards)
Social and Global	<ul style="list-style-type: none"> - Save time when timekeeping and reduce the possibility of fraud in timekeeping (time and attendance by face recognition and QR Code) - Easily manage employees (Time off shift, manage requests, location) - Easily track employee's location while on a business trip 	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	Change the timekeeping habits of employees	<p>Which cultural characteristics could influence the approach?</p> <p>How does the design from different cultures differ?</p>
Sustainability	It is necessary to maintain the continuous operation of the system, so as not to affect the real time Tracking.	Refers to sustainability of resources, including material, energy, supplies, manufacturing techniques, personnel, operation, and the need for additional infrastructure, as well as sustainability of the design including reliability, lifetime, durability, reusability, maintainability.

8. Conclusion

Timekeeping management is a tough problem that businesses need to solve. The TES team hopes to create a new timekeeping system to help businesses step by step solve the problem of optimizing this problem through intelligent functions.

We can apply smart timekeeping software in many different places such as businesses, schools, etc. And especially our Duy Tan University. With about 3 months and costs

about \$3456/system to do this project. Smart Timekeeping will optimize timekeeping and improve the disadvantages of traditional timekeeping.

9. References

Table 12. References

No .	References	Document Information
1	Scrum Model	https://en.wikipedia.org/wiki/Scrum_(software_development) https://www.atlassian.com/agile/scrum https://www.digitel.com/agile/scrum-methodology/ https://docs.microsoft.com/en-us/azure/devops/boards/sprints/best-practices-scrum?view=azure-devops https://www.scrum.org/resources/scrum-guide
2	Technical	https://www.npmjs.com/package/google-map-react https://reactnative.dev/docs/getting-started https://firebase.google.com/docs/admin/setup https://www.eff.org/pages/face-recognition https://www.mindk.com/blog/build-a-geolocation-app/ https://viblo.asia/p/location-based-services-trong-android-phan-2-mPjxMezgG4YL
3.	Software Engineering Standards	https://www.nws.noaa.gov/oh/hrl/developers_docs/General_Software_Standards.pdf https://standards.ieee.org/standard/12208-2017.html https://sw-eng.larc.nasa.gov/

10. Attachment

DESCRIPTION OF PRODUCT REQUIREMENTS FORM

DESCRIPTION OF PRODUCT REQUIREMENTS

Group: C1SE.02

Project: TES

Date: 19/08/2022

I. Short description of product ideas (less than 7 statements)

TES-TRACKING EMPLOYEE SYSTEM is an intelligent timekeeping system. The system applies facial recognition technology and QR Code to confirm employee attendance. In addition, the system also integrates GPS to record the travel schedule of employees when traveling on business trips.

II. Requirements

High-level Functional Requirements	1. Timekeeping by QR Code and facial Recognition
	2. Check in – Check out Room
	3. Tracking Employees by GPS
	4. Management request
	5. Statistic Report
	6. View Timesheet

	7. Employees Information Management
	8. View the map tracking

Quality Attributes Requirements (example related to issues: Ease Use, Easy to Like, Easy to Learn, Easy to Understand, Easy to Buy / Yes, ...)	1. Usability – Use efficiently
	2. Security - Each employee will only login to their own device, if they change the device, they must request for the system admin. When checkin users must use the school's wifi and stay on campus
	3. Portability and compatibility: The system is operated on a web-based platform and can run on many web browser.
	4. Have a user-friendly interface, color harmony, and clearness.
	5. The processing features are logical and easy to understand

Operation Requirements (related to issues: Speed, Accuracy, Performance, Stability, Load Resistance,	1. Fast page loading speed (1-3s)
	2. 24/7 performance (Tracking real time)
	3. High precision (Tracking with high accuracy)

Scalability, Safety, ...)	4. Reliability
---------------------------	----------------

Environment & Operation Requirements (related to issues: physical impacts on the environment, interact with relevant or existing systems, conditions for product commercialization, ...)	1. Operate on the internet
	2. Interact with relevant Firebase and maps.
	3. Web browsers: Google Chrome lastest version.
	4. Mobile: Android 10 and more, IOS 13 and more

Requirements for Maintenance & Support	1. With 95% performance
	2. 24/7 support
	3. Watch keeping by operators who monitor changes in equipment behaviour and raise a warning
	4. Equipment history record keeping system.
	5. Collect user feedback and monthly system maintenance

<p>Security/ Safety Requirements (related to issues: conditions of use / access to products, personal freedom, inspection, ...)</p>	<ol style="list-style-type: none"> 1. Clear authorization for each type of user and restrict access. 2. QRcode will random to secure 3. Check authentication 4. Check IP is using wifi of department when timekeeping.
--	--

<p>Culture Requirements</p>	<ol style="list-style-type: none"> 1. Change users' habits of timekeeping 2. The QRcode also been rated as than environmentally friendly and save of resources. 3. Help the school or Company build a civilized professional environment. 4. Culture according to international standards
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<p>Evaluate the complexity of engineering problems /Đánh giá mức độ phức tạp của các vấn đề kỹ thuật</p>	<ol style="list-style-type: none"> 1. Involving wide-ranging or conflicting technical issues 2. Having no obvious solution 3. Addressing problems not encompassed by current standards and codes
--	---

	X	4. Involving diverse groups of stakeholders
	X	5. Including many component parts or sub-problems
	X	6. Involving multiple disciplines
		7. Having significant consequences in a range of contexts

Standard requirements	X	1. Code standard. (GNU, Oracle standard for Java,...)
	X	2. Design standard. (design patterns, object-oriented analysis and design,...).
		3. IEEE (1058, 1540, 830, 1016, 829, 1012, 1008)
		4. ISO/IEC/IEEE 12207:2017 (TCVN 10539:2014); ISO/IEC 25051:2006(TCVN 10540:2014);
		5. Other standards. (related to specific topics)



Capstone Project 1

CMU-SE 450/CMU-IS 450

Project Plan

Version 1.4
Date: 29/11/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
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29/11/2022

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PhD. Man, Nguyen Duc 29/11/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	TRACKING EMPLOYEE SYSTEM		
Start Date	15 Aug 2022	End Date	16 Dec 2022
Lead Institution	International School, Duy Tan University		
Project Mentor	PhD. Man, Nguyen Duc		
Scrum master / Project Leader & contact details	H Na Ri, Mlo Email: narimlo2001@gmail.com Tel: 0886 912 935		
Partner Organization	Duy Tan University		
Project Web URL	https://tes-web.vercel.app/		
Team members	Name	Email	Tel
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REVISION HISTORY

Version	Date	Comments	Author	Approval
Draft	29/08/2022	Initiate Document	H Na Ri, Mlo	
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1.1	12/09/2022	Update WBS	H Na Ri, Mlo	
1.2	25/10/2022	Update Critical Dependency	H Na Ri, Mlo	
1.3	29/11/2022	Update Detailed Schedule	H Na Ri, Mlo	
1.4	10/12/2022	Update Quality Management	H Na Ri, Mlo	

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1. PROJECT OVERVIEW

1.1 Project Description

Project code	C1SE.02	Contract type	Internal Project
Customer	International School, Duy Tan University	End-User	Duy Tan University
Project Type	Internal	Project Manager/ Scrum master	H Na Ri, Mlo
Project Category	Development & Maintenance	Business domain	Resource Management
Application type	Business Applications		

1.2 Scope and Purpose

1.2.1. Purpose

Build an intelligent timekeeping system that applies facial recognition technology and a QR Code to confirm employee timekeeping. In addition, the system also integrates GPS to record the travel schedule of employees when traveling on business trips and other features such as: Check in/ Check out between rooms, managing employees, room committees, statistical reports, requirements management, etc.

Provide solutions for business needs and show system context and architecture overview.

Identify resources, time, budget, implement actual projects and ensure on schedule and budget.

1.2.2. Scope

- Provide smart timekeeping solutions for businesses and human resource management.
- Detect and locate employees while on business trips.
- Interaction between users and the map (of the business) right on the application.
- The focus of the project is on timekeeping and employee tracking. Meanwhile, management functions are built-in to create a complete picture of the system.
- Interact with external systems to support employee location and data storage.

1.3 Assumptions and Constraints

Table 1. Assumptions and Constraints

No	Description	Note
Assumptions		
1	Nodejs version v14.8.0 (or above) and lower version not supported.	Scope
2	Customer reviewers will get seven days to approve a milestone document. If no comments are received within this time, it will be considered as approved.	External Interfaces
Constraints		
1	The project is developed within 14 weeks and quarterly deployed on the market.	Schedule
2	The project shall conform to security requirements specified by the customer in the NDA	Security
3	The product operates at a high level of performance and has a page load of no more than 5 seconds.	Quality
4	The application operates in android 10 and iOS 14 (or above)	Scope
5	The project will be implemented by a team including 4 members	Resources
6	The financial estimation for the project is at a budget limit of \$3456	Budget

1.4 Project Objectives

1.4.1 Standard Objectives

Table 2. Standard Objectives

Metrics	Unit	Committed	Note
Start Date	dd-mmm-yy	15-Aug-22	
End Date	dd-mmm-yy	16-Dec-22	
Duration	days	90	
Team Size	Person	4	
Billable Effort	Person-day	5	
Number of work hours per day for one engineer	Person-hour	4	

1.4.2 Specific Objectives

- Based on human resources, allowable time, and budget, we will build a system using facial recognition technology, and a QR Code to timekeeping and tracking employees by GPS.
- The system operates with high performance and safety for the user. User security data is encrypted and stored carefully, avoiding data loss.
- The deployment system minimizes defects and good control of risks by the project team.
- Strengthen brand promotion activities and bring products to users.

1.5 Critical Dependencies

Table 3. Critical Dependencies

No	Dependency	Expected delivery date	Note
1	Openstreetmap	26/09/2022	Track employee's route
2	Firebase	30/09/2022	Store location tracking data

1.6 Project Risk

Table 4. Project Risk

Risk	Description	Probability	Impact	Risk exposure	Mitigation Strategy
Requirements	Internal contradictions that may exist in the request. Important requirements may be missing from the formal requirements specification.	4	5	20	Uniform requirements prior to analysis.
Estimates of project planning	The plan may be delayed for the initial estimate of the project.	3	4	12	Analysis and assessment of the scale. Reduce requirements.
Estimated project schedule	Too optimistic when estimating work for features. The feature takes a longer time than planned.	3	4	12	Time project was created to be updated and evaluated regularly.
Lack of technical	All members must learn new	3	3	9	Spend a lot of time for learning and

experiences	knowledge of programming languages				training
Communication	Team members can conflict with each other while discussing something related to the project.	2	4	8	Conduct a meeting to share knowledge, experience and learning methods.
Time	Teamwork time is limited because team members go to school and work at the same time	2	3	6	Schedule daily online meetings, encourage members to spend more time on the project
Health	Health may change during the project. An accident or incident may occur delaying the project.	2	3	6	The project plan has backup time to ensure that if there are any health risks, they will not interrupt the project.

2. PROJECT DEVELOPMENT APPROACH

2.1 Technical Process

2.1.1 Reasons for selecting

To keep up with today's increasingly changing technology trends, we want a flexible and easy project development model to adapt to that change. Our project will develop more new features in the future. We will continuously update and apply new technologies that increase the attractiveness and intelligence of the application.

Therefore, Applying the Agile Scrum model will help us to solve these problems, and bring a lot of experience and the best performance for project development.

2.1.2 Agile Methodology

Agile is an iterative approach to project management and software development that helps teams deliver value to their customers faster and with fewer headaches. Instead of betting everything on a "big bang" launch, an agile team delivers work in small, but consumable, increments. Requirements, plans, and results are evaluated continuously so teams have a natural mechanism for responding to change quickly.

Agile software development is more than frameworks such as Scrum, Extreme Programming, or Feature-Driven Development (FDD).

Agile software development is more than practices such as pair programming, test-driven development, stand-ups, planning sessions, and sprints.

Agile software development is an umbrella term for a set of frameworks and practices based on the values and principles expressed in the Manifesto for Agile Software Development and the 12 Principles behind it. When you approach software development in a particular manner, it's generally good to live by these values and principles and use them to help figure out the right things to do given your context.

2.1.2.1 Scrum Process

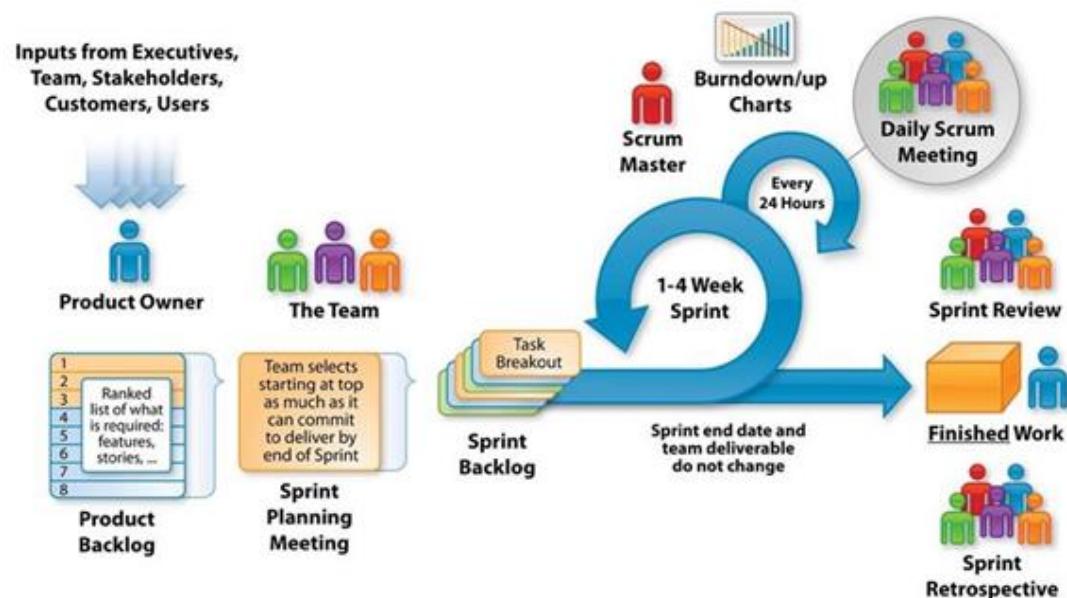


Figure 1. Scrum Framework

References to Scrum of C1SE.02-Proposal-TES.docx

2.2 Quality Management

2.2.1 Estimates of Defects to be detected

Pre-release review defects

Table 5. Pre-release review defects

Process	Pla	Actual found by review
Requirement	15	5
Design	10	12
Coding	35	20
Other	10	2
Total	70	39

Pre-release test defects

Table 6. *Pre-release test defects*

Process	Planned found by review	Actual found by testing
Requirement	15	5
Design	10	12
Coding	35	30
Other	10	2
Total	70	49

2.2.2 Strategy for Meeting Quality Objectives

Table 7. *Strategy for Meeting Quality Objectives*

Strategy	Expected Benefits
Do defect prevention using the standard defect prevention guidelines and process; use standards developed in ABC for coding.	10–20% reduction in defect injection rate and about 2% improvement in productivity
Group review of program specs for the first few/ logically complex use cases. Group review of design docs/first time-generated code by the project leader, developer, and one consultant.	Improvement in quality as overall defect removal efficiency will improve; some benefits in productivity as defects will be detected early
Introduction of RUP methodology and implementation of the project in iterations. Milestone analysis and defect prevention exercises will be done after each Iteration.	Approximately 5% reduction in defect injection rate and a 1% improvement in overall productivity

2.2.3 Quality Control

Table 8. Quality Control

Review Item	Type of Review	Reviewer	When
<work product to be reviewed>	Group review or One-person review	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy	Initial
Project plan Project schedule	Group review Group review One-person review	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy	End of Initiation stage
Design document, object model	Group review	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy	End of 90% design
Stage plans	One-person review	Man, Nguyen Duc	Beginning of each stage
Complex/first time generated program specs incl. test cases, interactive diagram	Group review	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy	End of detailed design
Code	Group review	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy	After coding for first few programs

2.2.4 Measurements Program

Table 9. Measurements Program

Data to be collected	Purpose	Responsible	When
Size: No. of KLOC// FP	Early estimate project cost	PM	At the end of stages
Effort: No. person-day	Calculate project effort for scheduling	Team members	Daily
Quality: No. defects detected	Early evaluate product quality and the feasibility of the project	Reviewer, QA	Right after the review/test
Schedule	Divide work and allocate resources properly, ensure the project is completed on time and on budget	PM	Weekly and at the end of stages

2.3 System Testing Strategy

We employ the following technique for system testing:

- Usability Testing: Test focuses on user-friendly, easy-to-interact interface, flexibility in handling controls, and ability of the system to meet project objectives.
- Functional Testing: Provide missing functionality, and a functions list that testers think are likely to affect the product.

We are using manual testing. Our goal is the failed test case should be lower than 10%.

3. ESTIMATION

3.1 Size

Table 10. Value Adjustment Factor

No.	VAF	Weight: 0 ~ 5
1	Data communications	4
2	Distributed data processing	1
3	Performance	4
4	Heavily used configuration	2
5	Transaction rate	3
6	On-Line data entry	3
7	End-user efficiency	4
8	On-Line update	3
9	Complex processing	3
10	Reusability	2
11	Installation ease	0
12	Operational ease	3
13	Multiple sites	2
14	Facilitate change	4
		38

3.2 Effort

The Effort estimation is documented in <C1SE.02-SprintBacklog-TES>

3.3 Schedule

3.3.1 Project Milestone & Deliverables

Table 11. Project Milestone & Deliverables

No.	Task Name	Duration (days)	Start	Finish
1	Initial	15	15/08/2022	31/08/2022
1.1	Project's Kick-off Meeting	1	15/08/2022	15/08/2022
1.2	Collect and analyze requirements	4	16/08/2022	19/08/2022
1.3	Research technical	5	22/08/2022	26/08/2022
1.4	Setup Development Environment	3	29/08/2022	31/08/2022
2	Development	60	05/09/2022	27/11/2022
2.1	Sprint 1	15	05/09/2022	25/09/2022
2.2	Sprint 2	15	26/09/2022	16/10/2022
2.3	Sprint 3	15	17/10/2022	06/11/2022
2.4	Sprint 4	15	07/11/2022	27/11/2022
3	Close project	15	28/11/2022	16/12/2022
Total		90		

3.3.2 Work Breakdown Structure

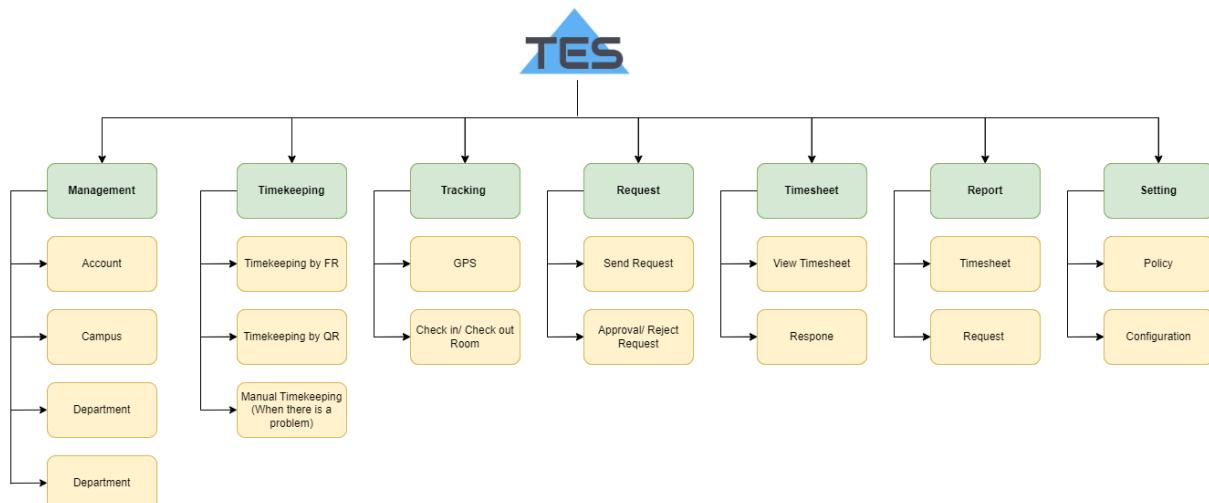


Figure 2. Work Breakdown Structure

3.3.3 Detailed Schedule

Table 12. Detailed Schedule

No.	Task Name	Duration (Days)	Start	Finish	Assign to
1	Initial	15	15/08/2022	31/08/2022	Team
1.1	Project's Kick-off Meeting	1	15/08/2022	15/08/2022	
1.2	Collect and analyze requirements	4	16/08/2022	19/08/2022	
1.3	Research technical	5	22/08/2022	26/08/2022	
1.4	Setup Development Environment	3	29/08/2022	31/08/2022	
2	Development	60	05/09/2022	27/11/2022	Team
2.1	Sprint 1	15	05/09/2022	25/09/2022	Team
	Develop Authentication				Team
	Develop Account Management				Team
	Develop Campus Management				Team
	Develop Department Management				Team
	Develop Home				Team
2.2	Sprint 2	15	26/09/2022	16/10/2022	Team
	Develop Room Management				
	Develop Timekeeping by QR				
	Develop Check in/Check out room				
	Develop View Maps Tracking				
	Integrate map checking places				
2.3	Sprint 3	15	17/10/2022	06/11/2022	Team
	Develop Create Request				Team
	Develop Approval Request				Team
	Develop Timekeeping by Facial Recognition				
	Develop Timesheet				Team
	Develop User Profile				Team
2.4	Sprint 4	15	07/11/2022	27/11/2022	Team
	Develop Dashboard				

	Develop Report				Team
	Develop Configuration Management				Team
3	Close project	15	28/11/2022	16/12/2022	Team, mentor
	Duration	90			

3.4 Resource

Specified as in the section *Project Team*

3.5 Infrastructure

Table 13. Infrastructure

Work/Product	Purpose	Expected Availability by	Note
Development Environment			
Windows 10	Operating System	Initiation stage	
MySQL, Firebase, AWS S3 Bucket	DBMS	Initiation stage	
JavaScript	Development language	Initiation stage	
React, React Native, Express.js	Frameworks, libraries for development	Initiation stage	
Hardware & Software			
Figma	UI Design & prototype	Implementation stage	
Diagrams.net (Draw.io)	Architecture design	Planning stage	
Other Tools			
Git, GitHub	Source version control	Definition stage	
Trello	Task Tracking	Initiation stage	
Google Sheet	Effort logging	Initiation stage	
Microsoft 365	Managing documents	Definition stage	
Zoom, Google Meet	Meeting online	Initiation stage	
Slack	Task discussion	Initiation stage	

3.6 Training Plan

Table 14. Training Plan

Training Area	Participants	When, Duration	Waiver Criteria
Technical			
JavaScript Language	All member	7 days	If already trained
React Native	All member	7 days	If already trained
Face API	Phong, Bui Duy	7 days	Mandatory
OpenStreetMap	Hung, Le Van	7 days	Mandatory
Business domain			
Human Resource Management	All member	4 days	
Timekeeping	All member	3 days	
Process			
Quality system	All member	3 hrs	If already trained
Configuration management	All member	2 hrs	If already trained for CC. For others, on-the- job training
Group review	All member	4 hrs	If already trained
Defect prevention		4.5 hrs	Mandatory
SPC tool		4.5 hrs	If already trained
RUP methodology		2 hrs	Mandatory

4 PROJECT ORGANIZATION

4.1 Organization Structure

Table 15. *Organization Structure*

Role	Responsibility	Name
Scrum Master	<ul style="list-style-type: none"> – Communicate the value of Scrum – Teach the organization on Scrum to maximize business value – Preserve the integrity and spirit of the Scrum framework – 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 – As a timekeeper – Helping the team agree on what they can achieve during each development sprint (or other period of time). – Facilitating the daily standup (sometimes called the daily scrum) and helping the team reach consensus on each of the three questions. – Helping the team continuously make progress on the project by making sure each person is working on the right tasks, helping to remove any obstacles to the team members' progress, and protecting the team from distractions. 	H Na Ri, Mlo

Product Owner	<ul style="list-style-type: none"> – A spokesperson for the customer and needs to represent them – Gathers, manages, and prioritizes the product backlog. – Has technical product knowledge or specific domain expertise. – Tracks progress towards the release of a product. 	Phong, Bui Duy
Developer	<ul style="list-style-type: none"> – Responsible for quality – Responsible for delivering the potentially shippable product of the Application each sprint – Report progress based on the remaining time – Self-organized – Owns the Sprint backlog 	All members
Mentor	<ul style="list-style-type: none"> – Guide on the process. – Monitoring all activities of the Team. – Help with anything. – Reviews project documents – Reviews product 	PhD. Man, Nguyen Duc

4.2 Project Team

Table 16. Project Team

Full Name	Position
H Na Ri, Mlo	Scrum Master, Dev-team
Phong, Bui Duy	Product Owner, Dev-team
Hung, Le Van	Dev-team
Hoang, Nguyen Duc	Dev-team

5. COMMUNICATION & REPORTING

Table 17. *Communication & reporting*

Topic / Deliverable	Frequency	Method	Audience / Attendees
Daily meeting	Daily	Face to Face / Zoom Meeting / Slack Chat	Scrum Master, Members
Sprint Planning Meeting	When starting a sprint	Zoom Meeting	Scrum Master, Members
Sprint Review Meeting	When finishing a sprint	Face to face, Zoom Meeting	Scrum Master, Members, Mentor
Sprint Retrospective	When the sprint review finish	Face to Face	Scrum Master, Members
Individual Meeting	When need	Face to Face, Zoom Meeting, Message	Scrum Master, Members
Working report, review problems	Once a week	Face to face	Scrum Master, Members, Mentor

6. CONFIGURATION MANAGEMENT

No	Tool	Content
1	Trello	Track member activities. At the end of the day, team members will post on time log and Scrum Master will check.
2	Microsoft 365	Track the changing of documents & manage versions of documents.
4	Google Drive	Store document resources and designed component
5	GitHub	Repositories for source code version management
6	Postman	Management, test and modify APIs

7. SECURITY ASPECTS

- The credential data is carefully secured by multi-layer encryption and data integrity is ensured. Regularly back up system data.
- Research on network attack prevention solutions to ensure data security, avoid being exploited and stolen data by hackers.
- Deploy project architecture with a high priority in security. Optimized architectural solutions enable the deployment of data security with 99% reliability.

8. REFERENCES

No	References	Document Information
1	Scrum Model	https://en.wikipedia.org/wiki/Scrum_(software_development) https://www.atlassian.com/agile/scrum https://www.digitel.com/agile/scrum-methodology/ https://docs.microsoft.com/en-us/azure/devops/boards/sprints/best-practices-scrum?view=azure-devops https://www.scrum.org/resources/scrum-guide
2	Technical	https://www.npmjs.com/package/google-map-react https://reactnative.dev/docs/getting-started https://firebase.google.com/docs/admin/setup https://www.eff.org/pages/face-recognition https://www.mindk.com/blog/build-a-geolocation-app/ https://viblo.asia/p/location-based-services-trong-android-phan-2-mPjxMezgG4YL
3.	Software Engineering Standards	https://www.nws.noaa.gov/oh/hrl/developers_docs/General_Software_Standards.pdf https://standards.ieee.org/standard/12208-2017.html https://sw-eng.larc.nasa.gov/



Capstone Project 1

CMU-SE 450/CMU-IS 450

Product Backlog & User Story

Version 1.2
Date: 10/12/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
C1SE.02

Hoang, Nguyen Duc
Hung, Le Van
H Na Ri, Mlo
Phong, Bui Duy

Approved by

Proposal Review Panel Representative:

Name	Signature	Date
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10/12/2022

Capstone Project 1- Mentor:

Name	Signature	Date
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PhD. Man, Nguyen Duc

10/12/2022

Product Backlog

Id	As a	Epic	I want to ..	so that ..	Acceptance Criteria	Priority	Sprint No	Status	Remarks
PB01	Employee	Authentication	Login with my account	I can access the system	- Already have an account in the system. - Enter the correct username, password. - Each user can only log in on 1 device => Click Request to add another device	1	1	DONE	
PB02	Employee	Authentication	Reset my password	I can change my password when I forgot it.	- The email requesting password reset must exist in the system. - Enter the correct code sent to the email. - The code requesting reset the password is only valid for 5 minutes.	3	1	DONE	
PB03	Employee	Profile	View my profile	I can view my personal information	- Click on the avatar to see the profile details. - Show Read-only View => Click the ""edit"" icon to edit.	4	2	DONE	
PB04	Employee	Profile	Update my profile	I can edit my personal information	- Do not edit username and email. - Do not change the role and department. - User can upload photos to change avatars.	4	2	DONE	
PB05	Employee	Profile	Change my password	I can change when I forgot my password	- The new password must not be the same as the old one. - Confirmation email valid for 24 hours	4	2	DONE	
PB06	Employee	Timekeeping	Timekeeping by Facial Recognition	I can timekeeping quickly and accurately	- The face when the timekeeping must be the same with the registered one - Do not make mistakes more than 3 times - Successful timekeeping => Start counting working time. - Update Timekeeping status on Timesheet and Dashboard."	1	3	DONE	
PB07	Employee	Timekeeping	Timekeeping by QR Code	I can use the QR code every day for timekeeping.	- Wifi when timekeeping must coincide with the field wifi IP. - Each account is only timekeeper on the device. - Each department has 1 fixed QR code - Success time time => start working time. - Timekeeping status on Timesheet and Dashboard.	1	2	DONE	
PB08	Employee	Timekeeping	View my timekeeping information	I can know that I have successfully attended	- After employee the timekeeping shows the timekeeping timeline in homepage	1	2	DONE	
PB09	Employee	Timekeeping	View Timesheet	I can check if my attendance history is correct	- See the weekly table - By default show the current week - Click Calendar to select another week	2	3	DONE	
PB10	Employee	Tracking	Check in when I get to the rooms	I can know which department I visited that day? Who did I meet?	- If the user has not checked out the old room -> automatically check out. - Update on Timeline and Tracking Room Report.	1	2	DONE	
PB11	Employee	Tracking	Check out	I can check in another room	- Automatically check out when the user checks in another room	1	2	DONE	
PB12	Employee	Tracking	View Timeline	I can review the departments I visited	- Display the latest check in history first. - Display Timeline of the current day	1	2	DONE	
PB13	Employee	Tracking	View GPS maps	I can see my current location and the departments I have checked in	- Show the current position of the employee - Can move to another position on the map	1	2	DONE	
PB14	Employee	Tracking	View my tracking GPS information	I can review my route	- Show the closest check in - Show the check in time and place	1	2	DONE	
PB15	Employee	Request	Create a request	I can submit a leave request, go on a business trip quickly	- Send notice to the approval and the notified person. - Required time > the current time. - Show the remaining number of days.	3	3	DONE	

PB16	Employee	Request	View list request	I can view and manage all my requests	- Displayed at first order requirements - Display the status of the requirement	3	3	DONE	
PB17	Employee	Request	Cancel request	I can cancel if I don't want to request anymore	- Send notice to the approval and the notified person. - Unable to do it - Only canceled if the request has not been approved	3	3	DONE	
PB18	System Admin	Account Management	Create Account	Users will have an account to access the system	- Fill in compulsory fields. - Email is not coincided with accounts that have existed in the system. - Send Randomly Username and Password to User via email address. - The account activation URL exists only within 24 hours. - Role: President and Head of Personnel only 1 person	1	1	DONE	
PB19	System Admin	Account Management	View List Account	So that I can easily view and manage all Account.	- Show in the latest order - You can choose a page to see 8,10,20,50 users/page	1	1	DONE	
PB20	System Admin	Account Management	Edit Account	I can update User information	- Immediately update at the list and account. - Do not edit email - Do not change the Role Super Admin if the system has only 1 Super Admin. - Do not change Role President	1	1	DONE	
PB21	System Admin	Account Management	Delete account	Delete the account of the employee who is no longer working at the company	- User is not accessible to the system. - Do not delete user data. - Send an email notification to the user. - Do not delete the GREL SUPER admin if the system has only 1 Super Admin. - Do not edit Role President, Head of President if the system has existed.	1	1	DONE	
PB22	System Admin	Account Management	Filter Account	I can filter account by username, department, role or email	- System return results immediately - If there is no matching results => show "no data"	1	1	DONE	
PB23	System Admin	Campus Management	Create campus	I can create new campus	- Campus name is not overlapping - The campus position is not overlapping - The new campus creates the top position	1	1	DONE	
PB24	System Admin	Campus Management	View List Campus	So that I can easily view and manage all campus.	- Currently in the latest order	1	1	DONE	
PB25	System Admin	Campus Management	Edit campus	I can update campus information	- Immediately update on the Campus list	1	1	DONE	
PB26	System Admin	Campus Management	Delete campus	I can Delete the department	- Show Popup Confirm	1	1	DONE	
PB27	System Admin	Department Management	Create department	I can create new department	- The name of the department is not overlapping - Must choose Campus for each department - The new Department creates the top position	1	1	DONE	
PB28	System Admin	Department Management	View List Department	So that I can easily view and manage all departments.	- Currently in the latest order	1	1	DONE	
PB29	System Admin	Department Management	Edit department	I can update department information	- If there is no change, disable button "Save"	1	1	DONE	
PB30	System Admin	Department Management	Delete department	I can delete the department	- Show Popup Confirm - Remove Department from Campus	1	1	DONE	
PB31	System Admin	Room Management	Add room	I can Create new room	- The name of the room and 1 campus is not overlapping - The new room creates the top position in each campus - Automatically create QR Code if creating a successful room	1	2	DONE	
PB32	System Admin	Room Management	View List Room	So that I can easily view and manage all room.	- See the room list according to Campus - Show in the latest order	1	2	DONE	

PB33	System Admin	Room Management	Edit room	I can update room information	- Update instant change - Do not edit Campus => Disable Field Campus	1	2	DONE	
PB34	System Admin	Room Management	Delete room	I can Delete the room	- Show Popup Confirm - After deletion, the user cannot check in	1	2	DONE	
PB35	System Admin	Setting Config	Setting location	Employees are only allowed to check-in within the school premises	- Auto search location when user enters location - Enter the location manually when the user clicks on the "Manual input" check box, default is not checked - All fields are required	3	4	DONE	
PB36	System Admin	Setting Config	Setting wifi address	Employees are only allowed to check-in within wifi of shool	- Auto fill ipv4 input when user selects "Current wifi address" - All fields are required	3	4	DONE	
PB37	System Admin	Setting Config	Setting time in , time out	I can Customize working time in, time out	- Fill check in and check out is required	3	4	DONE	
PB38	System Admin	Request device	View list request device	I can Receive request device from employee	- List view sort by created date - Show popup "successfully" when approve success	3	4	DONE	
PB39	System Admin	Request device	Approval request device	Employees can log in on their new device	- Send notifications to users - Allow user to login from new device	3	4	DONE	
PB40	President	Report	View Report	I can monitor and make better decisions	- Default is current month	3	4	DONE	
PB41	President	Report	Export Report	I can download it to see the details or send it to someone else	- Download file in excel format	3	4	DONE	
PB42	President	Request	Approval	I can approve requests from the Personnel Department and Dean or approve urgent requests	- Send notifications to User - Change the status of the request - Update changes at timesheet	3	4	DONE	
PB43	President	Request	View Dashboard	I can see the business picture quickly & comprehensively.	- Realtime update - Default display latest	3	3	DONE	



Capstone Project 1

CMU-SE 450/CMU-IS 450

Architecture Design

Version 1.5
Date: 12/12/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
C1SE.02

Hoang, Nguyen Duc
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12/12/2022

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Name Signature Date

PhD. Man, Nguyen Duc

12/12/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	TRACKING EMPLOYEE SYSTEM		
Start Date	15 Aug 2022	End Date	16 Dec 2022
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REVISION HISTORY

Version	Date	Comments	Author	Approval
Draft	22/08/2022	Initiate Document	Hung, Le Van, H Na Ri, Mlo	
1.0	29/08/2022	Update diagram module view, C&C, workflow	Hung, Le Van Phong, Bui Duy	
1.1	05/09/2022	Update diagram Allocation View	Hung, Le Van	
1.2	19/10/2022	Update document and fix diagram	Hung, Le Van, H Na Ri, Mlo	
1.3	20/10/2022	Update technical constraints	Hung, Le Van	
1.4	22/11/2022	Update diagram, prose, and table description	Hung, Le Van	
1.5	12/12/2022	Update allocation	Hung, Le Van	

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1. Introduction

1.1 Project overview

TES-TRACKING EMPLOYEE SYSTEM is an intelligent timekeeping system. The system applies facial recognition technology and QR Code to confirm employee attendance. In addition, the system also integrates GPS to record the travel schedule of employees when traveling on business trips and other features such as: Check in/ Check out between rooms, managing employees, rooms committees, statistical reports, requirements management, etc. TES makes management faster, simpler and easier.

1.2 Purpose

This specification covers following:

- Brief specification of the project, high level requirement.
- Detailed quality attribution.
- System context, sequence diagrams.
- Architecture presented by various view types: Component and Connect, Module view and Allocation view.

1.3 Business driver

1.2.1 Business Problems:

- Fingerprint timekeeping still has many hidden corners, employees can enter timekeeping and leave the workplace at any time if desired, fingerprints are sweaty, the device will not be recognized.
- The timekeeping by fingerprint and card scanner is difficult for personnel to move the timekeeper and takes a lot of time if the company has many employees...
- It takes a lot of effort and cost when investing in equipment.
- Time-consuming if the company has many employees.
- Current software cannot solve the problem of tracking employees in different departments.
- Takes a lot of paperwork to store
- Statistics take time
- Unable to track statistics
- Can't control whether employees really go on business or not?

1.2.2 Business Need:

- Smart timekeeping software can track employees
- Timekeeping by QR code
- Check in according to different departments
- Tracking employee location by GPS
- Data statistics report
- Manage employee requests
- Automatic timesheet of employees
- Time attendance by facial recognition on the phone to save machine costs.
- Can manage branches and departments.

2. Architecture driver

2.1 Business constraints

- Sources: 4 people.
- Project was started on: 15/08/2022.
- Project will be ended on: 16/12/2022.
- Project will be finished in 90 days.
- Cost: \$3456.

2.2 Technical constraints

Table 1. *Technical constraints*

Technical to develop	
Programming Language	JavaScript
Frameworks/Libraries	Frontend: ReactJS, Redux, OpenStreetMap, Ant Design, Tailwind Backend: NodeJS (ExpressJS) Mobile: React Native, Expo, NativeBase (for styling)
Database	MySQL, Firebase (Firestore), AWS S3 Bucket
Another	QR Code, face-api
Environment	
Web browsers	Google Chrome, Fire Fox, Opera.
App environment	iOS and Android
Operation systems	Microsoft Windows, Ubuntu,

2.3 Functional requirement

References to Product Backlog specification of C1SE.02-ProductBacklog-TES.docx

2.4 Quality attributes

2.4.1 Utility table

There are the following quality attributes that drive the design of architecture. Each quality attribute scenario is ranked with importance (I) defined by the Product Owner, and the estimated level difficulty (D). Both values are based on a scale of High (H) - Medium (M) - Low (L).

2.4.2 Quality attributes

2.4.2.1 Security

Scenario: When employee logs in for the first time, the system will recognize the user's original device, then the employee changes the device to log in the app

Type	Security
Stimulus	Login
Source of stimulus	Employee
Environment	In runtime
Artifact stimulated	Mobile devices
Response	The system will report an error and recommend the user submit a request for a new device
Response measure	less than 5 seconds

Scenario: When a user checkin using facial recognition outside the school campus

Type	Security
Stimulus	Check-in
Source of stimulus	Employee
Environment	In runtime
Artifact stimulated	Mobile devices
Response	Failed to check-in and reported an error about the employee being not in the designated area and not using the school's wifi
Response measure	Less than 8 seconds

2.4.2.2 Performance

Scenario: When an employee check-in by facial recognition, the system will check and analyze the face of the timekeeper and respond less than 10 seconds.

Type	Performance
Stimulus	Check-in by facial recognition
Source of stimulus	Employee
Environment	In runtime
Artifact stimulated	Mobile devices
Response	The system recognizes faces, analyzes and then responds to the results
Response measure	less than 10 seconds

Scenario: Staff scans the QR code, the system will analyze and return the result in less than 3 seconds

Type	Performance
Stimulus	Scan QR code
Source of stimulus	Employee
Environment	In runtime
Artifact stimulated	Mobile devices
Response	The system receives requests, analyzes and responds to the results
Response measure	less than 3 seconds

2.4.2.3 Usability

Scenario: Users log in with the account provided by the system, If the user does not remember the password, they can use the forgot password function using the verify OTP sent via email to reset the password

Type	Usability
Stimulus	Reset password when user forgot login password
Source of stimulus	User
Environment	In runtime
Artifact stimulated	Mobile devices, Web
Response	Verify OPT from email and then reset password
Response measure	OTP code is valid for 5 minutes

Scenario: Staff can check-in by QR code or facial recognition

Type	Usability
Stimulus	Check-in
Source of stimulus	The employee
Environment	In runtime
Artifact stimulated	Mobile devices
Response	The system receives the request and responds to the check-in results
Response measure	less than 5 seconds

2.4.2.4 Correctness

Scenario: The system will analyze and summarize the employee's payroll according to the data in the database, the timesheet will be correct with the day you went to work.

Type	Correctness
Stimulus	Report timesheet
Source of stimulus	System
Environment	The system
Artifact stimulated	Mobile phone
Response	The timesheet by excel
Response measure	Correct quantity of working days

Scenario: When the user turns on the GPS tracking mode, the system will record exactly where you have passed

Type	Correctness
Stimulus	GPS tracking
Source of stimulus	Employee
Environment	Runtime
Artifact stimulated	The system
Response	Save location
Response measure	The system only records the location each 3 minutes one times and user moves more than 5 meters.

3. Architecture overview

This section shows the diagrams which bounds our target system and describes the architecture and interaction between components.

3.1 System Context Diagram

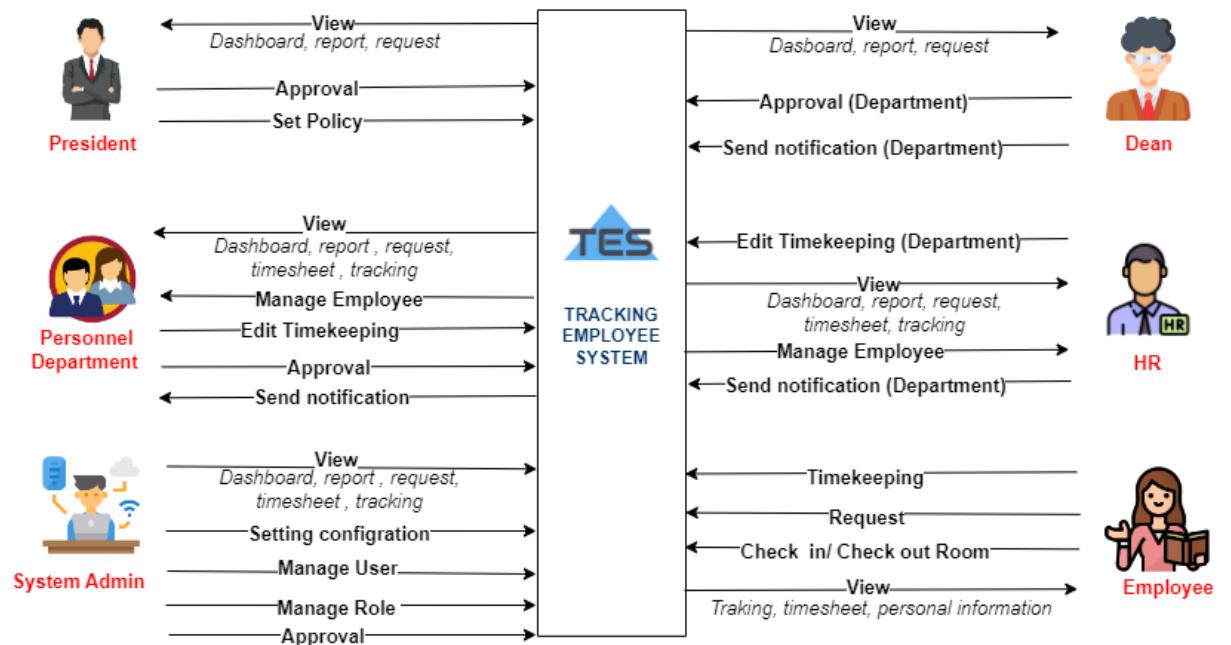


Figure 1. System Context Diagram

References to Engineering Approach of C1SE.02-Proposal-TES.docx

3.2 Component and connector

We mainly used a C&C view to argue and reason about architectural properties, quality attribute requirements, and functional requirements that the system must add here.

This view type partitions the system into components that have some runtime presence such as processes, objects, data stores, and connectors or that represent pathways of communication such as data flows and access to shared storage.

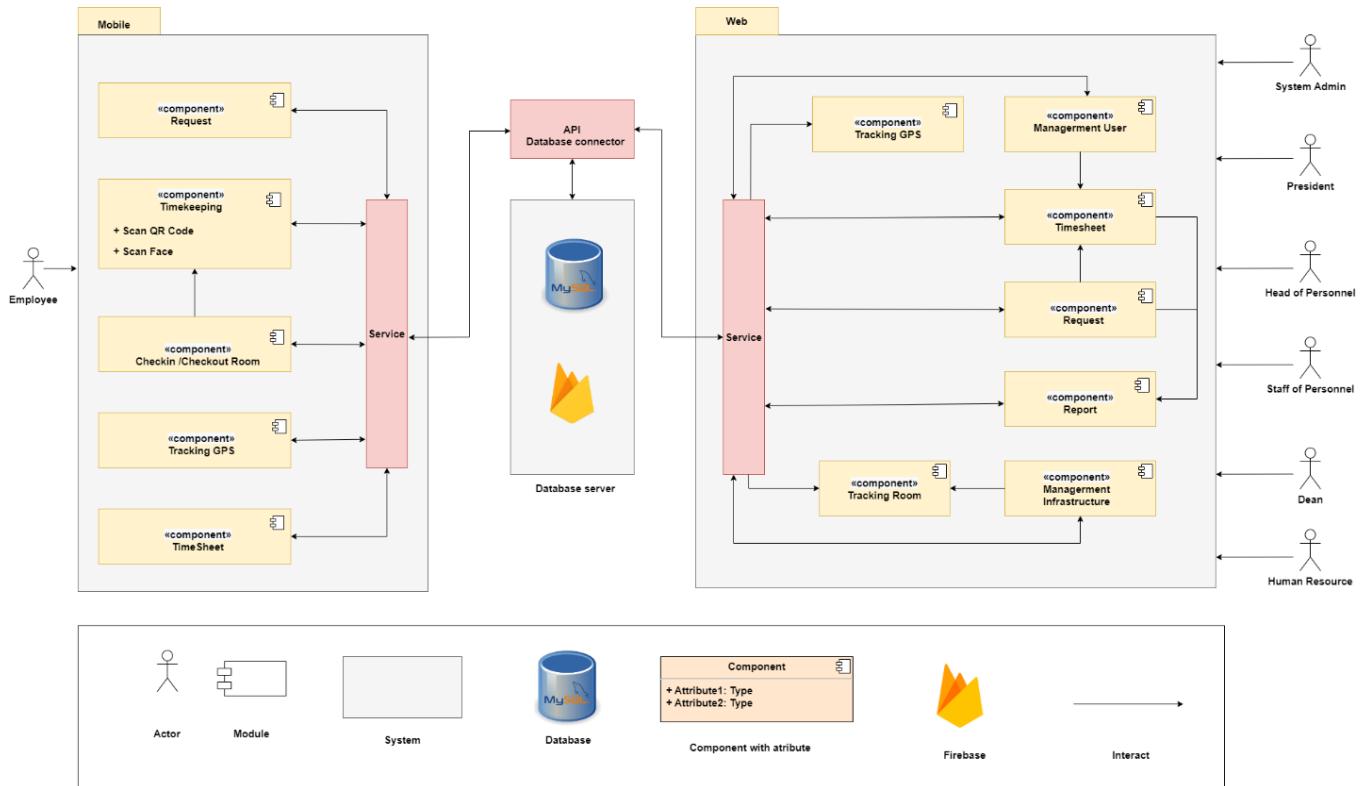


Figure 2. C&C view

Prose

The web client sends and receives data from the server through the web service API. User operations will send requests to the server through the API, the server will process the data with the corresponding models and access the database to retrieve data, then respond to the information to the web client through the API to display it to the user.

Element	Responsibilities
Service	Web Service is a component that manages and performs activities related to retrieval and storage of data such as get the user list, user authorization...
API Database Connector	This is a server that contains the entire API of the system, the API that also provides the whole web and app
Database server	Database is a component which contains information of users, department, campus, room, location... All data the system needs
Request	Request is a component of handling employee requests, requests such as remote, vacation, late arrival, business trip, etc. will be processed at the Component Request.
Timekeeping	Timekeeping is a component that processes requests including time checkin using QR codes and facial recognition
Checkin/Checkout Room	Checkin/Checkout is a component that handles when users check in the QR code when entering the room and checkout when leaving the room
Tracking GPS	Tracking GPS is a component that handles when the user goes outside of the school and has GPS tracking enabled
Timesheet	Timesheet is a component that manages employee's attendance information
Management User	Timesheet is a component that manages employee's information
Management Infrastructure	Management Infrastructure is a component that manages room, campus and department
Report	Report is a component that manages and file report timesheet and statistics chart

3.3 Workflow diagram

A workflow diagram is a visual layout of a process, project or job in the form of a flow chart. It's a highly effective way to impart the steps more easily in a business process, how each one will be completed, by whom and in what sequence.

3.3.1 QR Code

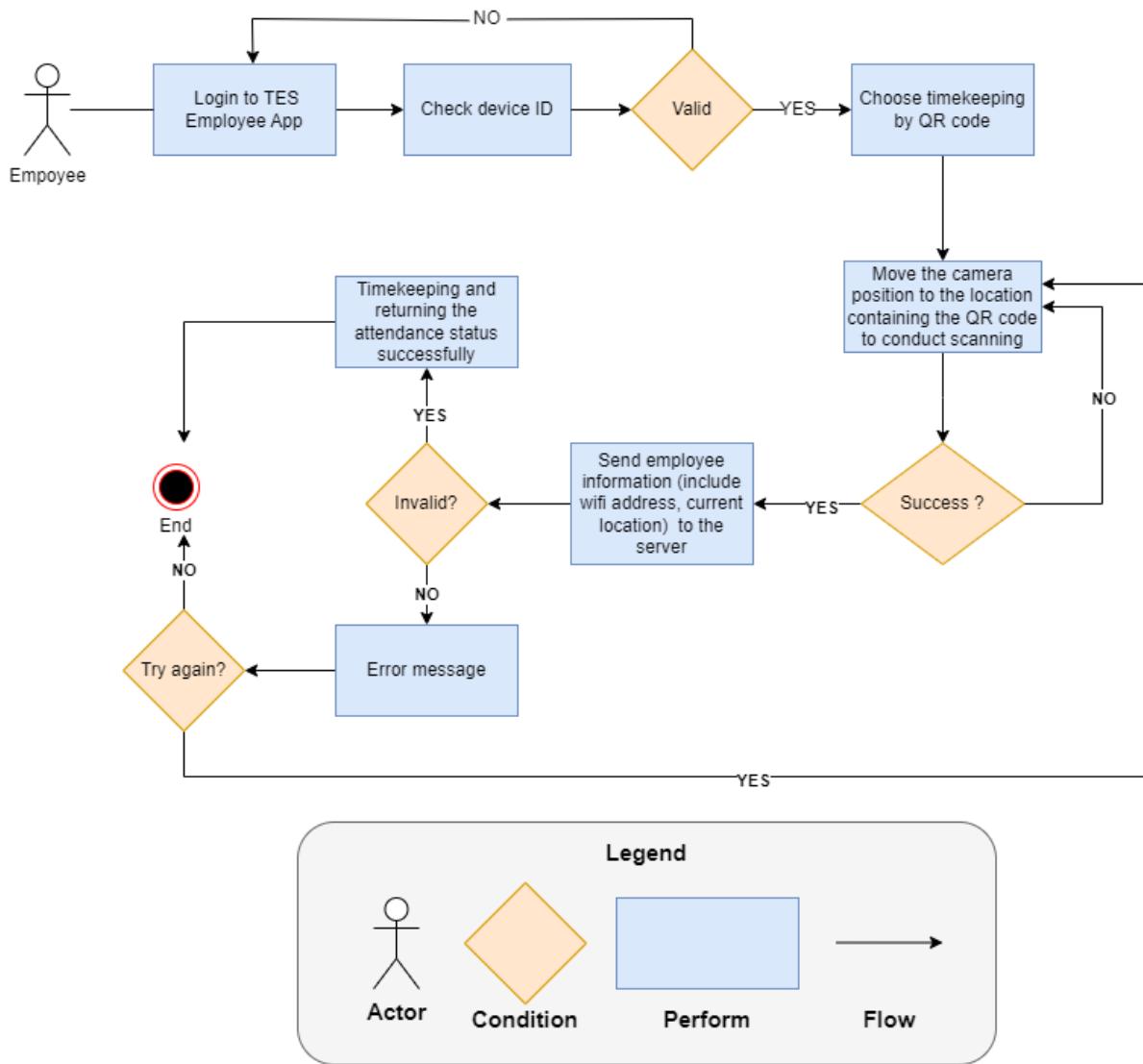


Figure 3. Workflow of Timekeeping by QR Code

Description:

- Employees use their phones to scan QR codes for timekeeping and room tracking
- The person scanning the QR must be in the school area and use the school wifi.

3.3.2 Facial Recognition

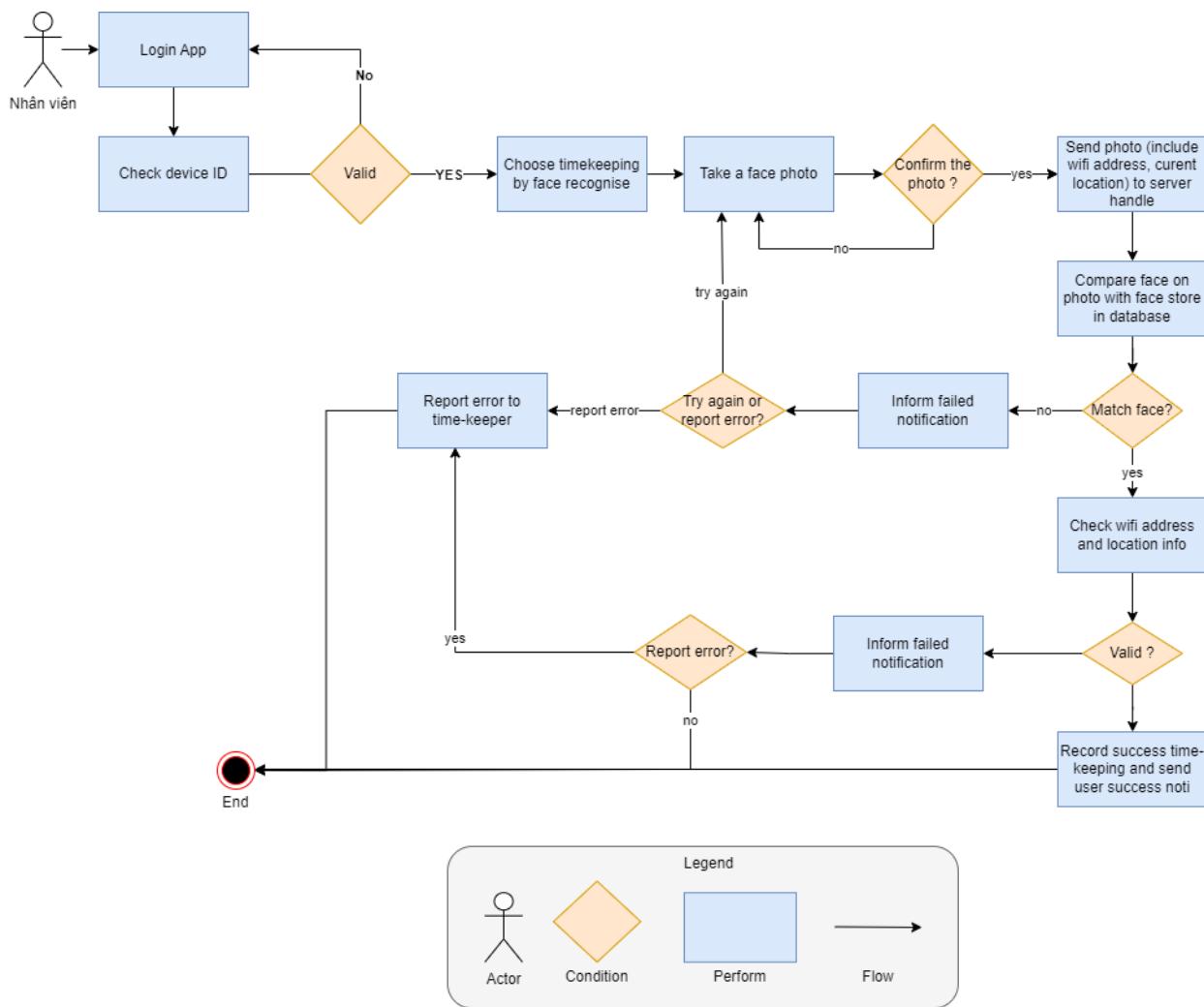


Figure 4. Workflow of Timekeeping by Facial Recognition

Description:

- Employees use their phones to scan their faces for timekeeping.
 - The person scanning the face must be in the school area and use the school wifi.

3.3.3 GPS Tracking

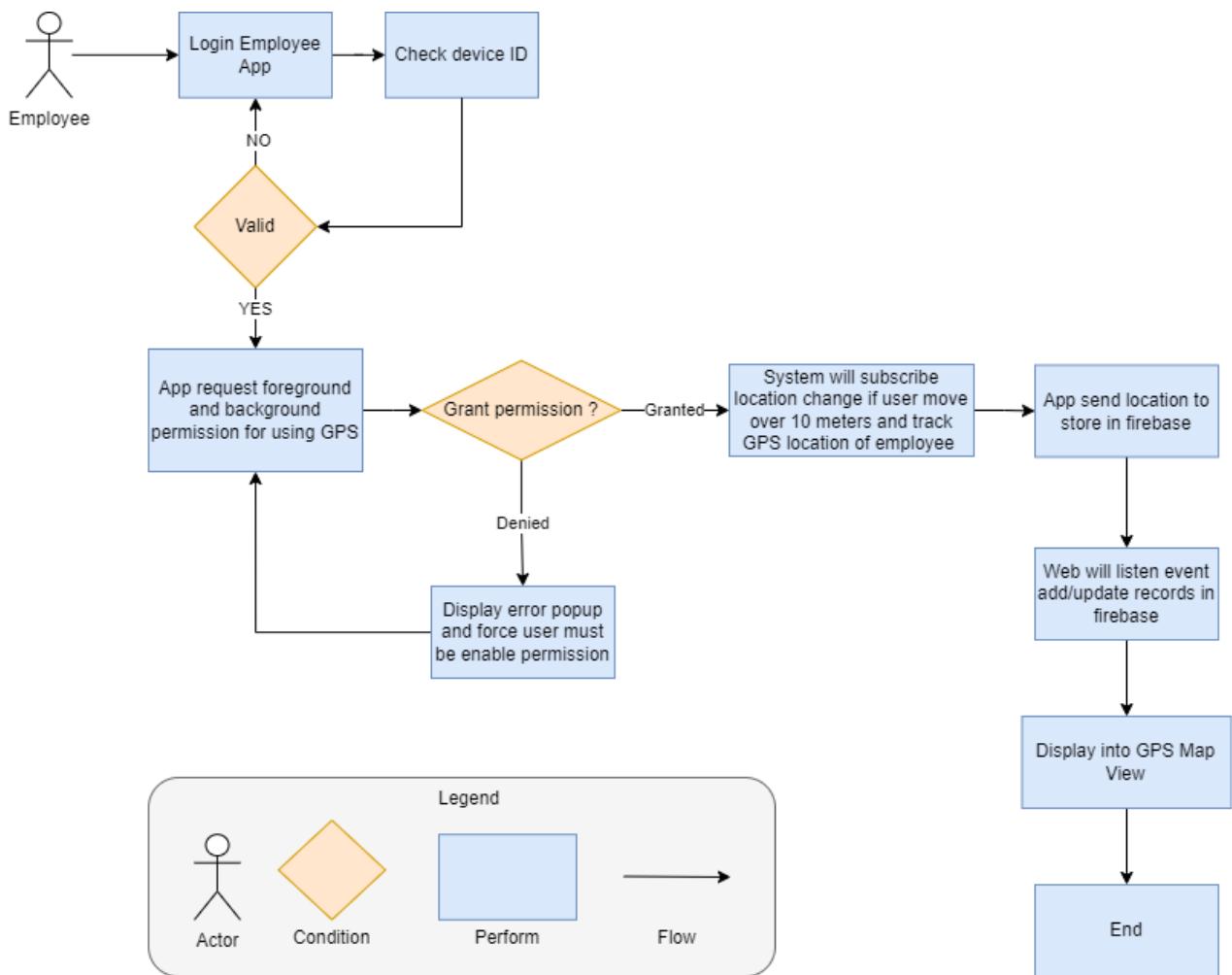


Figure 5. GPS Tracking

Description:

- Users will turn on GPS tracking mode when leaving the school campus, and GPS data will be stored and served for employee tracking and tracing in times of need (epidemic).

3.4 Module view

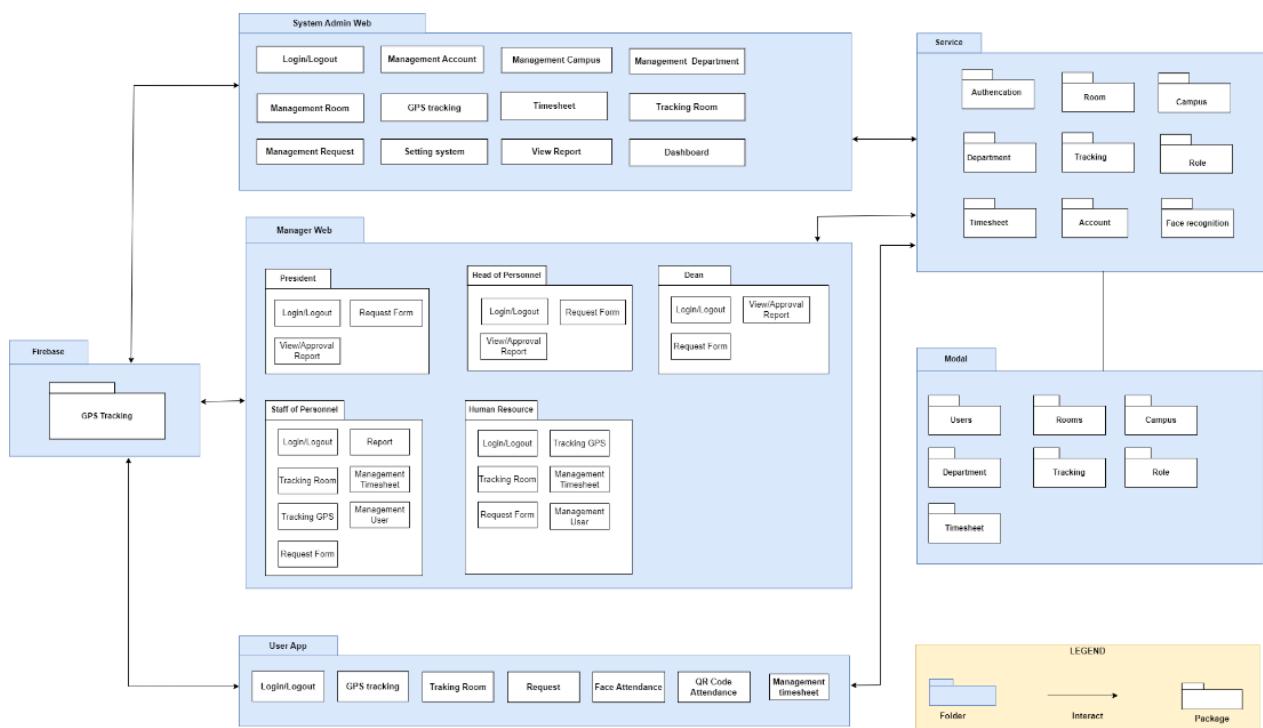


Figure 6. Module View

Prose

Web and mobile app are 2 platforms of TES users, web and mobile will use through service, this is the place to receive requests and is responsible for handling logic and the modal is where TES database design.

Element	Responsibilities
System admin web	Web version for system admin, fully functional and can execute all features
Manage web	Web version for management, will perform specific functions in scope role
User app	Used for school employee, lecturers
Service	Provide API for web and app
Modals	Object data modules connect to tables in the database for transmission to the system interface
Firebase	Use firestore to store GPS data

3.5 Allocation view

The allocation view models the run-time architecture of a system. It shows the configuration of the hardware elements when the system is deployed.

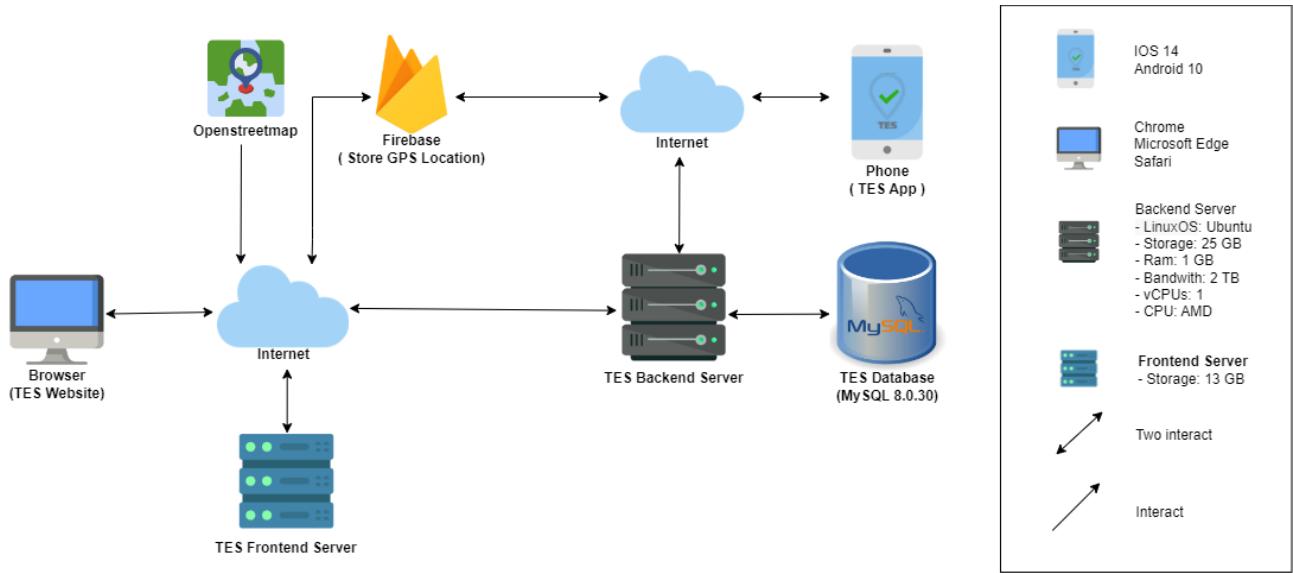


Figure 7. Allocation view

Prose

The system admin and manager use the web in the browser, through the internet to request resources from a web server, third party (firebase and OpenStreetMap), and send requests to the API server. The API server is a component that contains the service API responsible for handling system logic and interacts directly with the database. Similarly, the mobile app will also use the internet to send requests to the API server and firebase.

Element	Responsibilities
TES App	Employee use this device to install and use TES app.
TES Website	TES website is accessed on browser, users of TES website are system admin, head of personnel, staff of personnel, dean, human resource.
Firestore	Use firestore to store GPS data.
TES Backend server	This is where the backend source code is stored. Backend server contain API service to provide API for web and app. As the place to handle the logic of the system, receive requests from the website, process data.
TES Database server	As a place to store data of system.
TES Frontend server	This is where the frontend source code is stored. handle logic on the user side and system interface.
Openstreetmap	Integrating maps into the application to view tracking GPS.

4. References:

No.	References	Document Information
1	Design standards, Document standards	https://www.softwarearchitecturebook.com/svn/main/slides/ppt/26_Standards.ppt
		https://standards.ieee.org/standard/1471-2000.html
		https://ieeexplore.ieee.org/document/917550
2	Patterns	https://en.wikipedia.org/wiki/Architectural_pattern
3.	Evaluation standards	https://www.iso.org/obp/ui/#iso:std:iso-iec-ieee:42030:ed-1:v1:en



Capstone Project 1

CMU-SE 450/CMU-IS 450

Database Design

Version 1.3
Date: 08/11/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
C1SE.02

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10/12/2022

Capstone Project 1- Mentor:

Name	Signature	Date
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PhD. Man, Nguyen Duc

10/12/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	TRACKING EMPLOYEE SYSTEM		
Start Date	15 Aug 2022	End Date	16 Dec 2022
Lead Institution	International School, Duy Tan University		
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Draft	26/10/2022	Initiate Document	Hoang, Nguyen Duc	
1.0	26/09/2022	Update Database of Sprint 1, 2	Hoang, Nguyen Duc	
1.1	05/10/2022	Add location constructure Database	Hoang, Nguyen Duc	
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1.3	10/12/2022	Initial Release	Hoang, Nguyen Duc	

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1. Introduction

1.1 Purpose

Place information system's database design document describes structure of database and file structure of system. Database Design document will introduce all attribute the System that will help developer and tester base on this design to implement and test.

1.2 Goal

To create database tables most accurate.

1.3 Scope

This Database Design Document provides the basic for “Tracking Employee System” Database design.

It describes both logical and physical definition, non-functional issues, and the database interfaces; storage aspects are defined in the physical database design sections.

The tables performance considerations requirements. The following topics are covered in this document:

- + Assumptions and decisions on database design.
- + Entity-mapping.
- + Table column definitions.
- + Primary, unique and foreign key definitions.
- + Column and row level validation rules (check constraints).
- + Rule for populating specific columns (sequences, derivations, demoralized (column)).
- + Interfaces and dependencies with other components.

During design, these initial definitions are enhanced to support the functionality described in the functional specification/ user stories and defined in the primary and supporting modules of the application high level design.

1.4 Data storage platforms

Data of the system is stored in MySQL database.

In MySQL, data structure is stored as tables that the database objects that behave as containers for the data, in which the data will be logically organized in rows and columns format.

1.5 Definition, Acronyms and Abbreviations

Table 1. *Definition, Acronyms and Abbreviations*

Abbreviations	Description	Comment
PK/FK	Primary/ Foreign Key	Use to indicate a file is a Primary or Foreign key in a table
ERD	Entity Relationship Diagram	Show the relationship between entities in the system
UNI	Unique	Ensure all values going to store into the column will be unique

2. Database Design

2.1 SQL Database

2.1.1 Table Overview

Table 2. *Table Overview*

No.	Table name	Short Description
1	users	This table contains information about user.
2	roles	This table contains information about roles in system
3	departments	This table contains information about departments
4	campuses	This table contains information about campus of DTU
5	rooms	This table contains information about rooms
6	trackings	This table contains information about check in/checkout room
7	time_sheets	This table contains information about timesheets
8	forms	This table contains information about form request
9	reports	This table contains information about report time sheet and form
10	configs	This table contains information about time in, time out, ip address, location, ...
11	requests	This table contains information about the request change device: device id, device name,

2.1.2 Table Relationship Diagram

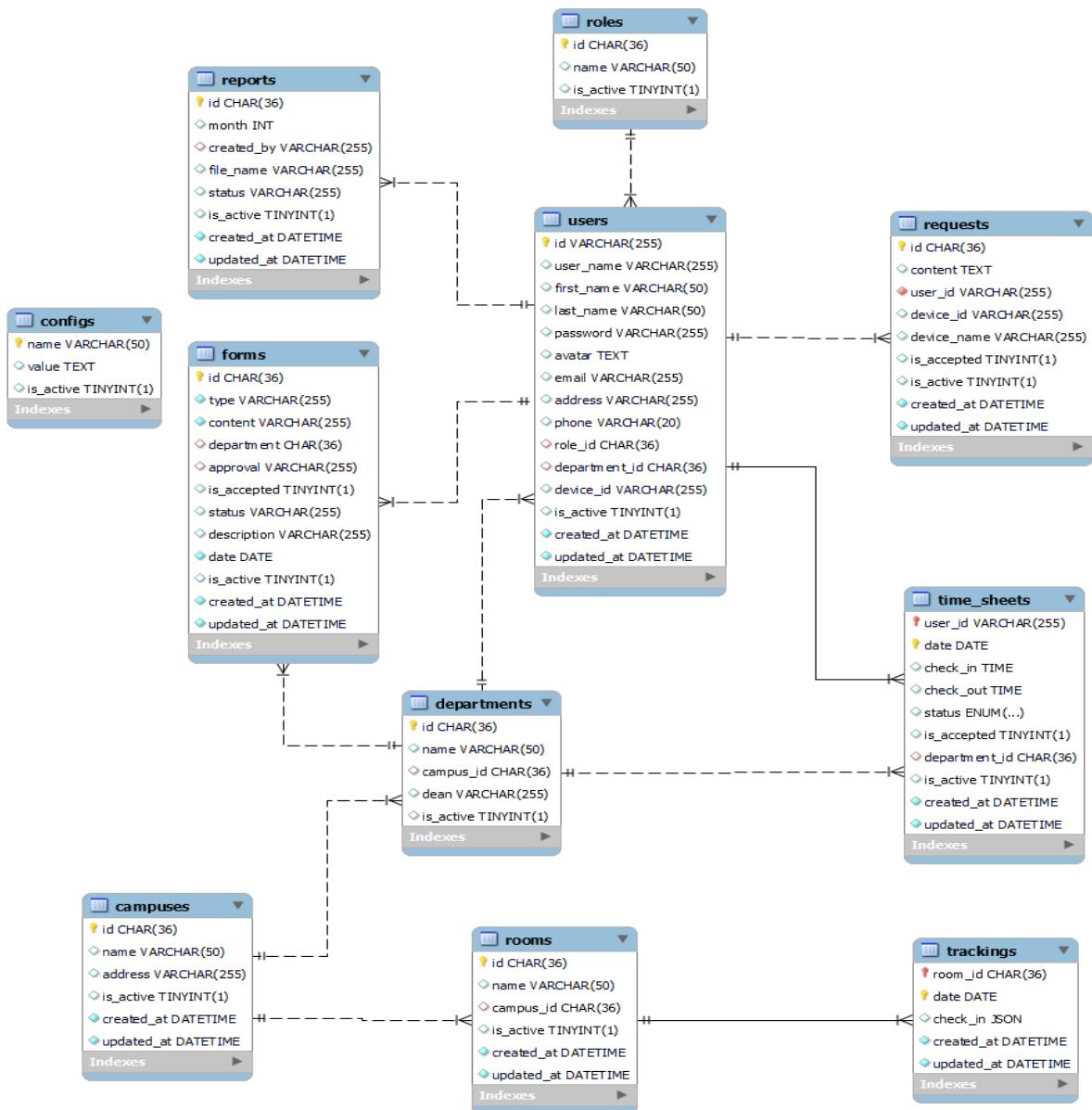


Figure 1. Table Relationship Diagram

2.1.3 Details

2.1.3.1 Users

Table 3. Detail of Users

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
user_name	VARCHAR(255)	No	UNI	NULL	
first_name	VARCHAR(50)	No		NULL	
last_name	VARCHAR(50)	No		NULL	
password	VARCHAR(255)	No		NULL	

avatar	VARCHAR(255)	No		NULL	
email	VARCHAR(255)	No	UNI	NULL	
address	VARCHAR(255)	No		NULL	
phone	VARCHAR(255)	No		NULL	
role_id	CHAR(36)	No	FK	NULL	
department_id	CHAR(36)	No	FK	NULL	
device_id	VARCHAR(50)	No		NULL	
is_active	TINYINT(1)	No		1	

2.1.3.2 Roles

Table 4. Detail of Roles

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
name	VARCHAR(50)	No		NULL	
is_active	TINYINT(1)	No		1	

2.1.3.3 Campuses

Table 5. Detail of Campuses

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
name	VARCHAR(50)	No		NULL	
address	VARCHAR(255)	No		NULL	
is_active	TINYINT(1)	No		1	

2.1.3.4 Rooms

Table 6. Detail of Rooms

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
name	VARCHAR(50)	No		NULL	
department_id	CHAR(36)	No	FK	NULL	
is_active	TINYINT(1)	No		1	

2.1.3.5 Departments

Table 7. Detail of Departments

Attributes	Datatype	Null	Key	Default	Extra

id	CHAR(36)	No	PK	NULL	
name	VARCHAR(50)	No		NULL	
dean	CHAR(36)	No	FK	NULL	
campus_id	CHAR(36)	No	FK	NULL	
is_active	TINYINT(1)	No		1	

2.1.3.6 Timesheets

Table 8. *Detail of Timesheets*

Attributes	Datatype	Null	Key	Default	Extra
user_id	CHAR(36)	No	PK		
date	DATE	No	PK		
checkin	TIME	No		NULL	
checkout	TIME	Yes		NULL	
status	ENUM	No		on_time	
is_accepted	TINYINT(1)	No		0	
department_id	STRING(36)	No	FK	NULL	
is_active	TINYINT(1)	No		1	

2.1.3.7 Trackings

Table 9. *Detail of Trackings*

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
room_id	CHAR(36)	No	FK	NULL	
user_id	CHAR(36)	No	FK	NULL	
date	DATE	No		NULL	
checkin	TIME	No		NULL	
checkout	TIME	No		NULL	

2.1.3.8 Forms

Table 10. *Detail of Forms*

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
type	VARCHAR(255)	No		NULL	
content	VARCHAR(255)	No		NULL	
department	CHAR(36)	No	FK	NULL	
approval	CHAR(36)	Yes	FK	NULL	
is_accepted	TINYINT(1)	No		0	
requester	CHAR(36)	No	FK	NULL	
status	VARCHAR(25)	No		pending	

description	VARCHAR(255)	Yes		NULL	
date	DATE	No		NULL	
is_active	TINYINT(1)	No		1	
created_at	DATETIME	No		NULL	
updated_at	DATETIME	No		NULL	

2.1.3.9 Reports

Table 11. *Detail of table Reports*

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(36)	No	PK		
month	INT	No		NULL	
created_by	CHAR(36)	No	FK	NULL	
approve_by	CHAR(36)	No	FK	NULL	
file_name	VARCHAR(255)	Yes		NULL	
status	ENUM()	No		PENDING	
is_active	TINYINT(1)	No		1	
created_at	DATETIME	No		NULL	
updated_at	DATETIME	No		NULL	

2.1.3.10 Requests

Table 12. *Detail of Requests*

Attributes	Datatype	Null	Key	Default	Extra
id	CHAR(56)	No	PK		
content	TEXT	No		NULL	
user_id	CHAR(36)	No		NULL	
device_id	VARCHAR(255)	No			
device_name	VARCHAR(255)	No			
is_accepted	TINYINT(1)	No		0	
is_active	TINYINT(1)	No		1	
created_at	DATETIME	No		NULL	
updated_at	DATETIME	No		NULL	

2.1.3.11 Configs

Table 13. *Detail of Configs*

Attributes	Datatype	Null	Key	Default	Extra
name	VARCHAR(50)	No	PK		
value	TEXT	No		NULL	
is_active	TINYINT(1)	No		1	

2.2 Firebase Firestore

2.2.1 Collection Overview

No.	Collection name	Short Description
1	Location	This collection store user's tracking location

2.2.2 Specified Properties

Table 14. Specified Properties

Properties	Values	Description
id	String of user id + date	This id is unique to identify each record
coords	Array of coordinate object { address: string, latitude: number, longitude: number, timestamp: timestamp }	Location and time update location of user
date	Date string	Date of location
user	Object	Information of user

2.2.3 Firebase JSON Structure

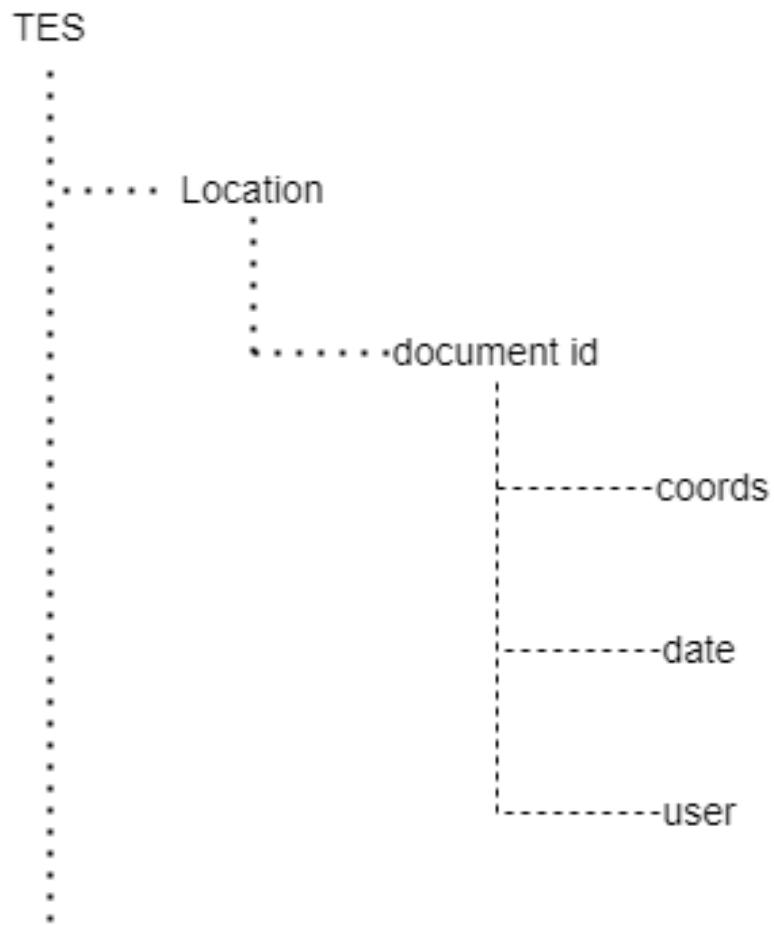


Figure 2. *Firebase JSON Structure*

2.2.4 Detail

2.2.4.1 Location

Table 15. *Detail of Location*

Attributes	Datatype	Description
id	STRING	id location of user
coords	Array[Object]	information of location (address, longitude, latitude, timestamp)
date	STRING	date when record location
user	Object	information of user

3. References

Table 16. *References*

No.	References	Document Information
1	Database	Shio Kumar Singh, <i>Database Systems Concepts, Designs and Application</i> , Pearson Education, Second Edition, 2011.
		C. J. Date, A. Kannan and S. Swamynathan, <i>An Introduction to Database Systems</i> , Pearson Education, Eighth Edition, 2009.
2	MySQL	https://dev.mysql.com/doc/
		https://docs.oracle.com/en-us/iaas/releasenotes/services/mysql-database/
		https://dev.mysql.com/doc/heatwave-aws/en/
3.	Firebase	https://firebase.google.com/docs/admin/setup
		https://firebase.google.com/docs/database/ios/structure-data



Capstone Project 1

CMU-SE 450/CMU-IS 450

User Interface Design

Version 1.1
Date: 12/11/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
C1SE.02

Hoang, Nguyen Duc
Hung, Le Van
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Approved by

Proposal Review Panel Representative:

Name	Signature	Date
------	-----------	------

29/11/2022

Capstone Project 1- Mentor:

Name	Signature	Date
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PhD. Man, Nguyen Duc

29/11/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	TRACKING EMPLOYEE SYSTEM		
Start Date	15 Aug 2022	End Date	02 Dec 2022
Lead Institution	International School, Duy Tan University		
Project Mentor	PhD. Man, Nguyen Duc		
Scrum master / Project Leader & contact details	H Na Ri, Mlo Email: narimlo2001@gmail.com Tel: 0886 912 935		
Partner Organization	Duy Tan University		
Project Web URL	https://tes-web.vercel.app/		
Team members	Name	Email	Tel
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REVISION HISTORY

Version	Date	Comments	Author	Approval
Draft	27/08/2022	Initiate Document	H Na Ri, Mlo	
1.0	28/10/2022	Initial Release	H Na Ri, Mlo	
1.1	12/12/2022	Update UI	H Na Ri, Mlo	

1. Introduction

1.1 Purpose

This document serves the purpose of specifying application's UI design

1.2 Scope

Create complete interfaces, and describe them clearly.

Overview of the stages and modules of the system

2. Describe User Interface System in Detail

2.1 Web Application

2.1.1 Log in

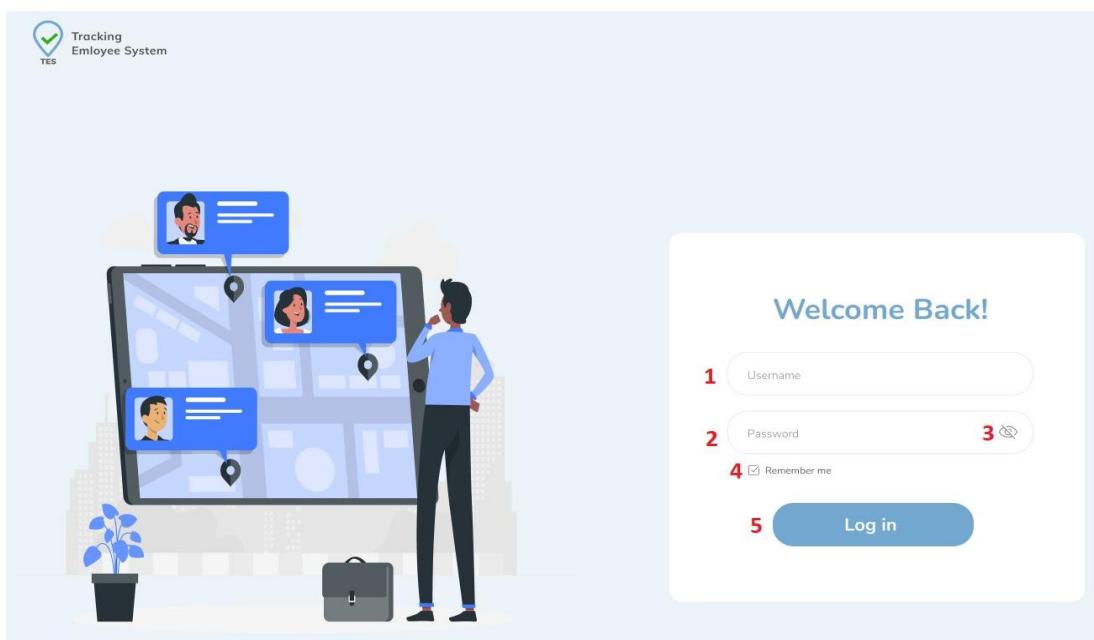


Figure 1. UI of Log in

ID	Condition	Control Type	Target	Notes
1	Input	Box tex	Input “username”	
2	Input	Icon	Input “password”	
3	Click	Icon	Click to show/hide password	
4	Click	Icon	Click to remember account	
5	Button	Link	Switch to Profile Page	

2.1.2 Homepage

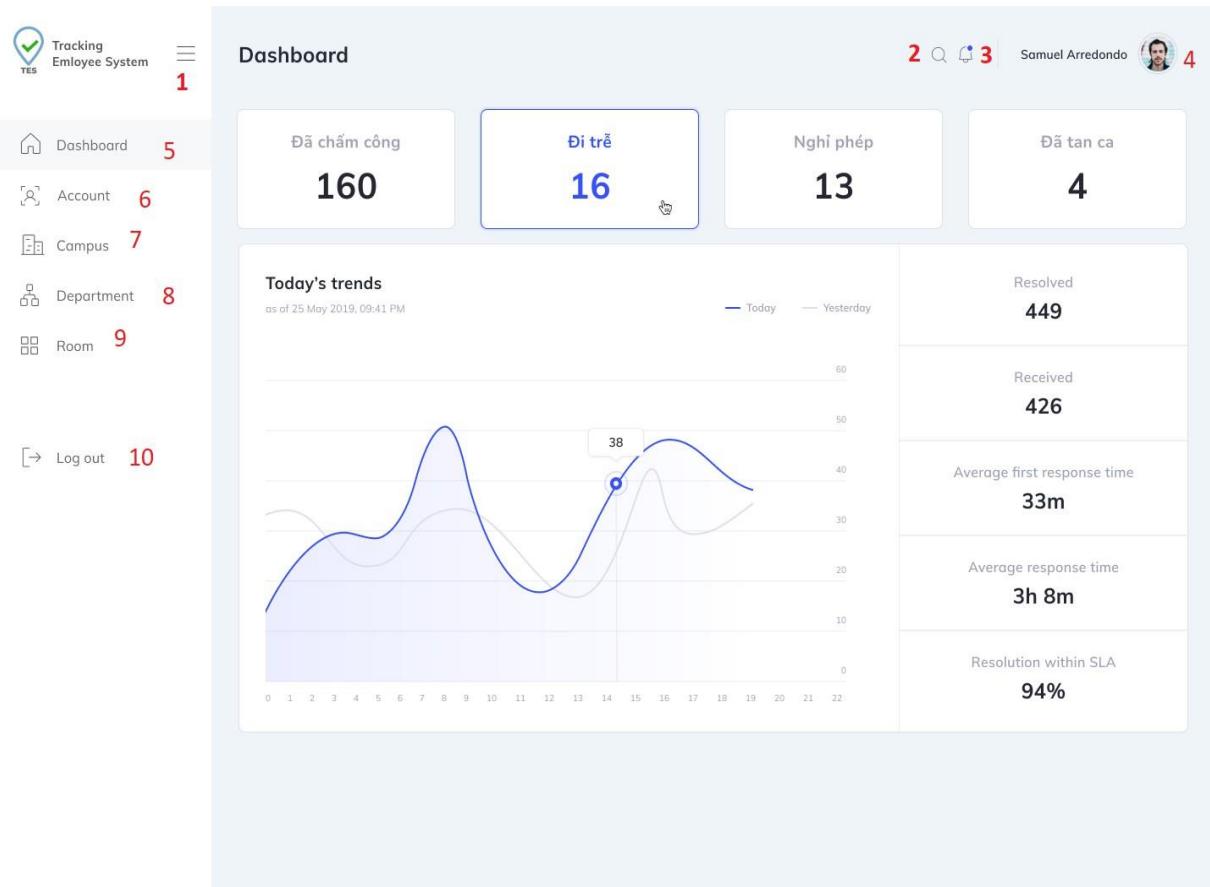


Figure 2. UI of Homepage

ID	Condition	Control Type	Target	Notes
1	Hover	Icon	Collapse sidebar	
2	Click	Icon	Search	
3	Click	Icon	Show Notification	
4	Click	Link	Switch to Profile Page	
5	Click	Link	Switch to Home Page	
6	Click	Link	Switch to Account Page	
7	Click	Link	Switch to Campus Page	
8	Click	Link	Switch to Department Page	
9	Hover	Link	Switch to Room Page	
10	Click	Click	Click to Log out	

2.1.3 Dashboard

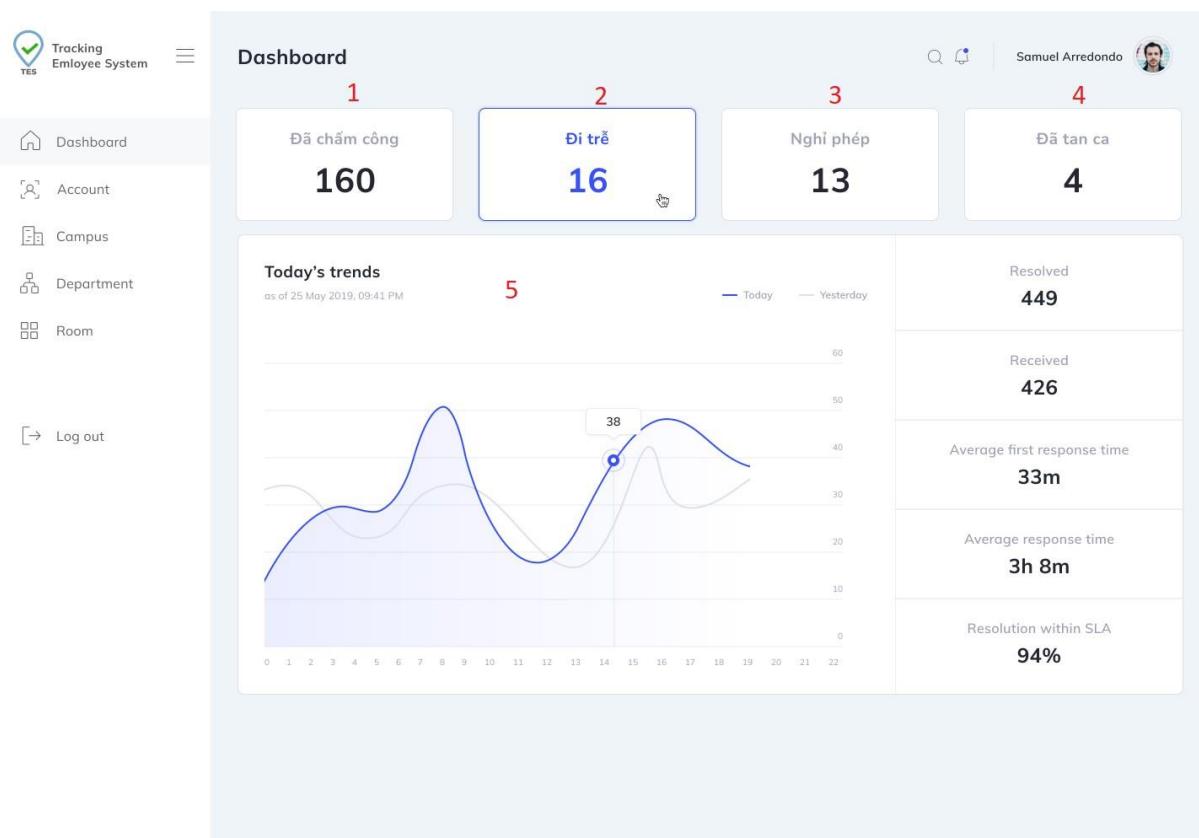


Figure 3. UI of Dashboard

ID	Condition	Control Type	Target	Notes
1	Click	Link	Click to see the number of employees who have timekeeping	
2	Click	Link	Click to see the number of employees who are late	
3	Click	Link	Click to see the number of employees on leave	
4	Click	Link	Click to see the number of employees who have finished their shift	
5	Logged	Panel	View attendance statistics of the whole school	

2.1.4 Department Management

The screenshot displays the 'Department Management' section of the Tracking Employee System. On the left, a sidebar lists navigation options: Dashboard, Account, Campus, Department (selected), Room, and Log out. The main area is titled 'Department Management' and contains a table with the following data:

Department name	Department Information	Action
Đào Tạo Quốc Tế	Khoa ĐTQT đào tạo theo chương trình Quốc Tế	
2 > Khoa CNTT	Khoa ĐTQT đào tạo theo chương trình Quốc Tế	3 4
Công Nghệ Phần Mềm		
Kỹ Thuật Mạng		
Big Data & Machine Learning		
> Khoa CNTT	Khoa ĐTQT đào tạo theo chương trình Quốc Tế	
> Khoa CNTT	Khoa ĐTQT đào tạo theo chương trình Quốc TẾ	
> Khoa CNTT	Khoa ĐTQT đào tạo theo chương trình Quốc TẾ	
> Khoa CNTT	Khoa ĐTQT đào tạo theo chương trình Quốc TẾ	

At the bottom right, there is a page number '1-8 of 1240' and navigation arrows.

Figure 4. UI of Department Management

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to add a new department	
2	Hover	Icon	Room of the department	
3	Click	Button	Click to edit the department	
4	Click	Link	Click to delete the department	

2.1.5 Account Management

The screenshot shows the 'Account Management' section of the Tracking Employee System. On the left is a sidebar with icons for Dashboard, Account, Campus, Department, Room, and Log out. The main area has a header 'Account Management' with a search bar and a user profile for 'Samuel Arredondo'. Below is a table listing nine accounts. Each account row includes a small profile picture, the account details, and three red numbered icons: 1 (ADD ACCOUNT), 2 (Edit), and 3 (Delete). The footer shows '1-8 of 1240' and navigation arrows.

Name	Username	Email	Department	Role
Le Thanh Trung	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Bui Duy Phong	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Nguyen Duc Hoang	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Le Van Hung	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Truong Pham Minh Nhan	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Truong Pham Minh Nhan	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Truong Pham Minh Nhan	thanhtrung	thanhtrung@dtu.vn	International School	Admin
Truong Pham Minh Nhan	thanhtrung	thanhtrung@dtu.vn	International School	Admin

Figure 5. UI of Account Management

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to create a new Account	
2	Hover	Button	Click to edit the account	
3	Click	Button	Click to delete the account	

2.1.6 Add Account

The screenshot shows the TES application's main dashboard with a sidebar containing links for Dashboard, Account, Campus, Department, Room, and Log out. The main area is titled 'Account Management' and lists several account entries with small profile pictures. An 'ADD ACCOUNT' dialog box is open in the center. The dialog has the following fields:

- User Name: Enter user name **2**
- first_name: Enter first name **3**
- Last name: Enter last name **4**
- Phone: Enter phone number **5**
- Email: Enter mail **6**
- Password: Enter password **7**
- Confirm Password: Confirm Password **8**
- Select Department: Select Department **9**
- Select Role: Select Role **10**

At the bottom of the dialog are two buttons: **11** Cancel and **12** Done.

Figure 6. UI of Add Account

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to create a new Account	
2	Click	Input	Input username	
3	Click	Input	Input first name	
4	Click	Input	Input last name	
5	Click	Input	Input phone number	
6	Click	Input	Input email address	
7	Click	Input	Input password	
8	Click	Input	Input password	
9	Click	Hover	Select department	
10	Click	Hover	Select role	
11	Click	Button	Click to cancel add account	
12	Click	Button	Click to add a new account	

2.1.7 Room Management

Management Room

The screenshot shows a user interface for managing rooms. At the top, there are three user names: Nguyễn Văn Linh, Hòa Khánh, and Quang Trung. A blue header bar contains the text "ROOM", "CAMPUS", "QR CODE", and "ACTION". Below this is a table with four rows of room data:

ROOM	CAMPUS	QR CODE	ACTION
R02 - NVL	Nguyễn Văn Linh		
R1101 - NVL	Nguyễn Văn Linh		
R403 - NVL	Nguyễn Văn Linh		
P01	Nguyễn Văn Linh		

At the bottom right of the table area, there are navigation icons: a left arrow, a page number "1", and a right arrow.

Figure 7.. UI of Room Management

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to add a new room	
2	Click	Button	Download QR Code	
3	Click	Button	Click to edit the Room	
4	Click	Link	Click to delete the Room	

2.1.7 Campus Management

2.1.7.1 List of campus

Management Campus

			1. ADD CAMPUS
CAMPUS NAME	ADDRESS	ACTION	
Nguyễn Văn Linh	254 Nguyễn Văn Linh, P. Thạc Gián, Q. Thanh Khê, Tp. Đà Nẵng		2.
Hòa Khánh	120 Hoàng Minh Thảo, P. Hòa Khánh Nam, Q. Liên Chiểu, Tp. Đà Nẵng		3
Quang Trung	03 Quang Trung, Q. Hải Châu, Tp. Đà Nẵng		

4 1 < >

Figure 8. List of campus

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to add a new room	
2	Click	Button	Download QR Code	
3	Click	Button	Click to edit the Room	
4	Click	Link	Click to delete the Room	

2.1.7.2 Create campus

CREATE CAMPUS

Campus name

Address

CancelDone

Figure 9.. UI of Account Management

ID	Condition	Control Type	Target	Notes
1	Click	Input	Input Name of Campus	
2	Click	Input	Input Address of Campus	

2.1.8 Timesheet

Timesheet In Week

The screenshot shows a user interface for managing timesheets. At the top, there is a header with a date selector labeled 'Select week' (1), followed by dropdown menus for 'Username' (2), 'Department' (3), and 'Role' (4). To the right of these are a 'Filter' button (5) and a 'Clear' button (6). Below the header is a weekly grid table with columns for each day of the week: Mon 19, Tue 20, Wed 21, Thu 22, Fri 23, Sat 24, and Sun 25. Each column contains a row for each employee, displaying their name, profile picture, and their daily work status. The data is color-coded: green for 'On time', red for 'Form Request' or 'Unpaid Leave', and yellow for 'Business Trip'. Some rows also show specific times like 'In : 09:00' and 'Out : 17:00'.

	Mon 19	Tue 20	Wed 21	Thu 22	Fri 23	Sat 24	Sun 25
System Admin	In : 09:00 Out : 17:00 On time	In : 08:00 Out : 17:00 On time	In : 09:00 Out : 16:00 On time	Form Request ----- Unpaid Leave	In : 07:00 Out : 17:00 On time		
Phong Bui				In : 21:37 Out : On time			
Truong Khoa Kinh Te	In : 07:00 Out : 17:00 On time	Form Request ----- On Leave	In : 08:00 Out : 16:00 On time	In : 09:00 Out : 16:00 On time	Form Request ----- Business Trip		

Figure 10. UI of Timesheet

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to select date	
2	Click	Button	Click to select a Username	
3	Click	Button	Click to select the Department	
4	Click	Button	Click to Select the Role	
5	Click	Button	Click to select filter	
6	Click	Button	Click to delete the filter	

2.1.9 Request

Request

Start date End date 1
Type 2
Username 3
Department 4
5
6

DATE	TYPE	REQUESTER	APPROVER	MESSAGE	STATUS	ACTION
2022-10-19	LATE	Marisol O'Connell	Truong Khoa Cong Nghe Thong Tin	Cho em xin phep di tre a. Em c...		AGREE
2022-10-24	BUSINESS_TRIP	Marisol O'Connell	Truong Khoa Cong Nghe Thong Tin	Hom nay em co viec onsite o n...		AGREE
2022-10-26	LATE	Marisol O'Connell	Truong Khoa Cong Nghe Thong Tin	Cho em xin phep di tre a. Em c...		REJECT

Figure 11. UI of Timesheet

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to select a time period	
2	Click	Button	Click to select the Type of request	
3	Click	Button	Click to select a Username	
4	Click	Button	Click to select the Department	
5	Click	Button	Click to select filter	
6	Click	Button	Click to delete the filter	

2.1.10 Statistical reports

Statistical Reports



Figure 12. UI of Statistical reports

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to select date to view	
2	Click	Button	Click to select to download the report excel file	
3	Click	Button	Click to select month	
4	Click	Button	Click to select the Department	
5	Click	Button	Click to delete the filter	
6	Click	Button	Click to select the filter	
7	Click	Hover	Hover to view detail	

2.1. 11 Configuration

Configuration Management

Authentication	1	Time in - Time out	1	Leave Policy	1
Wifi device Apply with attendance by app. Employee can be connected when connecting to the company's wifi network.					
NAME WIFI	IP V4				
IHOME	123.19.13.9		4		
+ ADD EQUIPMENT 2					
Campus Location Apply with attendance by app. Personnel can clock in while in the company's GPS area.					
CAMPUS	RADIUS(KM)	LATITUDE	LONGITUDE		
IHOME	1	16.060225861526888	108.2171238020575 4		
+ ADD LOCATION 3					
Cancel Change 5	Save Change 6				

Figure 13. UI of Configuration

ID	Condition	Control Type	Target	Notes
1	Click	Switch tab	Click to switch to this tab	
2	Click	Button	Click to add new equipment	
3	Click	Button	Click to add new location	
4	Click	Button	Click to delete	
5	Click	Button	Click to cancel change	
6	Click	Button	Click to save new configuration	

2.1.11. 1 Add Equipment

The screenshot shows a dialog box titled "SETTING WIFI DEVICE". It contains two text input fields: the first for "Wifi name" (marked with a red asterisk) and the second for "IP V4" (also marked with a red asterisk). Below the first field is a button labeled "Use Current Ip". To the right of the second field is a red number "3". At the bottom right are two buttons: "Cancel" and "Done", with a red number "4" next to "Cancel" and a red number "5" next to "Done". A red "X" icon is in the top right corner of the dialog.

Figure 14. UI of Add Equipment

ID	Condition	Control Type	Target	Notes
1	Input	Text box	Input wifi name	
2	Input	Text box	Input IP	
3	Click	Button	Click to autofill current IP	
4	Click	Button	Click to cancel setting	
5	Click	Button	Click to save new setting	

2.1.11.2 Add location

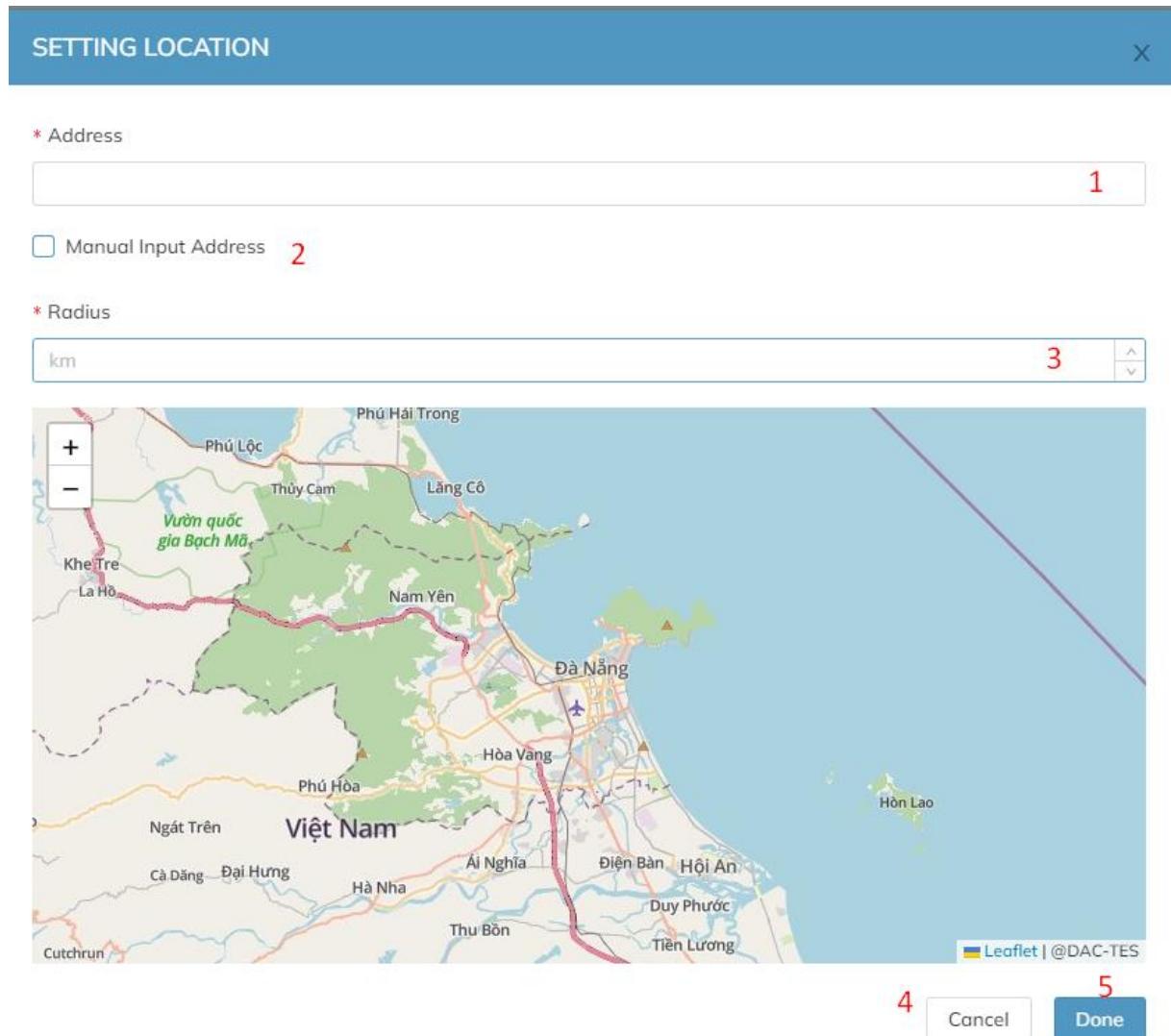


Figure 15. Add location

ID	Condition	Control Type	Target	Notes
1	Input	Text box	Input the address	
2	Click	Button	Select the manual input mode	
3	Input	Text box	Input the radius	
4	Click	Button	Click to cancel setting	
5	Click	Button	Click to save new setting	

2.2 Mobile Application

2.2.1 Login

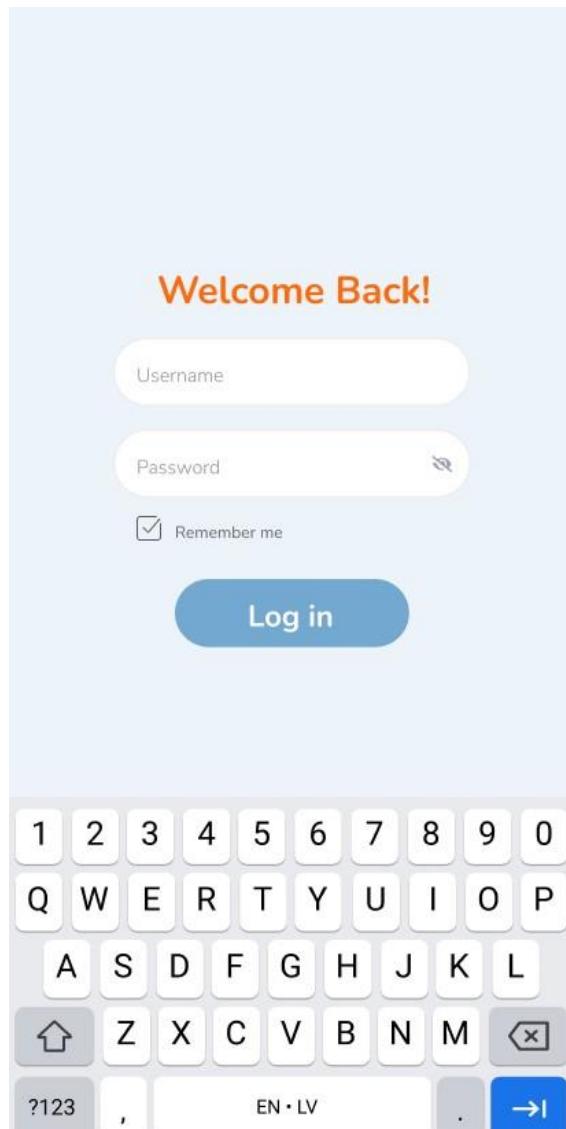


Figure 16.UI of Login

ID	Condition	Control Type	Target	Notes
1	Click	Input	Input username	
2	Click	Input	Input Password	
3	Click	Button	Click to show the Password	
4	Click	Button	Click to save account	
5	Click	Button	Click to login	

2.2.2 Homepage

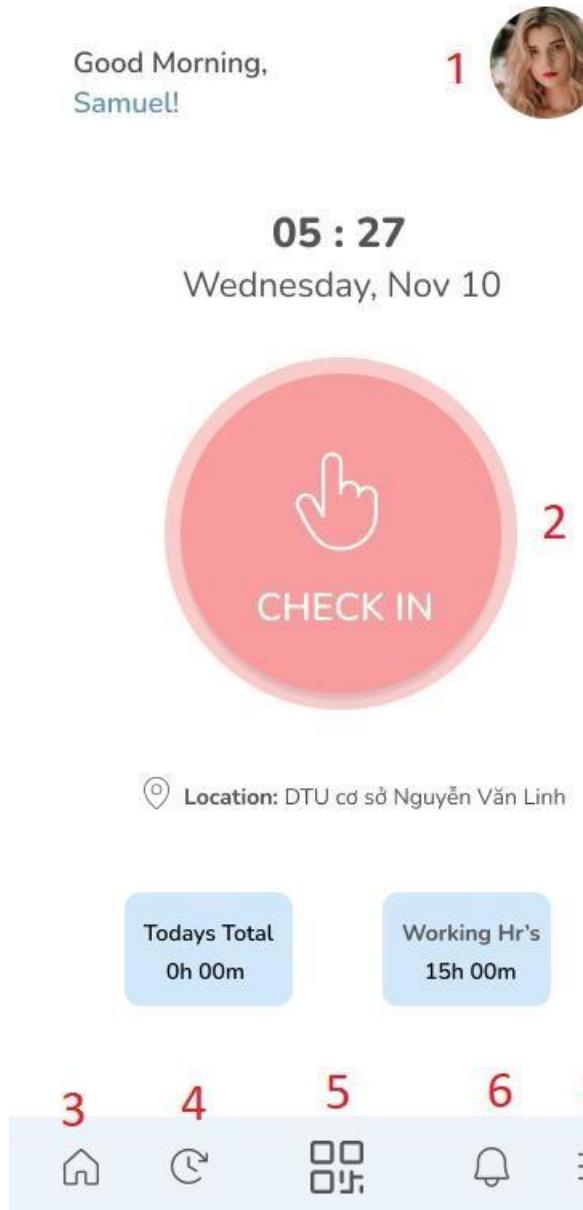


Figure 17.Homepage

ID	Condition	Control Type	Target	Notes
1	Click	Hover	Switch to Profile Page	
2	Click	Button	Click to check in	
3	Click	Icon	Switch to Homepage	

4	Click	Icon	Switch to Attendance Information	
5	Click	Icon	Click to Scan QR code	
6	Click	Icon	Click to see Notification	

2.2.3 Homepage (Logged)



Figure 18.UI of Homepage (Logged)

ID	Condition	Control Type	Target	Notes
1	Click	Button	Click to check out	
2	Click	Icon	Show Location	
3	Click	Panel	Show check in time	
4	Click	Panel	Show check out time	
5	Click	Panel	Show check in history	

2.2.4 Timekeeping Information

1 ← Attendance Information

< 2	31 March 2022	3 >	
Date	Clock In	Clock Out	Working Hr's
11 TUE	09:15am	05:45am	7:15am >
11 TUE	09:15am	05:45am	7:15am > 4
11 TUE	09:15am	05:45am	7:15am >
Weekend: 09 Sunday & 08 Saturday			
11 TUE	09:15am	05:45am	7:15am >
11 TUE	09:15am	05:45am	7:15am >
11 TUE	09:15am	05:45am	7:15am >
11 TUE	09:15am	05:45am	7:15am >
11 TUE	09:15am	05:45am	7:15am >

Figure 19. UI of Timekeeping Information

ID	Condition	Control Type	Target	Notes
1	Click	Button	Switch to homepage	
2	Click	Button	The previous month	
3	Click	Button	The next month	
4	Click	Button	Click to see detail attendance information	



Capstone Project 1

CMU-SE 450/CMU-IS 450

Test Plan

Version 1.1
Date: 20/09/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by

C1SE.02

Hoang, Nguyen Duc
Hung, Le Van
H Na Ri, Mlo
Phong, Bui Duy

Approved by

Proposal Review Panel Representative:

Name	Signature	Date
------	-----------	------

20/09/2022

Capstone Project 1- Mentor:

Name	Signature	Date
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Ph.D Man, Nguyen Duc

20/09/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	TRACKING EMPLOYEE SYSTEM		
Start Date	17 Aug 2022	End Date	16 Dec 2022
Lead Institution	International School, Duy Tan University		
Project Mentor	PhD. Man, Nguyen Duc		
Scrum master / Project Leader & contact details	H Na Ri, Mlo Email: narimlo2001@gmail.com Tel: 0886 912 935		
Partner Organization	Duy Tan University		
Project Web URL	https://tes-web.vercel.app/		
Team members	Name	Email	Tel
25211216456	Hoang, Nguyen Duc	hoang922001@gmail.com	0778 727 300
25211215965	Hung, Le Van	88levanhung@gmail.com	0823 474 409
25211216453	Phong, Bui Duy	buiduyphong921@gmail.com	0906 547 932

REVISION HISTORY

Version	Date	Comments	Author	Approval
Draft	10/09/2022	Initiate Document	H Na Ri, Mlo	
1.0	11/09/2022	Initial Release	H Na Ri, Mlo	
1.1	20/09/2022	Update Test schedule	H Na Ri, Mlo	

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1. Introduction

A test plan is a detailed software verification document that provides specifics on how the validate will test all aspects of software design. Test plans are test specifications used as guides for writing test case suites for design validation in both the software engineering fields. This test plan document contains a description of product functionality, a description of test cases to be written for each function, and a description of the testing platform to be used.

1.1. Purpose

The purpose of the Test Plan is to define, schedule and monitor the test execution. It supports the following objectives:

- Provide a high-level list of the major target test functions.
- List the Requirements for Test.
- Describe the testing strategies to be employed on each target test functions.
- Identify the required resources and schedule the Test execution

1.2. Scope

This Test Plan is for release Test Plan for TRACKING EMPLOYEE SYSTEM. The Test Plan defines the unit, system testing approach. The test scope includes the following:

- Testing of all functions, application performance and use cases requirements listed in the Product Backlog document.
- Quality requirements and fit the “TRACKING EMPLOYEE SYSTEM” metrics.
- End-to-end testing of the “TRACKING EMPLOYEE SYSTEM” Platform.

1.3. Out of scope

The following are considered out of scope for the “TRACKING EMPLOYEE SYSTEM” Test Plan and testing scope: Functional requirements testing for Business Information Management System Platform.

1.4. Reference

Table 1. Document references

No	Document references
01	Proposal document
02	Product Backlog document
03	Project Plan Document

1.5. Risk list

Table 2. Risk list

Risk	Mitigation Strategy	Responsibility	Contingency (Risk is realized)
External Risks	Get fewer projects but will definitely succeed or have a high success rate	Not under control of the Project Team or Project Steering Group	Do your part, recognize and eliminate risks as soon as possible
Project Management	Agree on all the standards before starting the project	Leader	It is mandatory to revise the whole project to the original standard if it is not correct
Tester	Sick, busy or crash cannot do it	Team tester	self-supplementing undo their assigned work, the way other members are supposed to support
Technology	Technology analysis before starting each project	Tester	Exchange learning in groups
Tester Skill	Train, or recruit experienced people	Tester, Team leader	Train technology professionals or invite professors to help with the project
Estimate Plan	Calculate carefully and accurately when taking requests and analyzing, apply good models and methods for estimation	Request Collectors, Request Analyst	Enlist the product delivery time or overtime for timely delivery
Automation Tool Risks	Choose the right tools and quality, check the	Tester, Team leader	Exchange in groups, change new tools and

	tools before starting the project		remove inconsistent tools
Out of system scope	Analyze and find solutions to test all testable areas	Tester	

2. Target Test Areas

Black box Testing

3. Test Specification

3.1. Features

Mobile

- ❖ FE01 – Authentication user's account
 - Login/ Logout
 - Forgot Password
- ❖ FE02 – Timekeeping
 - Timekeeping by Facial Recognition
 - Timekeeping by QR
- ❖ FE03 – Tracking Room
 - Check in room
 - Check out room
 - View timeline
- ❖ FE04 – Tracking GPS
 - View GPS maps
 - View by Campus
 - View tracking detail
- ❖ FE05 – Request
 - View list request
 - Create Request
 - Approval/ Reject Request
 - Cancel Request
 - Filter Request

Web application

- ❖ FE01 – Authentication user's account
 - Login with username
 - Forgot password
- ❖ FE02 – Account Management

- Create, Edit, Delete Account
 - View list Account
 - Filter Account
- ❖ FE03 - Employee Management
- View list Employee
 - Filter Employee
- ❖ FE04 – Campus Management
- Create, Edit, Delete Campus
 - View list campus
- ❖ FE05 – Department Management
- Create, Edit, Delete Campus
 - View list campus
- ❖ FE06 – Tracking GPS
- View GPS maps
 - Filter by Username, Department, Day.
 - View tracking detail
- ❖ FE07 – Tracking Room
- Filter by Username, Date.
 - View tracking detail
- ❖ FE07 – Timesheet
- Filter by username, date, department, role
 - View list timesheet
- ❖ FE07 – Request
- Create Request
 - View list request
 - Approve, Reject request
 - Filter date, type, username, department
- ❖ FE08 – Report
- View report
 - Export excel
- ❖ FE09 – Dashboard
- View dashboard
 - View chart user by role and by department
 - Statistics of employees going to work by month

- ❖ FE10 – User Profile
 - View user Profile
 - Update profile

- ❖ FE10 – Config Setting
 - Config wifi device
 - Config location
 - Config time in, time out
 -

- ❖ FE10 – Request Device
 - List request device
 - Approve device

3.2. Test deliverables

- Test Plan Document
- Test Case Document

3.3 Test Schedule

Table 3. Test Schedule

No	Task name	Start	Finish	Owner
1	Test Sprint 1	05/09/2022	25/09/2022	
1.1	Test Module Authentication			H Na Ri, Mlo
1.2	Test Module Account Management			H Na Ri, Mlo
1.3	Test Module Campus Management			H Na Ri, Mlo
1.4	Test Module Department Management			H Na Ri, Mlo
1.5	Test Module Home (Mobile)			H Na Ri, Mlo
2	Sprint 2	26/09/2022	16/10/2022	
2.1	Test Module Room Management			H Na Ri, Mlo
2.2	Test Module Timekeeping by QR			H Na Ri, Mlo
2.3	Test Module Check in/Check out room			H Na Ri, Mlo
2.4	Test Module GPS Maps Tracking			H Na Ri, Mlo
3	Sprint 3	17/10/2022	06/11/2022	
3.1	Test Module Timekeeping by FR			H Na Ri, Mlo
3.2	Test Module Request			H Na Ri, Mlo
3.3	Test Module Timesheet			H Na Ri, Mlo
3.4	Test Module User Profile			H Na Ri, Mlo
4	Sprint 4	07/11/2022	27/11/2022	
4.1	Test Module Dashboard			H Na Ri, Mlo
4.2	Test Module Report			H Na Ri, Mlo
4.3	Test Module Configuration Management			H Na Ri, Mlo

4. Test Cycle and Exit Criteria

4.1. Entry criteria

- All test hardware platforms must have been successfully installed, configured, and functioning properly.
- All the necessary documentation, design, and requirements information should be available that will allow testers to operate the system and judge the correct behavior.
- Proper test case is available.
- The test environment such as, lab, hardware, software, and system administration support should be ready.

4.2. Exit criteria

- All test cases have been run.
- The Testing process finishes when 90% test cases pass status.
- A certain level of requirements coverage has been achieved.
- No high priority or severe bugs are left outstanding.
- All high-risk areas have been fully tested, with only minor residual risks left outstanding.
- The schedule has been achieved.

5. References

Table 4. References

No .	References	Document Information
1	Scrum Model	https://en.wikipedia.org/wiki/Scrum_(software_development) https://www.atlassian.com/agile/scrum https://www.digitel.com/agile/scrum-methodology/ https://docs.microsoft.com/en-us/azure/devops/boards/sprints/best-practices-scrum?view=azure-devops https://www.scrum.org/resources/scrum-guide
2	Technical	https://www.npmjs.com/package/google-map-react https://reactnative.dev/docs/getting-started https://firebase.google.com/docs/admin/setup

		https://www.eff.org/pages/face-recognition
		https://www.mindk.com/blog/build-a-geolocation-app/
		https://viblo.asia/p/location-based-services-trong-android-phan-2-mPjxMezgG4YL
3.	Software Engineering Standards	https://www.nws.noaa.gov/oh/hrl/developers_docs/General Software Standards.pdf
		https://standards.ieee.org/standard/12208-2017.html
		https://sw-eng.larc.nasa.gov/



Capstone Project 1

CMU-SE 450/CMU-IS 450

Test Case

Version 1.2

Date: 10/12/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by

C1SE.02

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10/12/2022

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10/12/2022

Project Code	C1SE.02
Project Name	TES - TRACKING EMPLOYEE SYSTEM
Target Platform	Chrome, iOS 14
Sprint No.	1
Tester Name	H Na Ri, Mlo
Test Lead	H Na Ri Mlo

Test Result			
Module	Total TC	Pass	Fail
Authentication	10	10	0
Account Management	17	17	0
Campus Management	13	13	0
Department Management	11	11	0
TOTAL	51	51	0

TC ID	Test case Description	Steps	Expected Result	Module	Status	Note
Authentication						
TC01-01	Verify the web homepage is appropriately laid out and rendered	1. Access to the system via URL 2. Observe on the screen	Show login page like design	Authentication	Pass	
TC01-02	Verify the mobile homepage is appropriately laid out and rendered	1. Access to app TES 2. Observe on the screen	Shows app intro slider when logging in for the first time	Authentication	Pass	
TC01-03	Verify that user can see form these fields: Email, Password, Remember me Check-box and Login button	1. Access to the Login page. 2. Observe on the screen	Login form displays these fields: Email, Password, Remember me Check-box and Login button	Authentication	Pass	
TC01-04	Verify that user can login with enter correct account	1. Access to the Login page 2. Enter correct Email 3. Enter correct Password 4. Click on button Login	Login sucessfull	Authentication	Pass	
TC01-05	Verify that user can not login with enter incorrect account	1. Access to the Login page 2. Enter incorrect Email 3. Enter incorrect Password 4. Click on button Login	Displays error message "Incorrect Username or Password"	Authentication	Pass	
TC01-06	Verify that user can not login with leave blank all fields	1. Access to the Login page 2. Click on button Login	2 error messages displays in both the Email and Password fields required the user to enter these fields.	Authentication	Pass	
TC01-07	Verify that user can not login when enter incorrect email	1. Access to the Login page 2. Enter incorrect Email 3. Enter correct Password 4. Click on button Login	Displays error message "Incorrect Username or Password"	Authentication	Pass	
TC01-08	Verify that user can not login when enter incorrect password	1. Access to the Login page 2. Enter correct Email 3. Enter incorrect Password 4. Click on button Login	Displays error message "Incorrect Username or Password"	Authentication	Pass	
TC01-09	Verify that user can log out their account after click on Logout option	1. Login successful 2. Click on Logout option in the Admin Profile drop-down	Logout successful and return to Login Page	Authentication	Pass	

TC01-10	Verify that the user can reset their password after clicking on Forgot Password option.	1. Access to the Login page. 2. Click "Forgot password" 3. Enter OTP Code. 4. Enter new password	Reset Password successful and return to the Admin Login form	Authentication	Pass	
Account Management						
TC02-01	Verify that the Create Account form open and ready for input when clicking on Create Account button in the Account Management	1. Click on Account Management in the side bar 2. Click on button Create Account	Create Account form open and ready for input	Account Management	Pass	
TC02-02	Verify that the Create Account form layout rendered as the design	1. Click on Account Management in the side bar 2. Click on button Create Account	Create Event form layout rendered as the design	Account Management	Pass	
TC02-03	Verify that user can create account successfully when entering valid all required fields	1. Click on Create Account button 2. Enter valid all required fields 3. Click on button Create Account	Create new account successfully	Account Management	Pass	
TC02-04	Verify that user can not create account when leave fields all fields	1. Click on Create Account button 2. Click on button Create Account	Error message displays	Account Management	Pass	
TC02-05	Verify that user can not create account when leave blank one of the required files	1. Click on Create Account button 2. Enter valid 6 fields and leave blank 1 field 3. Click on button Create Account	Error message displays	Account Management	Pass	
TC02-06	Verify that user can not create account when enter email does not correct with format	1. Click on Create Account button 1. Enter 'aksjdkasjd' into the Email field 5. Enter valid all the remain fields 6. Click on Create button	Error message displays	Account Management	Pass	
TC02-07	Verify that cannot create an account with an existing email	Enter all fields and enter an existing email in the system	Error message displays	Account Management	Pass	
TC02-08	Verify that user can not create account when entering Phone number does not contain 10 numbers as required	1. Access the Admin site 2. Click on Account management dropdown 3. Click on Create button 4. Enter '123' into the Phone number field 5. Enter valid all the remain fields 6. Click on Create button	Error message displays	Account Management	Pass	
TC02-09	Verify that user can not create account when entering alphabetic characters into Phone numbers field	1. Click on Account management 2. Click on Create button 3. Enter 'asdsd' into the Phone number field 4. Enter valid all the remain fields 5. Click on Create button	Error message displays	Account Management	Pass	
TC02-10	Verify that user can return the Account list when clicking on Cancel button in the Create account form	1. Click on Create Account button 2. Enter valid all required fields 3. Click on cancel button	The account is not created and return to the account list	Account Management	Pass	
TC02-11	Verify that a new account will display in the Account list	1. Create account sucessful 2. Return to Account List	New account displays in account list	Account Management	Pass	

TC02-12	Verify that only the System Admin can edit the account	1. Click on account 2. Click edit icon 3. Edit information of account. 4. Click "Save"	Account update successful	Account Management	Pass	
TC02-13	Verify that the updated role will change immediately to the new role	1. Click on account 2. Click edit icon 3. Edit information of account. 4. Click "Save"	User will be applied the new role	Account Management	Pass	
TC02-14	Verify that System Admin cannot change the user's role to President/ Head of Personnel if it already exists	1. Click on Account "Na Ri" 2. Click edit icon 3. Change role to President 4. Click "Save"	Show snackbar " Le Hung is already President"	Account Management	Pass	
TC02-15	Verify that disable button "Done" if there are no any update	1. Click on edit icon. 2. Click "Done" button	Disable button "Done"	Account Management	Pass	
TC02-16	Verify that show popup confirm when System Admin deletes Account	Click icon "Delete" on List of Account	Show Popup confirm delete	Account Management	Pass	
TC02-17	Verify that System Admin cannot delete account if the system has only 1 System Admin	Click on user has role System Admin	Error message displays	Account Management	Pass	
Campus Management						
TC03-01	Verify that the Create Campus form open and ready for input when clicking on Create Account button in the Account Management	1. Click on Campus Management in the side bar 2. Click on button Done	Create Campus form open and ready for input	Campus Management	Pass	
TC03-02	Verify that the Create Campus form layout rendered as the design	1. Click on Campus Management in the side bar 2. Click on button Done	Create Event form layout rendered as the design	Campus Management	Pass	
TC03-03	Verify that user can create Campus successfully when entering valid all required fields	1. Click on Create Campus button 2. Enter valid all required fields 3. Click on button Done	Create new account successfully	Campus Management	Pass	
TC03-04	Verify that user can not create Campus when leave fields all fields	1. Click on Create Campus button 2. Click on button Done	Error message displays	Campus Management	Pass	
TC03-05	Verify that user can not create Campus when leave blank one of the required fields	1. Click on Create Campus button 2. Enter valid 1 fields and leave blank 1 field 3. Click on button Done	Error message displays	Campus Management	Pass	
TC03-06	Verify that user can not create Campus when the campus already exists	1. Click on Create Campus button 2. Enter "Hoa Khanh" in field 3. Click on button Done	Error message displays	Campus Management	Pass	
TC03-07	Verify that only the System Admin can edit the Campus	1. Click on campus 2. Click edit icon 3. Edit information of campus. 4. Click "Save"	Campus update successful	Campus Management	Pass	
TC03-08	Verify that disable button "Done" if there are no any update	1. Click on edit icon. 2. Click "Done" button	Disable button "Done"	Campus Management	Pass	
TC03-09	Verify that user can edit name of Campus	1. Click on Campus "Hoa Khanh" 2. Click icon edit 3. Enter new name of campus 3. Click on button Done	Error message displays	Campus Management	Pass	

TC03-10	Verify that Unable to change the existing campus name	1. Click on Campus "Hoa Khanh" 2. Click icon edit 3. Enter campus name was exist 3. Click on button "Done"	Error message displays	Campus Management	Pass	
TC03-11	Verify that System show popup confirm when user deletes campus	Click icon "Delete" on List of Campus	Show Popup confirm delete	Campus Management	Pass	
TC03-12	Verify that user can return the Campus list when clicking on Cancel button in the Campus account form	1. Click on Create campus button 2. Enter valid all required fields 3. Click on cancel button	The campus is not created and return to the campus list	Campus Management	Pass	
TC03-13	Verify that a new account will display in the Campus list	1. Create campus sucessful 2. Return to Campus List	New campus displays in campus list	Campus Management	Pass	
Department Management						
TC04-01	Verify that the Create Department form open and ready for input when clicking on Create Account button in the Account Management	1. Click on Campus Management in the side bar 2. Click on button Done	Create Department form open and ready for input	Department Management	Pass	
TC04-02	Verify that the Create Department form layout rendered as the design	1. Click on Campus Management in the side bar 2. Click on button Done	Create Event form layout rendered as the design	Department Management	Pass	
TC04-03	Verify that user can Create Department successfully when entering valid all required fields	1. Click on Create Department button 2. Enter valid all required fields 3. Click on button Done	Create new account successfully	Department Management	Pass	
TC04-04	Verify that user can not Create Department when leave fields all fields	1. Click on Create Department button 2. Click on button Done	Error message displays	Department Management	Pass	
TC04-05	Verify that user can not Create Department when leave blank one of the required files	1. Click on Create Department button 2. Enter valid 1 fields and leave blank 1 field 3. Click on button Done	Error message displays	Department Management	Pass	
TC04-06	Verify that user can not Create Department when the campus already exists	1. Click on Create Department button 2. Enter "Internation School" in field 3. Click on button Done	Error message displays	Department Management	Pass	
TC04-07	Verify that only the System Admin can edit the Department	1. Click on account 2. Click edit icon 3. Edit information of department. 4. Click "Save"	Department update successful	Department Management	Pass	
TC04-08	Verify that disable button "Done" if there are no any update	1. Click on edit icon. 2. Click "Done" button	Disable button "Done"	Department Management	Pass	
TC04-09	Verify that System show popup confirm when System Admin deletes Department	Click icon "Delete" on List of Department	Show Popup confirm delete	Department Management	Pass	
TC04-10	Verify that user can return the Department list when clicking on Cancel button in the Create Department form	1. Click on Create Department button 2. Enter valid all required fields 3. Click on cancel button	The Department is not created and return to the Department list	Department Management	Pass	

TC04-11	Verify that a new account will display in the Department list	1. Create Department sucessful 2. Return to Department List	New account displays in Department list	Department Management	Pass	
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Project Code	C1SE.02
Project Name	TES - TRACKING EMPLOYEE SYSTEM
Target Platform	Chrome, iOS 14
Sprint No.	2
Tester Name	H Na Ri, Mlo
Test Lead	H Na Ri Mlo

Test Result			
Module	Total TC	Pass	Fail
Room Management	10	10	0
Timekeeping by QR	13	12	0
Tracking Room	12	12	0
Tracking GPS Maps	16	15	1
	0		
TOTAL	51	49	1

TC ID	Test case Description	Steps	Expected Result	Module	Status	Note
Room Management						
TC01-01	Verify that the Create Room form open and ready for input when clicking on Create Room button	1. Click on Room Management in the side bar 2. Click on button Create Room	Create Room form open and ready for input	Room Management	Pass	
TC01-02	Verify that the Create Room form layout rendered as the design	1. Click on Room Management in the side bar 2. Click on button Create Room	Create Room form layout rendered as the design	Room Management	Pass	
TC01-03	Verify that user can Create Room successfully when entering valid all required fields	1. Click on Create Room button 2. Enter valid all required fields 3. Click on button Create Room	Create new account successfully	Room Management	Pass	
TC01-04	Verify that user can not Create Room when leave fields all fields	1. Click on Create Room button 2. Click on "Done"	Error message displays	Room Management	Pass	
TC01-05	Verify that user can return the Room list when clicking on Cancel button in the Create Room form	1. Click on Create Room button 2. Enter valid all required fields 3. Click on cancel button	The Room is not created and return to the Room list	Room Management	Pass	
TC01-06	Verify that a new room will display in the room list	1. Create Room sucessful 2. Return to room List	New room displays in room list	Room Management	Pass	
TC01-07	Verify that only the System Admin can edit the room	1. Click on room 2. Click edit icon 3. Edit information of room. 4. Click "Save"	Room update successful	Room Management	Pass	
TC01-08	Verify that disable button "Done" if there are no any update	1. Click on edit icon. 2. Click "Done" button	Disable button "Done"	Room Management	Pass	
TC01-09	Verify that show popup confirm when System Admin deletes room	Click icon "Delete" on List of room	Show Popup confirm delete	Room Management	Pass	

TC01-10	Verify that the room name cannot be duplicated	1. Click on Create Room button 2. Input "IT" in field name 3. Click "Done"	Error message displays	Room Management	Pass	
Timekeeping by QR Code						
TC02-01	Verify that the Show popup to timekeeping when user click button "Checkin"	1. Login to app. 2. Click "Checkin" button	Show 2 popup timekeeping by QR Code and Facial Recognition	Timekeeping by QR	Pass	
TC02-02	Verify that Scan QR button rendered correct as design	1. Login to app. 2. Click "Checkin" button	Scan QR displays correct as design	Timekeeping by QR	Pass	
TC02-03	Verify that user can open the camera when clicking on the Scan QR button	1. Login to app. 2. Click "Checkin" button	Open the Camera	Timekeeping by QR	Pass	
TC02-04	Verify that user can not open the camera when choose 'Not allow' option	1. Login to app. 2. Click "Checkin" button	Camera is disable	Timekeeping by QR	Pass	
TC02-05	Verify that user can take attendance successfully when scan QR code	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Take timekeeping successfully	Timekeeping by QR	Pass	
TC02-06	Verify that user can see the successfully take attendance notification when scan successfully the QR code	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Displays successfully notification	Timekeeping by QR	Pass	
TC02-07	Verify that the timekeeping status will change to "On time" when scanning successfully	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Change status in home	Timekeeping by QR	Pass	
TC02-08	Verify that start count working time when scanning successfully	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Count working time	Timekeeping by QR	Pass	
TC02-09	Verify that the user cannot timekeeping outside of working hours	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Error message displays	Timekeeping by QR	Pass	
TC02-10	Make sure that when the user scans an inactive QR Code, nothing happens.	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Error message displays	Timekeeping by QR	Pass	
TC02-11	Verify that the user cannot scan the QR code when not connected to the internet.	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Error message displays	Timekeeping by QR	Pass	
TC02-12	Verify that the user cannot scan the QR code when QR Code is deleted.	1. Login to app. 2. Click "Checkin" button 3. Scan QR Code	Error message displays	Timekeeping by QR	Pass	
TC02-13	Verify that cannot timekeeping outside of working hours	1. Login to app. (7PM) 2. Click "Checkin" button 3. Scan QR Code	Error message displays	Timekeeping by QR	Pass	

Tracking Room						
TC03-01	Verify that Scan QR button rendered correct as design	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Scan QR displays correct as design	Tracking Room	Pass	
TC03-02	Verify that user can open the camera when clicking on the Scan QR button	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Open the Camera	Tracking Room	Pass	
TC03-03	Verify that user can not open the camera when choose 'Not allow' option	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Camera is disable	Tracking Room	Pass	
TC03-04	Verify that user can check in successfully when scan QR code of the room	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Take checkin successfully	Tracking Room	Pass	
TC03-05	Verify that update timeline when scanning successfully	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Count working time	Tracking Room	Pass	
TC03-06	Verify that the user cannot checkin outside of working hours	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Error message displays	Tracking Room	Pass	
TC03-07	Verify that the system automatically checks out the room when the user wants to check-in another room	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Auto check out old room	Tracking Room	Pass	
TC03-08	Verify that the manager can filter tracking room by user	1. Click Tracking Room 2. Click username 3. Click filter	Show results instantly	Tracking Room	Pass	
TC03-09	Verify that the manager can filter tracking room by department	1. Click Tracking Room 2. Click username 3. Click filter	Show results instantly	Tracking Room	Pass	
TC03-10	Verify that the manager can see timeline of tracking room	1. Click Tracking Room 2. Click username 3. Click filter	Show results instantly	Tracking Room	Pass	
TC03-11	Verify that user can reset filter	1. Click Tracking Room 2. Click Clear	Return default view	Tracking Room	Pass	
TC03-12	Verify that can't checkin if the room is deleted	1. Login to app. 2. Click "QR" icon 3. Scan QR Code	Error message displays	Tracking Room	Pass	
Tracking GPS						
TC04-01	Verify that the Tracking Maps layout rendered as the design	1. Click on Tracking Maps in the side bar	Tracking Maps layout rendered as the design	Tracking GPS Maps	Pass	

TC04-02	Verify that shows the user's current location on maps	1. Click Tracking maps	Display employee avatars and information	Tracking GPS Maps	Pass	
TC04-03	Verify that the user can scroll to see other locations of the map	1. Click Tracking maps	View GPS maps	Tracking GPS Maps	Pass	
TC04-04	Verify that users can view maps by department	1. Click Tracking maps 2. Choose department to see	Show employee in the department	Tracking GPS Maps	Pass	
TC04-05	Verify that user can see tracking details	1. Click Tracking maps 2. Click "Na Ri" 3. Click "View GPS detail"	Open GPS tracking detail	Tracking GPS Maps	Pass	
TC04-06	Verify that manager can filter tracking maps by department	1. Click Tracking maps 2. Click department to see 3. Click Filter	show results by filter	Tracking GPS Maps	Pass	
TC04-07	Verify that manager can filter tracking maps by username	1. Click Tracking maps 2. Click username to see 3. Click Filter	show results by filter	Tracking GPS Maps	Pass	
TC04-08	Verify that manager can filter tracking maps by date	1. Click Tracking maps 2. Click date 3. Click Filter	show results by filter	Tracking GPS Maps	Pass	
TC04-09	Verify that user can reset filter	1. Click Tracking maps 2. Click reset	Return default view	Tracking GPS Maps	Pass	
TC04-10	Verify that Dean only can see employee in department	1. Click Tracking maps	Show employee of department	Tracking GPS Maps	Pass	
TC04-11	Verify that user can choose to automatically focus on the user while in another location	1. Click Tracking maps 2. Click user in	Move to employee's location immediately	Tracking GPS Maps	Pass	
TC04-12	Verify that when filtering by the user only see 1 person	1. Click Tracking maps 2. Click username to see 3. Click Filter	Show maps tracking of 1 employee	Tracking GPS Maps	Fail	
TC04-13	Verify that user can zoom in-zoom out the maps	1. Click Tracking maps 2. Click zoom in icon	Zoom in maps but still show avatar of employee	Tracking GPS Maps	Pass	
TC04-14	Verify that user can zoom out the maps	1. Click Tracking maps 2. Click zoom in icon	Zoom out maps but still show avatar of employee	Tracking GPS Maps	Pass	
TC04-15	Verify that can see total of employee in tracking detail	1. Click Tracking maps	Show total employee	Tracking GPS Maps	Pass	
TC04-16	Verify that GPS cannot be tracked if User does not enable geolocation		Error message displays	Tracking GPS Maps	Pass	

Project Code	C1SE.02
Project Name	TES - TRACKING

Target Platform	Chrome, iOS 14
Sprint No.	3
Tester Name	H Na Ri, Mlo
Test Lead	H Na Ri Mlo

Test Result			
Module	Total TC	Pass	Fail
Request	19	18	1
Timekeeping by facial recognition	14	12	2
User Profile	10	10	0
Timesheet	12	12	0
TOTAL	55	52	3

TC ID	Test case Description	Steps	Expected Result	Module	Status	Note
Request						
TC01-01	Verify that the Create Account form open and ready for input when clicking on Create Account button in the Account Management	1. Click on Request management in the side bar 2. Click on button Create Request	Create Request form open and ready for input	Request	Pass	
TC01-02	Verify that the Create Request form layout rendered as the design	1. Click on Room Management in the side bar 2. Click on button Create Request 3. Click Submit	Create Request form layout rendered as the design	Request	Pass	
TC01-03	Verify that the user cannot Submit 2 requests in a day	1. Submit a leave request on October 16. 2. Submit a business trip request on October 16.	Error message displays	Request	Fail	
TC01-04	Verify that user submit request successfully when inputting valid all required fields	1. Click on "Leave request" 2. input full required field 3. Click Submit	Submit Request sucessful	Request	Pass	
TC01-05	Verify that user can not submit request when leave fields all	1. Click on "Leave request" 2. Click Submit	Error message displays	Request	Pass	
TC01-06	Verify that After sending the request, there will be a notification sent to the approver	1. Click on "Leave request" 2. input full required field 3. Click Submit	Notify to Approval	Request	Pass	

TC01-07	Verify that user can not submit request when leave blank one of the required fields	1. Click on "Leave request" 2. input valid fields and leave blank 1 field 3. Click Submit	Error message displays	Request	Pass	
TC01-08	Verify that change status of request when user accept request	1. Click on "Leave management" 2. Click Appove	Chang status of request	Request	Pass	
TC01-09	Verify that change the status of request when user cancels the request form	1. Click on "Leave management" 2. Click detial request 3. Click Cancell Request	Chang status of request	Request	Pass	
TC01-10	Verify that notify to approval when user cancels the request form	1. Click on "Leave management" 2. Click detail request 3. Click Cancel Request	Notify to Approval	Request	Pass	
TC01-11	Verify that changes the status of the request when approved	1. Approval request 2.Observe on the screen	Change status on detail reque	Request	Pass	
TC01-12	Verify that the approved request will not be re-approved	Click Request Management	Hide approval/reject button	Request	Pass	
TC01-13	Verify that Default request list shows latest time	Click Request Management	Show list request	Request	Pass	
TC01-14	Verify that cannot create requests on the past date	1. Click on "Leave request" 2. Choose the day in past 3. Click Submit	Error message displays	Request	Pass	
TC01-15	Verify that Update the status on the timesheet when the request is approved	1. Click on "Leave request" 2. Click "Approval"	Update status in Timesheet	Request	Pass	
TC01-16	Verify that the user can only cancel the request if the request has not been approved	1. Click on "Leave management" 2. Click detail of request 3. Click Cancel Request	Request has been cancel	Request	Pass	
TC01-17	Verify that appoval can't approve the canceled request	1. Click on "Leave management" 2. Click detail of request	Disable Approval/Reject button	Request	Pass	
TC01-18	Verify that appoval receives a notification when a request needs approval		Receives a notification	Request	Pass	
TC01-19	Verify that the request will not be submitted if "Cancel" is clicked.	1. Click on "Leave request" 2. input full requied field 3. Click Cancel	Request will not be submitted	Request	Pass	

User Profile

TC02-01	Verify that show user profile in read-only mode (Web)	1. Click avatar on the header 2. Click "Profile"	Show User Profile	User Profile	Pass	
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TC02-02	Verify that show profile in read-only mode (Mobile)	1. Click menubar 2. Click "My Profile"	Show User Profile	User Profile	Pass	
TC02-03	Verify that User can not edit their avatar	1. Click "My Profile" 2. Click "Edit" button	Disable Avatar field	User Profile	Pass	
TC02-04	Verify that only admin can change avatar of user	1. Click "My Profile" 2. Click "Edit" button 3. Click "Upload Avatar" 4. Click "Save"	Update avatar of user	User Profile	Pass	
TC02-05	Verify that only admin can change email of user	1. Click "My Profile" 2. Click "Edit" button 3. input new email 4. Click "Save"	Update email of user	User Profile	Pass	
TC02-06	Verify that disable field Department with role System Admin, President and Head of Personnel	1. Click "My Profile" 2. Click "Edit" button 3. Click "Upload Avatar" 4. Click "Save"	Disable Department field	User Profile	Pass	
TC02-07	Verify that disable button "Save" if there are no any update	1. Click on edit icon. 2. Click "Save" button	Disable button "Save"	User Profile	Pass	
TC02-08	Verify that user can edit profile	1. Click on edit icon. 2. Click "Save" button	Error message displays	User Profile	Pass	
TC02-09	Verify that the update is not saved if user click cancel	1. Click "My Profile" 2. Click "Edit" button 3. Edit address 4. Click "Cancel"	Error message displays	User Profile	Pass	
TC02-10	Verify that user cannot edit role	1. Click "My Profile" 2. Click "Edit" button 3. Click Role	Disable role field	User Profile	Pass	
Timekeeping by Facial Recognition						
TC03-01	Verify that the Show popup to timekeeping when user click button "Checkin"	1. Login to app. 2. Click "Checkin" button	Show 2 popup timekeeping by QR Code and Facial Recognition	Timekeeping by facial recognition	Pass	
TC03-02	Verify that timekeeping by facial recognition button rendered correct as design	1. Login to app. 2. Click "Checkin" button	timekeeping by facial recognition displays correct as design	Timekeeping by facial recognition	Pass	
TC03-03	Verify that user can open the camera when clicking on "Face scan" button	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Open the Camera	Timekeeping by facial recognition	Pass	

TC03-04	Verify that user can not open the camera when choose 'Not allow' option	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Camera is disable	Timekeeping by facial recognition	Pass	
TC03-05	Verify that user can take attendance successfully when timekeeping by facial recognition	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Take timekeeping successfully	Timekeeping by facial recognition	Pass	
TC03-06	Verify that cannot time attendance when the IP address of the wifi has not been set up correctly	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Error message displays	Timekeeping by facial recognition	Pass	
TC03-07	Verify that cannot time timekeeping when wrong registered face	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Error message displays	Timekeeping by facial recognition	Pass	
TC03-08	Wrong timekeeping more than 3 times	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Try again in 15 minutes	Timekeeping by facial recognition	Fail	
TC03-09	Verify that shows successful timekeeping status when correct face recognition	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Shows successful timekeeping status	Timekeeping by facial recognition	Pass	
TC03-10	Verify that shows Wrong timekeeping status when incorrect face recognition	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Show button try again	Timekeeping by facial recognition	Pass	
TC03-11	Verify that Start counting working time when timekeeping is successful	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Return to homepage and start counting working time	Timekeeping by facial recognition	Pass	
TC03-12	Verify that timekeeping cannot be done outside of working hours	1. Login to app. 2. Click "Face Scan" button (7PM) 3. Scan Face	Error message displays	Timekeeping by facial recognition	Fail	
TC03-13	Verify that timekeeping is not possible on Saturday and Sunday	1. Login to app. 2. Click "Face Scan" button (Sunday) 3. Scan Face	Error message displays	Timekeeping by facial recognition	Fail	
TC03-14	Verify that timekeeping is not possible on the past date	1. Login to app. 2. Click "Face Scan" button 3. Scan Face	Error message displays	Timekeeping by facial recognition	Pass	
Timesheet						
TC04-01	Verify that the Timesheet form layout rendered as the design	1. Click on Timesheet in the side bar	Timesheet form layout rendered as the design	Timesheet	Pass	

TC04-02	Check default view of timesheet	1. Click on Timesheet in the side bar 2. Observe on the screen	Show time sheet of current week	Timesheet	Pass	
TC04-03	Verify that the user can choose another week to view the timesheet	1. Click on Timesheet in the side bar 2. Click date box 3. Choose Week	Automatically change the timesheet view	Timesheet	Pass	
TC04-04	Verify that the user can filter by username	1. Click on Timesheet in the side bar 2. Click date box 3. input username 4. Click Filter	Only show timesheet of one person	Timesheet	Pass	
TC04-05	Verify that the user can filter by Department	1. Click on Timesheet in the side bar 2. Click department 3. input Department 4. Click Filter	Show timesheet by filter	Timesheet	Pass	
TC04-06	Verify that the user can filter by Role	1. Click on Timesheet in the side bar 2. input Role 3. Click Filter	Show timesheet by filter	Timesheet	Pass	
TC04-07	Verify that if no data is found it show messages "no data"	1. Click on Timesheet in the side bar 2. Click Filter	Show meessages "No Data"	Timesheet	Pass	
TC04-08	Verify that Dean can only see timesheet information of employees in the department	1. Click on Timesheet in the side bar 2. Observe on the screen	Show timesheet of employees in the department	Timesheet	Pass	
TC04-09	Verify that HR of Department can only see timesheet information of employees in the department	1. Click on Timesheet in the side bar 2. Observe on the screen	Show timesheet of employees in the department	Timesheet	Pass	
TC04-10	Verify that show correct status of timekeeping	1. Click on Timesheet in the side bar 2. Observe on the screen	Matches the timekeeping data	Timesheet	Pass	
TC04-11	Verify that employee can only view his own timesheet	1. Click on Timesheet in the side bar 2. Observe on the screen	Show timesheet	Timesheet	Pass	

TC04-12	Verify that clicking "Clear" resets the filtered timesheet	1. Click on Timesheet in the side bar 2. Observe on the screen	Reset filter	Timesheet	Pass	
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	C1SE.02
Project Name	TES - TRACKING EMPLOYEE SYSTEM
Target Platform	Chrome, iOS 14
Sprint No.	4
Tester Name	H Na Ri, Mlo
Test Lead	H Na Ri Mlo

Test Result			
Module	Total TC	Pass	Fail
Setting Configuration	20	18	0
Dashboard	10	6	4
Report	12	12	0
TOTAL	42	36	4

TC ID	Test case Description	Steps	Expected Result	Module	Status	Note
Setting Configuration						
TC01-01	Verify the Setting configuration is appropriately laid out and rendered	1. Click on Setting configuration in the side bar 2. Observe on the screen	Show Setting configuration page like design	Setting Configuration	Pass	
TC01-02	Verify that by default opens the authentication tab when open Configuration Management	1. Click on Setting configuration in the side bar 2. Observe on the screen	Default opens the authentication	Setting Configuration	Pass	
TC01-03	Verify that show modal setting wifi when user clicks "ADD EQUIPMENT" button	1. Click "ADD EQUIPMENT" 2. Observe on the screen	Open modal wifi setting	Setting Configuration	Pass	
TC01-04	Verify that user can Add Equipment successfully when entering valid all required fields	1. Click on Add Equipment 2. Enter valid all required fields 3. Click on button "Done"	Add Equipment successfully	Setting Configuration	Pass	
TC01-05	Verify that enter properly formatted ipv4 address and full wifi name, and then create setting	1. Click "ADD EQUIPMENT" 2. Input "NVL1" for wifi name 3. Input "123123" for IPv4 4. Click "Done"	Error message displays	Setting Configuration	Pass	
TC01-06	Verify that System Admin can automatically render the current IP	1. Click "ADD EQUIPMENT" 2. Input wifi name 3. Click "Use Current IP" 4. click "Done"	Automatically render connected IP	Setting Configuration	Pass	
TC01-07	Verify that System Admin can not Add a new wifi device when leave fields all fields	1. Click "ADD EQUIPMENT" 2. Click "Done"	Error message displays	Setting Configuration	Pass	
TC01-08	Verify that System Admin can not add new wifi when entering alphabetic characters into IP field.	1. Click "ADD EQUIPMENT" 2. Input "NVL1" for wifi name 3. Input "abcdefghijkl" for IPv4 4. click "Done"	Error message displays	Setting Configuration	Pass	
TC01-09	Verify that the user will identify the new wifi IP when timekeeping	User timekeeping by facial recognition	Timekeeping successful	Setting Configuration	Pass	
TC01-10	Verify that the user will identify the new wifi IP when check in	User checkin room	Check in successful	Setting Configuration	Pass	

TC01-11	Verify that show modal setting location when user clicks "ADD LOCATION" button	1. Click "ADD LOCATION" 2. Observe on the screen	Open modal location setting	Setting Configuration	Pass	
TC01-12	Verify that enter longitude, latitude, place name and radius, and then create location	1. Click "ADD LOCATION" 2. Input "16.059848262006504" for longitude 3. Input "108.20817731270722" for longitude 4. Input "NVL" for name 5. Input 1 for radius 6. click "Done"	Create successfully	Setting Configuration	Pass	
TC01-13	Verify that show the marker when after fill longitude, latitude	1. Click "ADD LOCATION" 2. Input "16.059848262006504" for longitude 3. Input "108.20817731270722" for longitude	In the current marker color red true	Setting Configuration	Pass	
TC01-14	Verify that can add manual location	1. Click "Add Location" 2. Click Manual Input Address 3. Enter valid all required fields	Expand fields manual location	Setting Configuration	Pass	
TC01-15	Verify that can delete Campus location	1. Click Authentication 2. Croll to Campus Location 3. Click icon "Delete" 4. Click "Yes"	Only delete the Location of the campus, do not delete the campus	Setting Configuration	Pass	
TC01-16	Verify that user can Campus Location successfully when entering valid all required fields	1. Click "Add Location" 2. Enter valid all required fields 3. Click "Done"	Add Equipment successfully	Setting Configuration	Pass	
TC01-17	Verify that show open modal setting time in - time out when user clicks "UPDATE TIME IN - TIME OUT" button	1. Click "UPDATE TIME IN - TIME OUT"	Open modal time in - time out setting	Setting Configuration	Pass	
TC01-18	Verify that time out cannot be earlier than time in	1. Click "UPDATE TIME IN - TIME OUT" 2. Input Time in = 8AM 3. Input Time out = 7AM 4. Click Done	Error message displays	Setting Configuration	Fail	
TC01-19	Verify that apply working out immediately after updating time in - time out	1. Update Time in - Time out successful. 2. User Timekeeping	Record attendance according to the time frame just set up	Setting Configuration	Pass	
TC01-20	Verify that changes are not saved and applied if not click "Save Change"	1. User updated 2. Click Cancel	Show Popup reminder	Setting Configuration	Pass	
Report						
TC02-01	Verify the Report is appropriately laid out and rendered	1. Click "Report" 2. Observe on the screen	Show Report page like design	Report	Pass	

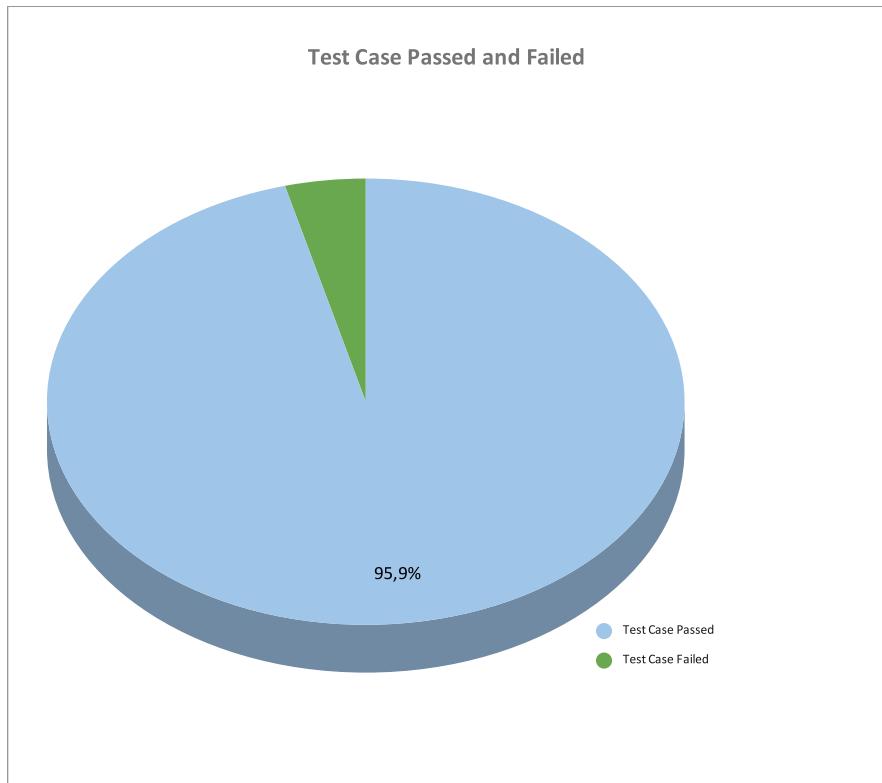
TC02-02	Verify that user can view Statistical Reports of current month	1. Click "Report" 2. Observe on the screen	Show Statistical Reports of current month	Report	Pass	
TC02-03	Verify that can't see next week's statics report	1. Click "Report" 2. Click date box 3. Choose the next week 4. Click Filter	Error message displays	Report	Pass	
TC02-04	Verify that user can Filter Statistical Reports by week	1. Click "Report" 2. Click date box 3. Click Filter	Show results by filter	Report	Pass	
TC02-05	Verify that user can Download Reports	1. Click "Report" 2. Click on preview of report	Report is downloaded as an excel file	Report	Pass	
TC02-06	Verify that user can View chart Statistical Reports	1. Click "Report" 2. Observe on the screen	Show Statistical chart of current month	Report	Pass	
TC02-07	Verify that Show detail of Statistical Reports when user hover on chart	1. Click "Report" 2. Hover on chart	Show detail of Statistical Reports	Report	Pass	
TC02-08	Verify that Show Statistical Reports every month by user's filter	1. Click "Report" 2. Click date box 3. Click Filter	Show Statistical Reports by filter	Report	Pass	
TC02-09	Verify that user can View Timesheet in current month	1. Click "Report" 2. Observe on the screen	Show Timesheet of current month	Report	Pass	
TC02-10	Verify that user can Filter Timesheet	1. Click "Report" 2. Click date box 3. Click Department 4. Click Filter	Show Timesheet by filter	Report	Pass	
TC02-11	Verify that the user Dean and HR of Department can only view the timesheet of employees in department	1. Login with Dean or HR of department account. 2. Click "Report"	Show timesheet of employees in department	Report	Pass	
TC02-12	User can reset filter	Click Clear button	Show the current report	Report	Pass	
Dashboard						
TC03-1	Verify the Dashboard is appropriately laid out and rendered	1. Access to the system via URL 2. Observe on the screen	Show Dashboard like design	Dashboard	Pass	
TC03-2	Verify that default opens Dashboard after successful login	1. Login successful 2. Observe on the screen	Default show Dashboard	Dashboard	Pass	
TC03-3	Verify that shows the number of employees on time, on business trips, on leave, and remotely during the day	1. Login successful 2. Observe on the screen	Show the exact amount	Dashboard	Pass	
TC03-4	Verify that show list employees go to work on time when clicking "On Time"	1. Login successful 2. Click Dashboard 3. Click "On Time"	Open detail	Dashboard	Fail	
TC03-5	Verify that show list employees go to business trip when clicking "Business trip"	1. Login successful 2. Click Dashboard 3. Click "Business Trip"	Open detail	Dashboard	Fail	

TC03-6	Verify that show list of employees on leave when click "On Leave"	1. Login successful 2. Click Dashboard 3. Click "On Leave"	Open detail	Dashboard	Fail	
TC03-7	Verify that show list employees work from home when clicking "Remote"	1. Login successful 2. Click Dashboard 3. Click "Remote"	Open detail	Dashboard	Fail	
TC03-8	Verify that show Statistics of employees going to work in 2022	1. Login successful 2. Observe on the screen	Show double column chart	Dashboard	Pass	
TC03-9	Verify that show detail Statistics when hover on the chart	1. Login successful 2. Hover on chart	Show detail of chart	Dashboard	Pass	
TC03-10	Verify that Dean and HR of department only see department data	1. Login with Dean or HR of department account 2. Click "Dashboard"	Onnly show data of Department	Dashboard	Pass	

TEST REPORT						
Project Name	TES - TRACKING EMPLOYEE SYSTEM			Test Successful	94,47%	
Post Design by:	H Na Ri, Mlo			Version	Ver 1.2	
Reviewer/ Approver	Team					

No.	Module Name	Planning	Pass	Fail	Not Run
1	Authentication	10	10	0	0
2	Account Management	17	17	0	0
3	Campus Management	13	13	0	0
4	Department Management	11	11	0	0
5	Room Management	10	10	0	0
6	Timekeeping by QR	13	12	0	0
7	Tracking Room	12	12	0	0
8	Tracking GPS Maps	16	15	1	0
9	Request	19	18	1	0
10	Timekeeping by facial recognition	14	12	2	0
11	User Profile	10	10	0	0
12	Timesheet	12	12	0	0
13	Setting Configuration	20	18	0	0
14	Dashboard	10	6	4	0
15	Report	12	12	0	0
Sum		199	188	8	0

Test Case Planned	Test Case Passed	Test Case Failed
199	188	8





Capstone Project 1

CMU-SE 450/CMU-IS 450

Sprint Backlog

Version 1.2
Date: 14/12/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
C1SE.02

Hoang, Nguyen Duc
Hung, Le Van
H Na Ri, Mlo
Phong, Bui Duy

Approved by

Proposal Review Panel Representative:

Name	Signature	Date
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14/12/2022

Capstone Project 1- Mentor:

Name	Signature	Date
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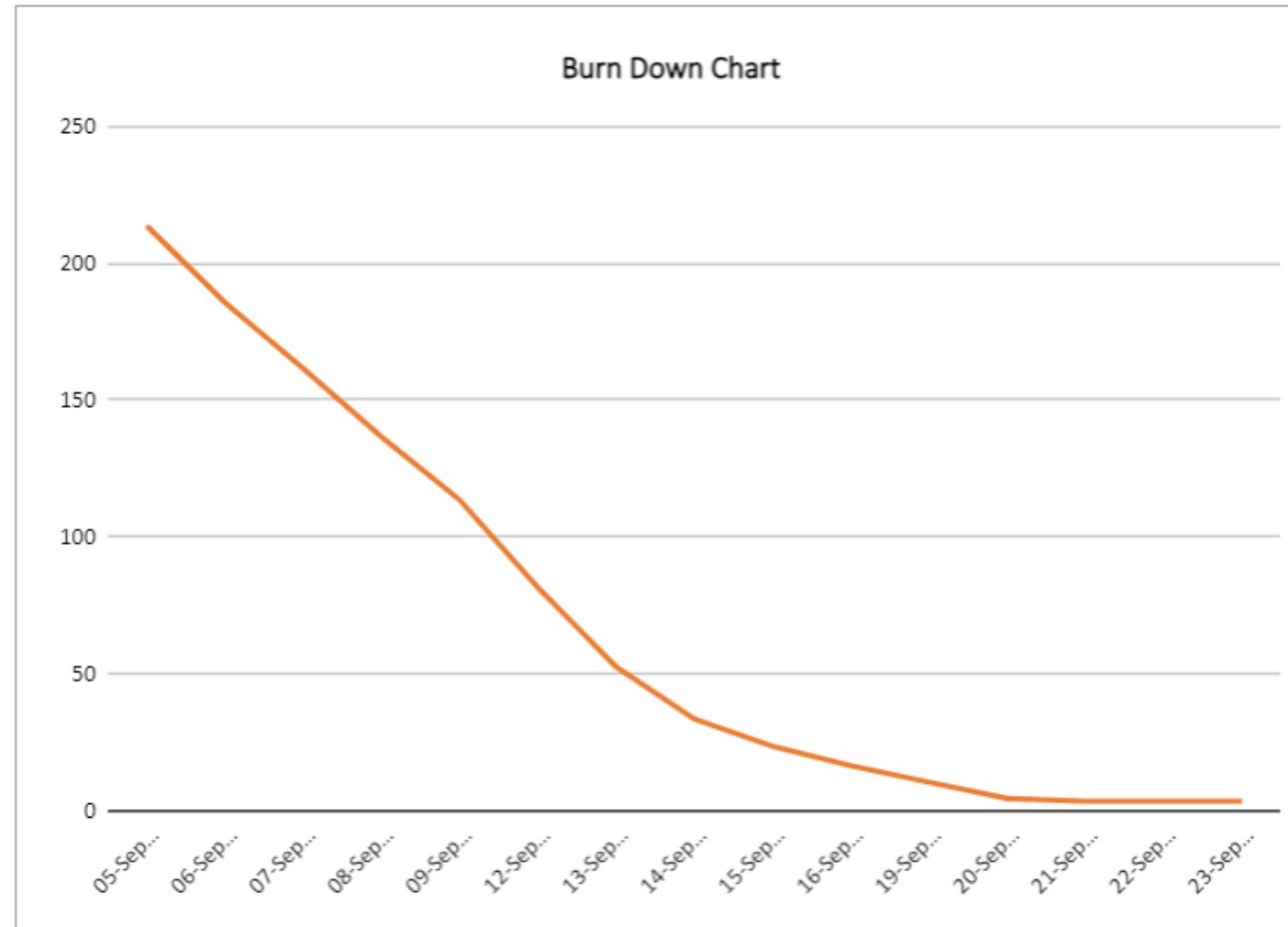
PhD. Man, Nguyen Duc

14/12/2022

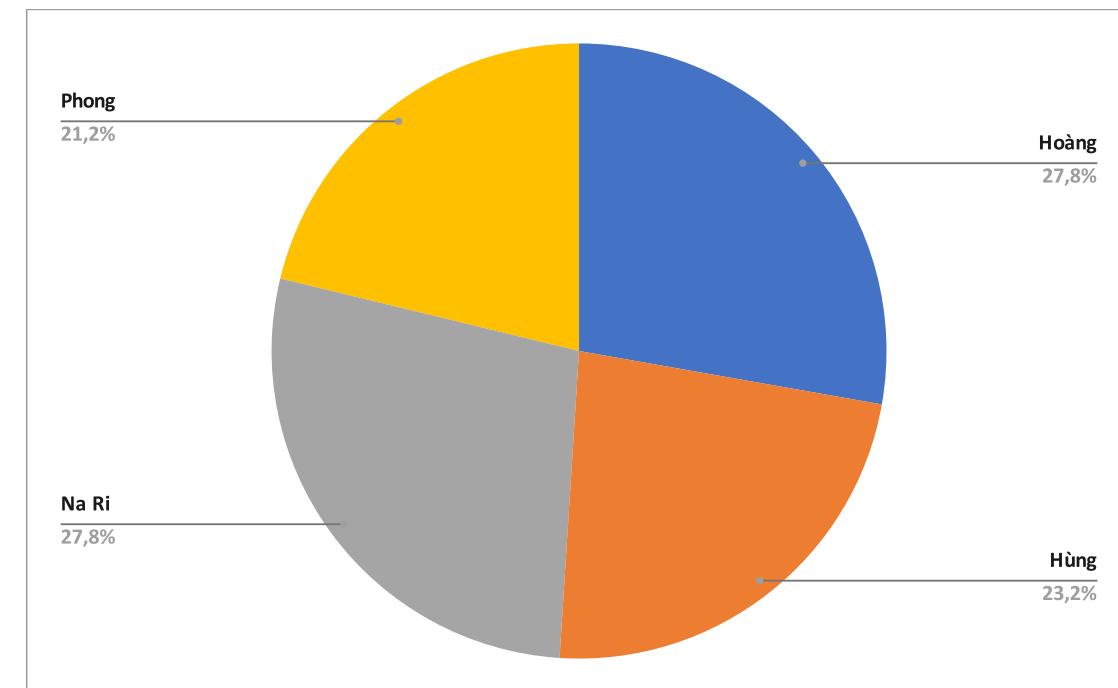
Sprint 1 Backlog

1.43		[MOBILE] Code UI app intro sides	Phong	Done	6	6	0	6	0			1	3	2	4	2	2							
1.44		[MOBILE] Code UI and integrate API for for Homepage	Phong	Done	8	8	0	8	0															
1.45		[MOBILE] Code UI and integrate API for for Login	Phong	Done	6	6	0	6	0															
1.46		[MOBILE] Code UI and integrate API for for Forgot Password	Phong	Done	6	6	0	6	0															
1.47		Testing	Na Ri	Done	14	14	0	14	0															
1.48		Fix bug	Hoang, Hung, Phong	Done	18	18	0	20	2															
1.49		Sprint 1 Review Meeting	Team	Done	3	3	0	3	0															3
1.50		Sprint 1 Retrospective	Team	Done	1,5	1,5	0	1,5	0															1,5
				Total	222	222	0	228	6	8,5	28	24	25	23	32	29	19	10	7	6	6	1	0	0
				Burn down						213,5	85,5	61,5	36,5	13,5	81,5	52,5	33,5	23,5	16,5	10,5	4,5	3,5	3,5	
				Burn up						8,5	36,5	60,5	85,5	108,5	40,5	69,5	88,5	98,5	205,5	211,5	217,5	218,5	218,5	

Reports & Dashboards



Contribution of each member in sprint 1

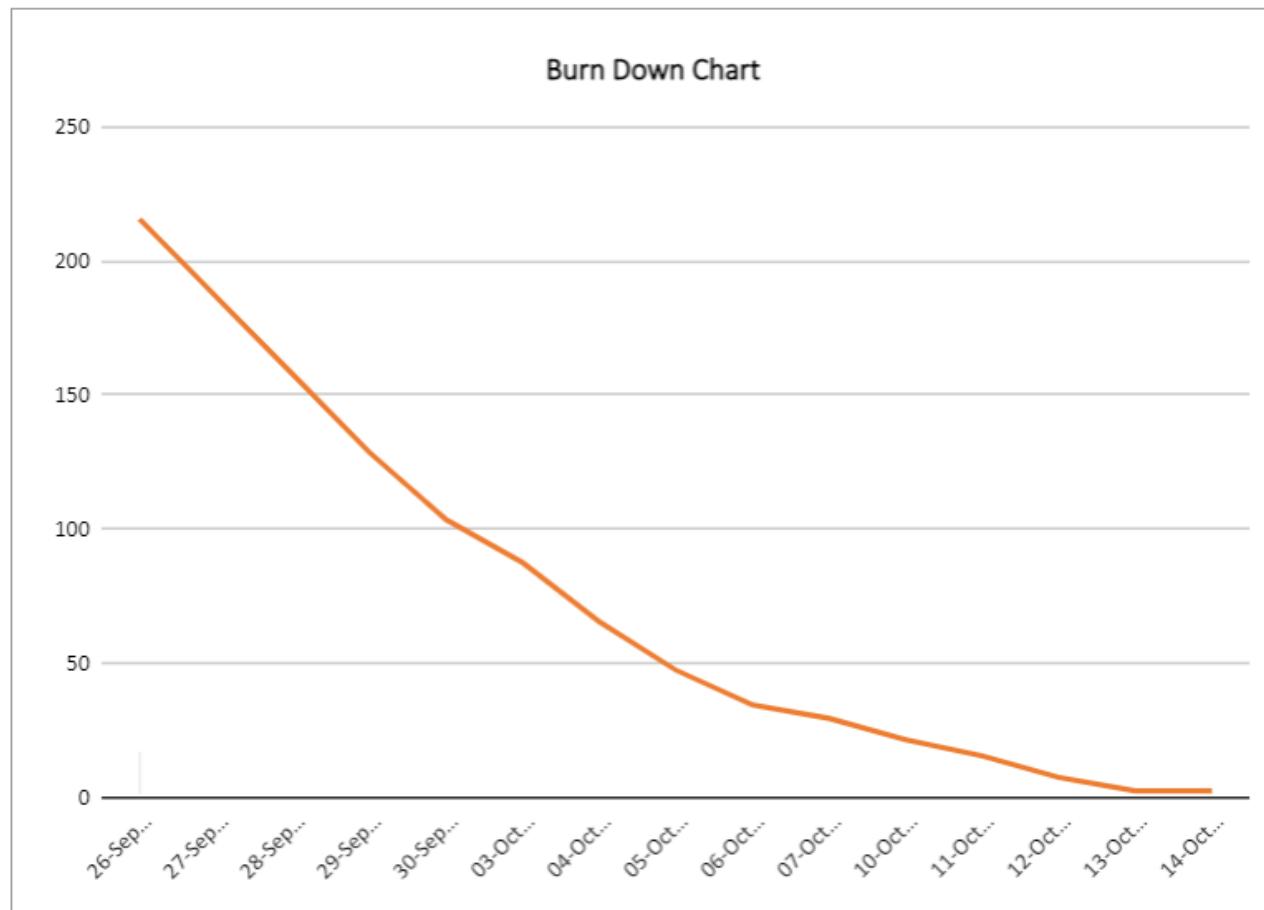


Sprint 2 Backlog

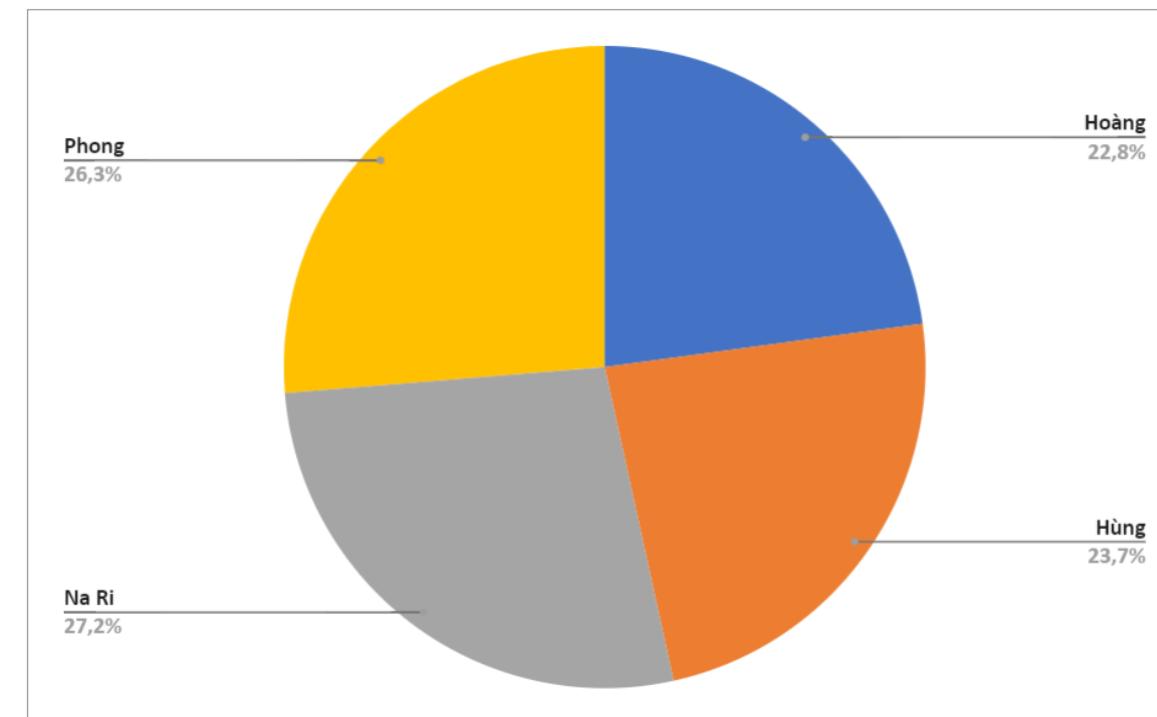
Sprint Id	Backlog ID	Description	Owner	Status	Estimate (Hours)	Completed	Pending	Total effort	Effort vs. Estimate	26-Sep-2022	27-Sep-2022	28-Sep-2022	29-Sep-2022	30-Sep-2022	03-Oct-2022	04-Oct-2022	05-Oct-2022	06-Oct-2022	07-Oct-2022	10-Oct-2022	11-Oct-2022	12-Oct-2022	13-Oct-2022	14-Oct-2022	
2.1		Sprint Planning Meeting	Team	Done	1,5	1,5	0	1,5	0	1,5															
2.2		Create Sprint Backlog	Na Ri	Done	2	2	0	2	0	2															
2.3		Create Database for Sprint 2	Hoang	Done	2	2	0	2	0	4															
2.4		Design interface for the Room management	Na Ri	Done	4	4	0	4	0	3	3														
2.5		Design interface for the Timekeeping by QR Code	Na Ri	Done	8	8	0	8	0	4	4														
2.6		Design interface for the Checkin/Check out Room	Na Ri	Done	5	5	0	5	0	1	4														
2.7		Design interface for View Timeline	Na Ri	Done	2	2	0	2	0	2															
2.8		Design interface for the Maps tracking for Web	Na Ri	Done	8	8	0	8	0	4	4														
2.9		Design interface for the View Maps tracking detail for Web	Na Ri	Done	2	2	0	2	0	2															
2.1		Design interface for the Filter Maps tracking for Web	Na Ri	Done	4	4	0	4	0	2	2														
2.11		Design interface for the Maps tracking for Mobile	Na Ri	Done	8	8	0	8	0	4	4														
2.12		Design interface for the Filter Maps tracking for Mobile	Na Ri	Done	2	2	0	2	0	2															
2.13		Testcase for sprint 2	Na Ri	Done	4	4	0	4	0	4															
2.14		[BE] Code API Room List	Phong	Done	3	3	0	3	0	3															
2.15		[BE] Code API Create Room	Phong	Done	4	4	0	4	0	2	2														
2.16		[BE] Code API Edit Room	Phong	Done	4	4	0	4	0	3															
2.17		[BE] Code API Delete Room Account	Hoang	Done	2	2	0	2	0	2															
2.19		[BE] Code API Timekeeping by QR	Hoang	Done	10	10	0	10	0	2	4														
2.2		[BE] Code API Check in Room	Hoang	Done	6	6	0	6	0	3	3														
2.21		[BE] Code API Check out Room	Hoang	Done	4	4	0	4	0	2	2														
2.22		[BE] Code API View Timeline	Hoang	Done	6	6	0	6	0	3															
2.23		[BE] Code API View Maps tracking	Hoang	Done	10	10	0	10	0	2	4														
2.24		[BE] Code API Filter Maps tracking	Hoang	Done	4	4	0	4	0	4															
2.25		[BE] Code API Detail Maps tracking	Hoang	Done	3	3	0	3	0	3															
2.26		[WEB] Code UI and integrate API for View List Room	Hung	Done	4	4	0	4	0	4															
2.27		[WEB] Code UI and integrate API for Create Room	Hung	Done	4	4	0	6	2	2	2														
2.28		[WEB] Code UI and integrate API for Edit Room	Hung	Done	4	3	1	4	0	3	1														
2.29		[WEB] Code UI and integrate API for Delete Room	Hung	Done	3	3	0	3	0	3															
2.3		[WEB] Code UI and integrate API for View Maps Tracking	Hung	Done	10	10	0	10	0	2	4														
2.31		[WEB] Integrate map checking places	Hung	Done	6	4	2	4	-2	4															
2.32		[WEB] Code UI and integrate API for Filter Maps Tracking	Hung	Done	10	8	2	8	-2	3															
2.33		[WEB] Code UI and integrate API for View detail Maps Tracking	Hung	Done	8	8	0	8	0	2															
2.34		[Mobile] Code UI and integrate API for Timekeeping with QR Code	Phong	Done	10	10	0	10	0	2	4														
2.35		[Mobile] Code UI and integrate API for Check in Room	Phong	Done	8	8	0	8	0	4															
2.36		[Mobile] Code UI and integrate API for Check out Room	Phong	Done	4	4	0	4	0	2															
2.37		[Mobile] Code UI and integrate API for View Timeline	Phong	Done	6	6	0	6	0	2	1														
2.38		[Mobile] Code UI and integrate API for View Maps Tracking	Phong	Done	10	10	0	12	2	2	2														
2.39		[Mobile] Code UI and integrate API for Filter Maps Tracking	Phong	Done	6	6	0	6	0	3	1														
2.40		Testing	Na Ri	Done	14	14	0	14	0	2	3														
2.41		Fix bug	Hoang, Hung, Phong	Done	18	18	0	18	0	3	2													3	
2.42		Sprint 2 Review Meeting	Team	Done	3	3	0	3	0	2	2														
2.43		Sprint 2 Retrospective	Team	Done	1,5	1,5	0	1,5	0	2	2													1,5	
					Total	238	233	5	236,5	-1,5	21,5	29	29	29	25	16	22	18	13	5	8	6	8	5	0

				Burn down						216,5 187,5 158,5 129,5 104,5 88,5 66,5 48,5 35,5 30,5 22,5 16,5 8,5 3,5 3,5
				Burn up						21,5 50,5 79,5 108,5 133,5 149,5 171,5 189,5 202,5 207,5 215,5 221,5 229,5 234,5 234,5

Reports & Dashboards



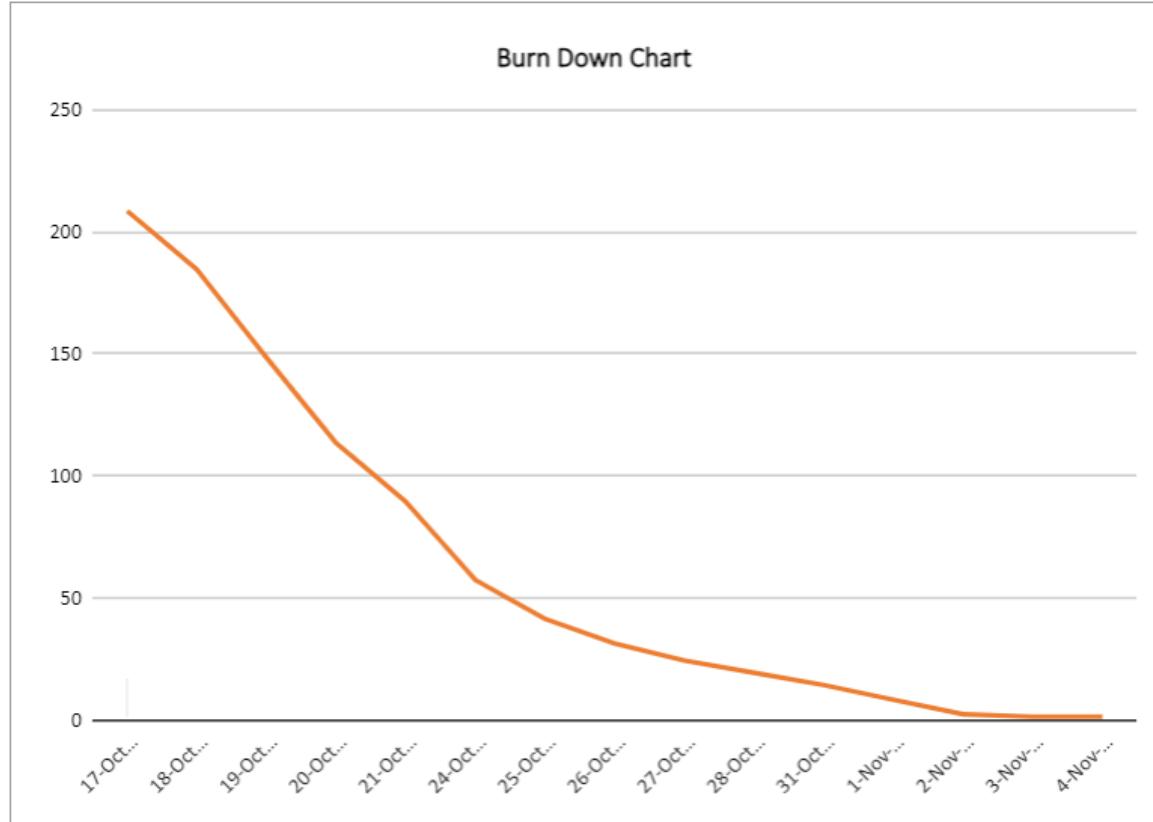
Contribution of each member in sprint 2



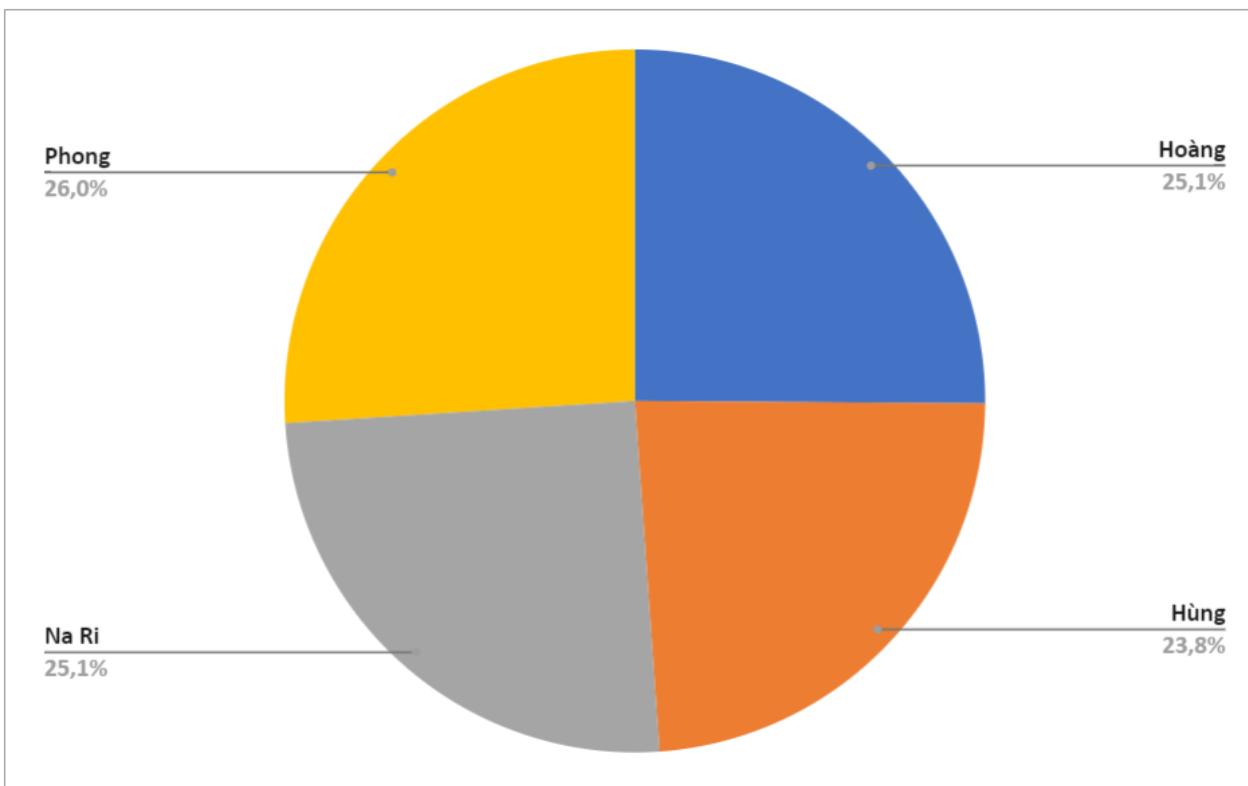
Sprint 3 Backlog

Sprint Id	Backlog ID	Description	Owner	Status	Estimate (Hours)	Completed	Pending	Total effort	Effort vs. Estimate	17-Oct-2022	18-Oct-2023	19-Oct-2024	20-Oct-2025	21-Oct-2026	24-Oct-2025	25-Oct-2026	26-Oct-2025	27-Oct-2026	28-Oct-2022	31-Oct-2020	1-Nov-2021	2-Nov-2021	3-Nov-2021	4-Nov-2021	
3.1		Sprint Planning Meeting	Team	Done	1,5	1,5	0	1,5	0	1,5															
3.2		Create Sprint Backlog	Na Ri	Done	2	2	0	2	0	2															
3.3		Create Database for Sprint 3	Hoang	Done	4	4	0	4	0	4															
3.4		Design interface for View list of request	Na Ri	Done	6	6	0	6	0	6															
3.5		Design interface for Create request	Na Ri	Done	6	6	0	6	0	6															
3.6		Design interface for Approval/ Reject request	Na Ri	Done	2	6	0	2	0	2															
3.7		Design interface for Filter request	Na Ri	Done	4	4	0	4	0	4															
3.8		Design interface for the user profile	Na Ri	Done	4	8	0	4	0	4															
3.9		Design interface for the Timekeeping Facial recognition	Na Ri	Done	8	8	0	8	0	8															
3.1		Design interface for Timesheet	Na Ri	Done	10	10	0	10	0	10															
3.11		Testcase for sprint 3	Na Ri	Done	4	4	0	4	0	4															
3.12		[BE] Code API View list of request	Hoang	Done	4	4	0	4	0	4															
3.13		[BE] Code API Create request	Hoang	Done	6	6	0	6	0	6															
3.14		[BE] Code API Approval/ Reject request	Hoang	Done	6	6	0	6	0	6															
3.15		[BE] Code API Filter request	Hoang	Done	4	4	0	4	0	4															
3.16		[BE] Code API the user profile	Hoang	Done	4	4	0	4	0	4															
3.17		[BE] Code API the Timekeeping Facial recognition	Hoang	Done	12	12	0	14	2	4	4	2	2												
3.18		[BE] Code API View Timesheet	Hoang	Done	6	6	0	6	0	6															
3.19		[BE] Code API Filter Timesheet	Hoang	Done	5	5	0	5	0	5															
3.2		[WEB] Code UI and integrate API for View list of request	Hung	Done	8	8	0	8	0	8															
3.21		[WEB] Code UI and integrate API for Approval/ Reject request	Hung	Done	5	5	0	5	0	5															
3.22		[WEB] Code UI and integrate API for Filter request	Hung	Done	4	4	0	4	0	4															
3.23		[WEB] Code UI and integrate API for the user profile	Hung	Done	8	8	0	8	0	8															
3.24		[WEB] Code UI and integrate API for View Timesheet	Hung	Done	14	14	0	14	0	14															
3.25		[WEB] Code UI and integrate API for Filter Timesheet	Hung	Done	8	8	0	8	0	8															
3.26		[Mobile] Code UI and integrate API for View list of request	Phong	Done	6	6	0	6	0	6															
3.27		[Mobile] Code UI and integrate API for Create request	Phong	Done	8	8	0	8	0	8															
3.28		[Mobile] Code UI and integrate API for Approval/ Reject request	Phong	Done	6	6	0	6	0	6															
3.29		[Mobile] Code UI and integrate API for Filter request	Phong	Done	4	4	0	4	0	4															
3.3		[Mobile] Code UI and integrate API for the user profile	Phong	Done	8	8	0	8	0	8															
3.31		[Mobile] Code UI and integrate API for Timekeeping by Facial	Phong	Done	14	14	0	16	2	4	4	2	2	2											
3.32		[Mobile] Code UI and integrate API for View Timesheet	Phong	Done	8	8	0	8	0	8															
3.33		[Mobile] Code UI and integrate API for Filter Timesheet	Phong	Done	4	4	0	4	0	4															
3.34		Testing	Na Ri	Done	10	10	0	10	0	10															
3.35		Fix bug	Hoang	Done	18	18	0	20	2	2															
3.36		Sprint 3 Review Meeting	Team	Done	3	3	0	3	0	3															3
3.37		Sprint 3 Retrospective	Team	Done	1,5	1,5	0	1,5	0	1,5															1,5
					Total	236	244	0	242	6	27,5	24	36	35	24	32	16	10	7	5	5	6	6	1	0
					Burn down						208,5	184,5	148,5	13,5	89,5	57,5	41,5	31,5	24,5	19,5	14,5	8,5	2,5	1,5	1,5
					Burn up						27,5	51,5	87,5	122,5	46,5	78,5	94,5	204,5	211,5	216,5	221,5	227,5	233,5	234,5	

Reports & Dashboards



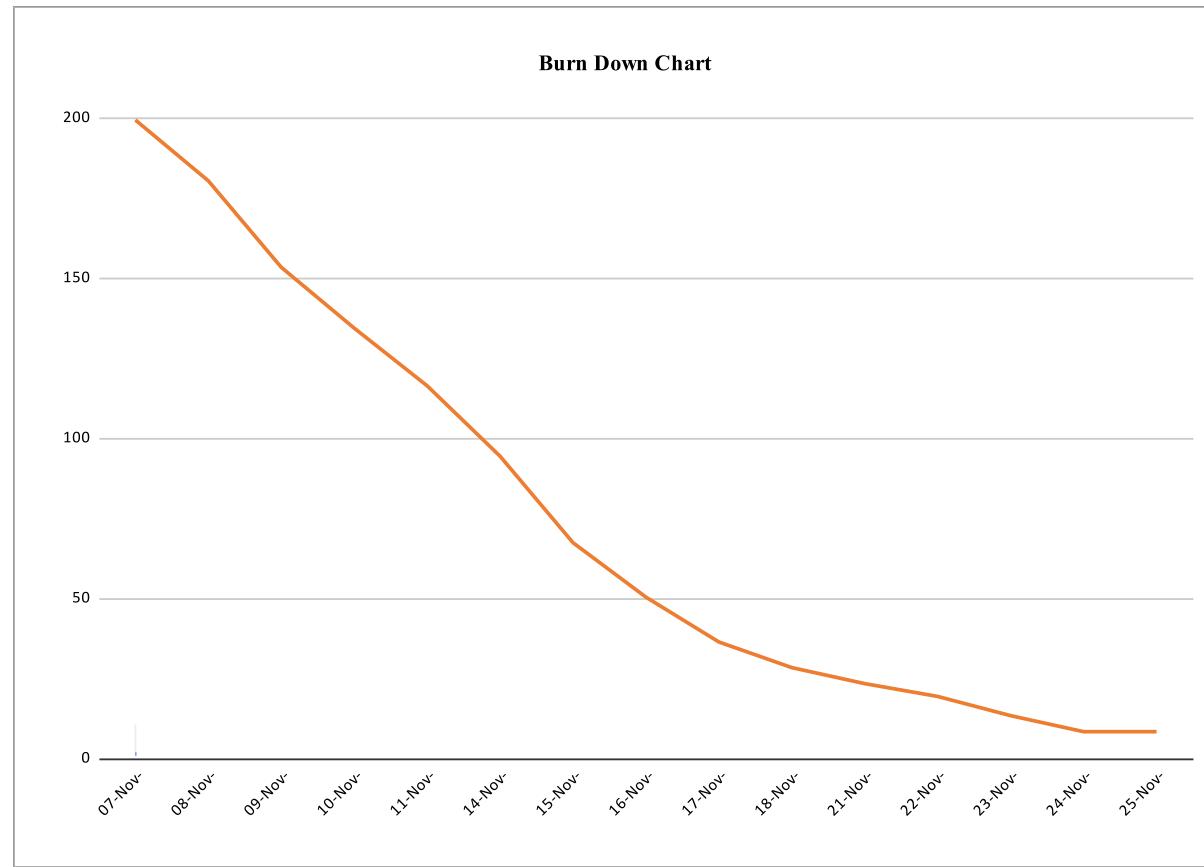
Contribution of each member in sprint 3



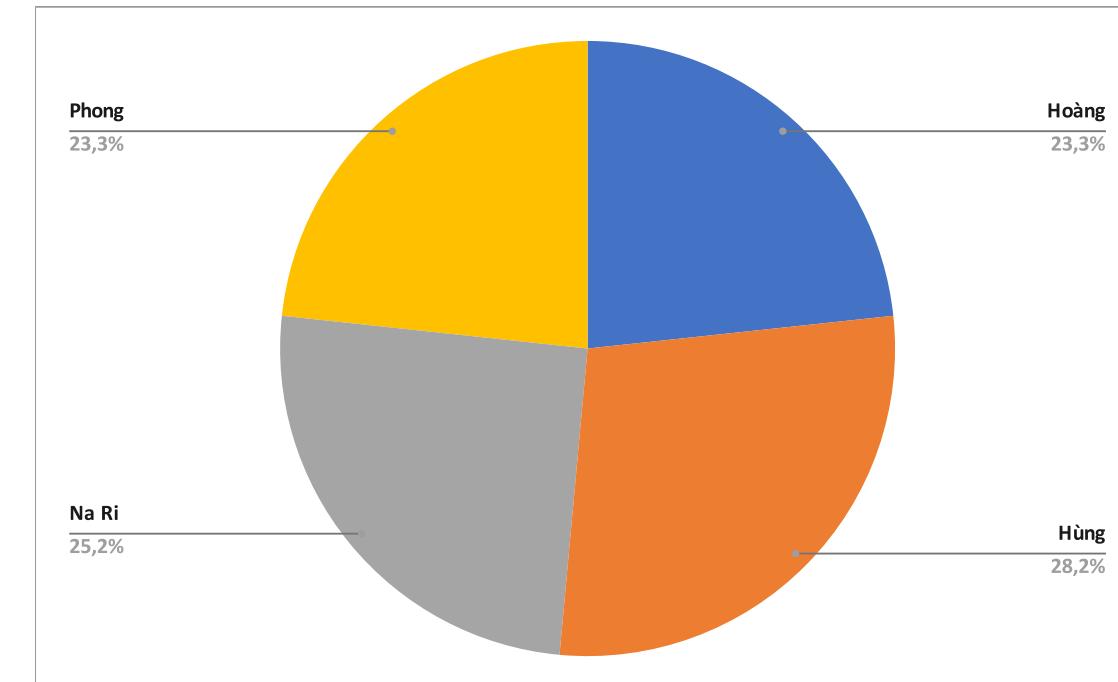
Sprint 4 Backlog

Sprint ID	Backlog ID	Description	Owner	Status	Estimate (Hours)	Completed	Pending	Total effort	Effort vs. Estimate	07-Nov-2022	08-Nov-2022	09-Nov-2022	10-Nov-2022	11-Nov-2022	14-Nov-2022	15-Nov-2022	16-Nov-2022	17-Nov-2022	18-Nov-2022	21-Nov-2022	22-Nov-2022	23-Nov-2022	24-Nov-2022	25-Nov-2022
4.1		Sprint Planning Meeting	Team	Done	1,5	1,5	0	1,5		1,5														
4.2		Create Sprint Backlog	Na Ri	Done	2	2	0	2	0	2														
4.3		Create Database for Sprint 4	Hoang	Done	4	4	0	4	0	4														
4.4		Design interface for Dashboard	Na Ri	Done	8	8	0	8	0	8														
4.5		Design interface for Report	Na Ri	Done	6	6	0	7	1	3														
4.6		Design interface for Configuration Management	Na Ri	Done	4	4	0	4	0	4														
4.7		Design interface for Setting location	Na Ri	Done	3	3	0	3	0	3														
4.8		Design interface for Setting wifi address	Na Ri	Done	3	3	0	3	0	3														
4.9		Design interface for Setting time in - time out	Na Ri	Done	4	4	0	4	0	4														
4.10		Design interface for View list Request Device	Na Ri	Done	4	4	0	4	0	4														
4.11		Design interface for Request new Device	Na Ri	Done	4	4	0	4	0	4														
4.12		Design Testcase for sprint 4	Na Ri	Done	4	4	0	4	0	4														
4.13		[BE] Code API for Dashboard	Hoang	Done	8	8	0	8	0	8														
4.14		[BE] Code API for Report	Hoang	Done	12	12	0	12	0	12														
4.15		[BE] Code API for Configuration Management	Hoang	Done	4	4	0	4	2	2														
4.16		[BE] Code API for Setting location	Phong	Done	8	8	0	8	0	8														
4.17		[BE] Code API for Setting wifi address	Hoang	Done	8	8	0	8	0	8														
4.18		[BE] Code API for Setting time in - time out	Hoang	Done	6	6	0	6	0	6														
4.19		[BE] Code API for View list Request Device	Phong	Done	8	8	0	8	0	8														
4.20		[BE] Code API for Request new Device	Phong	Done	8	8	0	8	0	8														
4.21		[WEB] Code UI and integrate API Dashboard	Hung	Done	10	10	0	10	0	10														
4.22		[WEB] Code UI and integrate API Report	Hung	Done	12	12	0	10	-2	10														
4.23		[WEB] Code UI and integrate API Configuration Management	Hung	Done	4	4	0	4	0	4														
4.24		[WEB] Code UI and integrate API Setting location	Hung	Done	6	6	0	6	0	6														
4.25		[WEB] Code UI and integrate API Setting wifi address	Hung	Done	6	6	0	6	0	6														
4.26		[WEB] Code UI and integrate API Setting time in - time out	Hung	Done	4	4	0	4	0	4														
4.27		[WEB] Code UI and integrate API View list Request Device	Hung	Done	6	6	0	6	0	6														
4.28		[WEB] Code UI and integrate API Approve new Device	Hung	Done	4	4	0	4	0	4														
4.29		[Mobile] Code UI and integrate API for Request new Device	Phong	Done	8	8	0	6	-2	6														
4.30		[Mobile] Improve UI	Phong	Done	8	8	0	8	0	8														
4.31		Testing	Na Ri	Done	14	14	0	14	0	14														
4.32		Fix bug	Hoang	Done	18	18	0	18	0	18														
4.33		Sprint 4 Review Meeting	Team	Done	3	3	0	3	0	3														3
4.34		Sprint 4 Retrospective	Team	Done	1,5	1,5	0	1,5	0	1,5														1,5
		Total			214	214	0	211	-3	14,5	19	27	19	18	22	27	17	14	8	5	4	6	5	0
		Burn down								199,5	80,5	53,5	34,5	16,5	94,5	67,5	50,5	36,5	28,5	23,5	19,5	13,5	8,5	8,5
		Burn up								14,5	33,5	60,5	79,5	97,5	119,5	146,5	163,5	177,5	185,5	190,5	194,5	200,5	205,5	205,5

Reports & Dashboards



Contribution of each member in sprint 4





Capstone Project 1

CMU-SE 450/CMU-IS 450

Code Standards

Version 1.1
Date: 1/12/2022

TES - TRACKING EMPLOYEE SYSTEM

**Submitted by
C1SE.02**

Hoang, Nguyen Duc
Hung, Le Van
H Na Ri, Mlo
Phong, Bui Duy

Approved by

Proposal Review Panel Representative:

1/12/2022

Capstone Project 1- Mentor:

Name _____ Signature _____ Date _____

PhD. Man, Nguyen Duc

1/12/2022

PROJECT INFORMATION

Project acronym	TES		
Project Title	Tracking Employee System		
Start Date	15 Aug 2022	End Date	02 Dec 2022
Lead Institution	International School, Duy Tan University		
Project Mentor	PhD. Man, Nguyen Duc		
Scrum master / Project Leader & contact details	H Na Ri, Mlo Email: narimlo2001@gmail.com Tel: 0886 912 935		
Partner Organization	Duy Tan University		
Project Web URL	https://tes-web.vercel.app/		
Team members	Name	Email	Tel
25211216456	Hoang, Nguyen Duc	hoang922001@gmail.com	0778 727 300
25211215965	Hung, Le Van	88levanhung@gmail.com	0823 474 409
25211216453	Phong, Bui Duy	buiduyphong921@gmail.com	0906 547 932

REVISION HISTORY

Version	Date	Comments	Author	Approval
Draft	27/11/2022	Initiate Document	Phong, Bui Duy	
1.0	29/11/2022	Initial Release	Phong, Bui Duy	
1.1	1/12/2022	Final version	Phong, Bui Duy	

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1. Introduction

1.1 Purpose

This Coding Standard requires certain practices for developing programs in the JavaScript language. The objective of this coding standard is to have a positive effect on:

- + Avoidance of errors/bugs, especially the hard-to-find ones.
- + Maintainability, by promoting some proven design principles.

1.2 Scope

This standard pertains to the use of the JavaScript language.

2. Code Standards

2.1 Variables

- Using **camelCase** for identifier names (variables and functions).
- All names start with a **letter**.
- Constants (like PI) written in **UPPERCASE**
- No unused variables.
- For var declarations, write each declaration in its own statement.
- Avoid modifying variables of class declarations.
- Avoid modifying variables declared using const.
- No re-declaring variables.
- Avoid assigning a variable to itself.
- Avoid comparing a variable to itself.
- Restricted names should not be shadowed.

2.2 Spaces Around Operators

Always put spaces around operators (= + - * /), and after commas.

2.3 Statement Rules

- Put the opening bracket at the end of the first line.

- Use one space before the opening bracket
- Put the closing bracket on a new line, without leading spaces.
- Keep else statements on the same line as their curly braces.

2.4 Object Rules

- Place the opening bracket on the same line as the object name.
- Use colon plus one space between each property and its value
- Do not add a comma after the last property-value pair.
- Place the closing bracket on a new line, without leading spaces.
- Maintain consistency of newlines between object properties.
- Always end an object definition with a semicolon.

2.5 Line Length

For readability, avoid lines longer than 80 characters

2.6 Spaces

- Use 2 spaces for indentation.
- Add a space after keywords.
- Add a space before a function declaration's parentheses
- Commas should have a space after them.
- Add spaces inside single line blocks.
- No space between function identifiers and their invocations.
- Add space between the colon and value in key-value pairs.

2.7 Quotes

Use single quotes for strings except to avoid escaping.

2.8 Comparative math

- Always use === instead of ==.
- Exception: obj == null is allowed to check for null || undefined.

2.9 Dot location

The dot should be on the same line as the property.

2.10 Array

Use array literals instead of array constructors

2.11 Modules

- Use a single import statement per module.
- Renaming import, export, and destructuring assignments to the same name are not allowed.

2.12 Functions

- Avoid unnecessary function binding.
- No unnecessary parentheses around function expressions.
- No function declarations in nested blocks.

2.13 String

- Regular strings must not contain template literal placeholders.
- No octal escape sequences in string literals.
- No multiline strings.
- No spacing in template strings.

2.14 Error catching

Only throw an Error object.

2.15 Files

Files must end with a new line.

2.16 Folders

The folder name must be named by camelCase.

2.17 Database

Using snake_case for naming long field name.

2.18 Others

- Semicolons must have a space after and no space before.
- Must have a space before blocks.
- Use isNaN() when checking for NaN
- Function typeof must be compared to a valid string.
- Never start a line with (, [, ` , or a handful of other unlikely possibilities.



Capstone Project 1

CMU-SE 450/CMU-IS 450

Sprint Meeting Document

Version 1.1
Date: 26/11/2022

TES - TRACKING EMPLOYEE SYSTEM

Submitted by
C1SE.02

Hoang, Nguyen Duc
Hung, Le Van
H Na Ri, Mlo
Phong, Bui Duy

Approved by

Proposal Review Panel Representative:

Name	Signature	Date
------	-----------	------

26/11/2022

Capstone Project 1 - Mentor:

Name	Signature	Date
------	-----------	------

PhD. Man, Nguyen Duc

26/11/2022

Meeting Information			
Product	TES		
Subject	First meeting with mentor		
Location	Online meeting via Zoom		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	15/08/2022	20:00	21:30
Attendees	Man, Nguyen Duc Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		Mentor Signature
Related documents	Document requirement, Proposal document		
Content	<ul style="list-style-type: none"> • Introducing members and mentor • Discuss and seek ideas 		
Result Items	<ul style="list-style-type: none"> • Find out the current needs of people from which to give ideas about the project • Unify the idea of an anti-fair software for facial recognition and QR code combined with location tracking 		

Meeting Information			
Product	TES		
Subject	Review proposal document		
Location	Online meeting via Zoom		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	20/08/2022	20:00	21:30
Attendees	Man, Nguyen Duc Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		Mentor Signature
Related documents	Document requirement, Proposal document		
Content	<ul style="list-style-type: none"> • Review proposal • Talk to mentor to point out what needs to be updated in the proposal document 		
Result Items	<ul style="list-style-type: none"> • Finish proposal 		

Meeting Information			
Product	TES		
Subject	Sprint 1 planning		
Location	Online meeting via Google Meet		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	05/09/2022	21:00	23:00
Attendees	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		

Related documents	Product backlog, Sprint 1 backlog
Content	
	<ul style="list-style-type: none"> • Select tasks from product backlog into sprint 1 backlog • Prioritize each task in sprint 1 backlog • Team estimates sprint point
Result Items	
	<ul style="list-style-type: none"> • Sprint 1 backlog

Meeting Information			
Product	TES		
Subject	Sprint 1 Review and Retrospective		
Location	Online meeting		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	25/09/2022	21:00	22:00
Attendees	Man, Nguyen Duc Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		Mentor Signature
Related documents	Sprint 1 backlog		
Content			
	<ul style="list-style-type: none"> • Demo feature have been implemented in Sprint 1 to entire team member and mentor <ul style="list-style-type: none"> ○ App: authentication flow ○ Web: demo web management about employee accounts, campuses, departments. • Get feedback from mentor (about what the team need to be improve) • Mentor help team identify the right path to continue develop 		
Result Items			

- Keep up the good points
- Goals to strive for in the next sprint
- Realize what the team needs to improve to work more effectively
 - Improve security of the web
 - Update login flow

Meeting Information			
Product	TES		
Subject	Sprint 2 planning		
Location	Online meeting via Google Meet		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	26/09/2022	21:30	23:30
Attendees	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		
Related documents	Product backlog, Sprint 2 backlog		
Content	<ul style="list-style-type: none"> • Select tasks from product backlog into sprint 2 backlog • Prioritize each task in sprint 2 backlog • Team estimates sprint point 		
Result Items	<ul style="list-style-type: none"> • Sprint 2 backlog 		

Meeting Information			
Product	TES		
Subject	Spint 2 Review and Retrospective		
Location	Online meeting via Zoom		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	16/10/2022	20:30	21:30
Attendees	Man, Nguyen Duc		Mentor Signature

	<p>Hoang, Nguyen Duc</p> <p>Hung, Le Van</p> <p>H Na Ri, Mlo</p> <p>Phong, Bui Duy</p>	
Related documents	Sprint 2 backlog	
Content	<ul style="list-style-type: none"> • Demo feature have been implemented in Sprint 2 to entire team member and mentor <ul style="list-style-type: none"> ◦ App: Timekeeping by face recognition, by QR code; checkin/checkout room to tracking what room employee have visited. ◦ Web: demo room management, GPS map view • Get feedback from mentor (about what the team need to be improve) 	
Result Items	<ul style="list-style-type: none"> • Improve flow timekeeping, need handle more case about security (limit employee device, wifi connection, location of employee) • Realize what the team needs to improve to work more effectively • Goals to strive for in the next sprint 	

Meeting Information			
Product	TES		
Subject	Sprint 3 planning		
Location	Offline meeting at iHome coffee		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	17/10/2022	9:00	11:00
Attendees	<p>Hoang, Nguyen Duc</p> <p>Hung, Le Van</p> <p>H Na Ri, Mlo</p> <p>Phong, Bui Duy</p>		
Related documents	Product backlog, Sprint 3 backlog		
Content			

<ul style="list-style-type: none"> • Select tasks from product backlog into sprint 3 backlog • Prioritize each task in sprint 3 backlog • Team estimates sprint point
Result Items
<ul style="list-style-type: none"> • Sprint 3 backlog

Meeting Information			
Product	TES		
Subject	Spint 3 Review and Retrospective		
Location	Offline meeting at room 507 (F area – 120 Hoang Minh Thao - Hoa Khanh campus)		
Date and Time	<i>Date</i> 05/11/2022	<i>Start Time</i> 9:15	<i>End Time</i> 10:30
Attendees	Man, Nguyen Duc Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		Mentor Signature
Related documents	Sprint 3 backlog		
Content			
	<ul style="list-style-type: none"> • Demo feature have been implemented in Sprint 3 to entire team member and mentor <ul style="list-style-type: none"> ○ App: send/cancel leave request, timeline tracking, timesheet view, user profile ○ Web: approve/reject leave request, timesheets view on web • Get feedback from mentor (about what the team need to be improve) 		
Result Items	<ul style="list-style-type: none"> • Realize what the team needs to improve to work more effectively • Goals to strive for in the next sprint 		

Meeting Information			
Product	TES		
Subject	Sprint 4 planning		
Location	Offline meeting at iHome coffee		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	07/11/2022	9:30	11:30
Attendees	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy		
Related documents	Product backlog, Sprint 4 backlog		
Content	<ul style="list-style-type: none"> • Select tasks from product backlog into sprint 4 backlog • Prioritize each task in sprint 4 backlog • Team estimates sprint point 		
Result Items	<ul style="list-style-type: none"> • Sprint 4 backlog 		

Meeting Information			
Product	TES		
Subject	Spint 4 Review and Retrospective		
Location	Offline meeting at room 507 (F area – 120 Hoang Minh Thao - Hoa Khanh campus)		
Date and Time	<i>Date</i>	<i>Start Time</i>	<i>End Time</i>
	27/11/2022	9:30	11:00
Attendees	Man, Nguyen Duc Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo		Mentor Signature

	Phong, Bui Duy	
Related documents	Sprint 4 backlog	
Content	<ul style="list-style-type: none"> • Demo feature have been implemented in Sprint 4 to entire team member and mentor <ul style="list-style-type: none"> ◦ App: Improve UI, UX, security ◦ Web: dashboard, excel timesheet report, configuration management 	
Result Items	<ul style="list-style-type: none"> • Improve the problems of the last sprint • Get feedback of mentor about feature: export excel report 	

Team Number/ Team Name	C1SE.02
Project title	TES-TRACKING EMPLOYEE SYSTEM
How many students are on your team?	4 members:
List the team member's name	Hoang, Nguyen Duc Hung, Le Van H Na Ri, Mlo Phong, Bui Duy

Reflection (Required)

1. What challenges did you face while completing this project?

- The technology we are applying for this project is Maps, Facial Recognition and QRcode , we have to study new knowledge to apply
- All members must learn about programming languages
- Our project runs on multiple platforms, so data integration and synchronization is difficult.
- We have little experience in estimating the time to complete tasks, so the first time is quite wasted
- Applying the scrum process to the initial working process was difficult because the members did not have much experience

2. What were the highlights for you/your team during this project?

- Programming, website-application, data processing.
- The bottom line is that we apply this technology to entrepreneurial companies, especially to Duy Tân University. So, I believe it will be very practical when our product is introduced into the application.
- Succeed in building team culture, teamwork skills. After a long time working together, everyone has positive changes in views, thoughts, actions, thoughts for others, and is more responsible for work.

3. What is the most important thing you learned in this project?

- Na Ri, Phong: teamwork. This is always important when working with others. Although we have worked together for some time, when starting something new it requires different skills and the ability to manage team members.
- Hoang, Hung: Process and teamwork. Estimation is also important. Because I didn't anticipate the difficulties of technology and prioritizing tasks. We have developed TES out of habit. I think our team should change it.

4. What part of the project did you do your best work on?

- Hoang, Nguyen Duc: Data management and processing
- Hung, Le Van: Develop Website App
- H Na Ri, Mlo: Management and process
- Phong, Bui Duy: Develop Mobile App.

5. What was the most enjoyable part of this project?

- Retrospective Meeting: We discuss 3 “Keep - Problem - Try” ideas, to get a look and solution for the next Sprint and start creating a new strategy Furthermore, we always have dinner together. after a classic meeting.

6. What was the least enjoyable part of this project?

- Change requirement, change code.

7. How could you/your mentor(s) change this project to make it better next time?

- Another way to make our project become better is that we should keep in touch with our mentors and report the difficulties that we are facin