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PathStrides: A Mobile-Web Application for Employee-Management and Work Productivity

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CHAPTER I

INTRODUCTION

Rationale

On-the-field work requires employees to go about their job outside of the office. In this case, how does the employer keep track of the productivity of the employees as well as promote positive reinforcement and a healthy employer-employee relationship? How can the employer check his/her employees' safety? This study is about the effectiveness of having a mobile and web application to promote work productivity and a healthy employee management system.

Location-based service (LBS) is a software service that gathers geodata from a mobile device where it's geographically located. These integrate from various resources such as Global Positioning System (GPS), cellular towers, and even Wi-Fi location tracking. According to Allied Market Research data (2021), the LBS market accounted for more than $36 billion in 2020 and is predicted to reach more than $318 billion by 2030. Understanding the advantages and disadvantages of location-based services (LBS) and how to maximize this technology for your small business are crucial given how many businesses are using LBS.

The researchers will be tackling the advantages of implementing LBS in companies that have on-the-field employees. PathStrides is a suggested tracking application that is both mobile and web-based. Employees will have access to the mobile application, while employers will use a standalone web application to find the general location of the staff members responsible for on-the-field duties. The researchers will consider a number of ways in order to make the application give the data that various company kinds require.

The gap of this study is about finding out how to track the progress of employees that do fieldwork. This study wants to direct the gaps in managing employees that work outside the office.

Employers have less control over their employees. This application aims to modernize the way of managing the employees by providing a live location to ensure the credibility of their assigned tasks. Since every destination is an employee's task, they should send a report to the employers on their every finished task. Once the manager approves the report, the task will be marked complete.

Review of Related Literature

This chapter includes ideas, case study, finished thesis, conclusion or methodologies and other related works that can help the study to be able to familiarize information and be relevant in the present studies.

According to Lawler and Cohen (1992), rewards systems are often implemented within organizations as a key management tool that can contribute to a firm's effectiveness by influencing individual behavior and motivating employees that work. The lack of rewards will create an unpleasant environment, thus diminishing employee's work efforts and may cause to withdrew their job (Ibrar and Khan, 2015). According to Gerald and Dorothee (2004), many researchers have found that employee job satisfaction is affected by both financial and non-financial rewards. Organizations tend to focus on financial rewards and non-financial rewards have become increasingly overlooked (Chiang and Birtch, 2008). Thus, increasing employee skills, knowledge and abilities in order to increase job satisfaction. According to Lai (2009), it is wrong to assume that everyone shares the same motivator, every employee has his or own set of needs and motivators. Therefore, employers have to carefully select the right rewards to respond the individual needs. Some people are driven by financial gain, while others are driven by recognition. Other employee also has other taste for their rewards. According to Dewhurst (2010), there are other means of reward employees that do not focus on financial compensations.

Some of these include the praised that employees that are able to acquire from their managers, the opportunity to take on Important projects or tasks, and even leadership attention.

Employees take recognition as feelings of value and appreciation which results a boost of morale that increases productivity of organizations. According to Freedman (1978), when effective rewards and recognition are implemented within an organization, favorable working environment is produced which motivates employees to excel their performance. Flynn (1998) also give support by affirming that rewards and recognition programs keeps high spirit among employees, boost up their morale and create a linkage between performance and motivation of employees. The purpose of the recognition and reward system is pay the performance of the employees which ultimately lead to employee's job satisfaction. Furthermore, Baron (1983) opines that when organization recognizes and acknowledges the employees, their working capacity and performance is very high especially when employees get an unexpected recognition.

A study of Etuk and Onwuachu (2016) also mentioned a case scenario that the need for an employee tracking information system to assist in the management, monitoring, searching, tracking, updating of the employees' records become paramount. For instance, some corporations employ over a thousand people. Several pieces of information are gathered from these employees throughout the recruitment process and employment phase. The personnel department stores these data manually. S Finding a specific employee record could take hours, which is unproductive in today's technologically advanced and fast-paced businesses. Within some business organizations, the employee tracking system is currently impacted by this straightforward circumstance. According to Partida (2021) many companies have a mobile workforce where employees travel from location to location daily, often using company-owned vehicles. According to a recent Quickbooks study, 300 out of 1,000 employees had their whereabouts monitored via GPS. It's a growing trend, and businesses are using GPS tracking for a variety of compelling reasons, including ensuring employee safety.

Observed that compensation and employee satisfaction drives productivity (Yamoah, 2013). Indicating a large compensation prerequisite for staff retention. The study observes that higher staff retention rates are better at retaining knowledge, which can lead to better performance for the company. The study also shows that compensation variables improve employee satisfaction, reducing of staff turnover in which it can build brand loyalty with staff and attracts talented people in the organization. Another study shows that answering the identified needs of the employee is the most basic tactic of every organization to push up the commitment of the employees (Chughtai, 2008). Provided the needed tools and basic needs employees do their work to compensate what was given to them. And with large compensation work productivity will surely increase.

According to Nickell, Jones, and Quintini (2002), Job satisfaction is an important factor among other factors in determining the employee performance. When an employee's job or experience is rated favorably, it results in a pleasant or happy emotional state. This helps employees to be recognize and compensated to the following work that they today and effectively increasing job productivity. Job satisfaction does also depend upon the employee that how the employee perceives the job itself. Thus, it appears to be the most situational effect on job satisfaction (Judge and Saari, 2004).

Review of Related Application

The primary function of PathStrides is the ability to monitor employees' work while they are out of the office. The employee would use a mobile application to give the management documents, and the manager would review the report and designate the task as finished after it was assessed. Similar to the application created by Etuk, Enefiok, and Onwuachu, Uzochukwu. (2016), allowing the managers to stay current on the general performance of the staff in their particular fields. This monitoring system is a revolutionary mobile app that makes use of Android OS to track employee time attendance. The daily activity information for each employee does not need to be manually entered into the database. It entirely does away with the conventional method of calculating performances. This will significantly cut down on paperwork and free up valuable time. This application effectively utilizes current mobile development technologies, improving staff productivity overall. It also provides significant commercial value by lowering hardware and maintenance costs and raising customer happiness.

Monitoring employee performance is a common feature of both PathStrides and this app. The other application’s algorithm focuses on the attendance of the employees in their respective areas. On the other hand, PathStrides has the feature of creating a report per task and sending a photo for validation on the company's end.

Objectives of the Study

The general objective of this project is to develop an application that is a location-based task monitoring with the ability to keep track the current location of employees, monitored by the managers, and supervised by the admin.

Furthermore, the study aims to:

1. Track out-of-field employees and record and monitor their routes and performance.
2. Improve productivity of the employees.
3. Modernizing the way of managing employees outside the office and ensure that their employees are working productively and efficiently.
4. Encourage the employees to finish as many tasks as they can to earn points that can be converted to vouchers.

Significance of the Study

Therefore, the introduction of the application to the market can assist companies in monitoring employee performance away from the workplace.

The following would greatly benefit from the application:

a. Socio-economic Significance: The application will motivate other developers to create a mobile and web-based geolocation tracking system that is more effective and efficient.
b. Technological Importance: People would utilize this most recent technology more frequently.
c. Safety Features: If an employee gets lost, this system makes it simple to find them and return them to a secure location.

Scope and Limitation of the Study

The scope of this application is for organizations that has workers who are working on the field that needs to be monitored. Geolocation will be the feature to be used in monitoring the employees. This could also ensure safety amongst the on-the-field employees and at the same time, evidence that the employee is in the assigned location. For more credibility, the application has a feature of create report in every finished task in which the employee must include a photo in the report for the report to be more credible.

The limitation of this application would be the potential for data loss as a result of signal disturbance because not all locations in the Philippines have a good signal connection. Additionally, a significant amount of battery life would be lost as a result of the application requiring the user to turn on his data. To be able to manage the application efficiently and evaluate everything as it is still new, the application would only be made available to businesses in well urbanized cities for the first year.

CHAPTER II

SOFTWARE REQUIREMENTS AND DESIGN SPECIFICATIONS

Use Case Diagrams

Use Case Diagrams are set of diagrams that outline various features that the system can provide. It displays every access option that the system offers users. When drawing use case diagrams, it is important to consider the behavior of all types of users. Depending on how many distinct roles users are expected to play, different use case diagrams may be present. This system in particular has three users: admin, manager, and employee.

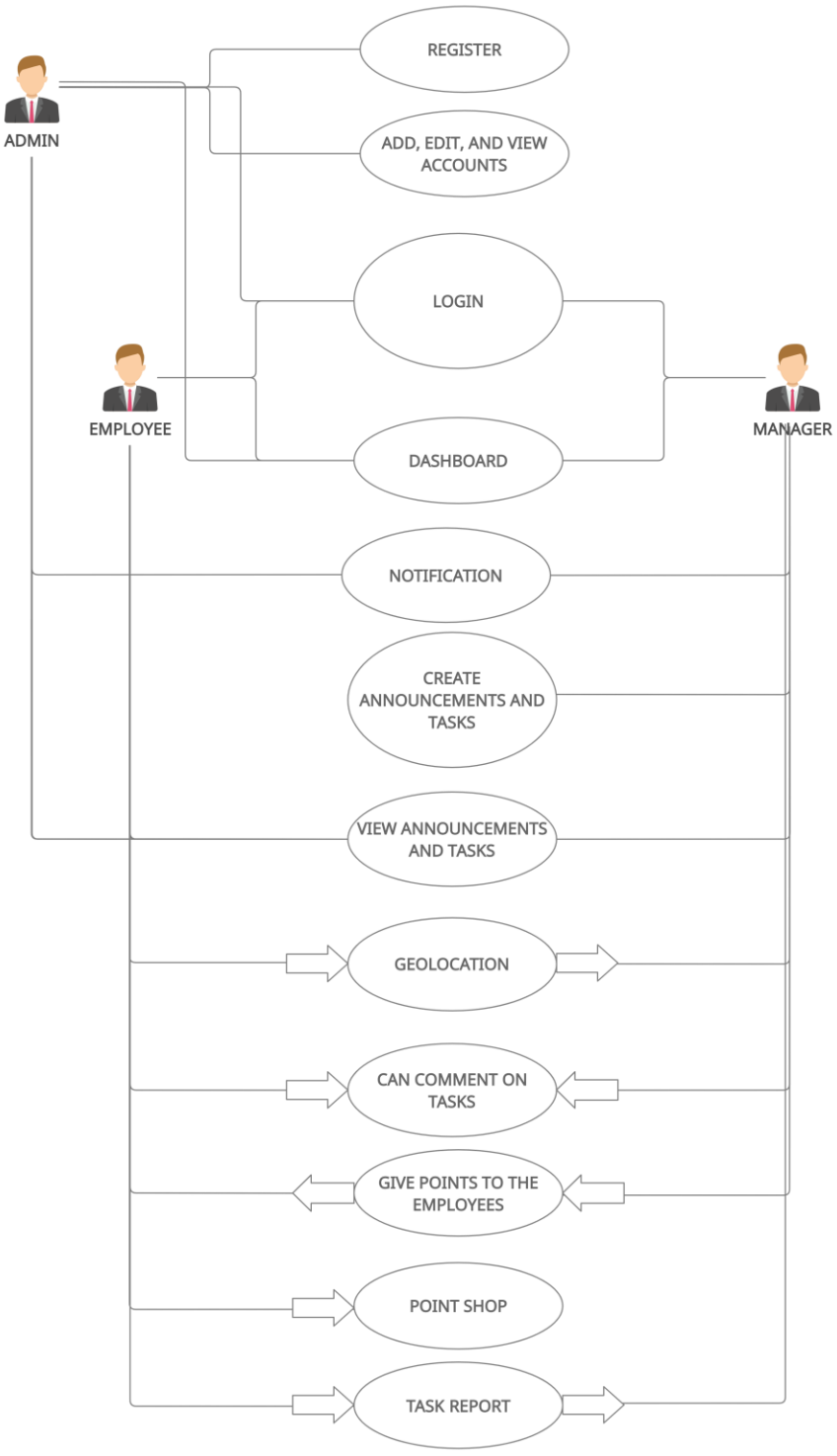


Figure 1. Use Case Diagram

Use Case Narrative

A use case narrative is a text-based explanation of a use case that may include decision trees or other easily understandable notations. The description should be written in the user's language and serves as a vital tool for communication between system engineers and the target audience. A numbered sequence of steps for the main action is frequently used in narratives, together with preconditions, postconditions, alternate or exception paths, etc.

<table>
<tr><td colspan="2">Number and Name: UC 100 – Log In</td></tr>
<tr><td colspan="2">Actor(s): Admin, Manager, and Employee</td></tr>
<tr><td colspan="2">Description: This logs the actors into the application to access their accounts. This is applicable if the admin already has an account registered. If not, they need to make an account in another use case (register). On the Manager’s and Employees’ end, they cannot make an account because only the admin can register them to the application.</td></tr>
<tr><td colspan="2">Pre - condition(s): 1. Account must be registered or added by the admin.
2. The login exists.</td></tr>
<tr><td colspan="2">Post - condition(s): Actor logs in successfully.</td></tr>
<tr><td>Actor Action</td><td>System Response</td></tr>
<tr><td>1. Enter email/username and password.</td><td>2. Verifies the information that has been inputted.
3. Verifies if the password is default or not.</td></tr>
<tr><td colspan="2">Exception Flow E1: The system errors on unregistered account.</td></tr>
</table>

1. System displays log in error 2. System lets you enter email/username and password again 3. If the information is confirmed correct, the system directs you to your homepage 4. End process.
Exception Flow E2: The system errors on wrong information
1. System displays pop up window indicating wrong password or email/username 2. System lets you enter email/username and password again 3. If correct information, system directs you to your homepage 4. End process.
Alternate Flow A1: The system detects the default password
1. System displays new page telling the user is using the default password 2. System lets you enter the current password, new password and confirm password. 3. If correct information, system directs you to your homepage 4. End process.

Number and Name: ***UC 101 – Register***
Actor(s): Admin
Description: This registers the admin in order to create an account.
Pre - condition(s): Account must not yet exist
Post - condition(s): None

Actor Action	System Response
1. Enter first name 2. Enter last name 3. Enter e-mail address 4. Enter username 5. Enter contact number 6. Enter password	1. Adds the admin to the database
Exception Flow E1: The system detects blank input fields	
1. System displays “The field is required” on fields that are left blank 2. System lets you input the blank input fields again 3. If all input fields are filled in, the system creates the admin’s account 4. End Process	
Exception Flow E2: The system detects the password is less than 6 characters	
1. System displays “The admin password must be at least 6 characters.” on the password input field 2. System lets you input another password 3. If the password contains at least at least 6 characters, the system creates the admin’s account 4. End Process	
Exception Flow E3: The system detects invalid credentials.	
1. System displays “Invalid credentials.”. The actor may input the wrong data type or exceeds the limit of characters that the field can only have.	

2. System lets the actor input again 3. If the all the credentials are valid, the system creates the admin's account 4. End Process
Exception Flow E3: The system detects that the account already exists
1. System displays that the account already exists 2. System lets you input again 3. If username and e-mail does not yet exist in the database, the system creates the admin's account 4. End Process

Number and Name: ***UC 102 – Dashboard***	
Actor(s): Admin, Manager, Employee	
Description: This is where the actor can see the overview of all the data that the actor's account has.	
Pre - condition(s): 1. The actor is logged in. 2. Check the type of actor	
Post - condition(s): The actor's data is updated	
Alternate Flow A1: The system detects that the actor is an admin	
Actor Action	System Response

1. Click announcement button and each announcement. 2. Click task button and each task. 3. Click manager 4. Click employee 5. Click department 6. Click profile	1. Display all details of the announcements data. 2. Display all the details of the task including the comments of the employees and managers. 3. Display all the managers' data. 4. Display all the employees' data. 5. Display all the department data 6. Display the respective profile
Alternate Flow A2: The system detects that the actor is a manager	
1. Click announcement button and each announcement. 2. Click task button and each task. 3. Click employee 4. Click profile	1. Display all details of the announcements. It also displays add announcement button. 2. Display all the details of the task the manager created, create task button, and displays the task comment. 3. Display all the employees' data. 4. Display the respective profile
Alternate Flow A3: The system detects that the actor is an employee	
1. Click announcement button and each announcement. 2. Click task button and each task. 3. Click points shop	1. Display all details of the announcements. 2. Display all the details of the respective task and the task comment.

4. Click profile	3. Display the points the actor earned. 4. Display the respective profile.

Number and Name: ***UC 103 – Account Profile***	
Actor(s): Admin, Manager, Employee	
Description: This displays all the personal information of the logged in account.	
Pre - condition(s): 1. The actor is logged in. 2. Actor's data from the database.	
Post - condition(s): The actor's data is updated	
Actor Action	System Response
1. Click edit profile	1. System can let the actor add profile photo or edit the actor's personal information
Alternate Flow A1: The system detects that the actor is an employee	
1. Click edit profile 2. Click log out	1. System can let the actor add profile photo or edit the actor's personal information 2. Goes out from the account information.

Number and Name: ***UC 104 – Add Managers***	
Actor(s): Admin	
Description: Admin creates managers	
Pre - condition(s): 1. Must have a PathStrides account 2. Manager's account must not yet exist	
Post - condition(s): None	
Actor Action	System Response
1. Enter the manager's first name 2. Enter the manager's last name 3. Enter the manager's e-mail 4. Enter the manager's contact number 5. Enter the manager's username 6. Enter the manager's password	1. Adds the manager to the database 2. Manager will now be able to login to PathStrides
Exception Flow E1: The system detects blank input fields	
1. System displays "The field is required" on fields that are left blank 2. System lets you input the blank input fields again 3. If all input fields are filled in, the system creates the admin's account 4. End Process	
Exception Flow E2: The system detects the password is less than 6 characters	

1. System displays “The admin password must be at least 6 characters.” on the password input field 2. System lets you input another password 3. If the password contains at least at least 6 characters, the system creates the admin’s account 4. End Process
Exception Flow E3: The system detects that the account already exists
1. System displays that the account already exists 2. System lets you input again 3. If username and e-mail does not yet exist in the database, the system creates the manager’s account 4. End Process

Number and Name: ***UC 105 – Edit Manager’s Information***	
Actor(s): Admin	
Description: Admin creates managers	
Pre - condition(s): 1. Must have a PathStrides account 2. Manager’s account already exists	
Post - condition(s): None	
Actor Action	System Response

1. Enter the manager's new first name 2. Enter the manager's new last name 3. Enter the manager's new e-mail 4. Enter the manager's new contact number 5. Enter the manager's new department	1. Updates the manager's information
Exception Flow E1: The system detects blank input fields	
1. System displays "The field is required" on fields that are left blank 2. System lets you input the blank input fields again 3. If all input fields are filled in, the system creates the admin's account 4. End Process	
Exception Flow E2: The system detects that the email/contact number already exists	
1. System displays that the email/contact number already exists 2. System lets you input again 3. If an email/contact number does not yet exist in the database, the system creates the update to the manager's account 4. End Process	

Number and Name: ***UC 106 – Add Employees***
Actor(s): Admin

<table>
<tr><td colspan="2">Description: Admin creates employees</td></tr>
<tr><td colspan="2">Pre - condition(s):
1. Actor must have a PathStrides account
2. Manager must already exist
3. Employee’s account must not yet exist</td></tr>
<tr><td colspan="2">Post - condition(s): None</td></tr>
<tr><td>Actor Action</td><td>System Response</td></tr>
<tr><td>1. Enter the employee’s first name
2. Enter the employee’s last name
3. Enter the employee’s e-mail
4. Enter the employee’s contact number
5. Enter the employee’s username
6. Enter the employee’s password</td><td>1. Adds the employee to the database
2. Employee will now be able to login to PathStrides</td></tr>
<tr><td colspan="2">Exception Flow E1: The system detects blank input fields</td></tr>
<tr><td colspan="2">1. System displays “The field is required” on fields that are left blank
2. System lets you input the blank input fields again
3. If all input fields are filled in, the system creates the admin’s account
4. End Process</td></tr>
<tr><td colspan="2">Exception Flow E2: The system detects the credential is invalid</td></tr>
</table>

5. System displays “The admin password must be at least 6 characters.” on the password input field 6. System lets you input another password 7. If the password contains the at least 6 characters, the system creates the admin’s account 8. End Process
Exception Flow E3: The system detects that the account already exists
5. System displays that the account already exists 6. System lets you input again 7. If username and e-mail do not yet exist in the database, the system creates the employee’s account 8. End Process

Number and Name: ***UC 107– Edit Employee’s Information***	
Actor(s): Admin	
Description: Admin creates managers	
Pre - condition(s): 1. Actor must have a PathStrides account 2. Actor must be logged in. 3. Employee’s account already exists	
Post - condition(s): None	
Actor Action	System Response

1. Enter the employee's new first name 2. Enter the employee's new last name 3. Enter the employee's new e-mail 4. Enter the employee's new contact number 5. Enter the employee's new department	1. Updates the employee's information
Exception Flow E1: The system detects blank input fields	
1. System displays "The field is required" on fields that are left blank 2. System lets you input the blank input fields again 3. If all input fields are filled in, the system creates the admin's account 4. End Process	
Exception Flow E2: The system detects that the email/contact number already exists	
1. System displays that the email/contact number already exists 2. System lets you input again 3. If an email/contact number do not yet exist in the database, the system creates the update to the employee's account 4. End Process	

Number and Name: ***UC 108 – Geolocation***
Actor(s): Manager and Employee

Description: Tracks location of the employee.
Pre - condition(s): 1. Actor must have a PathStrides account 2. The task must have an input location 3. Employee must click the Start Task button
Post - condition(s): None
Alternative Flow A1: The actor is the Employee

Actor Action	System Response
1. When the actor clicks the “Start Task” Button, the actor must go to the assigned location.	1. The system tracks the actor and sends real-time update of the actor’s location to the manager

Alternative Flow A2: The actor is the Manager	
Actor Action	System Response
1. The actor can track the employee’s location.	1. The system displays the real-time update of the employee’s location.

Number and Name: ***UC 109 – Task Report***
Actor(s): Manager and Employee

<table>
<tr><td colspan="2">Description: Once the task is accomplished, the employee must send a report and a picture for an evidence.</td></tr>
<tr><td colspan="2">Pre - condition(s):
1. The actor must be logged in
2. Employee must reach the destination before creating the report.
3. Employee must click the Start Task button</td></tr>
<tr><td colspan="2">Post - condition(s):
1. The system will save the report.</td></tr>
<tr><td colspan="2">Alternative Flow A1: The actor is the Employee</td></tr>
<tr><td>Actor Action</td><td>System Response</td></tr>
<tr><td>1. The actor will create a remark on what information is needed to be submit.
2. The actor will submit a photo for evidence depending on what the manager needs</td><td>1. Saves the submitted report and notify the manager.</td></tr>
<tr><td colspan="2">Alternative Flow A2: The actor is the Manager</td></tr>
<tr><td>Actor Action</td><td>System Response</td></tr>
<tr><td>1. The actor will open the report
2. The actor can click the button “Task Completed”.</td><td>1. The system displays the remarks and photos.
2. The system will mark the task completed and give the points to the</td></tr>
</table>

3. If the task is unapproved, the actor may comment to the employee on the task	employee depending on the task points.

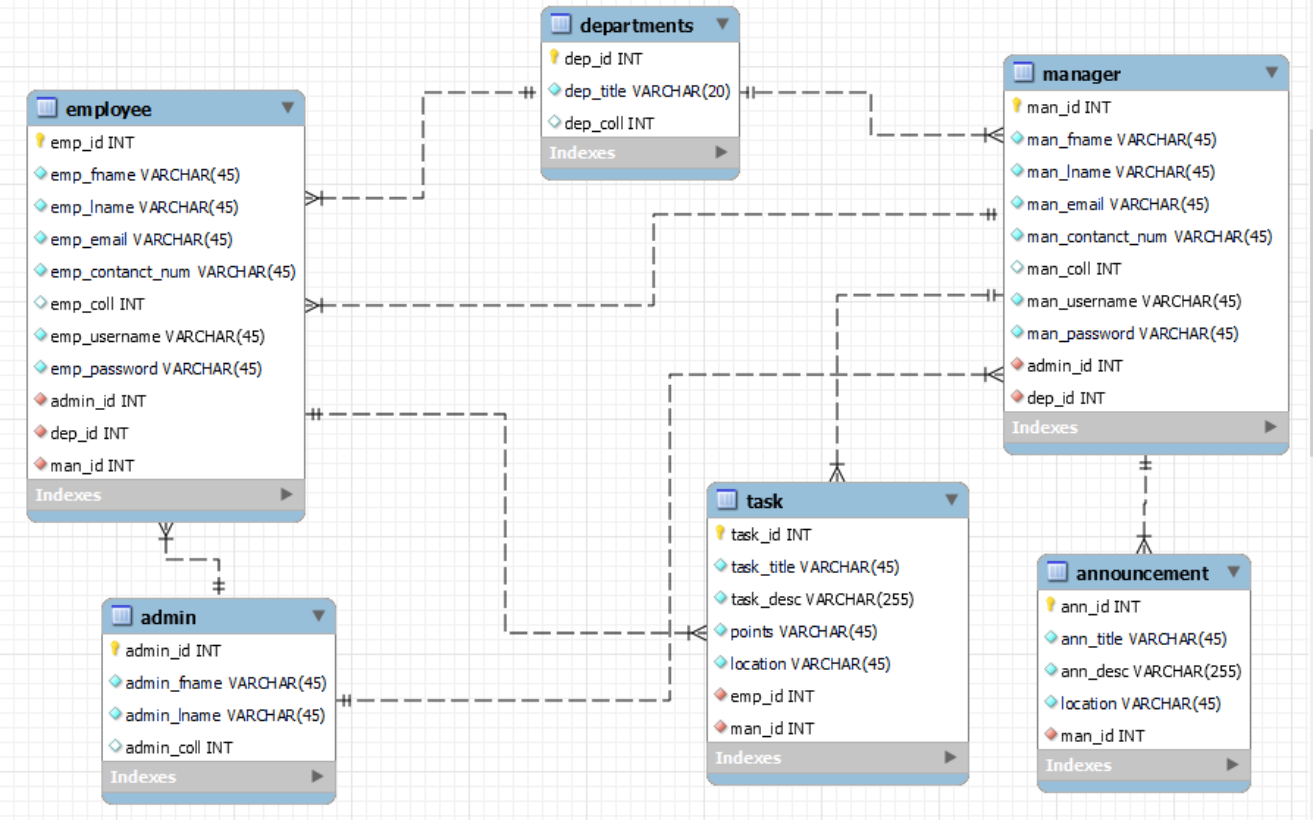
Number and Name: ***UC 102 – Notification***	
Actor(s): Admin, Manager, Employee	
Description: This is where the actor can see the latest data to be received.	
Pre - condition(s): 1. The actor is logged in. 2. Another type of user inputs a data	
Post - condition(s): Show an indicator that the notification is already seen.	
Actor Action	System Response
1. The actor clicks the notification	1. Displays all the notification arranged based on the date created. The user can view the full details of the notification

Number and Name: ***UC 110 – Points Shop***
Actor(s): Employee
Description: This displays all the personal information of the actor.
Pre - condition(s): 1. The actor is registered.

<table>
<tr><td colspan="2">2. Actor’s data from the database.</td></tr>
<tr><td colspan="2">Post - condition(s): The actor’s data is updated</td></tr>
<tr><td>Actor Action</td><td>System Response</td></tr>
<tr><td>1. Click any voucher the employee wishes to purchase</td><td>1. Redeems the code of the voucher.</td></tr>
<tr><td colspan="2">Exception Flow E1: The system detects employee’s points is insufficient to the voucher that the employee wishes to redeem</td></tr>
<tr><td colspan="2">1. System will not deduct the employee’s points
2. System will not redeem the voucher
3. Display “insufficient points”
4. End process</td></tr>
</table>

Entity Relationship Diagram

The Entity Relationship Diagram (ERD) is a diagram that shows the entities in a relational database and the attributes that characterize them graphically. It also explains the number of relationships between such entities (tables) and their relationship associated to one another (cardinalities).



User Interface Design

The User Interface (UI) design of mobile and web application covers the application's appearance and interaction between the users. This focuses on the overall presentation of the app.

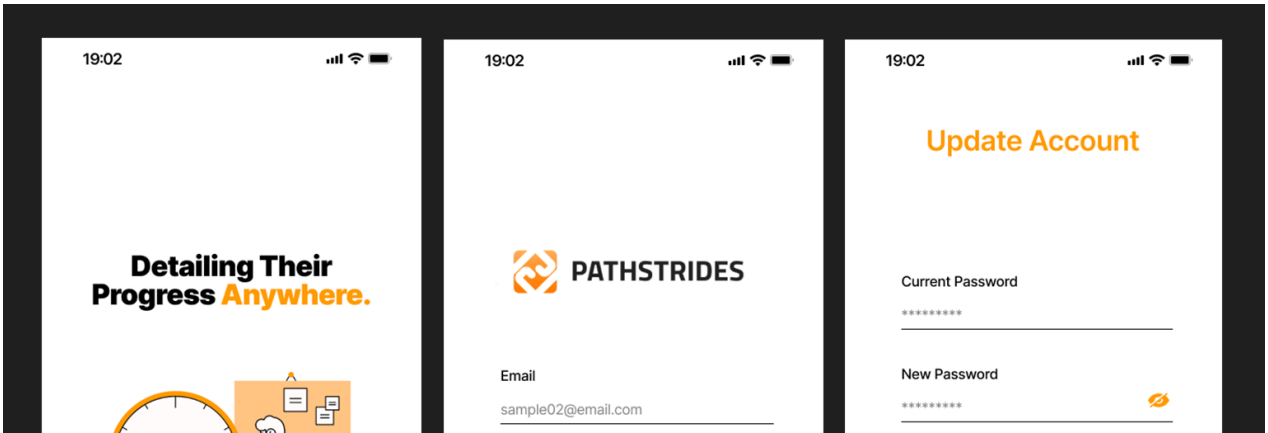


Figure 1. *PathStrides Mobile Landing and Log In Mobile UI*

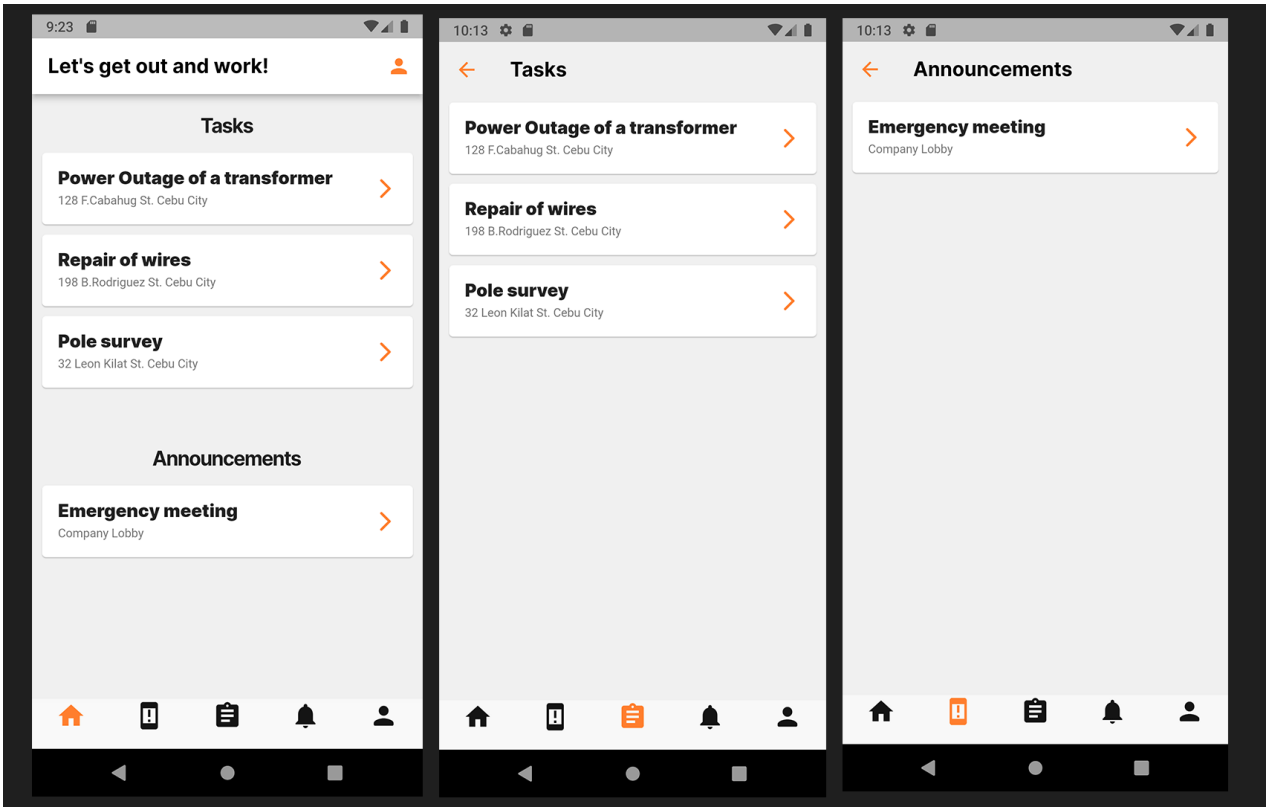


Figure 2. *PathStrides Dashboard, Task and Announcement Mobile UI*

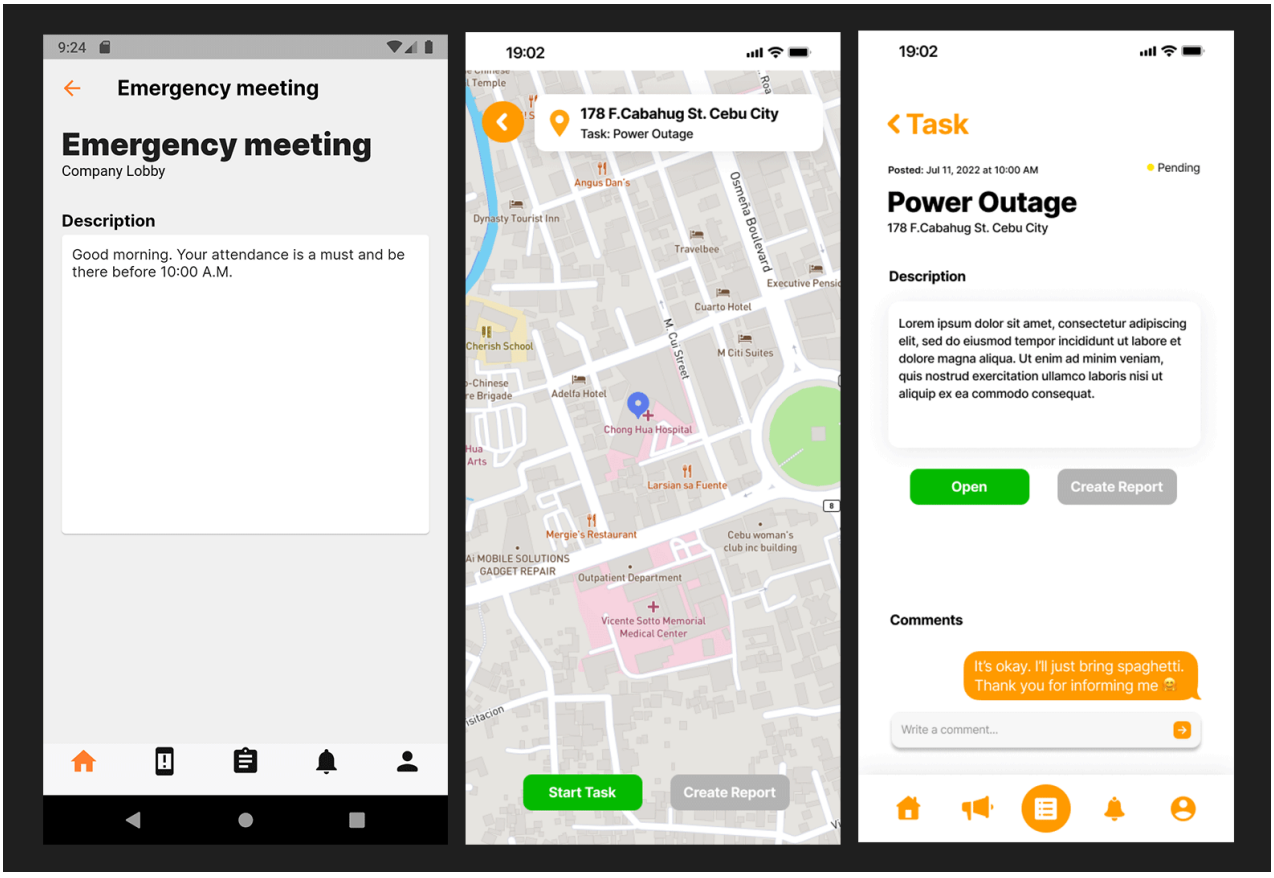


Figure 3. *PathStrides View Announcement, View and Start Task Mobile UI*

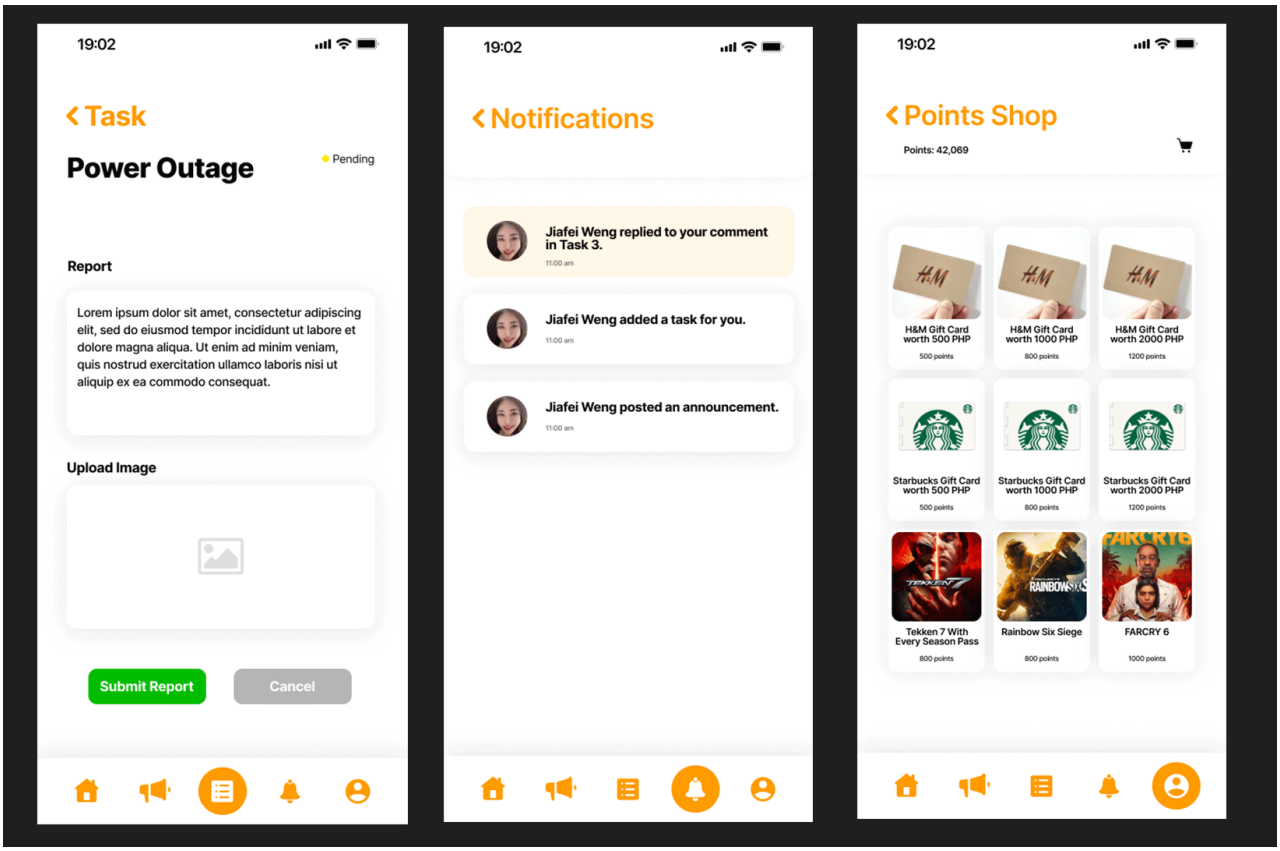


Figure 4. *PathStrides Submit Report, View Notifications, and Points Shop Mobile UI*

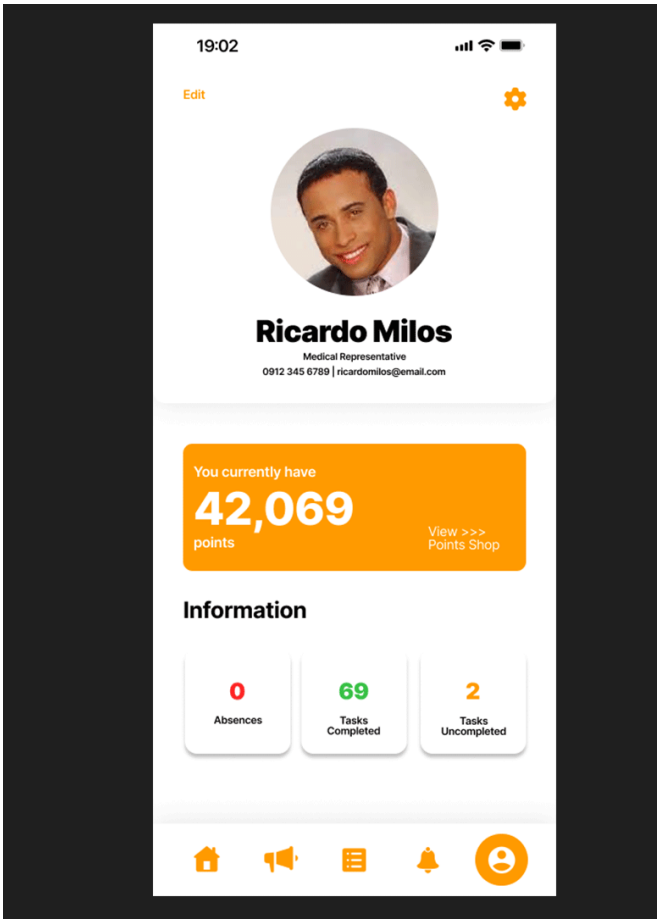


Figure 4. *PathStrides View Profile Mobile UI*

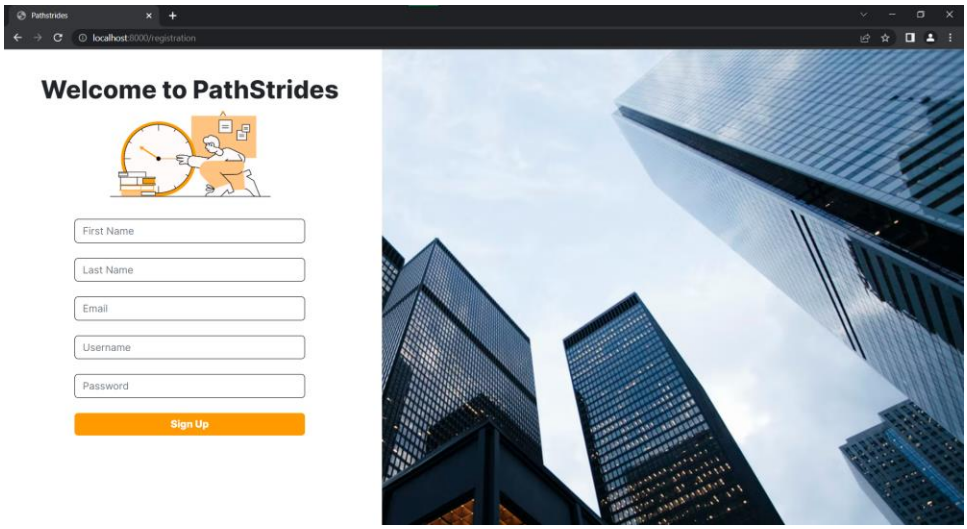


Figure 5. *PathStrides Registration Web UI*

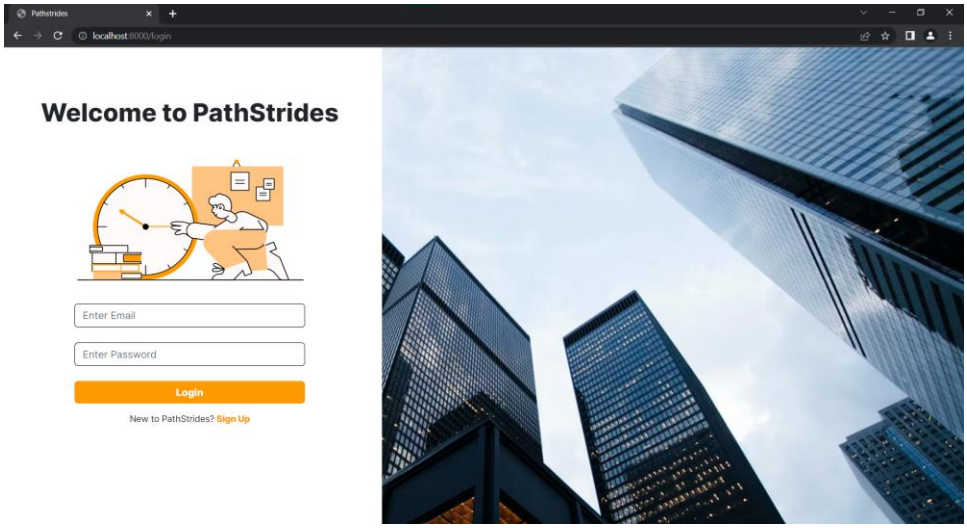


Figure 6. *PathStrides Login Page Web UI*

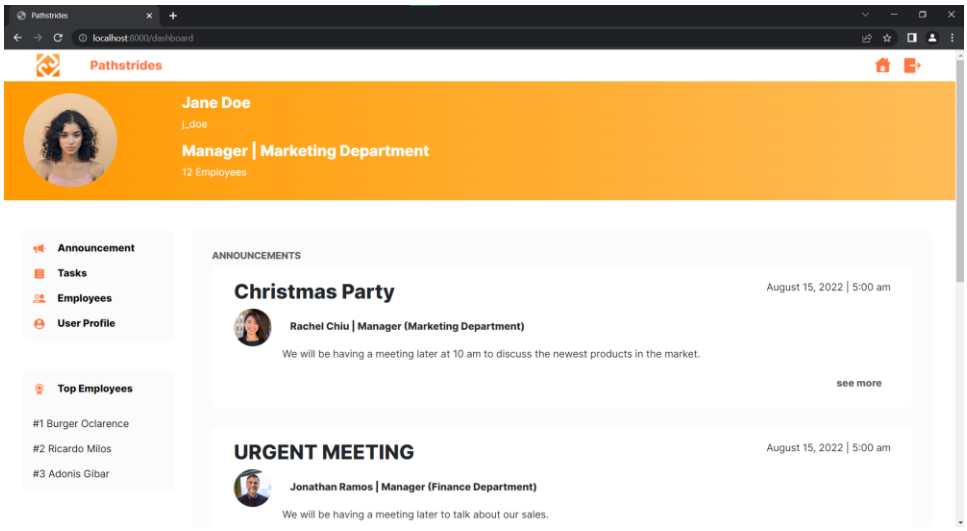


Figure 7. *PathStrides Dashboard Web UI*

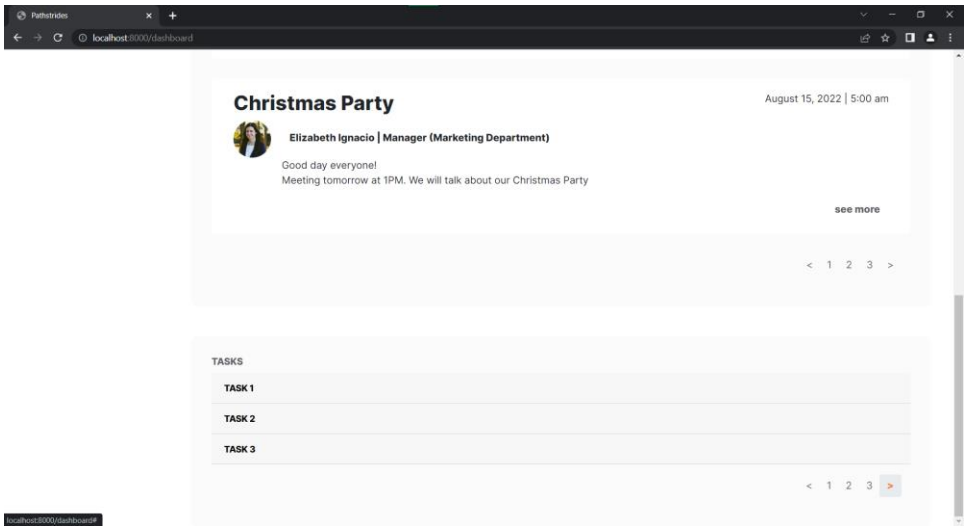


Figure 8. *PathStrides Dashboard Web UI*

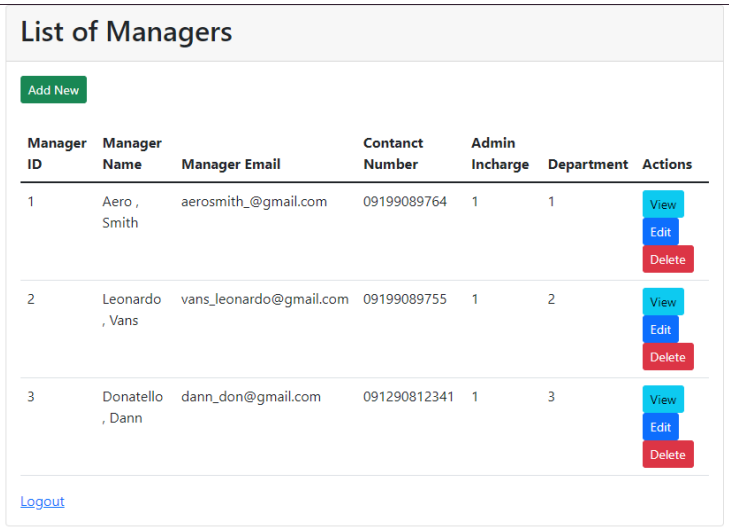


Figure 9. *PathStrides Admin (Manager List) Web UI*

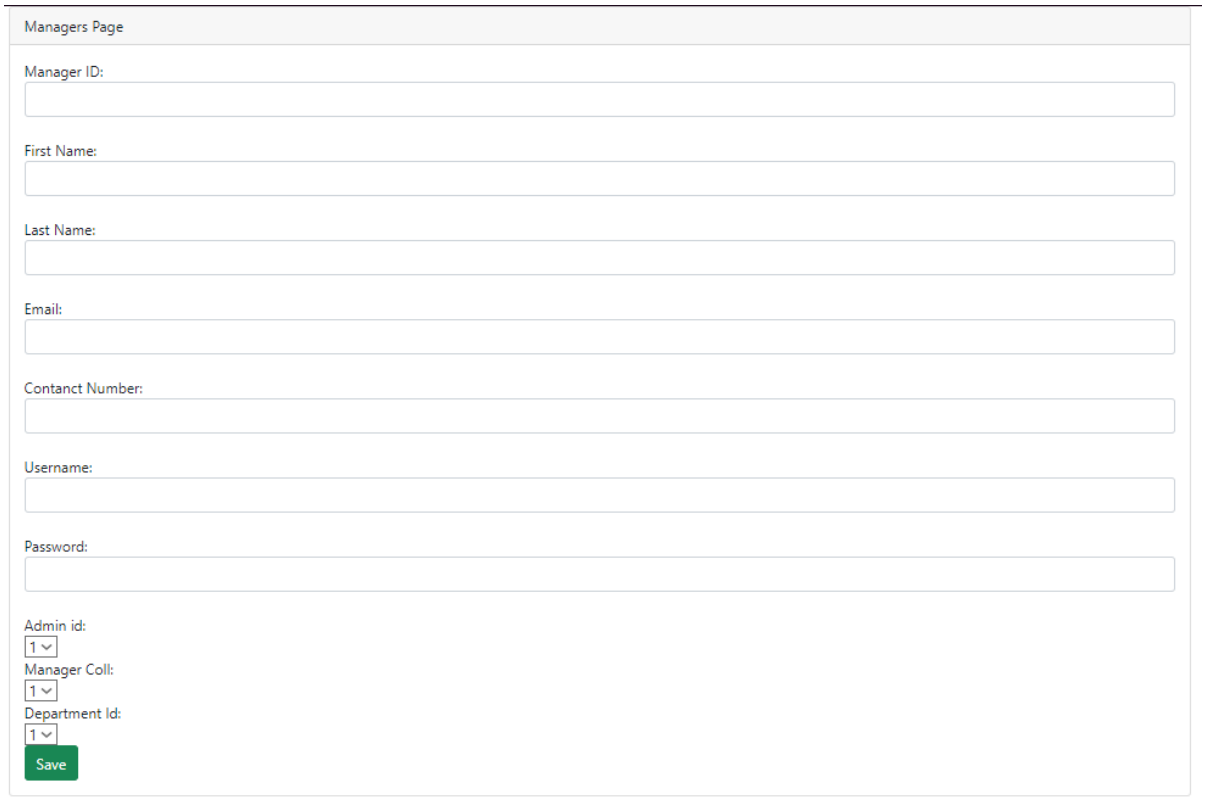


Figure 10. *PathStrides Admin (Adding Managers) Web UI*

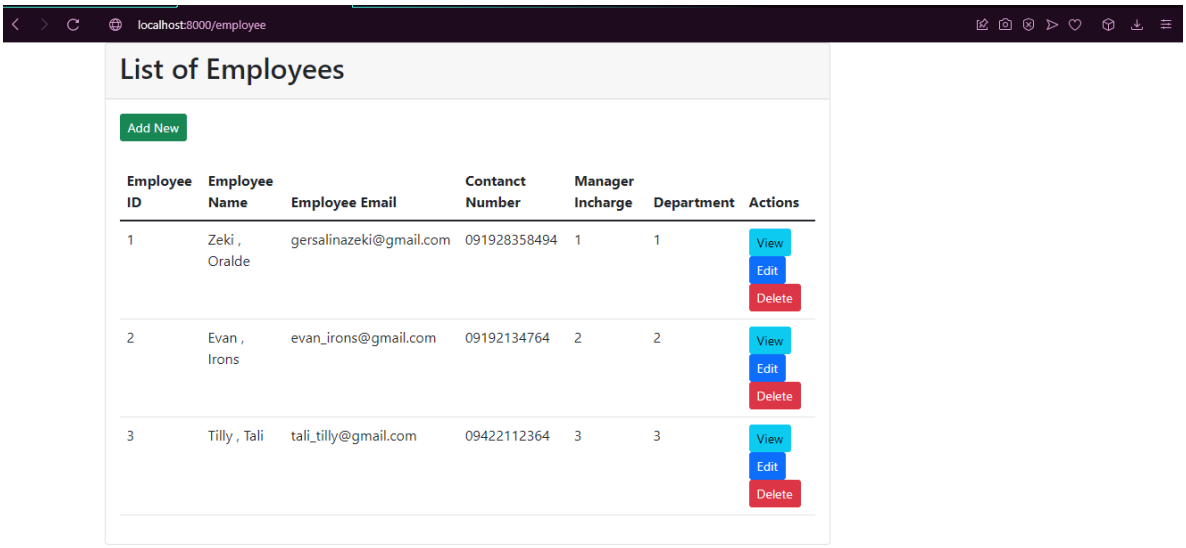


Figure 11. *PathStrides Manager (Employee List) Web UI*

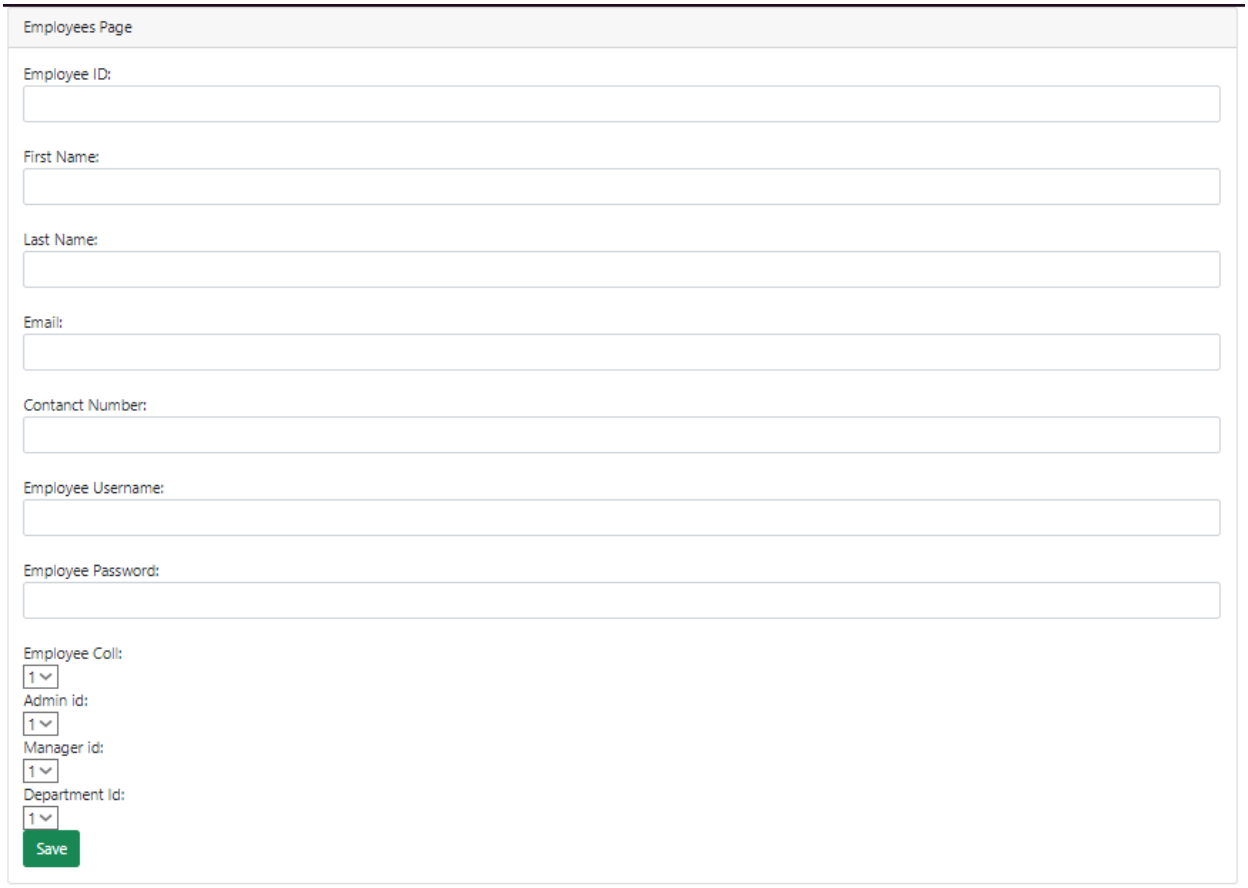


Figure 12. *PathStrides Manager (Adding Employees) Web UI*

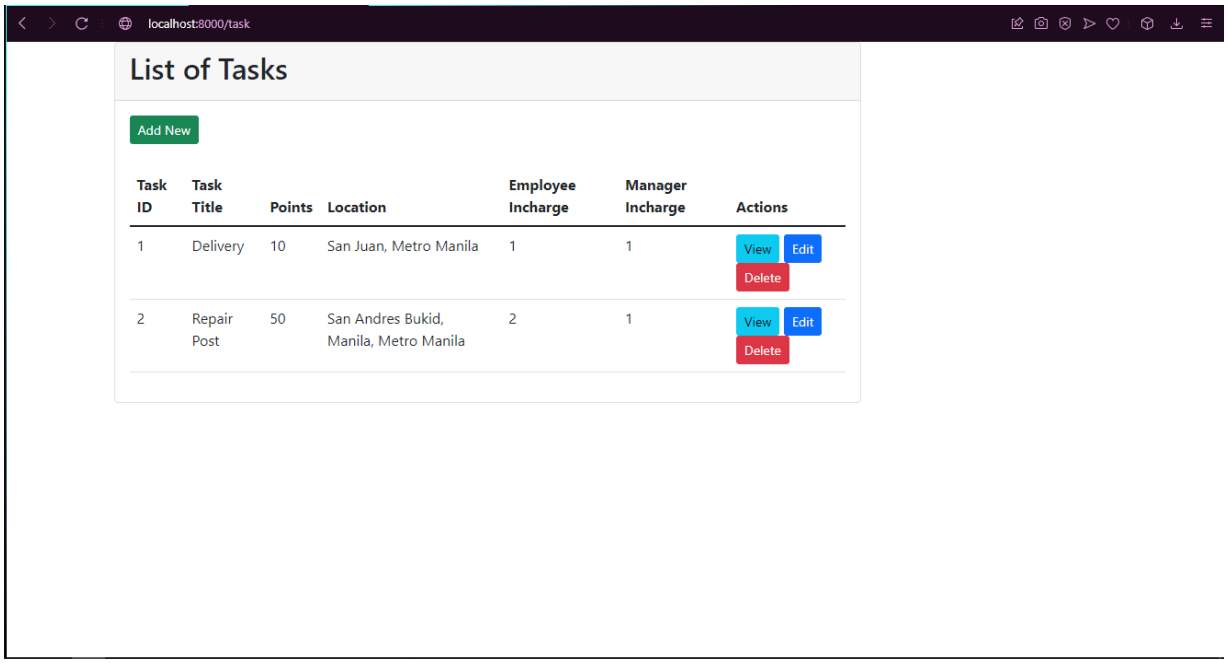


Figure 13. *PathStrides Manager (Task List) Web UI*

Figure 14. *PathStrides Manager (Task Adding) Web UI*

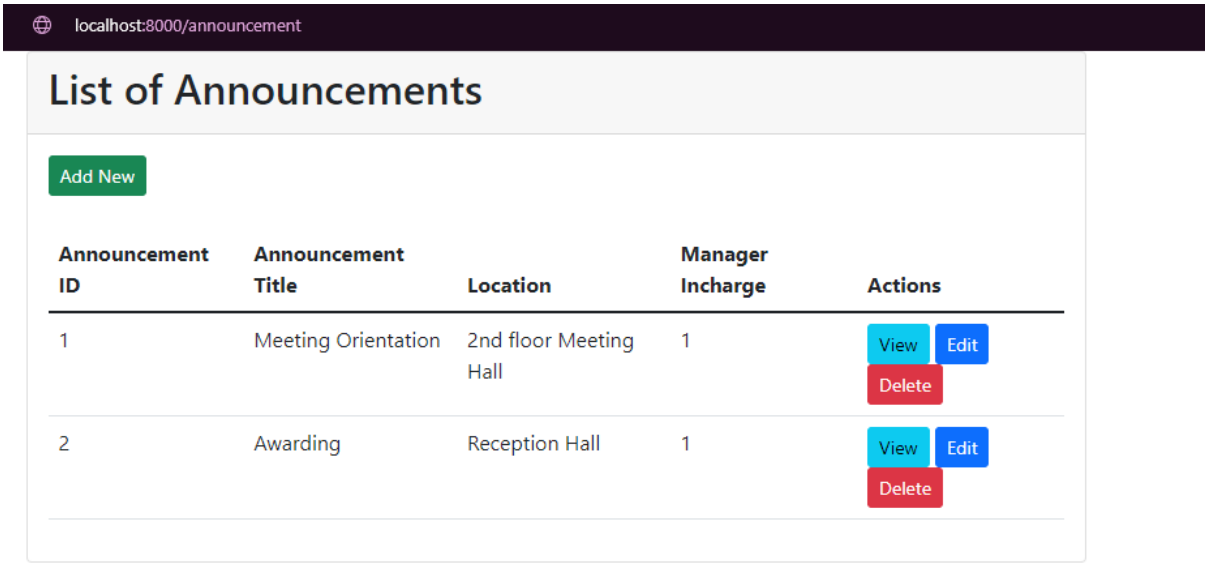


Figure 15. *PathStrides Manager (Announcement List) Web UI*

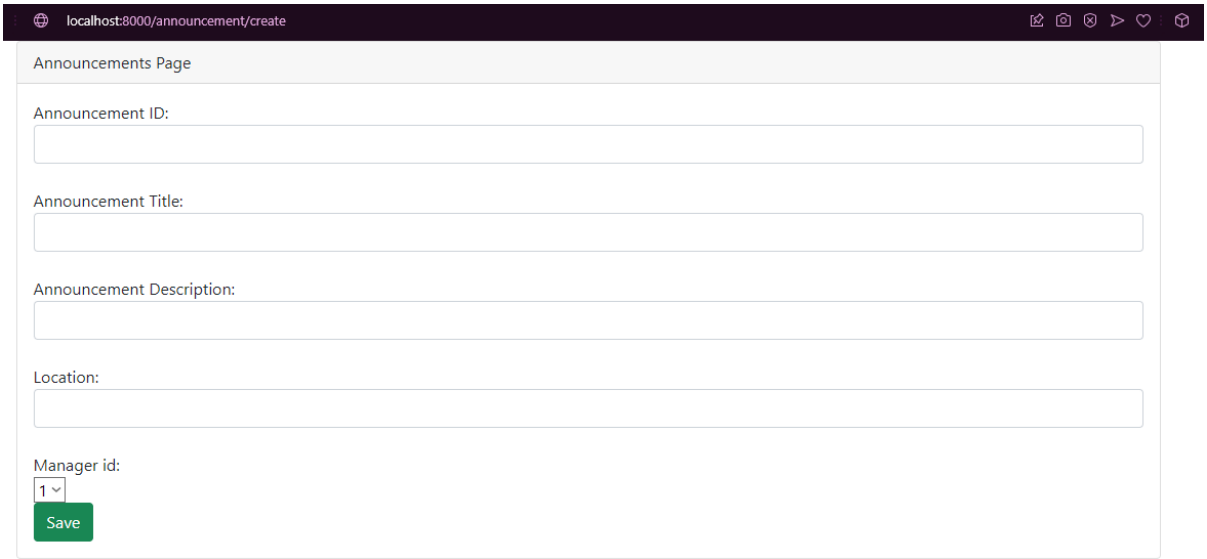


Figure 16. *PathStrides Manager (Announcement Adding) Web UI*

CHAPTER III

SOFTWARE DEVELOPMENT AND TESTING

DEVELOPMENT PLATFORM AND SOFTWARE TOOLS

HARDWARE PLATFORM

All of the development processes, from conceptualizing to deployment, the developers are using their PCs (personal computers) and laptops. In addition, for the mobile application to be tested, the developers also used a smartphone to identify the errors that the laptops and PC (Personal Computer) cannot identify.

SOFTWARE PLATFORMS, DEVELOPMENT ENVIRONMENTS, AND TOOLS

In preparation for the creation of PathStrides, the developers used LucidChart for creating flow charts and use case diagrams.

In creating this application, the developers used Visual Studio Code as their Integrated Development Environment (IDE) of choice. Visual Studio Code supports hundreds of languages and is recommended for web and mobile development because it is lightweight for any device. It supports Laravel and Flutter which are heavily used in the production of PathStrides.

In web development, the framework used is The Laravel Framework is used because it offers an excellent toolkit for a web application with many components for regulating audience circumstances, making it the perfect solution for developers. The language used is Hypertext Preprocessor (PHP).

For mobile development, the backend and frontend Software Development Kit used is Flutter, because it offers an abundance of dependencies which are essential for the production of the mobile application. The language used is Dart. Since the mobile application is dependent with the web application, Flutter can also connect with Laravel Framework.

For collaboration purposes, GitHub and GitKraken is utilized. GitHub allows you to manage code. GitKraken allows you to edit your code without affecting the main program for development purposes.

References

Baron, R. A. (1983). Behaviour in organisations. New York: Allyn & Bacon, Inc.

Chiang, F., & Birtch, T. (2008). Achieving task and extra-task-related behaviors: a case of gender and position differences in the perceived role of rewards in the hotel industry. International Journal of Hospitality Management, 27 (2008), pp. 491-503

Chughtai, Aamir Ali. 2008. Impact of Job Involvement on In-Role Job Performance and Organizational Citizenship Behavior. Institute of Behavioral and Applied Management 9 (2): 169–183

Dewhurst, M., Guthridge, M. & Mohr, E. (2010). Motivating people: getting beyond money. McK-insey Quarterly, (1), 12-15

E.E. Lawler, S.G. Cohen (1992). Designing pay systems for teams. ACA Journal 1, pp. 6-19

Etuk, E. and Onwuachu, U. (2016, November). An Android based Employee Tracking System. Retrieved from: https://www.researchgate.net/publication/310761520_An_Android_based_Employee_Tracking_System

Gerald, M., & Dorothee, L. (2004). Relationship of professionalism, rewards, market orientation and job satisfaction among medical professionals: The case of certified nurse—Midwives. Journal of Business Research, 57(2), 1042-1053.

Ibrar, M., & Khan, O. (2015). The impact of reward on employee performance: a case study of Malakand private school. International Letters of Social and Humanistic Sciences, 52, 95-103. https://doi.org/10.18052/ www.scipress.com/ILSHS.52.95

Lai, C. (2009). Motivating employees through incentive programs. Retrieved from: https://www.theseus.fi/bitstream/handle/10024/17561/jamk_1237444488_5.pdf

Nickell, S., Jones, P., and Quintini, G. (2002). A picture of job insecurity facing British men. The Economic Journal 112 (476): 1–27.

Partida, D. (2021, October 29). How Location Tracking Improves Worker Safety. Retrieved from: https://ohsonline.com/Articles/2021/10/29/How-Location-Tracking-Improves-Worker-Safety.aspx?Page=1

Rake R., & Wadodkar S. (2021). Location-Based Services: Definition and Examples. Retrieved from: https://www.businessnewsdaily.com/5386-location-based-services.html

Yamoah E. (2013). Relationship between compensation and employee productivity. Singaporean Journal of Business Economics, and management studies, Vol.2, No. 1. doi: 10. 12816/0003845