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SECTION 08

PROJECT – PHASE 1 (PROJECT PROPOSAL)

[CALUSTRATE: PERIOD TRACKER]

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1.0 PROBLEM BACKGROUND

1.1 Overview of Project

The period track app qualifies women to track ovulation and menstrual cycles automatically, which means women do not need to track it manually using a calendar and set dates day-by-day. Instead, using features such as “smart calculate” or automated tracking to calculate the average of women’s menstrual cycle based on the history and automatically set the certain date of a month by inserting women’s usual menstrual cycle as data input. These applications are developed by the research and using predictions on women’s average cycle length, that is 28-days with ovulating phases which are possible to occur on day 14 and the fertile window between day 10 to 16.

The development of period tracker applications complies intending to help and ease out women as they face out period phases as well as act as a data keeper for health references, so they can track for pregnancy, medical issues related to menstruation, and any crucial signs of cancer-related to women’s body part.

1.2 Problem Statement

Women have to face periods periodically, and yet not all of them make a correct prediction on which particular date does the menstrual cycle undergo as some of them are unable to predict their next period date or they might be unexpectedly bleeding. This becomes a huge concern since some of them could have menstrual bleeding during an unexpected time and it will bring devastation thus affecting them physically and socially. This event might cause women to be socially drawn and isolate themselves from the public as they are trying to protect themselves from humiliation and exposure of bleeding in public. Having the preparedness of expecting the next menstruation date is crucial to overcome this issue as it can prepare for the worst-case scenario and it can make your planning vacations easier.

Not only that, if women are unable to predict their period date, they are highly probably unable to be concerned about their menstrual cycle too. The menstrual cycle is important for a woman as it tells the proper time to have safe intercourse without any risk and chance of pregnancy. This could reduce the unplanned pregnancy rate and also reduce the living costs of a family. Finally, some women did not know if their period was normal or vice versa. Having an abnormal period could determine one's health quality. If they did not know the status of their menstruation, they could have serious health problems.

1.3 Proposed solution

As women bleed unpredictably and not all women come prepared when they go public, as such preparing for extra women pads and tampons, in case of bleeding at the worst unexpected moment. For that reason, applications such as period trackers exist to predict the next menstruation by sending out notifications to alert users, so they will come prepared days before menstruation occurs.

The period tracker app also resolves some of the issues such as carrying extra pads and tampons in a bag, which are considered a burden especially if a woman is having conditions such as heavy flow throughout her menstrual phases. Thusly, by placing the symptoms a woman is having during her usual menstrual phases, the period tracker app can record this info and remind her that her period is about to come if at that current time the woman is placing the same input as in the record on different time event, so this makes a woman prepare for her menstruation early and aware.

The user or specifically targeted for women can perform meditation or minimal workout precisely safe for women to overcome the PMS or premenstrual syndrome which occurred before menstruation and affected women's physical and emotional. The meditation consists of natural sound and steps that are conducted by a virtual conductor, the same as in workout which is featured in the period tracker app, Calustrate, so the user can follow the steps to accomplish it without having to go outside and find a real instructor as well as spends money to it. Thus, women can obtain peace and absolute distraction from PMS that is irritating to themselves and hardly able to manage it healthily.

Women also can track the pregnancy for family planning purposes by tracking the ovulation phases that are in the period tracker app. As we all know, this app sets the period length on average as 7 days and cycle length by 28 days, however, users have the choice to set up their period and cycle length to their preferences. So, with the data obtained from the user, the app can track down the ovulation phases that are made for the user. This estimation made for users helps them for family planning and to have safe intercourses if the user is unprepared for obtaining a child at that certain moment.

1.4 Objectives

Calustrate, a period tracker app, contains the main purpose to help women to track their period and the menstrual cycle, which it considers as a great way to learn about their body. This application helps women to know when their period comes, so women can prepare for their period flow. If they have a regular period cycle, they can also predict the fertility window to identify whether their body is susceptible to pregnancy or not. Tracking daily events or changes in body and mood can also help women to understand the effects of the menstrual cycle and how it affects their bodies.

A woman's menstrual cycle lasts on average 28 days. The ovulation of the menstrual cycle occurs when an egg is released from the ovaries, specifically on day 14 of the cycle. Menstruation, or bleeding, occurs on day 28 of the cycle. PMS symptoms can begin around day 14 and last until seven days after menstruation starts. The symptoms of Premenstrual Syndrome (PMS) are usually mild or moderate. Some of the most common signs of PMS are cramps in your belly or lower back, crying more than usual, craving certain foods, or being hungrier than usual. Thus, users can identify the details about PMS and get some advice to overcome or reduce these symptoms.

Calustrate also can predict and track when you are most likely to be fertile when you have a regular cycle. If you are taking a birth control method to prevent ovulation like the birth control pill, patch, ring, shot, IUD or implant but fall off track, this application will send notification as an alert to you when you could be fertile until you get back on track. Other than that, Calustrate also has birth control reminders and handy tips and tricks to help you get the most out of your method. This feature will help users to do family planning correctly.

Besides that, Calustrate provides self-care fitness features that are implemented using Augmented Reality (AR) where users can do some recommended workouts during menses depending on users' conditions so that users can keep themselves healthy and have good health also living carefree during PMS or menses. Calustrate also provides consultation between users and our health care officers using a hotline number if users have abnormal issues during the period cycle.

1.5 Scopes

This project focuses on the health and wellbeing of a woman as our potential client and concerns of their body parts that are needed to take care of from an application called Calustrate, a period tracker app, with features regarding female matters. The objective in performing and developing this period tracker app is to ensure women's health, particularly in their private part from any serious medical issues related to it. As Calustrate comes out with functions and features such as tracking period days that is acquired from the user or a particular woman, this helps her to track for a serious issue that possible to happen such as abnormal issues like overflow over days that are longer than usual or not having menstruation at all for several months. As an output or processed data to be given to the user, it may be able to alert users for reminders to refer issues to the healthcare department, thus helping the user to reach doctors and save her life from risks about their concern.

The main server used to accomplish this project is database and VoIP service. In order to accomplish the objectives of Calustrate, our organization needs a database for input processing and able to emerge output to its potential client and targeted audience. Database, based on Oracle, briefly known as an organized collection of structured information stored electronically in a computer system and controlled by database management system (DBMS) or the end-users consists of within the organizations to manage, update and retrieve data obtained from users of Calustrate. The database helps in managing data as users fill in their personal information, which consists of name, birth date, and phone number as part of the user's privacy. The data then will be programmed and stored by a database so then it will process the output in the form of a program and produce readable output to the user. As an example, when the user sets their cycle and period length as an input, this information is sent out to our databases for record purposes and processing the output. As the output, the program will be sent in readable form to the user so the user knows this month's period date starts from which to which. The use of database and other computing technology enables the organization of Calustrate for better decision-making and runs effectively in the scope of performances.

Calustrate connects to a technology service known as Voice over Internet Protocol (VoIP) which allows making calls, functioning as a regular analog phone line but instead using an Internet connection that allows calling another user within the same service or people who own a telephone number of that user, whether it is from local or international numbers. A high-speed internet connection is required for users to enable VoIP within Calustrate, so it enables the user to consult if any health issues and risks are available to the user through VoIP. Whenever the user detects an abnormal period cycle such as overflow or not having a period for several months, Calustrate provides medical numbers for users to interact with medical officers or consultants regarding their medical risks through VoIP services. In short, users are only able to use this service as they have a strong and stable Internet connection. This also gives an alternative for users if they are unable to manage to go to the hospital, so this service helps in private and comfortable communication between patients and consultants.

The 4th Industrial Revolution which applies in this project is cloud computing, big data analysis, and augmented reality (AR). Cloud computing applications used in Calustrate relate well to the mobility of users and involvement in worldwide travel too such that impeccable integration of service can be achieved if any user uses multiple

devices from multiple locations. Cloud computing helps in providing minimal amounts of hardware as most of the data is stored virtually on the cloud therefore it is safe from disasters and crowds. Calustrate stores users' data virtually therefore users need to back up data regularly so whenever a user is accidentally deleted by Calustrate or installing it in a new device, the same data as previous use can be restored and continued so it is safe to use as usual. As Calustrate uses cloud computing, therefore our organization must be aware of users' privacy and security, following ethical protocol and not exposing their personal information widely.

Calustrate is developed to help out women and targets women as an audience and potential client, so they are fit as a requirement to obtain data that will later be analyzed by our organization or any organization needed for big data analysis. The methods to obtain data from users can be as feedback or in a form of a questionnaire related to their health history. Data analysis can be developed into customer analysis which can be shown inside Calustrate for their health performance as overall or as in monthly regulation meanwhile big data analysis can be expanded in the form of statistics as a whole for research-related references and a view and justification of related issues to the people. Feedbacks, on the other hand, is obtained from users to review our app performance therefore we can fix any bugs and errors and able to achieve or develop into more functions than we currently own to increase the productivity of Calustrate, a period tracker app, as well as to determine decision-based on analysis to meet organizations' goal and objectives.

On the other hand, augmented reality (AR) is a clear version adapted from the real physical world that can be achieved through the utilization of visual elements and sensory stimuli such as vision that is exposed via technology. Using a transparent area for image target, this can be constructed for "virtual instructor" that is visible through a screen app for the use and coaching user in workout and self-examination features in Calustrate. This is because not all of the users have knowledge related to features available, therefore the existence of "virtual instructor" will show steps and methods for users within its scope. If a user is interested in performing breast self-examination, then the user can click on the screen and a virtual instructor will appear to show steps in doing breast self-exams. This feature might ease out women as most women are exposed to it by posters and 2D animation, also reducing the risk and possible symptoms of breast cancer as the user is receiving awareness and concern of risk-related issues. AR also uses cloud computing as it will be downloaded online and able to reach offline, by means users can reach out for virtual instructors even if they are offline as cloud computing stores the data virtually.

2.0 SYSTEM BOUNDARIES

2.1 Major user views

Our project is mainly to promote an application to women who have problems in noticing their menstrual cycle. We provide an application that helps women stay healthy even though they are in a period of time.

When a user enters the Calustrate application, the user is required to sign up to explore the application. To create an account, users need to provide their email, password and reconfirm their password. If a user already has an account, they just need to log in to an existing account. This application also allows users to stay signed in or log out when users have finished observing and interacting with the application.

Then the user must fill in certain details such as preferred name, phone number, birth date, length of the period (usually between 4-7 days for a normal person), length of the menstrual cycle which is the duration between two periods start date (usually 28-35 days for a normal person) and the start of the previous period cycle. This personal information helps in the data process, maximizing the effort and giving out the best output. An example of a data process given out for users is a smart calculation feature that can calculate an average of period cycles of users yearly.

After answering all questions, the application will bring you to the Calendar feature and there will be a reminder that will show the user's expected date for menstruations. If the user is on her period, the reminder will pop out to show how many days the user has undergone bleeding phases. There is also a function that allows users to get informed about their fertility and ovulation date through algorithms and calculations that are programmed within the app. Pregnancy mode is also available under the Calendar feature, in which the period cycle will stop and start a countdown until the delivery day as the user clicks the button.

On the same interface, at the lower part, there will be a diary or a journal. This feature is for users who want to express their feelings and condition on that particular day. Users can insert additional notes, symptoms, moods, medicine and there are also intercourse sections for record purposes. After the user has finished filling in their diary, the user can take a look at the previous diary by picking a date on the Calendar.

Then the user can go to the Home page to take a look at the forum that has been posted by another user. This feature consists of a group of people sharing and discussing the same issues they have all faced. Users can click to view and comment if the users are interested to do so. Forums are helpful if users are unable to refer to a doctor or answers are nowhere to be found on websites. Users can click "next forum" or "previous forum" for casual reading and gain any extra knowledge about the user's menstrual problem.

On another hand, there will be a feature that allows users to do some exercise by following the AR instructor that has been programmed into the application. On this page, users can choose to do light workouts for women who are having their period but still want to do some exercises or for women who just want to do normal workouts. So we will provide some workout that is suitable for them and they just need to follow the AR virtual instructor step-by-step. On the same page, there will be a self-examination

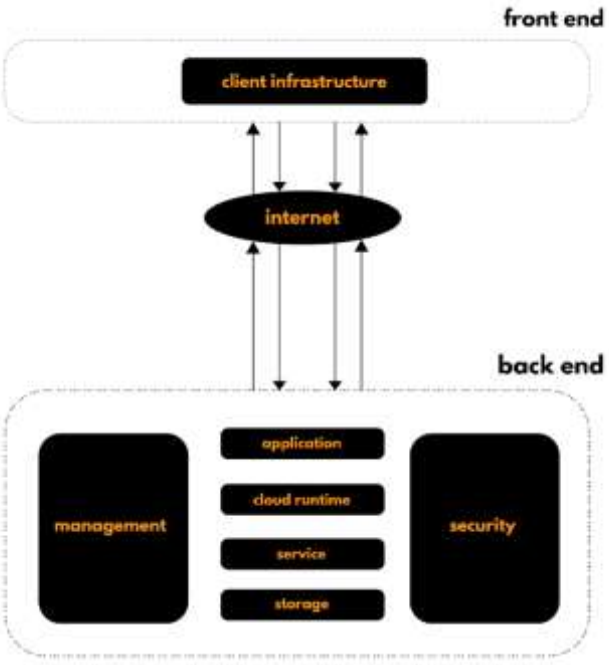
of breasts conducted by an AR virtual instructor for women who want to do self-checking to make sure their body is always in top quality condition and detect a possible risk of breast cancer. Then, the third feature on this page is there will be a meditation part where users can do mind-body therapies to enhance the mind's interactions with bodily function, induce relaxation, and improve overall health and well-being. This page is the interesting part of our application where users can maintain their body health even though they are pregnant or period.

The last feature is a profile part where users can change their profile settings and also contact our parties if any problem occurs during their access to our application. On this page, users will see their profile picture, name, birthday, email, and phone number. Users can change it in the settings provided. Users also can change the account by adding another account to this application. We also add some features using VoIP to make sure users can have a consultation with medical specialists if they are having problems regarding their menstrual cycle or with their body health. However, we also provide a section for users to see frequent questions that have been asked by others, so they do not necessarily need to consult with a doctor if they have a period problem. If a user wants to log out from this account, users can just click the logout button and it will bring them to the first page where the user needs to log in to the existing account.

Last but not least, if a user wants to exit the application without logging out, the data will be saved into our database and there will be a backup for the user's account if they accidentally delete the account. This application uses multifunction software that helps users browse anything about the period matter. It will help to improve the user's health to obtain a healthy body although we age and our body is getting frailer.

3.0 PROJECT PLAN

3.1 Architecture planning and design



Cloud computing works by providing interconnectivity between client devices and servers over the internet. The data allocated in a centralized remote server can be stored, reached, and managed depending on client requests. Suggesting a suitable cloud computing architecture is crucial to sustaining the service efficiency for this 'Calustrate : Period Tracker' project. Cloud computing architecture can be subdivided into two fundamental parts, the front end, and the back end.

The front end refers to the client-side or visible part with the aid of client infrastructure. Graphical User Interfaces (GUI) and applications are important things that enhance user experience on our service with graphical interactions like icons and buttons. Besides, the front end also allows users to access our provided period tracker features via the cloud. This will be explained in detail in the backend part.

As mentioned above, the internet acts like a bridge that connects those two parts of Cloud computing architecture. The back end can simply refer to the cloud system itself which allocates some functionality to be accessed by the front end and empower our project. About the architecture diagram attached, there are some mechanisms or parts that are implemented in the backend.

For security, it encompasses protection measures to our user details, the provided resources, and gathered data against undesired circumstances. For user secure measurements, strong user authentication is going to be applied to verify exact users'

identities. Since users are required to create an account using email, username, and password, the system will compare the existing files on the cloud. Once it matches, the system will grant the user's request, otherwise, the user needs to re-attempt or the system will notify any suspicious activity.

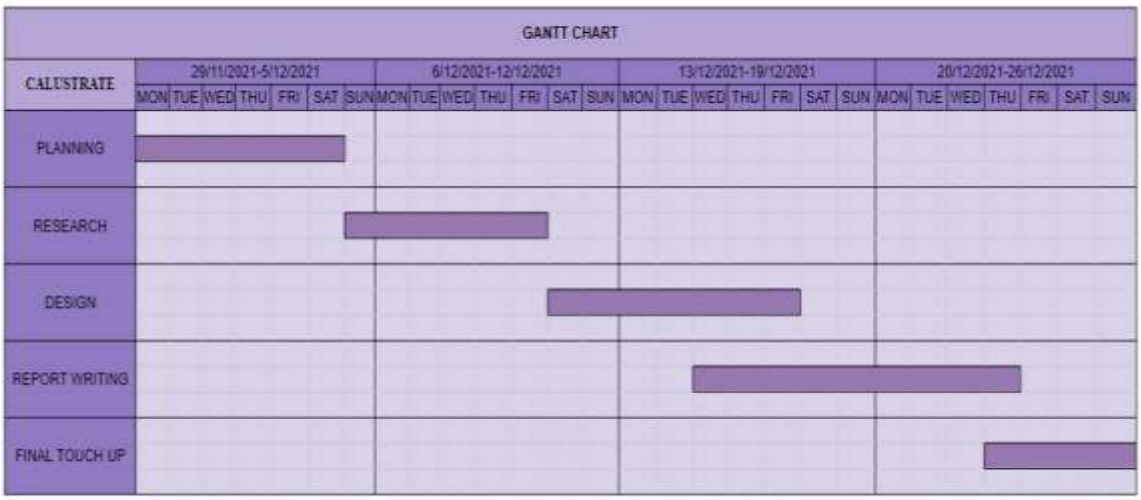
Correspondingly, this project deploys big data and analytics where it holds a myriad of valuable data focusing on women's health. Those data must be protected and sustain the accuracy to analyze authentically which leads to user trust and better service reputation.

Since cloud computing is capable of serving a vast manageable storage capacity for a system, all materials of the period tracker that the user requested on the frontend can be accessed in the storage. For instance, the self-care fitness features use augmented reality (AR), written diary, and users detail. The period phase length entered also is stored to be used in by smart calculator for menstrual cycle expectation generator.

In order to generate coordination or link between other components of the backend part, management components play a big role in this situation. The previous example for user authentication shows clear coordination between two distinct components, security, and storage. Infrastructure components refer to collections that are required in cloud computing support for this project. Infrastructure can include hardware and software like servers, network cards, and operating systems, or even implement it as virtualization like a virtual machine. Yet, this still depends on the workloads.

Cloud runtime serves as a platform for execution and runtime and describes the period from the beginning until terminated by the user or operating system. Next, cloud services exist in 3 major types, SaaS, PaaS, and IaaS. This component provides utilities to the backend where it controls the entire task running on the cloud. Platform-as-a-Service (PaaS) is a great service choice where it offers software development in the cloud, whereas the cloud service providers assist hardware and software parts. Lastly, application components carry out users' requests and requirements, referring to the user interface.

3.2 Gantt Chart



4.0 BENEFIT AND SUMMARY OF PROPOSED SYSTEM

4.1 Benefit

This project is aimed for women as they experience menstruation periodically. This project is specifically designed to help and assist women as they go through menstruation, with related information processed by their provided input. One of the benefits this project offers to the user is that the user is more aware of their period. With processed statistical data gathered through big data, the user can pinpoint what period is healthy and normal and what is not, and determine their normal period flows, thus making the user concerned and take things more seriously about their health and safety.

Next, the proposed system can reduce risk of more severe symptoms and lessen the ache. Some menstruation does have troublesome side effects such as back pain and period pain. Fortunately, some activities could reduce such effects and the proposed system does have features such as Self Care that could produce and recommend a few activities the user could do. The recommended activities are processed based on the user's input so that it is more suitable with their preferences. Furthermore, if the symptom worsens, this could indicate that the user is experiencing abnormal menstruation, therefore a consultation with a proper medical staff will be conducted using VoIP to further support the user.

An efficient family planning can be achieved by predicting an exact period date. This can be achieved since every menstruation has its cycle, and within this cycle lies a period that is fertile and infertile. This is important as it can reduce living costs and overpopulation. Finally, with enough data gathered using cloud database storage (RDS), an analysis can be executed such that new information about menstruation could be created. This could improve medical facilities and medicine so that it could assist women more compared to the current ones.

4.2 Summary of Proposed System

The purpose of our project is to help women track their period and the menstrual cycle, which is considers as a great way to learn about their bodies. This application will give a reminder a day before the period to make sure the user can prepare themselves. This application consists of a system that predicts the date of the user's period, an AR instructor that helps you maintain your body's health, a forum for discussion, a private diary that helps you express your feeling, and also a medical service that helps you to get a consultation from a specialist.

When first-time users enter our application, they need to sign up first to create an account and put their personal information. The data will be stored in our database to make sure the information and privacy of the user will not be accidentally deleted. The user's personal data will be kept safely in our database, and it will not leak or be shared to the third party. If the user already has an account, they just need to log in as we already have their information, so the system will read the user input and will display the data that has been stored in our database. This application is secure as we want to make a user-friendly system that helps users to easily browse our system.

The proposed system came with a feature called Self Care where the user can execute certain activity in order to lessen period ache and improve health quality. Our application will recommend a suitable activity based on the user input, so that the user could execute said tasks easily and safely. Furthermore, in order to make the activity more interactive, interesting and accurate, the project adopted and used Augmented Reality (AR) technology. A smartphone equipped with a camera module is capable of executing AR, the user can simply point toward an object, the system calculates and analyses, and finally adds some model overlays, with this technology, the user could execute said activities that are especially recommended for them with less hassle and more enjoyment.

Based on the user input, the application can determine whether the menstruation is normal or abnormal. This can be achieved by gathering enough data to be analysed by a medical expert. If the period is abnormal and has been showing severe symptoms, a proper medical expert will consult the patient via VoIP, and form a diagnosis. Next, the medical expert could recommend or give certain types of medicines that suit the patient. In some cases, some menstruation could demonstrate severe symptoms that could harm the patient, the medical expert could suggest the patient go to a hospital for more detailed checking. The safety of our users is guaranteed as they can properly consult with a medical expert and know more about their safety.

5.0 REFLECTION FROM PROJECT PROPOSAL

5.1 Reflection

Calustrate provides many features for women regarding app-supported menstrual tracking that users can get benefits from the application. Users can easily monitor their menstrual cycle from their smartphone since they have Calustrate's account to log in into the application. All the features provided like period tracker, fertile detector, workout guidelines and forum are very useful for the user to keep their menstrual and its cycle in a correct way.

The connection of the Internet in Calustrate helps users to always get updates about menstrual issues and information. The forum feature is the best way to encourage women to gain more knowledge about the menstrual cycle by sharing the information from factual sources. The VoIP service used in application for consultation also gives opportunities to users to get in touch directly from health officers if they have symptoms of an abnormal period.

Besides that, Calustrate also can drive our community to achieve a good knowledge about the importance of family planning. This is important because people (both couples) should have been prepared with strong knowledge about women's menstrual cycle so that they can manage their health and safety.

Calustrate will contribute a huge impact in the healthcare industry especially for women because it provides many features that can help them to solve their problem using 4th Industrial Revolution (4IR) technologies such as cloud computing, big data analytic and augmented reality. This application helps in reducing the time consumption, increases productivity, efficiency and quality in process to help women to practice the correct way for their menstrual cycle.

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