



FACULTY OF ENGINEERING
SCHOOL OF COMPUTING
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SECP1513 – TECHNOLOGY INFORMATION SYSTEM
SECTION 08
PROJECT – PHASE 1 (PROJECT PROPOSAL)
[Family Pluss]

LECTURERS: Izyan Izzati

GROUP NO: __1__

<Name>	<Matric ID>
ABDULLAH YASER ABDO ALI ALNADAHRI	A21EC0243
MOATAZ ABDO MOHAMMED ALSHATER	A21EC4011
EIKIESHA DEVI A/P SUBRAMANIAM	A21EC5015
MUHAMMAD WAFFI QAYYUM BIN DIN	A21EC0097
MALEK AYMAN MOHAMAD DAHY	A20EC3020

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Project overview

“Family Plus” is an application that focuses on assisting families in being more organized. In 2021, the traditional way of how family’s function, which is by marking calendars, keeping an accounting book, or pasting sticky notes on the refrigerator as announcements and reminders, is almost obsolete. Therefore, most families resort to using random applications that are solely designated for chatting, such as WhatsApp and Telegram to communicate and discuss matters among themselves. Several problems arise among families while using platforms like these, such as not knowing and leaving out someone’s schedule, running out of money due to the lack of budget tracking, and also accidentally ignoring important announcements or emergency updates.

As a result, “Family Plus” was created to assist parents in overcoming all of these issues. Parents will be able to manage their plans, track spending, make announcements, and receive emergency alerts all from one application. It enables family members to create and upload their own personal schedules from Google Calendar. Then, a family calendar will be automatically generated based on each family member's schedule that has been uploaded, allowing everyone to see each other's schedule. A budget tracker is also included in Family Plus. It gives parents the option of hiding or showing the family budget to all family members. Each child can input their spending into the app, which will be visible to their parents and will help in allocating monthly expenses for each child.

This application can also be used to make announcements that allow parents to choose who has the access to this feature. The announcements will be delivered to everyone's mobile phone as a priority notification. Parents can also use this feature to post To-Do lists. Emergency alerts are also available in Family Plus. If someone activates the emergency alert feature, everyone will receive a prioritized notification and their phone will ring.

1. Possible clients

Family Plus is aimed at every member of the family who owns a smartphone. Parents can use this application to create schedules and view the schedules of their children. Parents will also be able to track each child's expenses and efficiently allocate funds to each child. This application also allows parents to send important news and make announcements to all family members or a specific group, as well as to post To-Do Lists. Parents can use the emergency alerts to notify that an emergency call for a family member is needed immediately.

Family Plus also targets teens who own a smartphone to use this application. Teens can create and upload their schedule which includes school test dates, extra class dates, and many more which then allow their parents to see their schedule. Teens can also key in their expenses in the application. They are also able to receive announcements from their parents and also make their own announcements with permission from their parents. Teens can use emergency alerts to send an emergency notification to every family member especially their parents.

The elderly are also able to use Family Plus. They can create their own schedule and include important occasion such as hospitals appointment and upload it for their guardian(children) to see. They can also input their expenses into the application. This application allows the elderly to both receive and makes announcements. Emergency alerts feature can be used by the elderly to notify all family members if an emergency occurs.

2. Problem statement

The main theme in which most of the families face difficulties in when dealing with its members is the lack of the proper communication medium. This medium is designated to produce and provide families with the proper set of information that tells all members of the status of other members' time table and the status of the whole family financial situation. In the past, this was traditionally managed by using calendars and highlighting some of the important but this had an issue of occasionally forgetting to highlight some important dates or the sudden situations that came to a member of the family but he or she forgot to inform others of this sudden situation. There also appeared some problems of financial difficulties because of not being able to wisely calculate the expanses of the family. In addition some problems of having emergent situations occurred while not being able to contact a free family member since some of them could be busy.

The first problem mentioned is not knowing and leaving out a family member's schedule. Since the traditional way of having a 'family calendar' and marking everyone's important dates on it is very rarely used in most modern families, unfortunately, it is normal now that families don't know the whereabouts of others. There are two main issues to this. Firstly, it is extremely dangerous for someone to not announce their whereabouts to a trusted person whenever they are going out. This is because, if something were to happen to that person, nobody would be able to notice quickly enough and pinpoint their location to send some help. Secondly, accidental plans may be made. By not knowing or forgetting someone's schedule, a family might make some important plans on an important day. For instance, the parents do not know that the child has an important test on the day of a vacation planned. This problem actually happens very frequently among families, just because they are not aware of each other's schedules.

The second problem mentioned is families running out of money due to the lack of budget tracking. The traditional way of tracking budgets used to be done by manually writing them down using accounting books. This method of budget tracking is tedious, complicated, and extremely susceptible to errors, hence why many modern families have stopped implementing this in their households. Lack of budget tracking can cause the family to run out of money without them noticing it. For example, the children might not have enough money to spend during college because the parents did not pay enough attention to the family budget. This problem happens very frequently among families, just because they do not keep track and pay attention to their budget well.

The third problem is accidentally ignoring important announcements or emergency updates. The traditional way of doing this is probably by pasting sticky notes on the refrigerator or manually having to send a text message and call every single family member manually, which is impractical and time-consuming. This can cause delayed communication among family members. For instance, if someone were to be in a crucial emergency, they would have to search the names of the contacts of whom they want to text and call, which will be time-consuming. Not to mention, even text messages might get accidentally ignored due to a lot of other incoming messages. This problem happens very frequently among families, just because their text messages and calls may be ignored by accident during an important announcement or emergency.

3. Proposed solution for the problem:

Family Plus is the solution to all these problems. Family plus is a family super app, which can also be referred to as the “one-stop center for families” to manage their plans, track their expenses, make announcements and give out emergency alerts. It will definitely be any family’s new best friend, and it would defeat the need to use other irrelevant applications, as Family Plus is specially tailored for families, big and small.

Family Plus solves the first problem, which is not knowing and leaving out a family member’s schedule. Family Plus will allow its users to upload their own schedule from Google Calendar, or even choose to create their own schedule in the app itself. Based on everyone’s input, a family calendar will be generated, therefore everything will be synced all together in one spot. This will help families plan their upcoming vacations and holidays even more effectively, without worrying about having to leave someone behind on accident.

Family Plus also solves the second problem, which is running out of money due to the lack of budget tracking. Family Plus has a budget tracker function to solve this issue. Parents can choose to hide or share the budget with their children. Parents can also allocate money to each child, whereas each child can key in their own expenses into the app, and the parents would be able to monitor this. In the end, everything will be calculated automatically. This will help a family to manage their budget in the most fast, efficient, and accurate way. It will also be a good way to teach the kids to manage a budget from a young age itself, as the app will allow them to be directly involved in tweaking the budget by inputting their expenses.

Family Plus also solves the third problem, which is accidentally ignoring important announcements or emergency updates. With Family Plus, parents and whoever they choose can make an announcement in a flash. Announcements made will be sent as a priority notification to everyone’s phone, or a chosen group of people, like siblings and many more. Parents can post to-do lists as well on this function. Family Plus also allows emergency alerts to be sent. If anyone puts in an emergency alert, everyone in the family will get a priority notification, and their phone will ring. This will allow everyone to be notified of an emergency immediately. With the presence of this function, nobody will ever miss an important announcement nor be unnotified of an emergency event.

4. Family Plus, 4th IR technologies, and their uses:

4.1 Cloud Computing

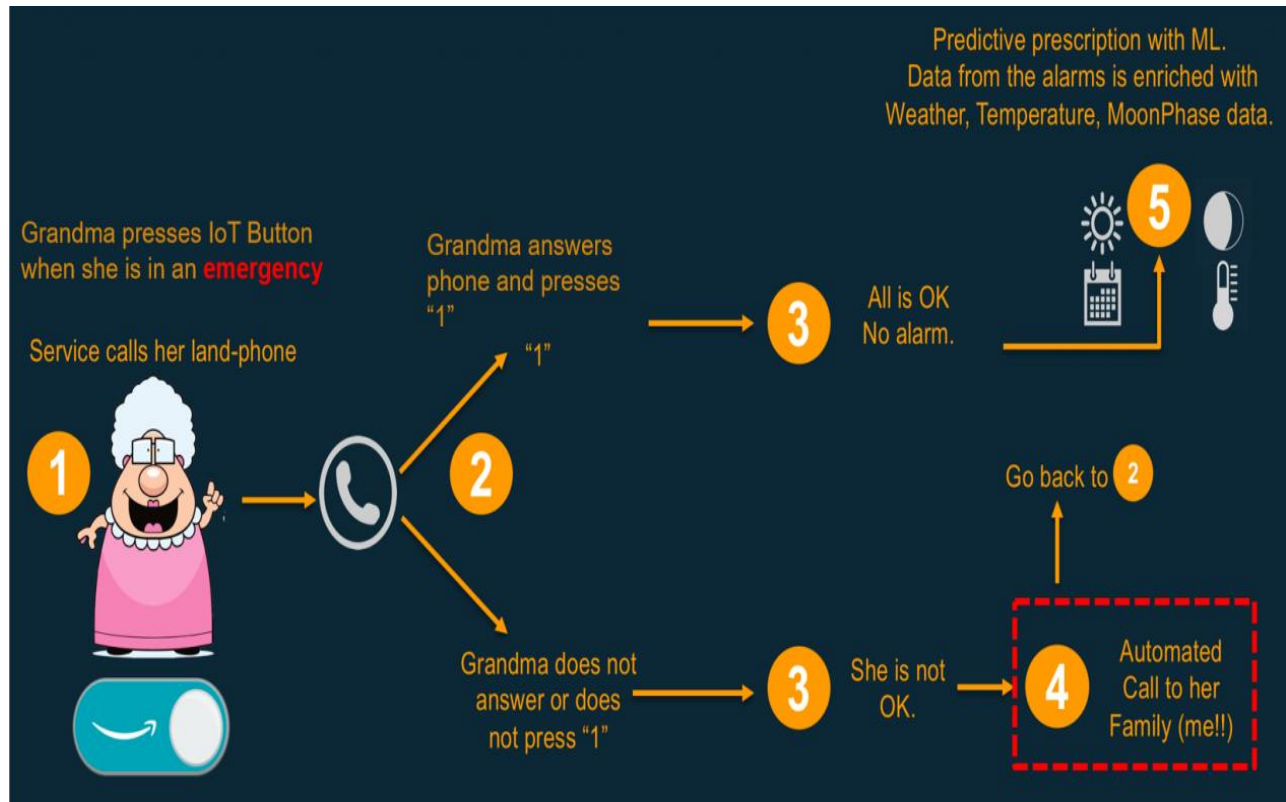
Cloud computing (the delivery of on-demand resources) plays a very important role in building Family Plus, in fact, all of Family Plus features will be implemented on the cloud. There will be three main Cloud pillars to build a full-fledged application, i.e., Virtual Machine, Storage, Relational database.

4.1.1 Amazon EC2 (Virtual Machine), Amazon Elastic Compute Cloud by AWS allows users to rent virtual computers to run applications, this will be a key part of building Family Plus and will be directly connected to other cloud services, storage, and the relational database. The virtual Machine by Amazon EC2 will hold the main server from which communications to the database server and the front-end will take place, an example of usage will be the integration of google calendar to upload the schedule, this will be done using Google Calendar REST API's, the REST API will be implemented in the Application by programming it to do the respective task which is meant to be implemented in the Application feature, then API will run on the server in which its hold on Amazon EC2 Service.

4.1.2 Amazon S3 or Amazon Simple Storage will be the storage object for Family Plus Application, it will hold all the data that will be used in the application, all the media, files, backups, will be stored here.

4.1.3 Amazon RDS or Amazon Relational Database Service will be the main service for managing the database, here is where the fetching of data is managed. The data will have to be managed using a database server provided by an RDBMS (Relational Database Management System), examples of those will be, My SQL, Postgre SQL, etc. This will be connected to the main server in Amazon EC2, where the main server will make requests to the Database server to fetch data. All of Family Plus features will use this service as all features need data fetching in some sort.

4.2 IoT: can be implemented in Family Plus in various ways, one feature is Emergency alerts, a feature that will let other family members know you are in an emergency, and make an emergency call



4.3 5G: High-speed mobile internet is needed, as all the features require an internet connection to be able to connect to the cloud for it could perform the appropriate services, like priority notifications will be received quicker to all family members if there was a stable and quick way to transmit the data which will be better achieved by 5G connection, the higher the speed of the internet, the lower the latency and the higher the quality of the services provided by Family Plus.

5. Architecture

Cloud Computing infrastructure has widely proved to have numerous advantages that outweigh on-premise infrastructure. This is the reason why in the Family plus project we would completely depend on the architecture provided by the cloud services which we chose to be AWS (Amazon Web Services). Cloud architecture has two major components that would be of great benefit which are **Front-End** representing the client-side, and **Back-End** representing the server-side. Those two components are normally connected together via a network or internet. In addition, there are two more points that also play a vital role when choosing the cloud computing architecture which are the **Model Deployment** and the **Delivery System**.

5.1 Front-End

At the beginning of any project front-end, architecture is basically the first thing that is developed because it provides the cloud services with the Planning, constructing, and documenting of the applications and interfaces. Front End is represented in all the interactive features used by the user in each program. In cloud architecture, those are the web browsers' applications like Google Chrome, Microsoft Edge, and Mozilla Firefox. It has only one component which is cloud infrastructure consisting of hardware and software elements like Virtualization software, data storage, and servers. Cloud infrastructure, moreover, helps execute respective tasks by providing a Graphical User Interface. In the Family plus program, the front end is going to be the login/registration interface. It will also represent the home page and the interface for the To-do list containing the tasks that the members have to do. It will also represent the displayed budget analysis. We will use the AWS SDK which provides several tools helping in the development of the program using JavaScript and C++ or any other programming tool.

5.2 Back-End

It forms major importance in the cloud architecture since it is responsible for observing all the programs running the application on the front end. The back-end has a good deal of servers

and data storage systems. Unlike front-end which has only one component, end-back has 5 major components, every one of which has an important role to play.

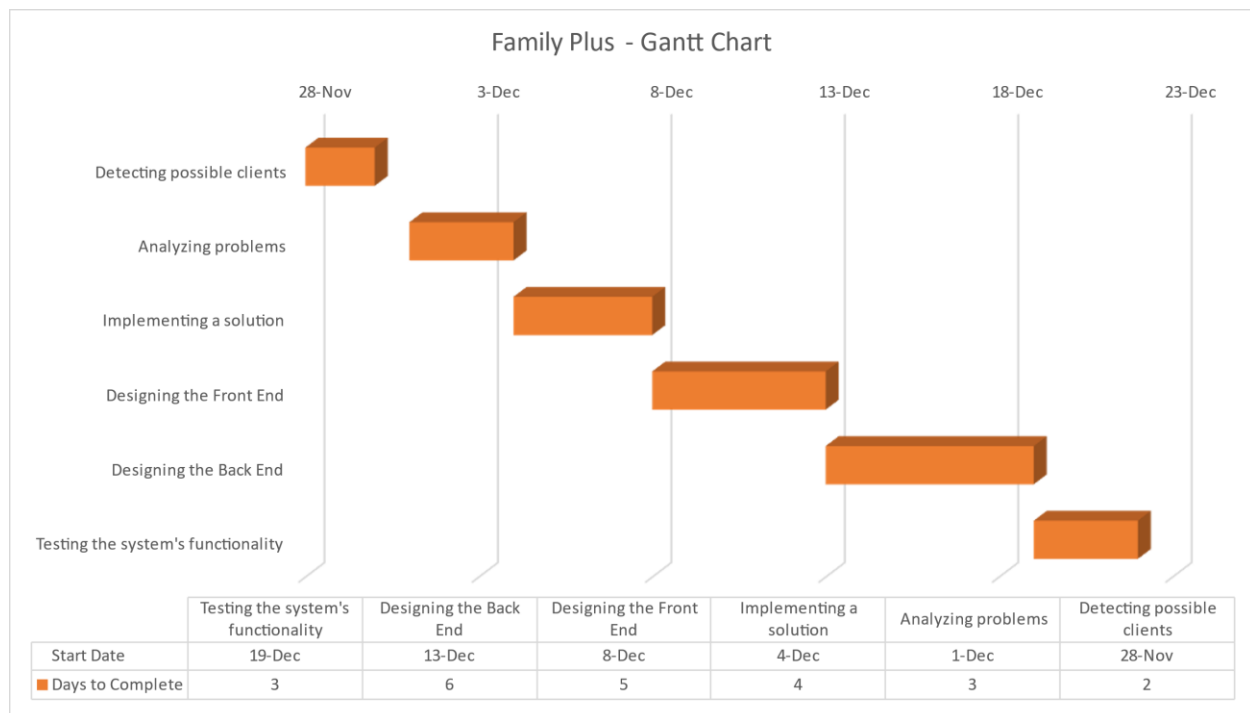
1. **Application:** Based on the client's need, the application will provide the end-user with the resulting combination of resources in the backend. It, as well, can come in the form of software or a platform.
2. **Service:** It almost controls all the tasks in the cloud computing system by providing utilities to the architecture. Some instances for services are applications for storage development environments as well as web services.
3. **Storage:** It helps in Maintaining and storing data like images, videos, or even documents and in AWS its capacity varies according to the use of the end-user. An example of storage is Amazon S3.
4. **Management:** It assigns certain resources to specific tasks along with Managing the elements of the cloud architecture like tasks, applications, security, data, and storage.
5. **Security:** It provides end-users with safe resources, infrastructure, files, and systems. It also prevents data loss by implementing secure management into the cloud servers which subsequently generates virtual firewalls.

In the Family plus program, we will initially use Amazon EC2 in order to launch a couple of virtual servers and to help configure security and manage storage. Based on the traffic the program receives, we will use a specific OS, computing power, and memory. This EC2 virtual machine will do all of our back-end programmings in addition to holding our web applications. According to the traffic we get in our instances we will decide whether to use Amazon auto-scaling and Cloud watch or not. For Family plus's Budget tracker, we will use AWS Budgets to keep calculating the budgets of both the parents and the children. With regards to the announcements, we will be using Amazon Simple Notification Service (Amazon SNS) to send the announcements and the To-do list. For the Emergency alerts we will be using the documentation used for the AWS IoT button, and registering it in the AWS IoT platform. Furthermore, with the need to use databases, we have decided to choose Amazon Relational Database Service. The last element which plays the same essential role as any other element in the program is the security and privacy and access of data and for that Family plus program will be following AES when encrypting data.

5.3 Delivery System: There are three major delivery systems in cloud computing commonly known as Infrastructure as a service (IaaS), Platform as a service (PaaS), and Software as a service (SaaS). In the Family Plus program, we are planning to use SaaS as it is the best option for a small young business. It will spare us the fatigue of managing the infrastructure and platform since it will be done by the cloud service. Another thing is that the software will be installed and regularly updated in the cloud and access to it will be given all the time.

5.4 Deployment model: Family Plus program will, of course, use cloud deployment in order to save the money of building an infrastructure and the installment of servers. Public, Private, Community, and Hybrid are the four deployment models of cloud computing. In our project, we will be using the community model to enhance the efficiency of the program since the facilities, management, implementation, and cost will be shared with other projects of the same background.

6. Gantt Chart



7. Reflection

To begin with, setting up a schedule will allow you to manage your time, which lets you prioritize your work, thus, getting it done faster. Not to mention, it will allow you to finish your tasks persistently. Most people ignore scheduling or managing their time, just because they are too lazy or feel like it is a waste of time. With Family Plus, you will be able to easily design your schedule. Not only that, but it will also share it with all of your family members so that they know when you will be busy and not interrupt you. To illustrate more, a study by Hugh Kearns has proven that time managing increases effectiveness which proves the benefit of Family Plus.

Secondly, Family Plus provides a fully functional budget tracker system, which helps the family members to properly split the money, and not to spend too much of it. It also has a feature where it can set a certain amount of the budget as monthly savings, which automatically counts each month's savings and of course saves everything so it can be checked later on. The money allocation feature allows the parents to get each of their children a certain amount of money on a daily, weekly, or monthly basis, which will as well be recorded in case the family members want to check it later.

In addition, the Announcement feature simply allows Family Plus users to send some alerts. These alert notifications will be displayed on each members' phone, and it can make a certain sound -ringtone- or members could choose to let it just display the message silently. Also, it can be scheduled, repetitively, or just for a one-time occurrence. This can be used as an alarm or a reminder for the other members. It can only be set by adults, to prevent the children from spamming the alerts.

Furthermore, the Emergency alerts, however, will always have sound- or maybe phone calls-, and if it is not turned off by the user, it will keep looping until it does. This feature is used in case of an emergency where you urgently need to notify the members. The emergency message can be set to any recognizable sound, but cannot be silent, to ensure that the user actually gets notified.

Finally, some people might be scared or avoid using the app due to security reasons, as they fear that their information is shared or accessed by others. Family Plus uses AES encryption, which is impossible to crack. Thus, all of the information stored cannot be accessed by anyone, not even the staff.