

**POLITEKNIK UNGKU OMAR**

**SITE SUPERVISION APP (VisiApp)**

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**CIVIL ENGINEERING DEPARTMENT**

**SESSION 2 2022/2023**

**POLITEKNIK UNGKU OMAR**

**SITE SUPERVISION APP (VisiApp)**

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**This report was submitted to the Civil Engineering Department in partial  
fulfillment of the requirements for the award of the Bachelor of Civil  
Engineering Technology with Honors**

**CIVIL ENGINEERING DEPARTMENT**

**SESSION 2 2022/2023**

## DECLARATION OF ORIGINAL AND OWNERSHIP

**TITLE:**                    **SITE SUPERVISION APP (VISIAPP)**

**SESSION:**                **2 2022/2023**

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## APPRECIATION

In the name of Allah, the Greatest and the Highest.

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## ABSTRACT

Construction is being transformed in the direction of furthering the development of digital commerce thanks to Industry Revolution 4.0, which offers an immediate revolution in innovation and has created an innovative model of education for the future. The lack of correct planning and the lack of information on tasks and events can all be considered risks to projects. The project's aim is to develop an application for area specifications as well as notification of tasks and events for users. The scope of the study is in block D at the construction site of Project 8MD3 located in Putrajaya. I developed the Site Supervision App (VisiApp) to achieve the aim of this project. Employees involved with projects can access VisiApp to monitor the work or any defects that had been completed at the construction site. With a percentage of 85.3% tend to strongly agree and agree with the VisiApp it is easy for the user to use anywhere, see tasks and events related to the project, and easy to use for project progress, and 94.1% strongly agree and agree with the VisiApp it is easier to manage and see tasks and events. To test the effectiveness of the VisiApp, a questionnaire was distributed, and it produced a total of 0.92 for the reliability test which claimed to be accurate followed by a descriptive test calculating a mean score of 4.37 which is a high interpretation with a standard deviation. A total standard division of 0.92 using the SPSS method compared to the mean analysis method. VisiApp is user-friendly and shows its productivity towards preventing users from overlooking site tasks and events, miscommunication, and smoothing the tasks of workers in a project.

**Keywords:** *View Placidly, Ease in Use, Professional Endeavor, Visual Communication.*

## ABSTRAK

Pembinaan sedang diubah ke arah memajukan lagi pembangunan perdagangan digital berkat Revolusi Industri 4.0, yang menawarkan revolusi segera dalam inovasi dan telah mencipta model pendidikan yang inovatif untuk masa hadapan. Kekurangan perancangan yang betul dan kekurangan maklumat mengenai tugas dan acara semuanya boleh dianggap sebagai risiko kepada projek. Matlamat projek ini adalah untuk membangunkan aplikasi untuk spesifikasi kawasan serta pemberitahuan tugas dan acara untuk pengguna. Skop kajian adalah di blok D di tapak pembinaan Projek 8MD3 yang terletak di Putrajaya. Saya membangunkan Apl Pengawasan Tapak (VisiApp) untuk mencapai matlamat projek ini. Pekerja yang terlibat dengan projek boleh mengakses VisiApp untuk memantau kerja atau sebarang kecacatan yang telah disediakan di tapak pembinaan. Dengan peratusan sebanyak 85.3% cenderung untuk sangat bersetuju dan bersetuju dengan VisiApp adalah mudah untuk pengguna menggunakan mana-mana sahaja, melihat tugas dan acara yang berkaitan dengan projek, dan mudah digunakan untuk kemajuan projek, dan 94.1% sangat bersetuju dan bersetuju dengan VisiApp lebih mudah untuk mengurus dan melihat tugas dan acara. Bagi menguji keberkesanan VisiApp, satu soal selidik telah diedarkan, dan ia menghasilkan sejumlah 0.92 bagi ujian kebolehpercayaan yang didakwa tepat diikuti dengan ujian deskriptif yang mengira skor min 4.37 iaitu tafsiran tinggi dengan sisihan piawai. Sebanyak 0.92 standard deviation menggunakan kaedah SPSS berbanding kaedah analisis min. VisiApp mesra pengguna dan menunjukkan produktiviti ke arah menghalang pengguna daripada mengabaikan tugas dan acara tapak, miskomunikasi dan melicinkan tugas pekerja dalam projek.

**Kata kunci:** *Paparan Jelas, Kemudahan Penggunaan, Usaha Profesional, Komunikasi Visual.*

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## **LIST OF ABBREVIATION**

VisiApp	Supervision App
TRC	Trans Resources Corporation Sdn Bhd
IR 4.0	Innovation Revolution 4.0
IoT	Internet of Thing
IVR	Interactive Voice Response
USGBC	United States Green Building Council
GBI	Green Building Index
ESG	Environmental, Social and Governance
AR	Augmented Reality
VR	Virtual Reality
AEC	Architecture, Engineering and Construction
PIC	Person In Charge

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 INTRODUCTION**

The construction industry is still in the process of recovering from the pandemic. Among the main challenges are the increase in the price of some building materials, the lack of workers, the increase in workers' minimum wage as well as the cost to house them and cash flow issues faced by contractors. Project managers tasked with ensuring projects remain on schedule, within budget, compliant with safety regulations, and running smoothly know that it can be difficult with the amount of potential and unanticipated issues that tend to crop up.

One of the more everyday construction issues is inadequate communication. Since projects require multiple professionals during the planning stage and many contractors on the job, effective information exchange is crucial for the project's success. Oftentimes, there's a disconnect between the office and on-site workers. Project managers will need to establish clear guidelines and can keep everyone in the loop by summarizing any obstacles and progress made at the end of each day. Documenting all communication also helps in cases where conflicts arise. The prevalent construction problems are lacking organization and haphazard document management. Construction involves dealing with a lot of documentation, from contracts to material orders to receipts to insurance certificates. Manual document management can be inefficient and create room for error.

#### **1.2 RESEARCH BACKGROUND**

In the digital age, people focus on generating, trading products and services through digital data, information, and knowledge. This era is based on an infrastructure consisting of information and communication technology. This new infrastructure

not only helps people do things better and faster than previous eras, but it enables new ways of controlling, coordinating, and collaborating in activities more easily, at lower costs, governed by the law of minimization of costs. Nowadays, almost all companies use computers and the internet to increase their productivity. But those serious about upgrading their companies are turning to smartphones instead of old desktops. Software for construction management is used for planning, scheduling, monitoring, and communication on almost all construction projects. It has proven to be a valuable instrument for improving productivity agility. However, construction technology also has a mobile application version for user convenience. (Wayne,2016)

The final year project Background section is to provide the typical reader with information that they cannot be expected to know, but that they will need to know to fully understand and appreciate the rest of the report. It explains how the project addresses the problem described in the report, indicates an awareness of other work relevant to this problem, and shows clearly that the problem has not been solved by anyone else.

The wider context of the final year project includes such things as its non-computing aspects. So, for example, if you are producing software or any other products, including business recommendations, for a specific organization then you should describe aspects of that organization's business that are relevant to the project. (Father Prada, 2022) In building sites, information may be delivered quickly exactly where it is needed thanks to mobile devices. Everyone involved in the project, from engineers to less tech-savvy laborers, should use it because it's simple and a no-brainer. Most adults (median 53%) reported using a smartphone. Across 11 countries, those under 30 are more likely to use a smartphone than those over 50. Supervisors and managers in companies believe that mobile phones are the best way to communicate with their subordinates. Therefore, it makes sense to use mobile applications on construction sites. Workers on construction sites and in the office need a lot of information and communicate with each other every day and providing them with quick access to applications can increase productivity and, subsequently, the profits of a company. (Laura Silver,2019)

### **1.3 PROBLEM STATEMENT**

The statement of the problem in the workplace and project site is the management of tasks and activities of workers at the construction site and at the project site office is done informed via WhatsApp, messages or by calling only. There is no official platform for more effective management, notification, information storage and information delivery, which has caused misunderstandings and issues in communication and management of employee affairs between workers on the construction site and in the site office, creating constraints in the management of documentation and dealings with consultants. There was a misunderstanding between the resident engineer receiving the structural inspection document before handing it over to the structure and architecture inspector, that is, the sides were exchanged between the two inspectors who will inspect the structure before it is concreted, apparently the zoning division had been notified on WhatsApp and the site supervisor overlooked the information, so it happened a little delay in the inspection work at the site. Conflict refers to several kinds of odds, disagreement, or maybe discord arising between people and within a group once the beliefs or maybe behavior of a single or maybe more people of the team are often resisted by and unacceptable to more than one member of another team. Conflict relates to the opposing actions and ideas of various entities, thus resulting in an antagonistic expression. (Madalina,2015)

As a result of the overlooked information about tasks, employees often miscommunicate and delay when doing work in the office or on the project site. Miscommunication is defined as a social inability to communicate adequately and properly. It is one of many types of communication barriers. It is an instant where either the speaker is unable to provide the proper and adequate information to the hearer or the hearer misperceived and couldn't recognize the communication from the speaker. The cases of miscommunication vary depending on the situation and the people included in it but often result in confusion and frustration. In some cases, miscommunication may even open the triangle of other factors that inevitably leads to a conflict. Miscommunication is a lack of alignment of the agent's intellectual state, especially when they diverge on the outcomes of communication. This type of miscommunication can now be classified as the source of the non-alignment of the communicative act. (Wikipedia, 2022)

Misunderstanding and miscommunication are two intertwined perils that

plague organizations. Misunderstandings involve erroneous interpretations, mistakes in discerning the true meaning of something, or misconceptions that can lead to grave consequences. Miscommunication, on the other hand, arises when two parties fail to effectively convey the desired information to each other, resulting in a breakdown of communication and potential disruption in the workplace. It is imperative for organizations to recognize the gravity of these issues and take immediate action to rectify the prevailing situation before it further undermines productivity and erodes trust within the workplace. (WikiDiff, 2015)

#### **1.4 OBJECTIVE**

The project's aim is to develop an application for area specifications as well as notification of tasks and events for users. The Application is easy to use and provides access to information at any time and from any location using only mobile devices or other tools at the office or the project site. The following are the exact objectives of this study:

- i. To identify the problem, area specifications, overlook tasks, and events at site project 8MD3.
- ii. To develop an application Site Supervision App (VisiApp).
- iii. To evaluate the effectiveness of the Site Supervision App (VisiApp) at project 8MD3.

#### **1.5 SCOPE OF THE STUDY**

The scope of the study is in block D in the construction site of Project 8MD3 located in Putrajaya, as described in Figure 1.1. Various occupations, including project managers, site engineers, architects, site supervisors and all workers can access this project and use the Supervision App to check who oversees each area that has been divided on the construction site.



Figure 1.1: Block D at Site Location (8MD3, Precinct 8, Putrajaya) (Source: Internet)

The aim of this research is to make it easier for users to refer to and understand tasks and activities at construction sites and site offices after getting changes in tasks and zoning inspectors. Users must ensure that tasks and related activities know the changes of inspectors in each zoning more precisely to enable a faster inspection documentation process and to deal with misunderstandings among employees on the construction site and in the site office. Additionally, would like to highlight Malaysia's technological advancement using Site Supervision App (VisiApp) that will grow in the country. Now with it, it can show national technology in any construction company with Site Supervision App (VisiApp). This application can be used by organizations for various other functions. Manufacturing firms and consulting firms in the fields of architecture, civil and structural engineering, and mechanical and electrical engineering, can all use this VisiApp to view tasks, and activities, or contact and post their tasks.

## 1.6 SIGNIFICANTION OF STUDY

The findings of this study help the workers at the construction site as well as in the office because there is a platform that makes it easier for them to keep track of their respective tasks and know who the inspectors are in every zoning area. Construction projects run more smoothly and sustainably now that there are no more misunderstandings about who oversees zoning or overlooking their respective task notifications from WhatsApp. As a result, employees that use the VisiApp suggested

based on the findings of the study will be successful and help their work easier, and no more confusion and overlook tasks. Moreover, this application is user-friendly as it is easy to use, manage, and access. Developing the official platform for viewing the task, and posting new information is upgrading technology in construction projects or other fieldwork.

This Site Supervision App will help the process of changing the work area will be easier to know and faster to deal with. The previous method used WhatsApp and paper only. It will be easier and more official for all departments and employees to track the inspector's certain zoning if there is a new person or a change of tasks. As a result, they do not need to waste more time to find out who is in charge of each zoning to go do inspections. This happens because of the lack of information, and an official platform application to view and refer to tasks. This happens because of the lack of information, and an official platform application to view and refer to tasks. This method was chosen for this project because the user was satisfied with the progress in construction technology. This method coordinates procedures in detail and displays the person in charge of the zoning area. In addition, it is used for the reduction of misunderstandings, speeding up the operation of notification and distribution of tasks available to each know their respective tasks, as well as the identification of employees related to them and the work process at the building site. VisiApp helps organizations become more productive in terms of technology, employee identification, and official platform. If projects aren't properly planned, it leads to unachievable aims, which results in construction issues like stagnant productivity. Forecasting may focus too much on the long term and too little on the short term. (Bridgit,2022)

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Moving towards a healthier, more socially and economically developed environment has made sustainability and sustainable development today an essential topic among decision-makers and politicians. The construction sector, particularly its environmental category, is more familiar with this idea than the other sectors. The industrial buildings sector of the construction industry has received less attention than other construction-related industries. Industrial structures need more consideration in this area because most nations are moving towards being more industrialized. It is crucial to provide an overview of current theoretical views, trends, applications, and restrictions towards the development of green, ecologically sustainable buildings considering the significance of environmental evaluation and energy performance of buildings. (V. Achal and A. Mukherjee,2015)

#### **2.2 CONSTRUCTION TECHNOLOGY**

Construction technology is the body of cutting-edge equipment, tools, modifications, software, and other devices utilized in the building phase of a project to develop field construction techniques, including semi-automated and automated construction machines. A few CII research practices are gathered under the umbrella of "Construction Technology," which deals with technological applications and potential to enhance project performance in the construction sector. The study supports the idea that implementing tried-and-true technologies may increase productivity in the construction sector by up to 45% while also enhancing material predictability and dependability.

Although the automation of other sectors has advanced faster than that of the construction industry, automation has improved most important aspects such as cost, schedule, quality, safety, and productivity. Industry has found electronic simulation to

be a highly useful tool for enhancing constructability, maintainability, operability, quality, and safety while lowering cost and schedule. RFI, wireless, and advanced building technology are a few more technologies that the sector has implemented that have all benefited it in terms of quality, productivity, dependability, less rework, and better inventory management. (CII40,2019)

In order to do this, the team carried out user testing on design review and planning activities, watching both inexperienced and experienced participants. The participants were instructed to examine the 3D model of a petrol refinery plant after being randomly allocated to either a treatment group that utilised the IVR system or a control group that used the conventional desktop environment.

The following user performance metrics were assessed and examined by the researchers:

- i. Recognizing design flaws
- ii. Determining the job's scope
- iii. Designating an installation order for each installation work package
- iv. Being aware of the work's breadth.

The test findings unmistakably showed that IVR improved users' capacity to carry out review duties. Participants in the IVR (treatment) group outperformed those in the desktop (control) group by scores ranging from 21.86% to 142.92%. While the participants' prior work experience only indicated higher performance in the mistake detection test, there was a statistically significant correlation between the device utilised and the scores obtained on both tasks. Further increases should be anticipated as participants gain greater equipment proficiency, as seen by the IVR group samples having bigger standard deviations independent of experience or task. (CII40,2019)

### **2.3 CONSTRUCTION INDUSTRY ISSUES**

According to Deloitte research, productivity has increased across all industries by 25% during the last 20 years. Only the manufacturing sector was able to increase its performance by 60%. Surprisingly, the construction industry's productivity has only increased by 5%.

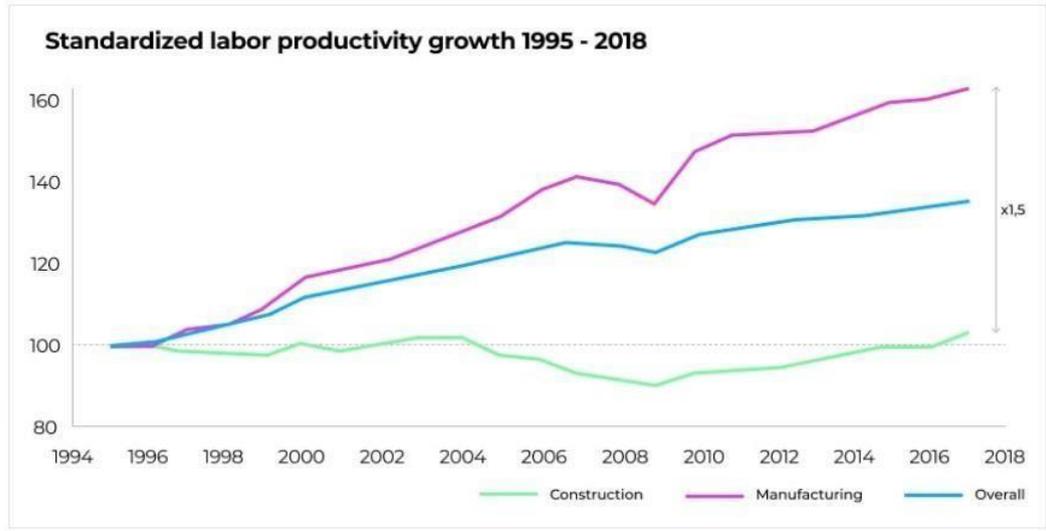


Figure 2.1: Labor Productivity Growth

Due to obstacles faced by construction employees on the job, productivity development has been slow. For instance, errors in building design might cause the construction process to be severely delayed. Additionally, it might cause delays throughout the project to anticipate the length of various processes like concrete curing. To address this productivity gap, the construction sector must think about digital transformation.

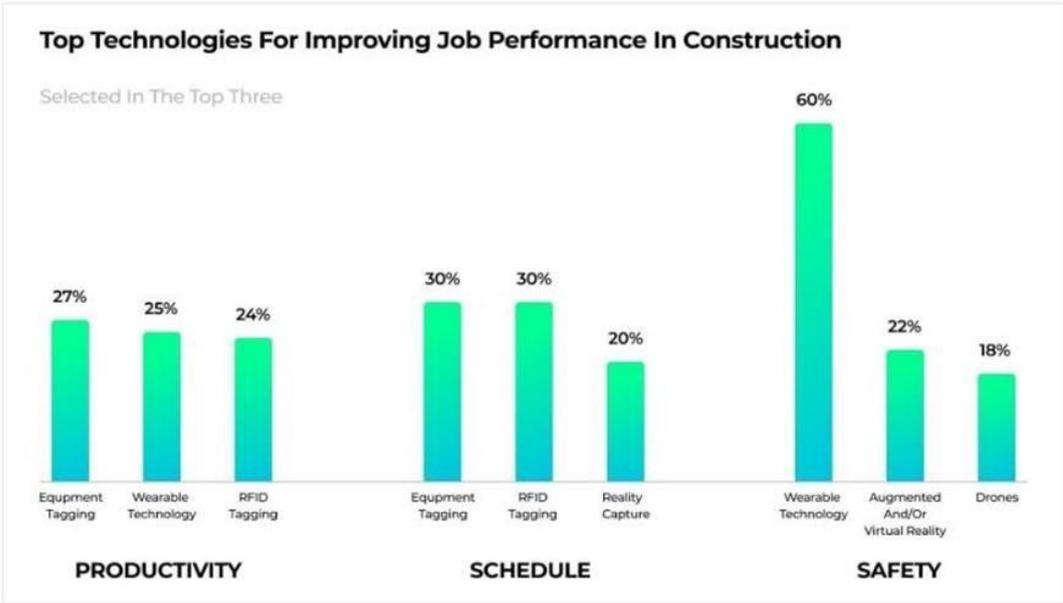


Figure 2.2: Combine Between Productivity, Schedule, and Safety

Longer project deadlines and decreased customer satisfaction are the outcomes of the labor shortage. Additionally, when more seasoned personnel retire, businesses

are obliged to hire less competent individuals, which increases accidents and safety concerns. In certain instances, technology provides a substitute for the labor force of people while also making it more appealing to younger generations.

In the construction sector, digital transformation gives us a wide range of exciting options, from obtaining a competitive edge to providing employees with improved working conditions and reducing our environmental impact. There will come a day when digitization won't be a choice anymore; it will be required. Businesses who didn't digitize will pay a high price. (Nadejda Alkhaldi, 2020)

## 2.4 TECHNOLOGY I.R 4.0

The Fourth Industrial Revolution (4IR) is anticipated to alter how we communicate, live, and work. It is also anticipated to alter our current values as well as how we will value them in the future. Changes in company structures and employment trends are already evident today.

The World Economic Forum estimates that 65% of children entering elementary education now will eventually work in positions that have not yet been developed. In the fourth industrial revolution, automation and artificial intelligence will replace certain groups of people with new ones that have the necessary abilities or with robots that can complete the task more cheaply. The days of attending college or university to earn a degree that would guarantee them a lifetime career are long gone. (StudyMalaysia, 2020)

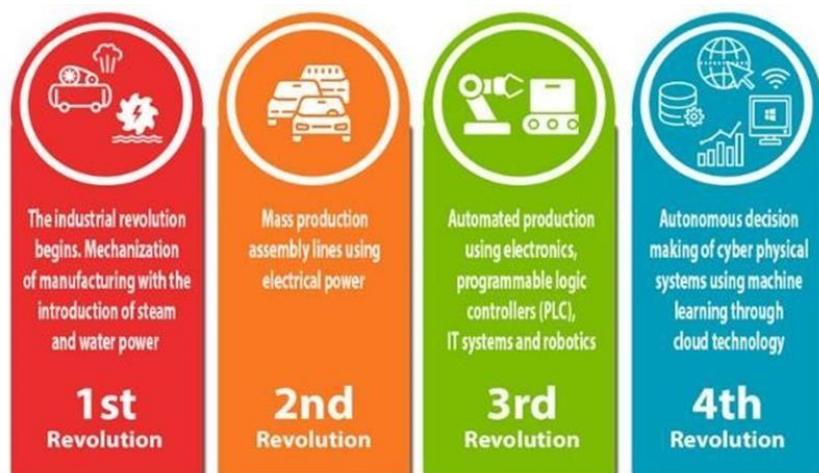


Figure 2.3: The Industrial Revolution

Jobs with these three characteristics are most likely to be automated because to technology advancements:

- i. Repetitive
- ii. governed by rules.
- iii. entail a little amount of clearly identifiable physicality.

## **2.5 GREEN ELEMENT IMPLEMENTATION**

Green building design and construction, according to the United States Green Building Council (USGBC), are meant to "significantly reduce or eliminate the negative impact of buildings on the environment and on the building occupants." The quality and features of a real structure built with sustainable construction concepts and techniques are referred to as green building characteristics. The term "green building" refers to buildings that are healthful, resource-efficient, and founded on ecological principles. Similar terminology for the application of sustainable principles to building design include ecological design, ecologically sustainable design, and green design.

In the Malaysian context, Green Building Index (GBI) is aware that the demand for green buildings is due to:

- i. Green buildings are designed to conserve energy and resources, recycle materials, and reduce harmful substance emissions over the course of their lifetimes.
- ii. Green structures blend with the regional climatic conditions, customs, culture, and natural surroundings.
- iii. Green structures may support and enhance human existence while preserving the ability of the environment on a local and global scale.
- iv. Green buildings utilize resources effectively, offer considerable operating savings, and boost employee productivity.

Building sustainably conveys the correct message about a business or organization, demonstrating its sound management, accountability, and commitment to the long term.

The government is aware that encouraging the business sector to take the lead is one of the best ways to persuade Malaysians to support the green agenda. (Ismail, Nidzam, Yani, 2015)

## **2.6 SUSTAINABLE TECHNOLOGY**

Sustainable technology drives ESG outcomes like improving wellness and giving the traceability required to ensure ethical business practices, according to Gartner Principal Analyst Autumn Standish. "Sustainable technology is increasingly important operationally for optimizing costs, energy performance, and asset utilization, for example," she adds. New business strategies and technologically advanced products are made possible by sustainable technology, which benefits consumers. (Jackie Wiles, 2022)

Sustainable technology involves choosing and collaborating with the appropriate software, hardware, and suppliers in order to produce the greatest amount of output with the fewest practical resources. Providing openness on sourcing and trade practices, enhancing energy and communication efficiency, lowering emissions, and using fair labor practices are a few examples.

Additionally, sustainable technology offers a lens through which to deliver goods and services that help clients achieve their own sustainability objectives. This necessitates an in-depth comprehension of the clients' top priorities and a delicate balance of their goals, which might occasionally collide. Customers could, for instance, desire a sustainable product yet be reluctant to forego price or quality. Make it simple for customers to understand how using your goods and services helps them achieve their sustainability objectives. (Jackie Wiles, 2022)

## **2.7 AUGMENTED AND VIRTUAL REALITY IN CONSTRUCTION**

The research on the state of AR and VR utilization in the AEC industry was done from July to December 2018 and is included in this document. To guide the research project, representatives from five businesses, Arcadis, A&H Group, Bentley Systems, Mott MacDonald, and Willmott Dixon, as well as five universities, Cardiff University,

Coventry University, Cranfield University, Loughborough University, and University of the West of England, formed a research network known as the Vision Network. (Lukumon Oyedele, 2020)

The Vision Network set up several experimental workshops and quantitative tools to gather information on how AR and VR are really used in real-world settings. To find the most recent research initiatives, a study of literature was conducted. To build and characterize the use-cases and set a research agenda specifically for the AEC industries, data from the sources mentioned above were employed. The Vision Network report provides more thorough information on the study that was done by the network, including the exploratory workshops, literature review, and quantitative tools. (Peter Demian, 2020)

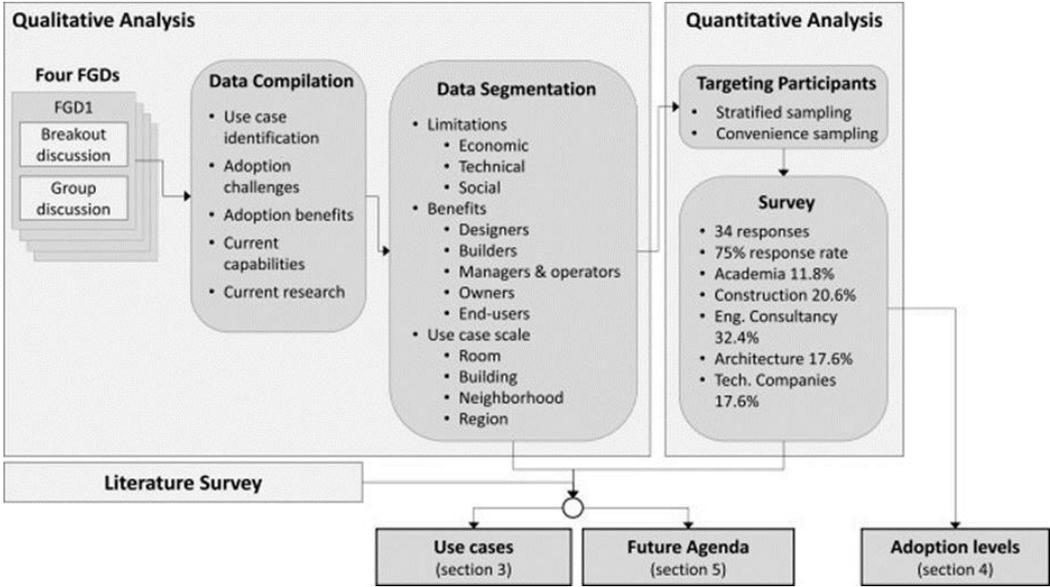


Figure 2.4: Diagram of the research method used in this study and the three research outputs.

To examine complex systems more effectively, a combination of qualitative and quantitative data collecting, and analysis methodologies were applied. The primary components of the study methodology, qualitative and quantitative analyses, as well as the three research outcomes, use cases, adoption levels, and the research agenda, presented in sections 3, 4, and 5 are all shown in Fig. 2.4. (Thomas Beach,2020)

## 2.8 THINGS FOR THE DEVELOPMENT OF SMART BUILDINGS

One of the most fundamental and important components of a human's living environment is a building. The idea of "smart buildings" emerged with the increased integration of cutting-edge technology into structures and their systems, enabling cost- and energy-efficient remote operation and control over the whole life cycle of the building. The realization of smart buildings, also known as intelligent buildings, is widely acknowledged to require the use of new technologies, including but not limited to sensor deployment, big data engineering and analytics, cloud and fog computing, software engineering development, and human-computer interaction algorithms, among other things. (Ali Komeily, 2019)

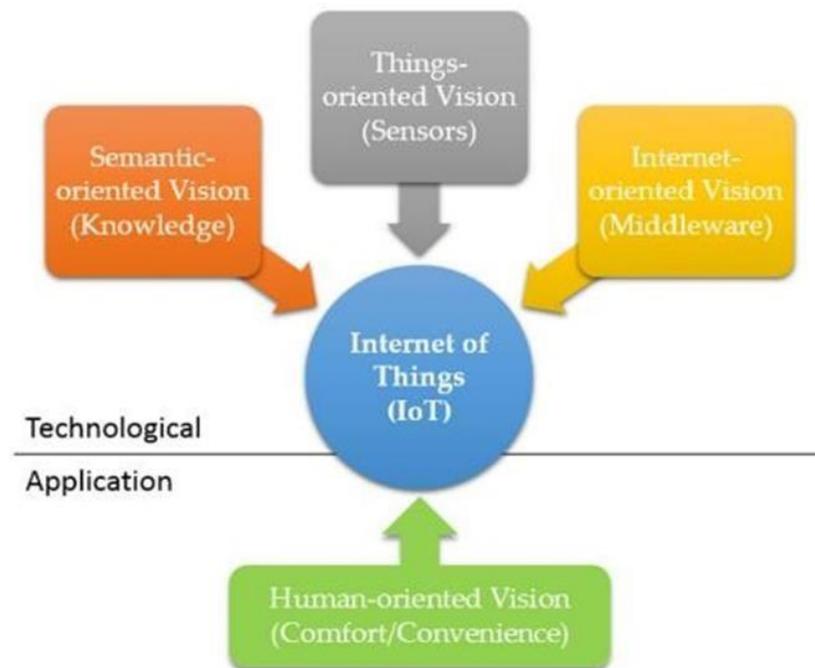


Figure 2.5: Four main paradigms of IoT definitions.

As one of the problems of smart buildings is to cope with a complex network of interconnected functional entities in many elements of a building, the growth of the Internet of Things (IoT) is one of the trending areas among these supporting technologies. There is a huge opportunity to move significantly closer to the desired objectives with the usage of IoT. There are several definitions of the technology in the literature due to the diversity of the stakeholders and uses of IoT. The confluence of three key paradigms, namely the things-oriented vision, the internet-oriented vision, and the semantic-oriented vision, on the technology side may lead to the realization of

the Internet of Things. The authors suggest a Human-oriented vision be included as the fourth paradigm on the application side based on this (Fig. 2.5). (Yueren Wang, 2019)

## **2.9 STEPS AND COMPONENTS OF THE COMMUNICATION PROCESS**

The act or process of successfully communicating is referred to as the communication process. It involves several elements, including the communicator, the message being sent, the message's encoding, the receiver, and the message's decoding. Within the communication process, there are many routes of communication to consider. This refers to the method used to send a message. This may be accomplished via a variety of channels, including voice, audio, video, writing, email, faxing, and body language. The main objective of communication is to convey information to a person or party and ensure that they comprehend it. For the communication process to be effective, the sender must select the best medium. (Indeed, Editorial Team, 2020)

The transmission of a message is made possible by a few components in the communication process. The pieces are as follows:

- i. **Sender:** The sender is the individual who sends the message to the receiver.
- ii. **Message:** This is the information that is being sent from the sender to the recipient.
- iii. **Communication channel:** This is how the message is transmitted or delivered.
- iv. **Decoding:** This is how communication is decoded. The receiver is responsible for decoding.
- v. **Recipient:** The recipient is the one who is receiving the communication.
- vi. **Feedback:** On occasion, the recipient may have comments or a rejoinder for the sender. This sparks communication.

Before, only WhatsApp and inspection documentation allowed employees to communicate with inspectors and resident engineers. The work of the workers on the site will be delayed if there is a misunderstanding over the zoning of other inspectors for inspection papers. Before the resident turned in the inspection document to the

structural inspector, they had to complete another inspection form and follow the same procedure to hand him the paperwork.

Understanding how communication works is crucial for effective communication. The seven steps of communication are as follows:

- i. The sender creates a message-related notion.

The creation of a concept that the sender intends to convey to a recipient or recipients is the first step in the communication process. In essence, they prepare the material they wish to convey in its entirety then deliver it over WhatsApp.

- ii. The communication is encoded by the sender.

Once an idea has been developed, the sender converts it into a format that may be shared with another person. This implies that they convert their ideas into the information they wish to deliver in a certain way. You would put your thoughts into words, for instance, while writing a letter. The message might either be symbolic, vocal, or nonverbal.

- iii. The channel of communication that will be utilized is chosen by the sender.

The sender then chooses how the message will be delivered. This entails deciding on the media that will best convey the message. Speaking, writing, computer transmission, and nonverbal communication are some examples of communication media. Make careful to choose the appropriate and most professional channel of communication when speaking at work. And phoning and WhatsApp are the only other options.

- iv. The communication channel carries the message.

The message then starts the transmission procedure when the medium is decided upon. The chosen media will determine the precise procedure. The sender should have chosen the suitable media to ensure that the message was

transmitted correctly. WhatsApp is the sole platform they utilize. Not an approved channel for sharing tasks and keeping records.

- v. The receiver receives the message.

The receiver then receives the message. This stage of communication is completed by receiving the message by hearing, seeing, feeling, or some other means of reception. They will respond to the WhatsApp message and send the tasks and information chat back.

- vi. The message is decoded by the recipient.

The message of the sender is subsequently decoded by the recipient. They interpret it, in other words, and turn it into an idea. Following this, they examine the message and try to comprehend it. When the sender and receiver both understand the meaning of the communicated message, communication is successful.

- vii. Whenever appropriate, the recipient offers comments

Finally, unless it is a one-way conversation, the recipient will respond to the message's original originator with feedback. Receiving feedback gives the sender the assurance that their communication was correctly understood and received. This involves two-way communication between two people. (Indeed, Editorial Team, 2020)

## **2.10 CAUSES OF MISCOMMUNICATION**

Companies might lose millions of dollars each year due to miscommunication. According to a survey of 400 businesses, communication errors cost each business an average of \$62.4 million annually. Although these mistakes can occur in a variety of settings, this article will concentrate on instances of misunderstanding in the workplace.

Proper communication between companies, their clients, and consumers is crucial in today's dynamic global business environment. Even the slightest lack of communication can result in significant delays in project deadlines, strained professional relationships, and lost revenue. Being able to recognize, prevent, and correct miscommunications in a professional situation might spare a company from all these hassles.

Various channels of corporate communication are available in the modern world, including e-mails, social media, and meetings held over the phone or in person. Miscommunication can still happen even with a wide range of communication mediums. This article will examine some of the more typical reasons for corporate misunderstanding as well as the potentially devastating outcomes. (Alvernia, 2018)

- i. Lack of Context

Context in a professional situation refers to the backdrop, surroundings, or framing of an event or occurrence. Context provides explanation and gives activities and obligations significance. A report's context would contain which report has to be sent, where it needs to go, by when, and who is responsible for delivering it. Without context, a communication error may occur, leaving customers perplexed or dissatisfied with the outcome.

The organization that produces phone directories, Yellow Pages, provided one instance of a lack of context in communication. More than 250 billboards across Canada were used in a 2015 marketing campaign to promote the usage of their app to locate "the best cup of coffee" or "fast fashion" in the local areas. Unfortunately, one advertisement misrepresented the Korean meal Bibimbap by showing noodles rather than rice. Social media users posted images of the advertisement, and in response, Yellow Pages quietly apologized on the platform. The entire marketing effort was then discontinued shortly after.

Lack of context may be harmful and have a negative impact on both internal and external company connections. Additionally, failing to take context into consideration damages brand trust, which affects how customers see a company's goods and services. Due to the ad designer's ignorance of the cultural setting in this instance, Yellow Pages suffered a setback. All people working in a project should be given enough time to ask questions and examine their work in order to avoid this

cause of misunderstanding. To make sure the project is presented successfully, think about consulting a subject matter expert. (Alvernia, 2018)

ii. Assumptions

When certain facts are assumed to be true but never verified in business communication, which can happen at any step of the product life cycle, assumptions arise. Business planning and decision-making frequently include the use of assumptions, although they are generally standardized. It's wise not to presume in some situations, such as when it comes to what people want to taste.

The beverage business concentrated on creating environmentally friendly and clean goods in the early 1990s. By introducing Crystal Pepsi, a transparent and caffeine-free variation of the classic beverage, Pepsi attempted to capitalize on this trend. The novelty of the beverage first brought in money, but the popularity was fleeting since many didn't like Crystal Pepsi because it didn't taste like regular Pepsi. Less than two years after hitting store shelves all across the country, Crystal Pepsi's manufacture was discontinued.

The makers of Crystal Pepsi cautioned the drink's then-COO David Novak about the likelihood of the beverage's failure, but he said he disregarded their advice. Millions of dollars were lost because of Pepsi's incorrect assumptions about customer interest and a dearth of study or verifiable proof. Business executives should consider their team's feedback before pushing forward with a product or choice to avoid a destiny like that of Crystal Pepsi. They should also do market research to support their assumptions. (Alvernia,2018)

iii. Uncertainty or Ambiguity

When a communication is not fully conveyed, the sender omits important details, or the recipient doesn't follow up with clarifying inquiries, there is vagueness and ambiguity. Ambiguity and vagueness make a task more complex and make it more difficult to decide and solve difficulties. It can be expensive for a firm if it cannot resolve consumer issues.

The Michigan Attorney General's Office claims that some General Motors personnel were aware of ignition switch flaws as early as 2004 that might cause airbags to not deploy and vehicles to stall. Internal documentation did not adequately address the ignition switch issue since it was referred to as "customer convenience". The committee entrusted with examining it saw the nebulous "customer convenience" as a minor problem rather than a serious one. Three years after GM issued a recall for 2.7 million vehicles in 2014, the company agreed to pay \$120 million to resolve claims arising from the defect.

Many individuals missed a severe issue because of GM's ambiguity. In the end, these misunderstandings cost the business millions of dollars and, more significantly, the confidence of customers. Businesses should be forthright in both internal and external communications, clearly identify issues, and use precise, concrete language if they want to avoid being ambiguous. (Alvernia, 2018)

#### iv. Excess Communication

Excessive communication is one of the main reasons for misunderstandings in business. The main points might be readily overlooked when information is provided in several messages over a long period of time or when significant information is buried in a lengthy message. This might lead to misunderstandings later in the process, which could be fatal for a good or service.

According to some information overload specialists, the yearly cost of excess knowledge to the U.S. economy might range from \$900 billion to \$1.3 trillion. According to a study of office workers in Ottawa, Canada, e-mail misunderstanding with their managers occurs often. Because they may be quickly written and dispatched, emails are typically the cause of excessive communication. Because of the many misunderstandings experienced by the Canadian personnel, project timeframes had to be slowed down by follow-up emails and chats. If the emails had been modified to include only pertinent information presented in an understandable way, the poor communication in the Canadian offices may have been prevented. (Alvernia, 2018)

#### v. Wrong Medium for Audience

Since there are many different channels available for corporate communication, it's essential to choose the best one for the intended audience and message. Neal L. Patterson, the CEO of Cerner Corporation, allegedly unleashed a tirade in internal emails sent to staff members, "berating employees for not caring" about the company. According to reports, he threatened firings, hiring freezes, and even closing the staff gym. According to reports, the emails were only meant for the 400 or so supervisors of the firm, but they ended up reaching all 3,100 workers. The company's \$1.5 billion stock market valuation dropped 22 percent in three days after the e-mails were made public.

Later, Patterson said that the primary purpose of his emails was to motivate his managers to work harder and that he regretted sending them. Although Patterson may have wanted to increase production, his excessive demands led to a "atmosphere of fear" in the workplace. In retrospect, a meeting or conference call with supervisors would have been preferable to effectively communicate his needs. (Alvernia,2018)

misunderstandings are These costly reasons for misunderstanding in business may have severe effects on the bottom line as well as internal morale. They range from missing context to utilizing the incorrect medium. A lack of concentration, a lack of creativity, and a decline in morale are some of the intangible effects of communication blunders that studies have shown may cost businesses millions of dollars annually.

A communications degree online is available from Alvernia University. Through the adaptable online programs offered by Alvernia University, you may juggle work and school. Develop the abilities required for professional success while taking classes with a limited number of skilled instructors. (Alvernia,2018)

## **2.11 REACT NATIVE**

The React Native platform is used by a wide range of individuals, including newbies to React and those just getting started with programming, to create sophisticated iOS and Android apps.

A grasp of the fundamentals of JavaScript is required in order to use React Native. You may learn more about JavaScript or brush up on your skills on the Mozilla Developer Network.

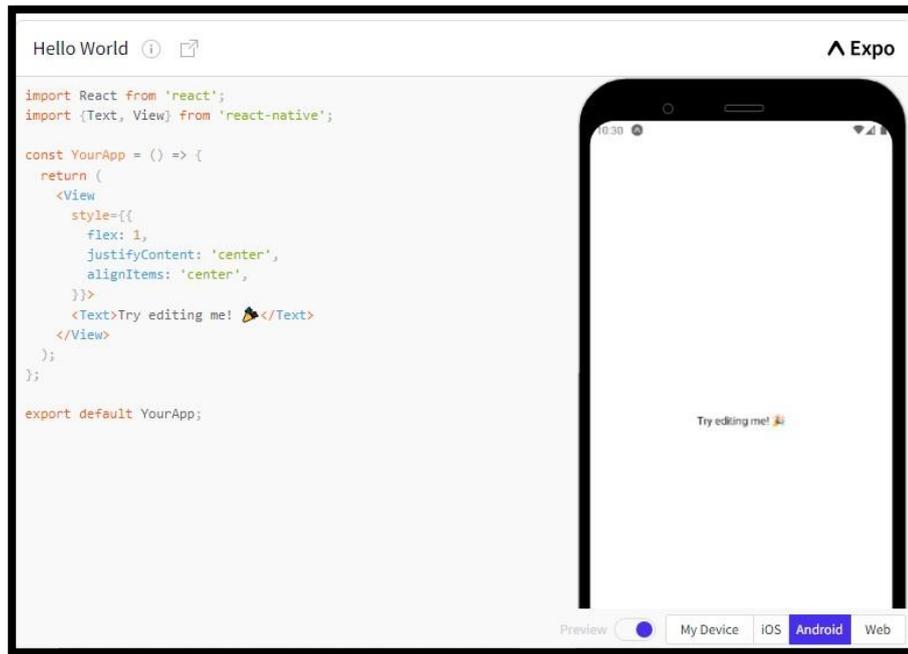


Figure 2.6: Snek Player tool created by Expo.

Above is the Snek Player, a handy tool created by Expo to embed and run React Native projects and share how they display on platforms like Android and iOS. The code is live and editable, so you can play with it directly in your browser. Go ahead and try changing the "Try to edit me!" text above to "Hello, world!"

Note to developers React Native is being studied by people with a variety of development backgrounds. Knowledge of a range of technologies, including web, Android, iOS, and others. writing for programmers of all experience levels. For some platforms, such as Formatting, we occasionally offer detailed explanations. The cart is used to traverse submenus along menu pathways that are shown in bold. Android Studio > Preferences, as an example. It's time to learn the fundamentals of React Native: Native Components, now that you understand how this guide operates.

Native Components, Native Modules, and Android Native Modules are our proven technologies that the heritage architecture uses. When the New Architecture is secure in the future, they will be deprecated. The New Architecture employs Fabric Native Components and Turbo Native Modules to accomplish comparable goals.

Create a Native Calendar Module, create a native module called Calendar Module using the instructions in the tutorial below to use JavaScript to access Android's calendar APIs. You'll be able to call Calendar Module once everything is done. `createCalendarEvent ('Dinner Party', 'My House')` is a Java/Kotlin method that is called from JavaScript to make a calendar event.

Setup, to get started, open the Android project within your React Native application in Android Studio. You can find your Android project here within a React Native app:

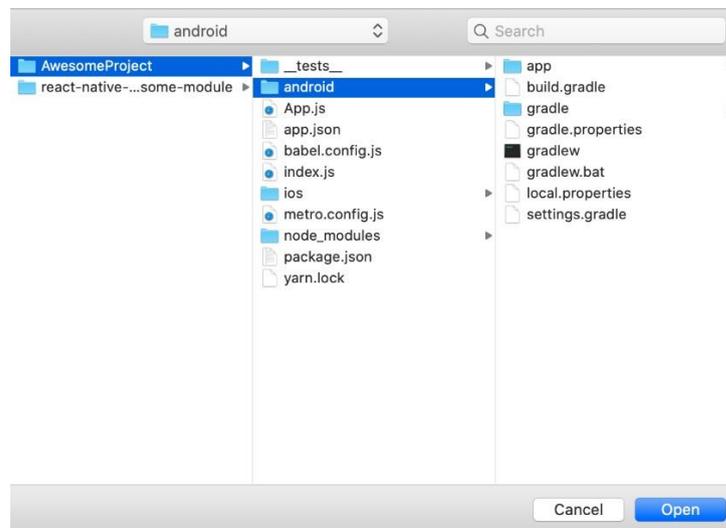


Figure 2.7: React Native to get started setup.

It is advised to write your native code using Android Studio. Using Android Studio, an IDE created for Android development, can enable you to swiftly fix little problems like incorrect code syntax. And advised turning on Gradle Daemon to quicken builds when you make changes to Java/Kotlin code.

A Custom Native Module File should be created, the first step entails creating the (*CalenderModule.java* or *CalendarModule.kt*) Java/Kotlin file inside the `android/app/src/main/java/com/your-app-name/` folder (the location is the same for both Java and Kotlin). Your native module Java/Kotlin class will be contained in this Java/Kotlin file.

## 2.12 MEAN ANALYSIS

There are two versions of the mean formula in math the sample and population formulas. In each case, the process for how to find the mean mathematically does not change. Add the values and divide by the number of values. However, the formula notation differs between the two types. (Frost, 2023)

### 2.12.1 Sample Mean Formula:

The sample mean formula is the following:

$$\bar{x} = \frac{\sum x_n}{n}$$

Where:

- i.  $\bar{x}$  is the sample average of variable  $x$ .
- ii.  $\sum x_n$  = sum of  $n$  values.
- iii.  $n$  = number of values in the sample.

Typically, the sample formula notation uses lowercase letters.

### 2.12.2 Population Mean Formula:

The population mean formula is the following:

$$\mu = \frac{\sum X_N}{N}$$

Where:

- i.  $\mu$  is the population average.
- ii.  $\sum X_N$  = sum of  $N$  values.
- iii.  $N$  = number of values in the population.

Typically, the population mean formula notation uses Greek and uppercase letters. (Frost, 2023)

### **2.13 FIND THE MEAN**

The mean is the arithmetic average of a set of given numbers. Therefore, the mean in math is often referred to as simply the "average." How to Find the Mean, it takes these two steps to calculate the mean:

- i. Step 1: Add all the scores together.
- ii. Step 2: Divide the sum by the number of scores used.

As an example, imagine that your psychology experiment returned the following number set: 3, 11, 4, 6, 8, 9, 6. To calculate the mean, you first add all the numbers together ( $3 + 11 + 4 + 6 + 8 + 9 + 6 = 47$ ). Then you divide the total sum by the number of scores used ( $47 / 7 = 6.7$ ). In this example, the mean or average of the number set is 6.7.

To convey the measure of central tendency, the mean makes use of all the integers in a collection. Outliers, or data that is far outside the data set, might skew the overall metric, too. As an illustration, a few high scores may skew the mean, making the average score look considerably higher than most of the scores actually are. Although the mean in maths is theoretically neutral, some claim that if care is not given when applying it, the mean in psychology might result in incorrect conclusions.<sup>1</sup> This is caused in part by the complexity and variability of behaviour and cognition. (Kendra Cherry,2022)

### **2.14 IBM SPSS STATISTICS**

IBM SPSS Statistics is the statistical software solution that is most often used worldwide. Here is a timeline of SPSS. There is a strong possibility that you were taught it if you have a degree in social science, and if you work in business analytics, there is a good likelihood that your company will utilize it. SPSS Statistics addresses issues in business and research through ad hoc analysis, hypothesis testing, spatial analysis, and predictive analytics.

The IBM SPSS software platform includes functions for advanced statistical analysis, a significant library of machine learning algorithms, text analysis, open-source extensibility, interaction with big data, and simple application deployment. Due to its accessibility, adaptability, and scalability, SPSS may be used by users of different skill levels. Additionally, it may help with the identification of new possibilities, greater productivity, and decreased risk. It is ideal for projects of all sizes and levels of complexity. IBM SPSS Statistics allows you to use a top-down, hypothesis-testing approach to your data, whereas IBM SPSS Modelers employs a bottom-up, hypothesis-generating method to find hidden patterns and models in your data. (Andy Field, 2023)

The best comparison between SPSS Statistics and SPSS modeler by IBM's SPSS Software, which principally comprises of SPSS Statistics, SPSS Modeler, and SPSS Amos. Users can create prediction models and carry out various analytics activities using SPSS Statistics and Modeler. Both programmers were designed to assist business users in carrying out intricate statistical analyses fast and effectively to address business and research issues.



Figure 2.8: IBM SPSS Statistics VS IBM SPSS Modeler

The subject of which software to purchase and the precise distinction between the two is one that is frequently asked. The short answer is that SPSS Statistics is excellent at deciphering intricate patterns and relationships, allowing you to come to your own conclusions and form forecasts either alone or in conjunction with open-source integrations. Furthermore, it works quickly, taking only a third as long as many nonstatistical programmers to complete tasks like data processing and statistical operations.

For data scientists and data analysts, IBM SPSS Modeler is a visual, drag-and-drop tool that expedites operational processes and shortens time to value. Without having to write any code, it enables users to compile various data sets from scattered

data sources around the organization and create predictive models. Numerous machine learning approaches are available with SPSS Modeler, including pre-built algorithms for association, segmentation, and classification.

To put it simply, SPSS Statistics provides a more top-down, hypothesis-testing approach to your data, whereas SPSS Modeler uses a bottom-up, hypothesis creation strategy to allow the patterns and models buried in the data to surface. To assist you in making your purchase, I considered compiling a more thorough comparison of these two goods. The table that follows compares the two items on many criteria that a consumer might consider before choosing one.

The most popular statistics program in the world is IBM SPSS Statistics. It is a lot more useful tool for analytics than spreadsheets, databases, or traditional multi-dimensional tools since it helps you to swiftly go deeper into your data. To help you reach conclusions and make predictions, SPSS Statistics excels in making sense of complicated patterns and correlations. Additionally, it handles jobs quickly, taking just a third as long as many nonstatistical programmers to complete activities like data processing and statistical operations. (Nitin Mathur, 2019)

## **2.15 CONCLUSION**

Construction firms are frequently criticized for their inefficiency and lack of innovation. Basic building methods, techniques, and technology have not advanced significantly since Roman times. It is difficult to implement innovation and progress in the building industry, nevertheless. The pace of technical progress in the construction industry today is one example of how a shortage of trained labor in that area inhibits innovation. Each building site functions as a single prototype, making every project unique. Construction labor includes businesses in several places, moving personnel and equipment constantly. Many of these workers will soon retire, and it has been challenging to find fresh, younger talent. The Union of Construction, Allied Trades and Technicians (UCATT) also reported a 14.6% decline in the number of construction apprenticeships that same year, and the Construction Industry Training Board (CITB, 2018) found that the overall appeal of the construction industry as a career option had decreased to only "4 out of 10 among 14 to 19-year-olds." (ManpowerGroup,2020)

The phrase "advanced construction technology" covers a wide range of modern techniques and methodologies, including current developments in quantity surveying, facilities management, communications, services, structural analysis and design, and management research. High levels of quality, efficiency, safety, sustainability, and financial value may be achieved by using sophisticated construction technology. For instance, by developing a building industry tool to help in the storing of documentation data. The phrase "advanced construction technology" covers a wide range of modern practices and approaches, including current developments in quantity surveying, facilities management, communications, services, structural analysis and design, and management research. Utilizing cutting-edge construction technology may raise the bar for quality, effectiveness, safety, sustainability, and economic value. For instance, by developing technology to help the building business, which would make the storing of documentation data easier.

Utilizing more sophisticated construction technologies calls for suitable design, dedication from the whole project team, acceptable procurement methods, excellent management of work displays, appropriate communication of feedback and activities, and delegating responsibility to employees. Construction firms are frequently criticized for their inefficiency and lack of innovation. Since the Roman era, the fundamental techniques, technologies, and methods of construction have hardly altered. However, applying innovation in the construction sector is not an easy task. (The Construction Wiki, 2022)

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

A research methodology chapter that covers the aspects of the resolve method is mentioned in this chapter. Importantly, a good methodology chapter, in this chapter dissertation or thesis explains the methodological flow to developing Site Supervision App (VisiApp) and explains the flow the VisiApp was developed. In other words, the methodology chapter justifies the design choices by showing that the chosen methods and techniques are the best fit for the research aims and objectives and will provide valid and reliable results. A good research methodology provides scientifically sound findings, whereas a poor methodology doesn't. (Derek Jansen and Kerryn Warren, 2020)

The strategy that is taken is fully explained in this chapter of the disputed problem as well as the selection of the appropriate system that will be used effectively in accordance with the system that will be used. This is based on all currently available work, references used such as records, studies and interactions used on site projects. The development process flow of this application used in the work environment at the project site will be attached in this chapter as well. At this early stage, the prototype is tested by users to monitor the response and whether they are satisfied with the solution of this app or not. A questionnaire was conducted among construction workers and office workers such as Project Managers, Architect Managers, Drafters, Site Engineers, Consultants, and all workers involved in using this app in the office or on the construction site.

While carrying out a task, observations will be carried out to evaluate the effectiveness of the app. This chapter also shows the development of the application, research, and observation are the main sources that have been used. It also occurs from the collection and analysis of data as a secondary source. This chapter will be

attached to the process flow that will be used to develop this project and use it at work. During the project, observations will be carried out with the objective of determining the sustainability of the project. Conceptual simulation is another aspect covered in this methodological chapter. Using both primary and secondary sources and simulating concepts effectively will increase the value of the project. In addition, the source will have a complete study.

### **3.2 DESIGN RESEARCH**

Research design, in general, is a framework for organizing and conducting research. The conceptual framework, determination of the responsible employee and what needs to be inspected, as well as the instruments and methods that will be utilized to collect and evaluate data to begin this project, are all integral parts of the research design, making it a crucial component of the study. The goal of the design study is to demonstrate and describe the process used to create a study plan that enables reliable evaluation of development carried out on the application project in the context of the site project and office.

In this study, the evolution of research was displayed as a research flow. Figure 3.1 depicts the progression of this study's research. The figure depicts the progression of research from literature review to the problem statement, ideate, testing, and assessment of the app's efficacy.

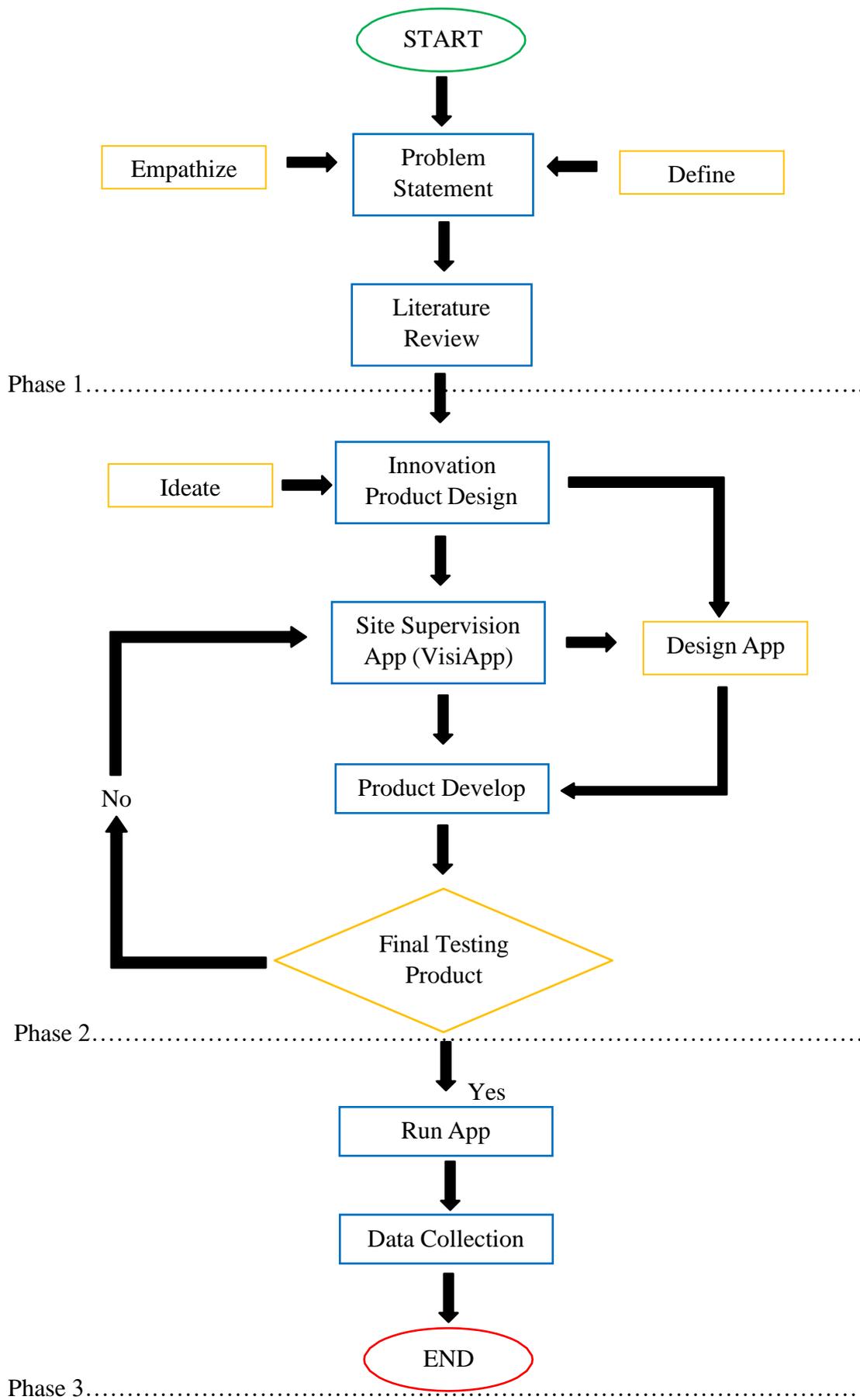


Figure 3.1: Flow of Research Design Flow

The methodology in this analysis is categorized into several levels and will be discussed in detail. In addition, other techniques are used for interviews, reading the results of the literature review, making questionnaires, and seeing the progress made during this project.

There are three methodological phases that will be involved throughout the process of completing this project, namely:

- i. Phase 1: Problem Statement and Literature Review
- ii. Phase 2: Develop App
- iii. Phase 3: Run App and Conclusion

#### 3.2.1 Phase 1: Problem Statement and Literature Review

Phase 1 is an important phase at this stage. This phase is about gathering information, referring to the literature review studies required to study and collecting problem statement data, as well as discussing it with supervisors and mentors. It takes some time to complete the literature review and research for the problem statement.

#### 3.2.2 Phase 2: Develop App

The aim of this phase is to ensure the right method to get the idea and design of this project according to the needs of the employees and solve their problems. This phase includes fact-finding procedures regarding employee misunderstandings and tasks, employee questionnaires regarding their work tasks, and their comfort interview method using only the WhatsApp platform to communicate at work.

The collected data will be used to build models, and prototypes and to proceed to the next stage as well. And this phase is also the phase to complete the objectives of this project. Interviews and observations were conducted to collect challenging information using questionnaires. This interview process is important to obtain certainty and accurate information about the variables being measured based on the input collected from the survey. Through direct contact with those involved in

construction projects involving contractors and consultants, this information is gathered. These data reinforce the need for this research. These details are also required to obtain additional information for this report.

Additional details are collected by the project as information. References used in this research are articles, the Internet, and company data collection. At this point, an interface sketch is needed, and additional functionality needs to be developed in the mobile application.

### 3.2.3 Phase 3: Conclusion and submit App.

The final phase is after finding a satisfactory data analysis that states that the development of this Application can continue. Some tasks will be run immediately after the completion of the entire mobile application, where the device will be checked to ensure that the application execution does not have any errors or compilation or deployment time problems. And where the project phase has been created and distributed to find out that the application is effective for employees to solve their problems and the analysis data has already been taken and studied the effectiveness of the application to achieve the objective.

## **3.3 DEVELOPMENT OF RESEARCH**

This research covers the development of the application's project at project 8MD3. Create the system's flowchart during this process to make sure the project goes as planned.

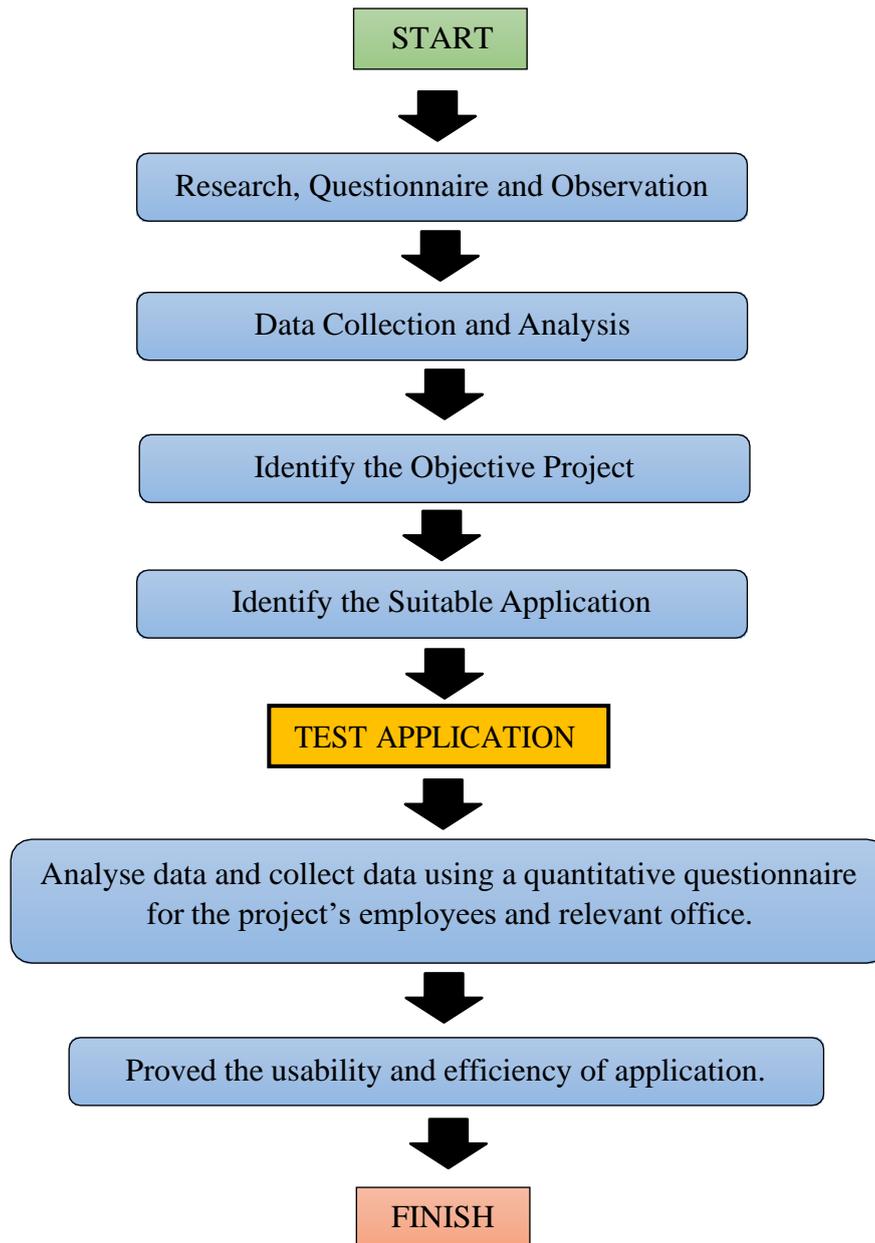


Figure 3.2: Flow on Development App

### 3.4 SITE SUPERVISION APP DESIGN AND DEVELOPMENT

The design and development of the system App-based systems are essential to ensuring that the creation and operation of the process go smoothly. A systematic system that can manage all the work activities is necessary for developing an application.

### 3.4.1 Site Supervision App (VisiApp) Design

The application and overall method function are described in the method design. For users and researchers to fully get how the app works, they must read this section. Additionally, every feature of a method that is contained therein is discussed. Employees may find the application to be user-friendly in the future. Systems design is the process of defining elements of a system like modules, architecture, components, and their interfaces and data for a system based on the specified requirements. It is the process of defining, developing, and designing systems that satisfy the specific needs and requirements of a business or organization (Bennett, 2021).

Here are the methods to make a digital application using 'bitrise' website to benefit React Native platform and its function. Users need to explore 'bitrise' to use React Native platform to develop the App.



Figure 3.3: Sign Up, login and create website account in React Native.

Create website account in React Native, by open website 'bitrise' to used React Native platform to develop App online easier.

bitrise

Already have an account? [Sign in](#) →

## Sign up, start building

Start building on the only true mobile-first CI/CD platform.

Email

Username

Password

I agree to the Bitrise [Terms of Service & Privacy Policy](#).

Figure 3.4: next step after opening 'bitrise' website.

Register an account to start building the App. Key-in email, username, and password to sign up dan ready to register 'bitrise' website and can open React Native platform.

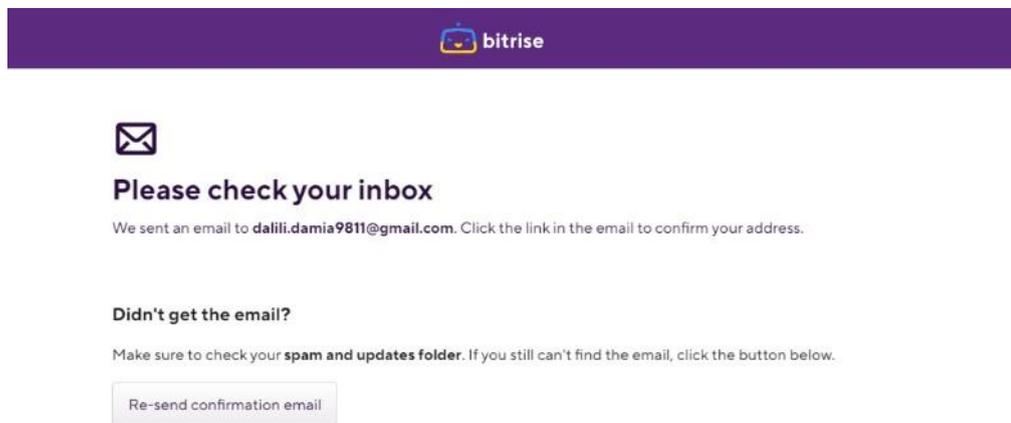


Figure 3.5: get information from 'bitrise' to check our email.

Check inbox user email for confirmation from user. To confirm if we use our own email. And not use another people's email. Their security really saves from scammers and fake account users.

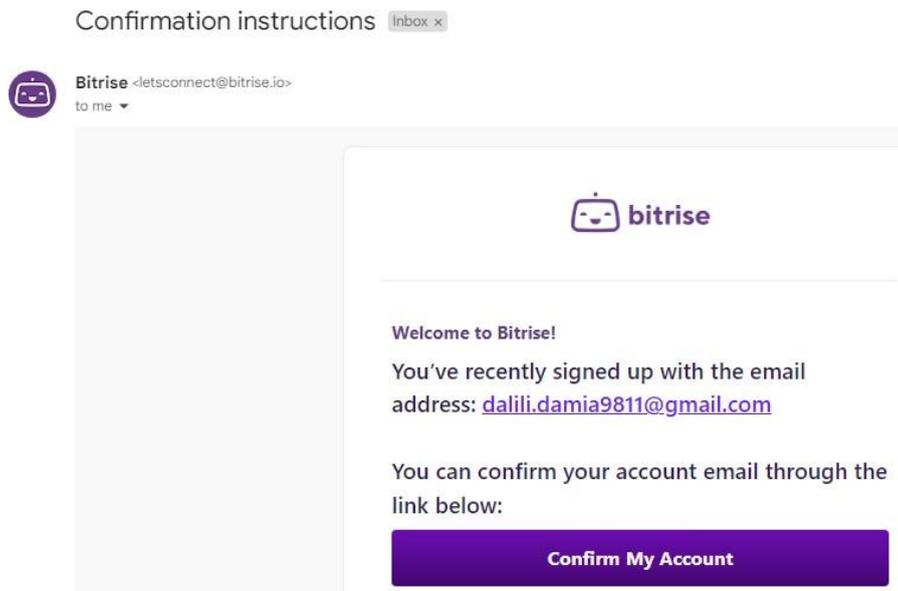


Figure 3.6: Confirmation instructions from email.

Users need to click confirm my account. Then can proceed to develop Application in React Native platform.

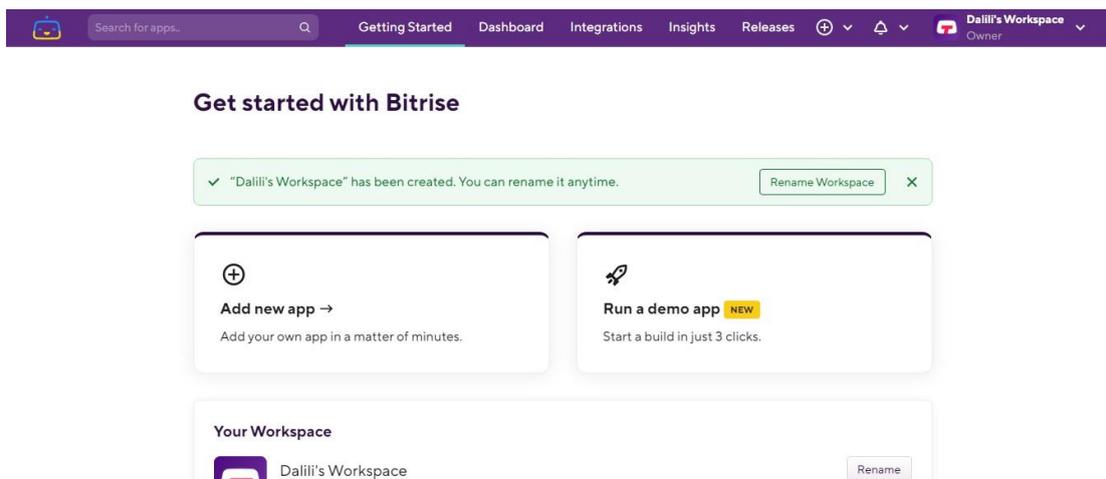


Figure 3.7: User can start developing the App.

Starting to develop by clicking React Native platform and choosing the type of application we want to develop.

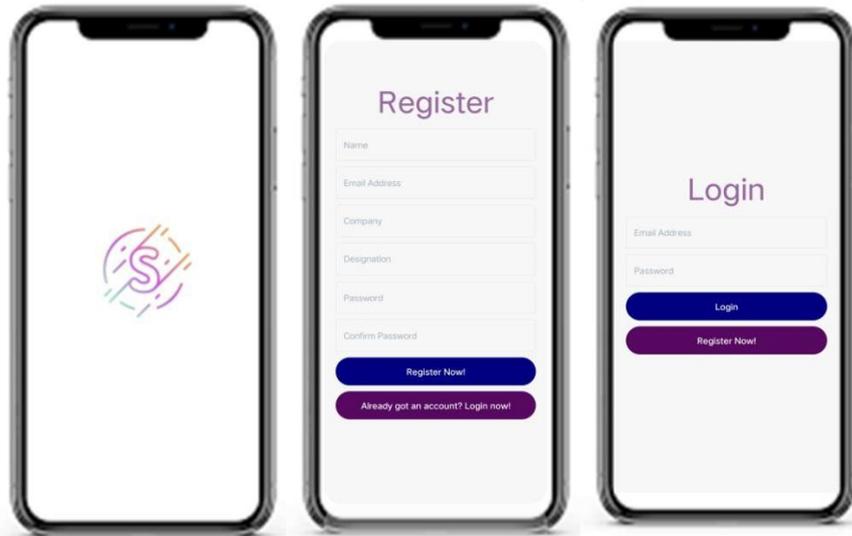


Figure 3.8: Starting user register and log-in VisiApp.

The Site Supervision App (VisiApp) shows in figure 3.8 how VisiApp runs by clicking the Application icon in mobile phone after installation. When a user wants to know the schedule daily at the workplace just click VisiApp icon. The user will be displayed logged in to the application.

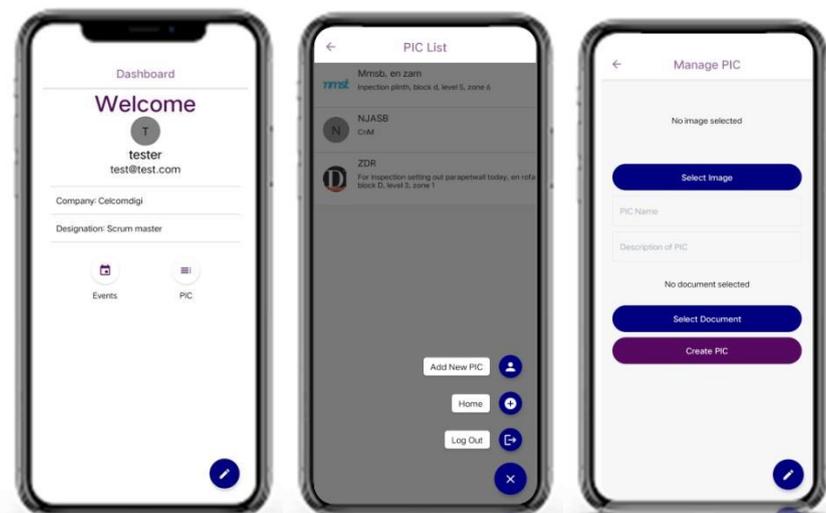


Figure 3.9: Home page the VisiApp.

The home page of the selection icon is displayed. After clicking one of icons in home page, Person in Charge (PIC). In PIC interface show the tasks. User can add who PIC for any tasks that day, every day at anywhere. Description of tasks can put it before posting the tasks to other users view the tasks.

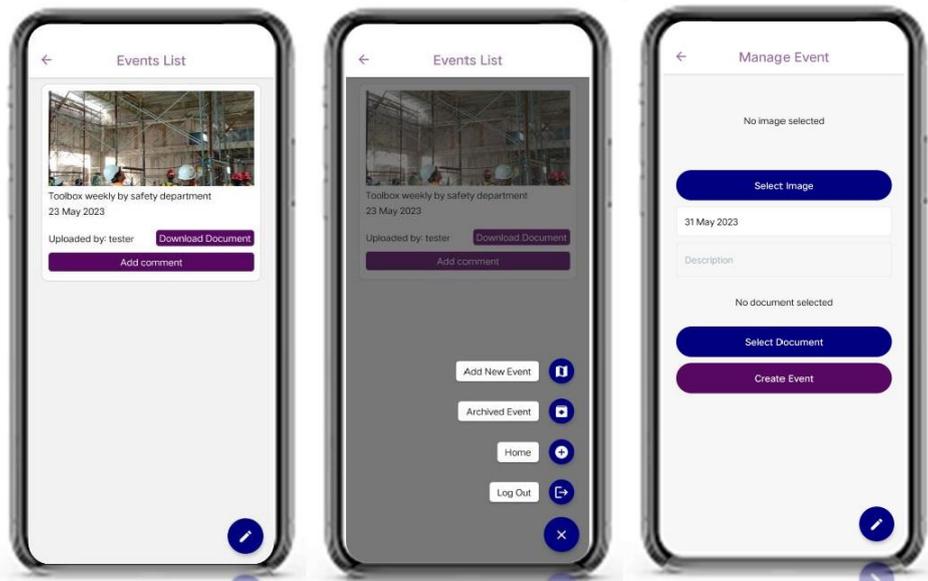


Figure 3.10: View the events and add new event in App.

Users can upload pictures and descriptions to inform any events they upload in VisiApp. To add another event, they just need to click edit icon below right phone screen. Users just select the date they want to inform them of events with pictures and description.

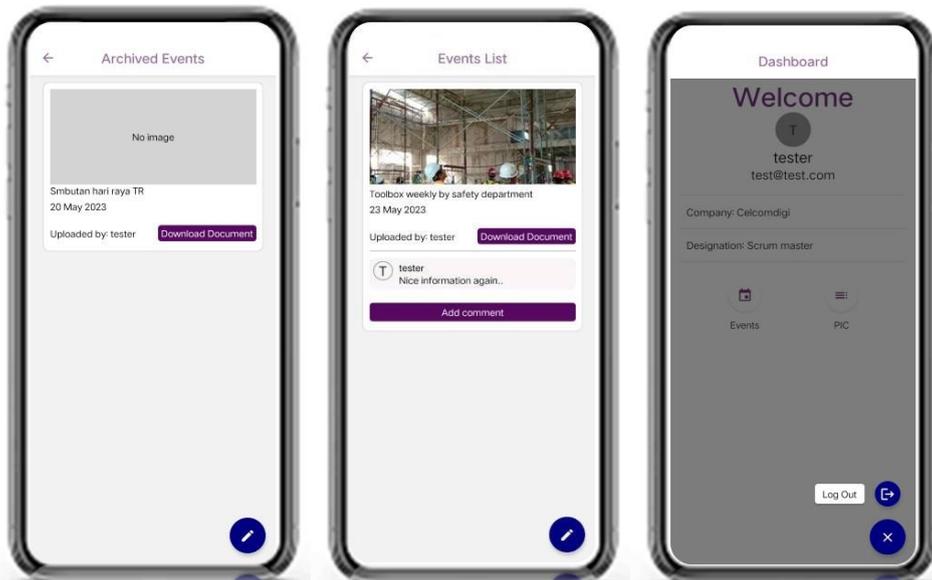


Figure 3.11: Archived events and add comments on task and events.

Users who post the event only can archive every they own post event that has been completed in Visi App. Every user can comment on every event until finish the events.

### 3.4.2 Site Supervision App (VisiApp) Development

Site Supervision App The process of conceiving, creating, testing, and implementing a new software application or program is known as app development. It includes the internal creation of specialized systems, the building of database systems, or the acquisition of software created by a third party. Written standards and procedures must be used in this system to keep an eye on all information system processing operations. The company's management must specify and put into practice guidelines and adopt appropriate system development life cycle practices to control the process of creating, acquiring, putting into use, and maintaining computerized information systems and related technologies. (Civil Service India,2022)

Material and tools to develop the application are laptop, smart phone, internet, google account, React Native platform, tasks lists, events lists, and employees lists. Laptop to create the application and access. Internet to connected link the laptop and internet to develop application. Google account to login and register account in creating the application. React Native platform to create and develop the application. Tasks, events, and employees to input the tasks on the application has been develop.

The stable technologies Native Module and Native Components are utilised by the legacy architecture. Native Modules in Android Studio were launched by setting up and opening the React Native application.

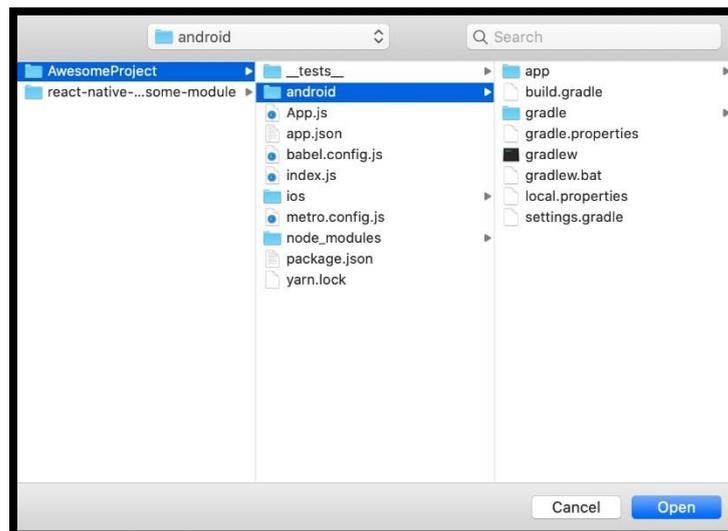


Figure 3.12: starting setup Android project.

Developing native code using Android Studio. By utilizing Android Studio, an IDE created specifically for Android programming, you may easily fix little problems like incorrect code syntax.

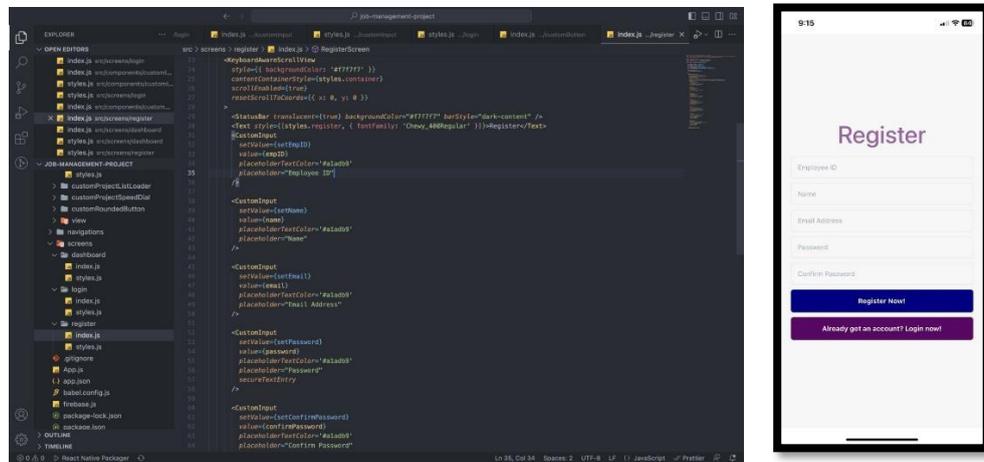


Figure 3.13: Register Interface

Figure above shows database for register, with its user can key-in name, company, and email address. After clicking register, it shown the main menu page.

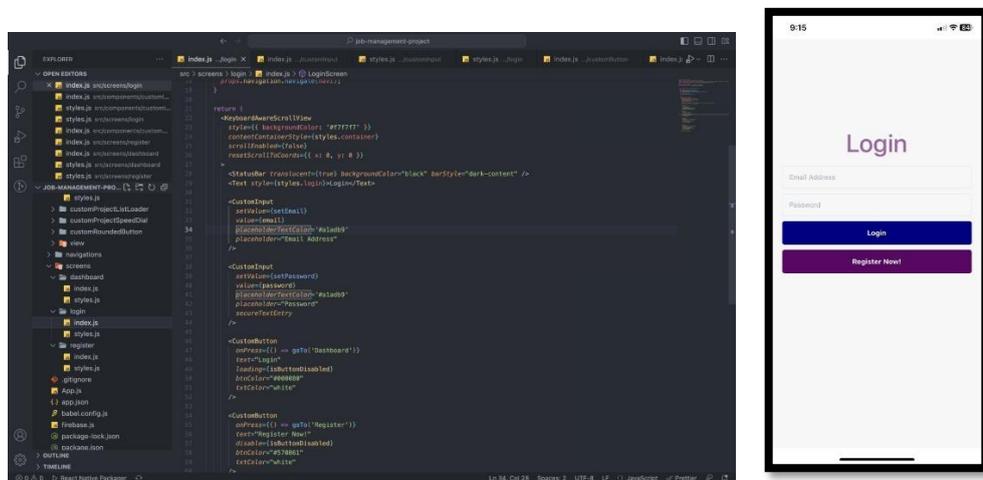


Figure 3.14: Log-in Interface

Figure 3.14 above shows database for log-in for who user already register, with its user just email address and password. After clicking log-in, it also shown the main menu page. After done all database coding develop the application, follow the design. The purpose of this step is to build the fundamental framework for this native Android module. By gaining access to the native module and calling its exported method in JavaScript, you may verify that.

### **3.5 DATA COLLECTION**

Since it depends on the subject and objective of the study, data analysis is given various approaches and ways of analyzing effectiveness. The basis for quantitative and qualitative research methodology forms the basis of data processing. For the pre and post data form using the product, it was calculated using the Statistical Package for the Social Sciences (SPSS) software. The data obtained will be displayed using tables, bar charts and pie charts showing the analyzed response rate.

#### **3.5.1 Reliability Analysis**

The degree to which a scale yields consistent findings after several repetitions of the measurements is referred to as reliability. Reliability analysis is the study of reliability. By assessing the correlation between the scores received from various administrations of the scale, reliability analysis may be done to identify the percentage of systematic variation in a scale. As a result, if the association in the reliability analysis is strong, the scale produces credible findings since the results are consistent.

#### **3.5.2 Description Analysis**

The practice of employing statistical techniques to describe or summarize a collection of data is known as descriptive analysis, sometimes referred to as descriptive analytics or descriptive statistics. Descriptive analysis, one of the main forms of data analysis, is well-liked for its capacity to produce understandable insights from uninterpreted data.

Descriptive analysis does not seek to make future predictions, in contrast to other methods of data analysis. Instead, it only uses historical data that has been altered to make sense of it to draw conclusions.

#### **3.5.3 Mean Analysis**

Mean analysis is the same as analysis of variance, but it can also be used for binomial distribution, which measures how frequently one of two outcomes occurs, and normal distribution, which is a bell-shaped symmetrical curve that represents the frequency of a given sum of objects or events in a data set.

In mathematics and statistics, the mean is a single integer that represents the center point or typical value of a dataset. The most typical way to measure central tendency is what is sometimes referred to as the arithmetic mean. It is often referred to as the "average."

#### 3.5.4 Standard Deviation

The square root of the variance is used to calculate the standard deviation, a statistic that expresses how widely distributed a dataset is in relation to its mean. By calculating the departure of each data point from the mean, the standard deviation may be determined as the square root of variance. The bigger the deviation within the data collection, the more the data points deviate from the mean; hence, the higher the standard deviation, the more dispersed the data.

### 3.6 CONCLUSION

The conclusion made from this chapter is to discuss the method of data and information collection in the study, that is how the process of creating an application and collecting data in terms of its effectiveness. To prove the project was successful, the collected data was examined. Location, respondents, research techniques, data interpretation, and projects carried out during the review process are among the main topics in this chapter.

Digital technology is better used in terms of enhancing product information and illustrations on applications. Users feel a little burdened with unofficial platforms to get work assignments to complete daily activities. The application is flexible as it is easy for users to find tasks, understand and use, making it suitable for use on any project, anywhere. The ability to access tasks through VisiApp and view tasks, site activities and zoning, better than in WhatsApp, no longer overlook tasks, activities and know task zoning is finally expected to benefit all employees.

Additionally, the approach that has been taken, based on the issues faced and the choice of the best method for workers to use when using it on the construction site and in the project site office, is fully explained. Based on all the work achieved, it is based on existing references which are websites, articles, observations, interviews, experiences, and other factors.

## **CHAPTER 4**

### **DATA AND ANALYSIS**

#### **4.1 INTRODUCTION**

The project's aim is to develop an application for area specifications as well as notification of tasks and events for users. The Application is easy to use and provides access to information at any time and from any location using only mobile devices or other tools at the office or the project site. The following are the exact objectives of this study:

- i. To identify the problem, area specifications, overlook tasks, and events at site project 8MD3.
- ii. To develop an application Site Supervision App (VisiApp).
- iii. To evaluate the effectiveness of the Site Supervision App (VisiApp) at project 8MD3.

#### **4.2 DATA COLLECTION AND FINDING**

The results are shown from a pre-questionnaire that has been distributed to 14 respondents consisting of Site Supervisors, Project Managers, Site Engineers, and anyone related to Project 8MD3, in Putrajaya. To find out what problems and issues are faced by the team and the required Application that needs to be designed and developed in this final year project. The results obtained will present the results and complete analysis of the study in the form of graphs, pie charts, and diagrams so that the main information is highlighted.

And the results are shown from the post questionnaire that has been distributed to 34 respondents consisting of Site Supervisor, Project Manager, Site Engineer, Consultant/Subcon and anyone related in the construction field. To find out the effectiveness of the Site Supervision App (VisiApp) that has been designed and

developed in this final year project. The results obtained will present the results and complete analysis of the study in the form of graphs, pie charts, and diagrams so that the aims and objectives of the project can be proven.

### 4.3 DATA COLLECTION OF QUESTIONNAIRES

#### 4.3.1 Pre-Questionnaire Section A: Demographic Information

The following data is taken from google form straight, and the classification of respondents is determined by Pie Chart, with men having the highest number of responses of 13 individuals with a percentage of 92.9%, followed by female responses which is only 1 individual with a percentage of 7.1% only.

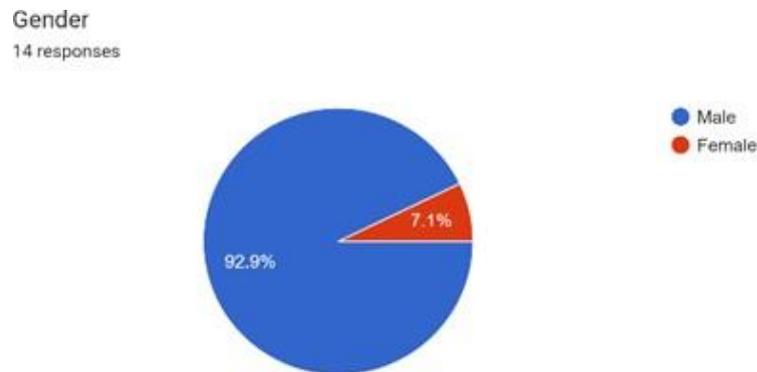


Figure 4.1: Gender of Respondents

In the google form that is the survey, the age list has been divided into 4 classes, namely under 25, 26 - 35 years, 36 - 45 years and over 46 years. individuals who have chosen their age within the range of under 25 years are 2 individuals, then 6 individuals as the highest response at the age of 26 - 35 years followed by 4 individuals who are within the range of 36 - 45 years and finally the rest of the respondents who are 46 years old and above only 2 individuals only.

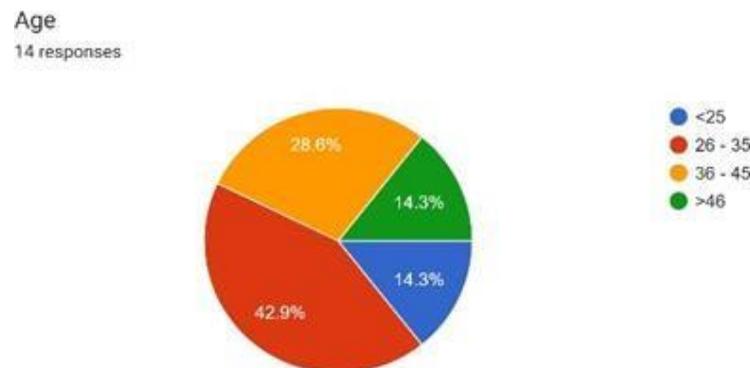


Figure 4.2: Age of Respondents

The survey conducted by the respondents consisted of all management ratings of the project, from site supervisors and consultants sharing the same percentage which is 21.4% with the same number of respondents which are 3 individuals each. Then followed by the second highest percentage of 14.3% from project engineers with 2 respondents. Lastly, is the management of other rankings such as site engineer, mechanical engineer, project manager, M&E, machine operator and intern with 1 individual respondent and the same percentage of 7.1%.

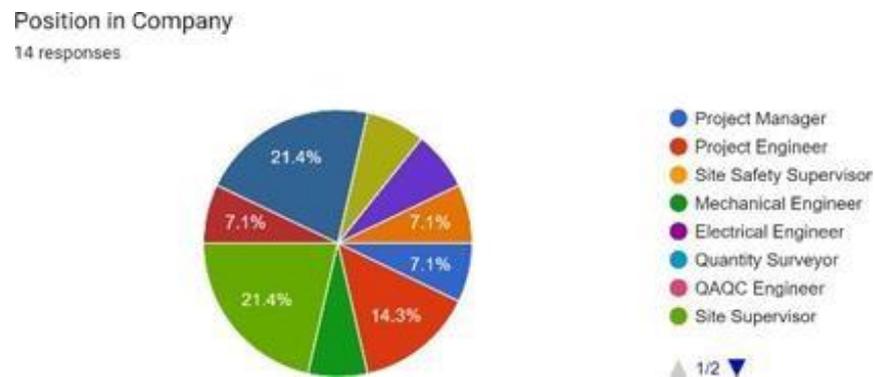


Figure 4.3: Position Respondents in Company

The explanation of work experience at the 8md3 project site was done with the help of a chart. The total number of respondents of 14 people was divided into 4 sections with a maximum of 10 years of experience with 7 individuals at a percentage of 50% followed by 4 individuals with 3-5 years of work experience at a percentage of 28.6%. 2 people 14.3% experience under 2 years and last, 7.1% with 1 individual at 6-10 years of experience.

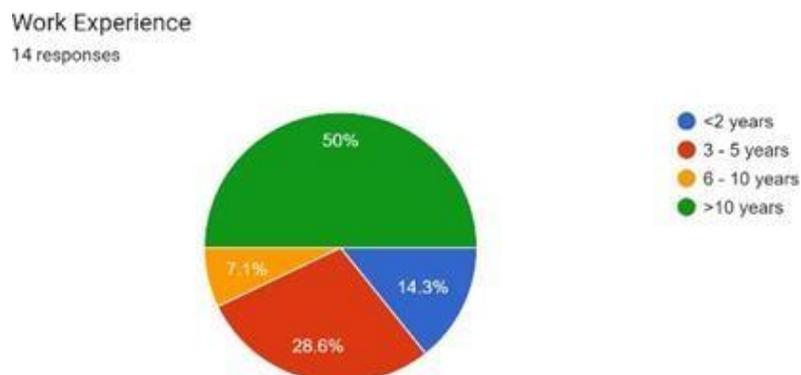


Figure 4.4: Respondents' Work Experience

4.3.2 Pre-Questionnaire Section B: Information Regarding Construction Miscommunication

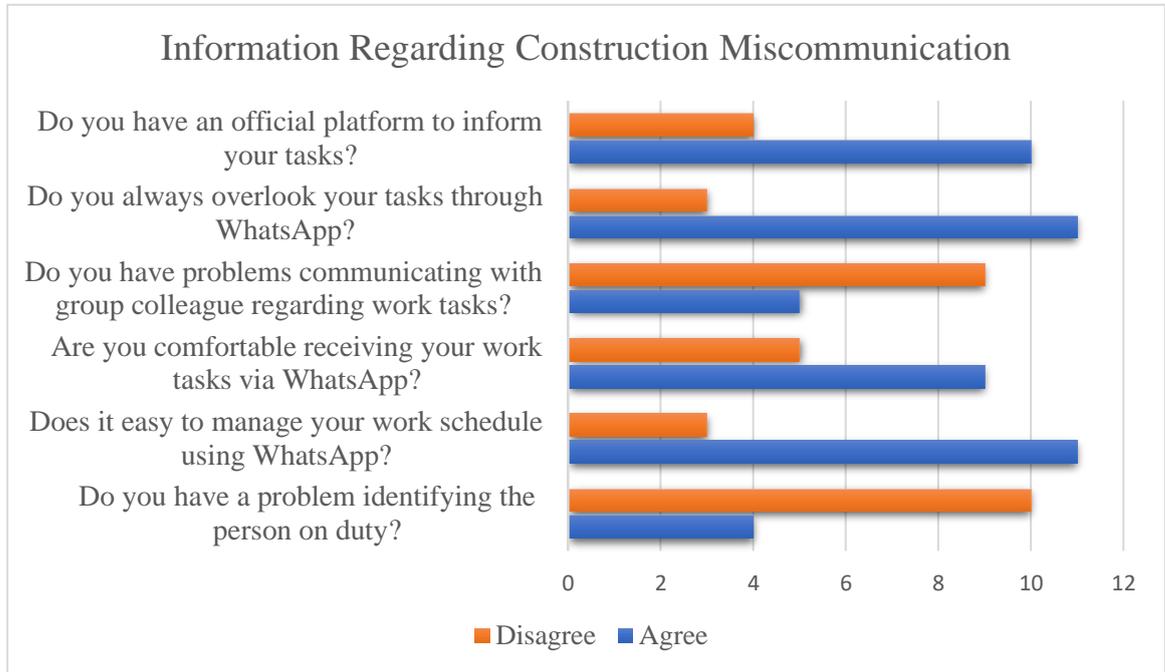


Figure 4.5: All data from pre-questionnaires

**Question 1:** Do you have a problem identifying the person on duty?

Table 4.1: Satisfactory of Identify Person on Duty

Satisfactory	Respondent	Percentage
No	10	71.4%
Yes	4	28.6%

The table above represents the data with the answer yes which is 28.6% with the average vote from 4 individuals, while the other 10 individuals who answered no in the percentage of 71.4%. The result of this table is that 4 individuals, equal to 28.6% of these 14 respondents, have problems identifying the person on duty.

**Question 2:** Does it easy to manage your work schedule using WhatsApp?

Table 4.2: Satisfactory of easy to manage work by using WhatsApp.

Satisfactory	Respondent	Percentage
Yes	11	78.6%
No	3	21.4%

From the table above which represents the data with yes which is the average voted by 11 people on this 8md3 project site with a percentage of 78.8%, then the average voted by not only 3 individuals with a percentage of 21.4%. The results from this pie chart are 3 individuals equal to 21.4% of respondents stating that it is not easy to manage work schedules through WhatsApp.

**Question 3:** Are you comfortable receiving your work tasks via WhatsApp?

Table 4.3: Satisfactory of comfortable receiving tasks from WhatsApp

Satisfactory	Respondent	Percentage
Yes	9	64.3%
No	5	35.7%

According to the respondents, the highest was on yes which is an average of around 9 individuals who voted with a percentage of 64.3% and followed by 5 individuals with 35.7% who voted No. Therefore, the percentage of respondents is less than 50% where the category is not comfortable receiving tasks via WhatsApp.

**Question 4:** Do you have problems communicating with group colleagues regarding work tasks?

Table 4.4: Satisfactory of problem communicated with group colleague.

Satisfactory	Respondent	Percentage
Yes	5	35.7%
No	9	64.3%

From the pie chart above, the most common form of communication used on the site is via WhatsApp which states 9 individuals with a percentage of 64.3% who have no communication problems, then the average number of 5 individual respondents who answered yes with a percentage of 35.7% have problems communicating with group colleagues.

**Question 5:** Do you always overlook your tasks through WhatsApp?

Table 4.5: Satisfactory of overlook tasks

Satisfactory	Respondent	Percentage
Yes	11	78.6%
No	3	21.4%

Table 4.5 gives us data from the respondents about the problem of ignoring work tasks notifications in WhatsApp that can affect the success of the project, the result is an average of 11 people voting yes with 78.6%, then 3 individuals voting with no which is 21.4%.

**Question 6:** Do you have an official platform to inform your tasks?

Table 4.6: Satisfactory of having official platform information tasks.

Satisfactory	Respondent	Percentage
Yes	10	71.4%
No	4	28.6%

According to the respondents, the highest is on yes, which is an average of around 10 individuals who have chosen with a percentage of 71.4% and then 4 individuals with 28.6% who voted that there is no official platform to inform tasks.

#### 4.3.3 Post-Questionnaires Data Analysis

This survey displays the results of a questionnaire distributed to respondents, including Project Managers, Site Engineers, Site Supervisors, and others, to determine which teams should use VisiApp. This questionnaire has two parts, Section A and Section B. Section A is about the background information of respondents. The respondent's assessment of the effectiveness of the development of the Site Supervision App (VisiApp) after the respondent used this VisiApp in Section B.

##### i. Post-Questionnaire Section A: Demographic Information

The following data figure 4.6 below is taken from an Excel chart, and the classification of respondents is determined by Pie Chart, with females having the highest number of responses of 18 individuals with a percentage of 52.9%, followed by male responses which 16 individuals with a percentage of 47.1%.

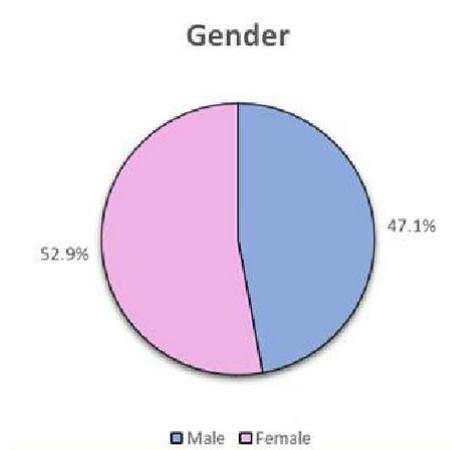


Figure 4.6: Gender of Post-Questionnaire Respondents

In the pie chart Figure 4.7 below, the age list has been divided into 4 classes, namely under 25, 26 - 35 years, 36 - 45 years, and over 46 years. Individuals who have chosen the age range of under 25 years are 18 individuals as the highest response, then 9 individuals at the age of 26 - 35 years, followed by 5 individuals in the range of 36 - 45 years and finally the rest. Of the respondents aged 46 and above only 2 were individuals.

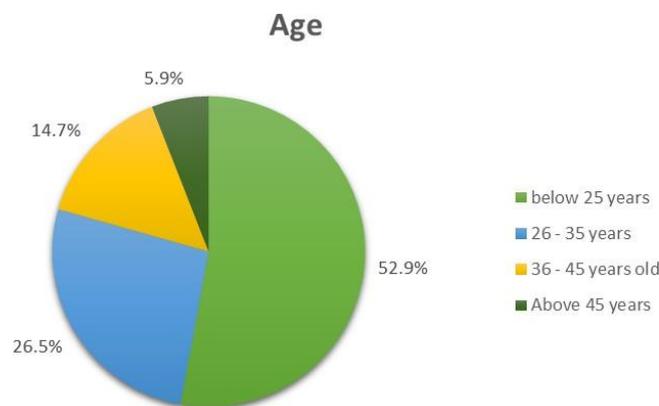


Figure 4.7: Age of Post-Questionnaire Respondents

The survey conducted by the respondents consisted of Site Supervisor App with the highest percentage of 29.4% of the 10 respondents. Then followed by respondents Site Safety Supervisor rating QAQC Engineer sharing the same second highest percentage which is 11.8% with the same number of respondents which is 4

individuals each. And followed by the third highest percentage which is 8.8% with the number of 3 respondents each namely Project Engineer and Quantity Surveyor. Next, the second lowest number of respondents are Project Manager, Intern, and Students, with the number of 2 people in each position with a percentage of 5.9%. Lastly, is the management of other positions such as Site Engineer, Consultant/Subcon, Electrical Engineer, and Junior Engineer with 1 individual respondent and the same percentage of 2.9%.

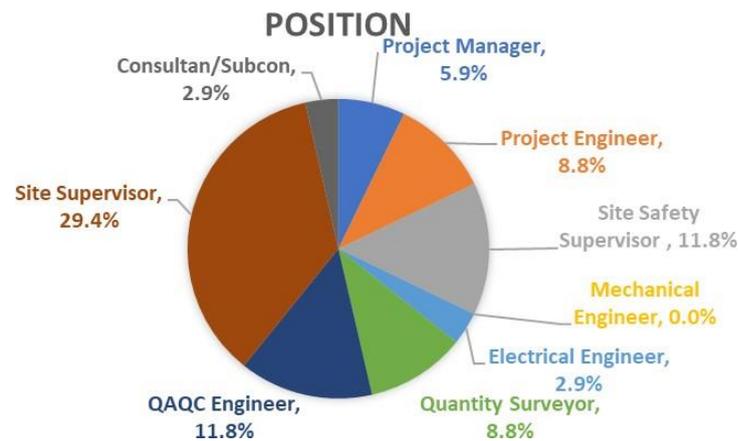


Figure 4.8: Position Respondents in Construction Industry.

Explanation of work experience in the field of construction is done with the help of charts. The total number of respondents of 34 people were divided into 4 sections with a maximum experience of 10 years with 5 individuals at a percentage of 14.7% followed by 3 individuals with 6-10 years of work experience at a percentage of 8.8%. 9 people 26.5% experience at 3-5 years and lastly, 50% with 17 individuals at less than 2 years of experience.

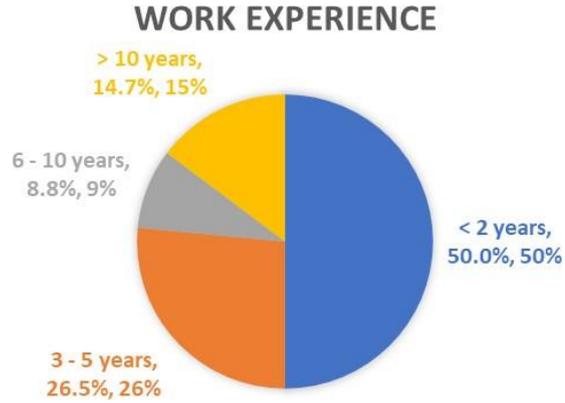


Figure 4.9: Respondents Work Experience

#### 4.3.4 Post-Questionnaire Section B: Effectiveness Using the VisiApp

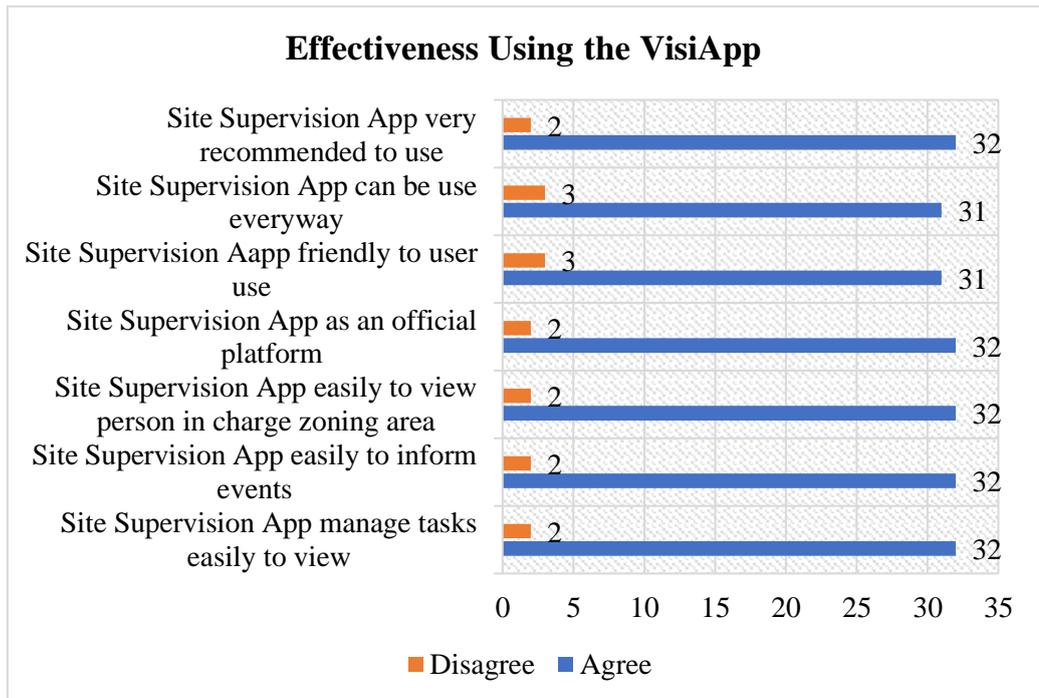


Figure 4.10: All data of effectiveness using the VisiApp.

The bar chart above represents data with an agreeable answer of 94.1% with an average vote from 32 individuals, while another 2 individuals who answered disagree in a percentage of 5.9%. The result of this table is that 32 individuals, equivalent to 94.1% of these 34 respondents, agree that VisiApp manages this task easily to view, to inform events, to view person in charge at zoning area, and as an

official platform and, they are recommended VisiApp to use.

From the bar chart above there is also data representing VisiApp can be used anywhere and is user-friendly with an average vote of agreement of 31 employees involved in this 8MD3 project with a percentage of 91.2%, and an average vote of disagreement of only 3 individuals with a percentage of 8.8%. The result of this bar chart is that 31 individuals, equal to 91.2% of respondents stated that it is easy to manage tasks and view activity information through VisiApp.

#### **4.4 RESPONDENTS PERSPECTIVE**

##### 4.4.1 Data Collection

User requirements can be determined using various statistics. Using data analysis from the questionnaire and empathize, to create a Site Supervision App (VisiApp) in this project. The objective of the questionnaire is to ensure that the statement problem is solved. This survey presents the results of a questionnaire distributed to respondents, including Project Managers, Site Engineers, Site Supervisors, Work Inspectors and All Employees involved to determine which need to improve the application and method criteria.

The questionnaire was distributed for 2 weeks. A total of 14 respondents filled out the questionnaire for this survey. To highlight the relevant information, the collected results will provide complete study and analysis results in the form of tables, graphs, and diagrams. At this point, the questionnaire is evaluated on target respondents to ascertain user needs. Two components, A and B, make up this questionnaire. Information about demographics is in section A. Section B discusses the problems with the current approach.

##### 4.4.2 Data Analysis

Use Microsoft Excel to enter the data collected from both surveys. The data submitted in this area will display the mean and standard deviation statistics. The average value, commonly referred to as the mean or statistical mean, is usually computed by summing all the data points in a collection and dividing the result by the total number

of values. After making an accurate sum of all the data, the average function in Excel divides the value by the number of values.

Also, the standard deviation is a group of numbers that shows how much a few deviates from its mean. The statistics ultimately remain unchanged and show no fluctuations. Methodical application of statistical and logical techniques to explain, describe, condense, summarize, and evaluate the data obtained.

Table 4.7: Respondents feedback from Questionnaire Google Form.

			Answers of Agreement	
No.	Problem Categories	Related issues to exiting method	Yes	No
1	Identify Person	Do you have a problem identifying the person on duty?	4	10
2	Manage Using WhatsApp	Does it easy to manage your work schedule using WhatsApp?	11	3
3	Comfortable Receive Tasks	Are you comfortable receiving your work tasks via WhatsApp?	9	5
4	Problem Communication	Do you have problems communicating with group colleague regarding work tasks?	5	9
5	Overlook Tasks	Do you always overlook your tasks through WhatsApp?	11	3
6	Official Platform	Do you have an official platform to inform your tasks?	4	10

#### 4.4.3 Average of Mean

The mean represents the measure of central tendency by using all the numbers in the collection. Outliers or data that are far outside of the data set, however, might skew the overall metric. As an illustration, a few high scores may skew the mean, making the average score look considerably higher than many of the scores are. Although the mean in math is theoretically neutral, some claim that if care is not given when applying it, the mean in psychology might result in incorrect conclusions.

The mean, sometimes referred to as the arithmetic mean, varies from the geometric mean of a dataset and is calculated as the sum of all values divided by the total number of values. It is sometimes referred to as the average and is the most often used central tendency measure. To understand the population from which the samples were taken, inferential statistics are frequently used in research to collect data from samples. The table below shows the result of respondents about the issues related to a mean analysis method.

Table 4.8: Percentage of Agree and Disagree Respondents

No.	Questions	Total Respondents	Mean, $\bar{X}$	Percentage Agree	Percentage Disagree
1	problem identifying the person on duty?	14	0.02	4 28.6%	10 71.4%
2	manage your work using WhatsApp?	14	0.06	11 78.6%	3 21.4%
3	receiving your work tasks via WhatsApp?	14	0.05	9 64.3%	5 35.7%
4	problems communicating?	14	0.03	5 35.7%	9 64.3%
5	always overlook tasks via WhatsApp?	14	0.02	11 78.6%	3 21.4%
6	have an official platform to inform your tasks?	14	0.02	10 71.4%	4 28.6%

#### 4.4.4 Data Collection after using VisiApp.

Once VisiApp was created to solve the problem of statistics on the project site. So, the data analysis is obtained from the questionnaire after being distributed at the construction site and the project office, to evaluate the effectiveness of the Site Supervision App (VisiApp) in this project. The objective of the questionnaire is to ensure the effectiveness of this VisiApp. Here we present the results of a questionnaire distributed to respondents, including Project Managers, Consultants, Safety Department, Site Engineers, Site Supervisors, Work Inspectors and All Employees involved to determine their satisfaction with this Application.

The questionnaire was distributed for 1 week. A total of 34 respondents filled out the questionnaire for this survey. To highlight the relevant information, the collected results will provide complete study and analysis results in the form of tables, graphs, and diagrams. At this point, the questionnaire is evaluated on the target respondents to ensure that the user's needs are fulfilled and facilitate the management of their tasks. Two components, A and B, make up this questionnaire. Information about demographics is in section A. Section B discusses the evaluation of VisiApp' s effectiveness.

#### 4.1.1 Data Analysis after using VisiApp.

Microsoft Excel and SPSS to analyze data, collect and calculate data, then enter the data collected from both surveys. The data submitted in this area will display the mean and standard deviation statistics of after launching VisiApp. The average value, referred to as the mean or statistical mean, is usually computed by summing all the data points in a collection and dividing the result by the total number of values. After making an accurate sum of all the data, the average function in Excel divides the value by the number of values.

The standard deviation is a group of numbers that shows how much a few deviates from its mean. The statistics ultimately remain unchanged and show no fluctuations. The numbers have a standard deviation of less than 1 as a result. Many academics use SPSS, which stands for Statistical Package for the Social Sciences, to

analyze complex statistical data for greater certainty. The research data will be analyzed using SPSS. Methodical application of statistical and logical techniques to explain, describe, condense, summarize, and evaluate the data obtained.

The rate to which test results hold true across testing sessions, test iterations, or raters evaluating test takers' replies is referred to as test score reliability. (StatisticsSolutions, 2023)

Table 4.9: Reliability Test of VisisApp

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.889	0.876	7

The Cronbach's Alpha in table above is shown 0.889 for 7 items, which is reliability test is Acceptable for internal consistency. the reliability test shows an acceptable result to approve the data collected and future evaluation.

Table 4.10: To Refer Cronbach's alpha

<b>Cronbach's alpha</b>	<b>Internal consistency</b>
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Table 4.11: Respondents feedback After Using VisiApp.

			Level of Agreement				
No.	Effectiveness Categories	Related issues to exiting method	Strongly Disagree	Disagree	Slightly Agree	Agree	Strongly Agree
			1	2	3	4	5
1	View tasks	Site Supervision App manage tasks easily to view.	1	1	N/A	10	22
2	View events	Site Supervision App easily to inform events.	1	1	N/A	12	19
3	Zoning area	Site Supervision App easily to view person in charge zoning area.	1	1	1	9	22
4	Proper Platform	Site Supervision App as an official platform	1	1	3	10	19
5	User-Friendly	Site Supervision App friendly to user use.	1	2	2	10	19
6	Multi-place can be used	Site Supervision App can be use every way.	1	2	3	5	23
7	Recommended	Site Supervision App very recommended to use	1	1	4	10	18

Statistics are used in research to show the underlying nature of data. A summary of the measurement and sample analysis is provided. When combined with clear graphical analysis, it serves as the basis for almost all data analysis studies. When using descriptive statistics in this project, here only explains what is obtained from the data.

Table 4.12: Show the Paired Sample Statistic

<b><i>Variables</i></b>	<b>Mean</b>	<b>Interpretation</b>
<i>Site Supervision App manage tasks easily to view</i>	<b>4.5</b>	<b>Very High</b>
<i>Site Supervision App easily to inform events</i>	<b>4.38</b>	<b>Very High</b>
<i>Site Supervision App easily to view person in charge zoning area</i>	<b>4.47</b>	<b>Very High</b>
<i>Site Supervision App as an official platform</i>	<b>4.32</b>	<b>Very High</b>
<i>Site Supervision App friendly to user use</i>	<b>4.29</b>	<b>Very High</b>
<i>Site Supervision App can be use everyway</i>	<b>4.38</b>	<b>Very High</b>

Table above shows that the interpretation is very high and the highest mean for manage tasks easily to view is 4.5.

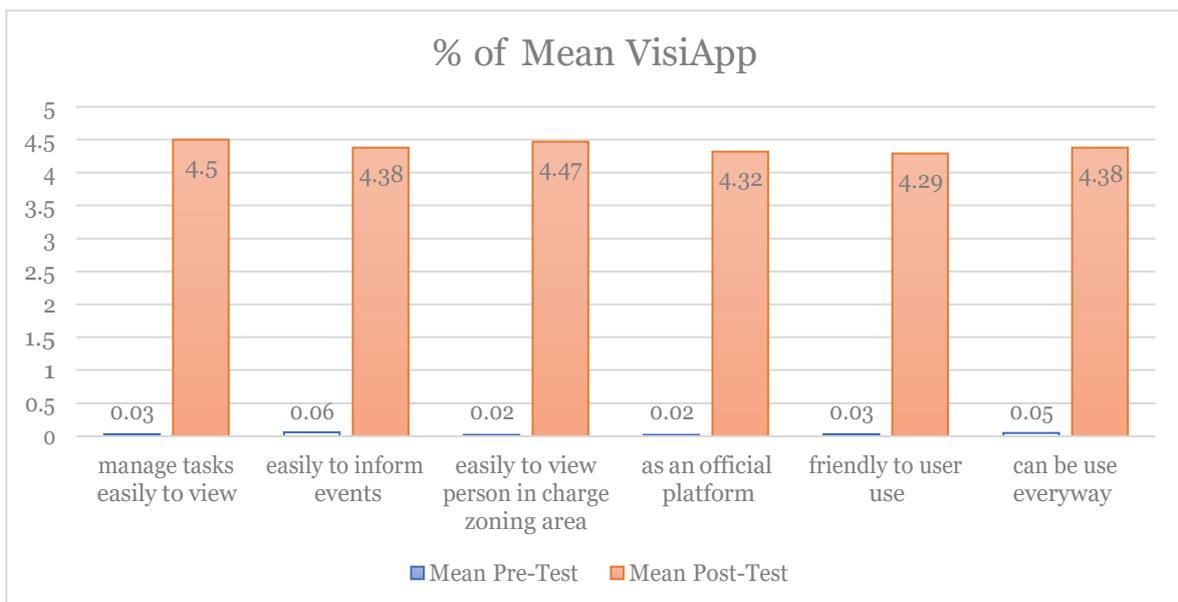


Figure 4.11: Percent of mean VisiApp.

Figure 4.11 shows the Mean percentage from the questionnaire data of the effectiveness of VisiApp on respondents when they use VisiApp. 4.5 of the mean manage tasks easily for respondents to see, 4.38 mean score respondents agree that VisiApp easily informs events, activities and can be used anywhere. With a mean score of 4.47, respondents agree that it is easy to see the person in charge (PIC) in the zoning area when using VisiApp. Means of 4.32 and 4.29 show that users agree with VisiApp as an official and user-friendly platform.

Table 4.13: Show Data Analysis in SPSS

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
easily tasks to view	34	4.50	.896
easily to inform events	34	4.38	.922
view person in charge zoning area	34	4.47	.929
as an official platform	34	4.32	.976
friendly-user	34	4.29	1.031
can use everyway	34	4.38	1.074
recommended to use	34	4.26	.994
Valid N (listwise)	34		

Table 4.13 shows the descriptive statistics Mean of the data that has been entered in SPSS, I know that the data is analyzed more accurately and well. The mean value in SPSS is no different from the mean value calculated using Excel. With the mean score listed, it can also be calculated manually according to the Sample Mean Formula, where  $\bar{x}$  is the sample average of variable  $x$ ,  $\sum xn$  is sum of  $n$  values and  $n$  is values number of respondents.

#### 4.5 CONCLUSION

In conclusion, based on the data analysis, over 70% of the respondents agreed with every questionnaire. The VisiApp was discovered to be helpful in conveniently viewing tasks and events at the workplace, which reduced misunderstandings among

Consultants, Site Supervisors, and all project-related employees. Additionally, it was easy to use in various ways. The study's findings indicated that implementing VisiApp in construction was effective and contributed to achieving the project's third objective and project's aim.

Analysis Pre-Questionnaire, the questionnaire was distributed to 14 people, they are involved in the development of project 8MD3. This survey has been distributed to collect data related towards the project progress, also this survey is conducted to identify the existing problem in the construction industry. This questionnaire is an instrument to collect information data especially about misunderstanding to help to develop Site Supervision App (VisiApp) which can overcome the industrial based problem.

And analysis questionnaire after use VisiApp, the questionnaire was distributed to 34 people, who are involved in the development of project 8md3 and who are involved in construction work. This survey has been distributed to collect data related to the project's progress, also this survey is conducted to identify the existing problem in the construction industry. This questionnaire is an instrument to collect information data, especially about the effectiveness of a Site Supervision App (VisiApp) which can overcome the industrial-based problem.

## **CHAPTER 5**

### **DISCUSSION, RECOMMENDATION AND CONCLUSION**

#### **5.1 INTRODUCTION**

This chapter explains the project's results, conclusions, and recommendations. This chapter will address how to assess the success of the research aim and how to assess the sustainability of the Site Supervision App (VisiApp) for the construction of the 8MD3 project. In this chapter, researchers should look at system improvements that will greatly improve and expand the functionality of this project. The researcher's rigorous analysis of the suggestions that will be made in relation to the finished product comes next. The purpose of this project is to develop an application that will inform users about tasks and events as well as area specifications. Workers in the construction industry receive proper instruction to use Innovation Revolution 4.0 (IR 4.0) technology through the Site Supervision App (VisiApp).

#### **5.2 DISCUSSION**

The results of the data analysis show that users agree that VisiApp is more effective than receiving information through the current method alone. The current method that has been used at the construction site is that they use WhatsApp as a communication tool and platform to inform them of any information regarding their work. More than 90% agree with this statement that the existing method is difficult for them to scroll back the assignments given and cause delays in their documentation matters.

Based on this problem, VisiApp can be an official task platform for employees and not waste their time and energy to deal with work inspectors or resident engineers. The effectiveness of the application was assessed using mean analysis. The results show that

VisiApp and existing methods when comparing the mean is 4.48. For the existing method mean is 0.02. While the mean for VisiApp is 4.50 and the standard deviation is 0.896. This means VisiApp is more effective than existing methods. This application is highly recommended for use in construction sites and project site offices.

### **5.3 ADVANTAGE**

There are several advantages when using the Site Supervision App (VisiApp) which is an official platform for employees to manage tasks better and communicate smoothly to get information on the construction site and office without any misunderstandings about overlooking tasks or any zoning changes and related activities with all the workers at the project site.

In addition, using VisiApp also helps more efficient employees because it can be seen anywhere and accessed anytime or can be called user friendly. Next, the task information in VisiApp is under custody that only the accessor can see it.

- i. VisiApp is an online Application and can be used with smartphones. The system is user-friendly where the system can access information and activities anywhere and anytime.
- ii. Only the relevant person who informs the authorized information and tasks can enter this application by using a personal username and password. And only they can delete or archive the posts they upload.
- iii. VisiApp can save users time and energy in managing documents. For now, researchers are only focusing on selected documents from the Project Department and the construction site as they relate to work inspection work on site.

### **5.4 RECOMMENDATION**

There were some recommendations for how to proceed, innovate, and improve the accuracy of VisiApp for better results in this area for future research. The suggested recommendations were as follows:

- i. Need multifunction, Users recommended that this VisiApp be multi-functional to increase the use of submissions, so that VisiApp can be multi-function.
- ii. More modes and theme of submission, users recommended for further attract

users' views and use of VisiApp.

- iii. User also said, 'It's good. But this VisiApp also can use for submitting inspections, status inspections, and comments during inspections, and everyone in the site team can open is more interesting'.
- iv. Help to manage the site more systematically,
- v. The options are not in the same space, making it the easiest option for the user.
- vi. 'Better storage and can be accessed by every phone user instead of only Android users', it also will be improvement for IOS users.

## **5.5 CONCLUSION**

In conclusion, the project's aim has been to develop an application for area specifications as well as notification of tasks and events for users. The system has been made easy to use and provides access to information at any time and from any location using only mobile devices or other tools at the office or the project site. Respondents to the analyzed questionnaire have faced difficulties in knowing the person in charge (PIC) for some zoning in a building block, especially when some of them have overlooked tasks and events given through social media (especially WhatsApp). Furthermore, it is not suitable for half of the workers due to the lack of an official information platform. The aim has clearly been completed based on the first objective, which has been to identify the problem of overlooked tasks and events at the site project 8MD3.

The second objective of the study has been to develop an Application Site Supervision App (VisiApp). Consequently, an official platform has been established once VisiApp has been developed and fully explained. As part of the final objective, an evaluation questionnaire has been sent to obtain input on the effectiveness of VisiApp after its use at the 8MD3 project site. The findings have shown that respondents have agreed that using VisiApp for construction has effectively displayed tasks and events in the 8MD3 project. Furthermore, VisiApp has successfully reduced the overlook of tasks and events for employees both at the project site and in the office. Based on user feedback, VisiApp has been recommended for use at the 8MD3 site due to its user-friendly interface for viewing tasks, events, and PIC zoning areas.

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[technology#:~:text=Gartner%20defines%20sustainable%20technology%20as,the%20enterprise%20and%20its%20customers.](https://www.gartner.com/en/articles/are-you-thinking-too-small-about-sustainable-technology#:~:text=Gartner%20defines%20sustainable%20technology%20as,the%20enterprise%20and%20its%20customers.)

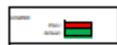
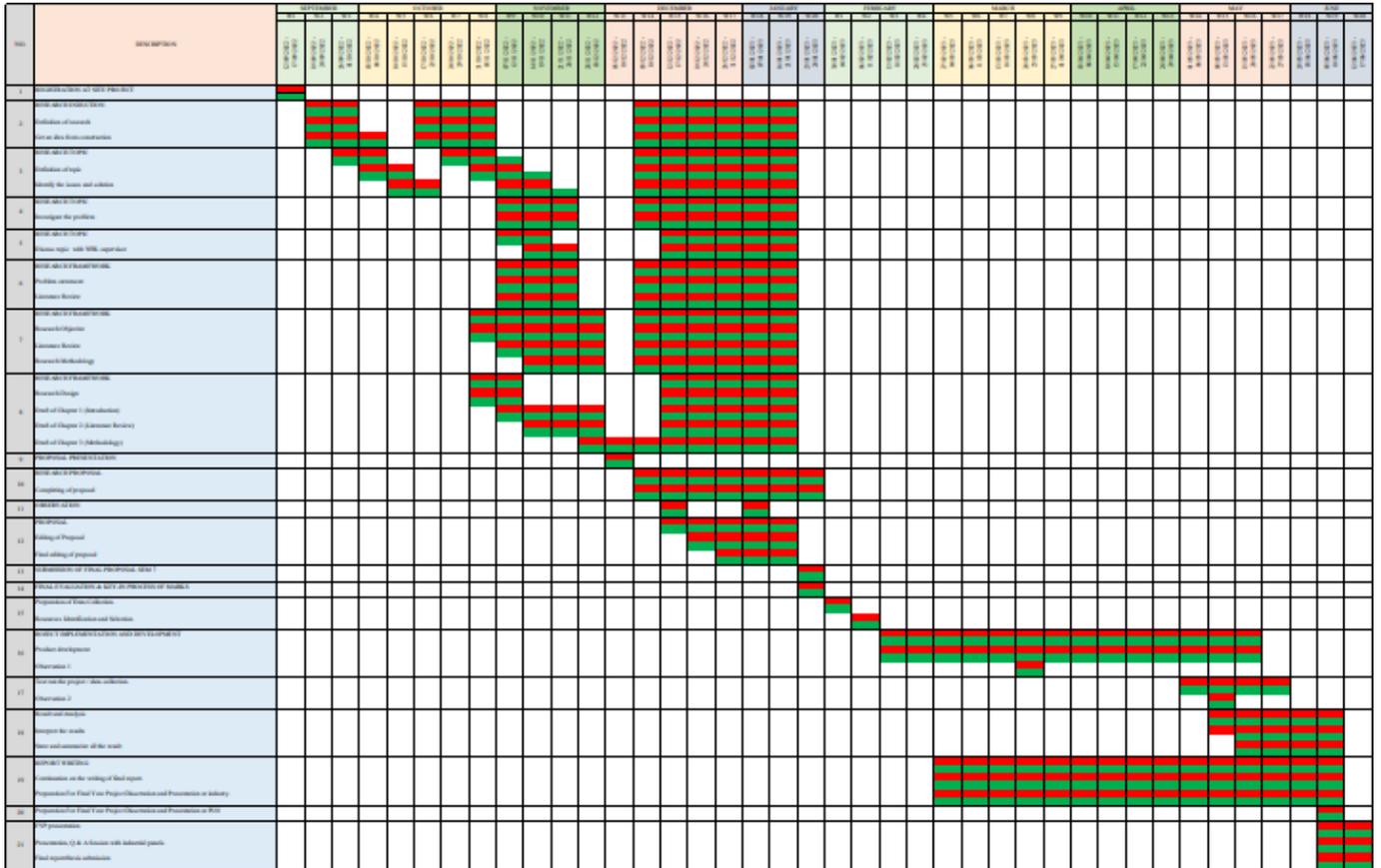
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# APPENDIX 1

## Gantt Chart



## APPENDIX 2

### Pre-Questionnaires

# JOB SCHEDULE APP

Dear respondents, I am Dalil Damia Binti Amran, a student's from Polytechnic Ungku Omar pursuing a bachelor's degree in civil engineering technology, thus sincerely welcome you to take part in a survey titled "Job Schedule Job for Block D Project BMD3, Putrajaya". This questionnaire is conducted to identify the existing problem in schedule job person in charge construction industry.

This questionnaire is an instrument to collect information data especially about overcome the industrial based problem. And also, this questionnaire is a one of way to collecting information, particularly concerning misunderstandings, in order to help develop a job schedule that can solve the industrial-based problem. Your opinion is important and is helpful for the purpose of this study. Your involvement with this study would be highly appreciated. Thank you.

\*Required

### Section A: Demographics

1. Gender \*

Mark only one oval.

- Male
- Female

2. Age \*

Mark only one oval.

- <25
- 26 - 35
- 36 - 45
- >46

2. Position in Company \*

Mark only one oval.

- Project Manager
- Project Engineer
- Site Safety Supervisor
- Mechanical Engineer
- Electrical Engineer
- Quantity Surveyor
- QAQC Engineer
- Site Supervisor
- Site Engineer
- Consultant
- Subcon
- Admin
- Other: \_\_\_\_\_

4. Work Experience \*

Mark only one oval.

- <2 years
- 3 - 5 years
- 6 - 10 years
- >10 years

**Section B : Information Regarding Construction Miscommunication**

5. Do you have a problem identifying the person on duty? \*

Mark only one oval.

- Yes
- No

- b. Does it easy to manage your work schedule using WhatsApp? \*

Mark only one oval.

Yes

No

7. Are you comfortable receiving your work tasks via WhatsApp? \*

Mark only one oval.

Yes

No

8. Do you have problems communicating with group colleague regarding work tasks? \*

Mark only one oval.

Yes

No

9. Do you always overlook your tasks through WhatsApp? \*

Mark only one oval.

Yes

No

10. Do you have an official platform to inform your tasks? \*

Mark only one oval.

Yes

No

### APPENDIX 3

#### Post-Questionnaires

#### SECTION A: DEMOGRAPHIC

Tick  one for your answer.

<b>a) Gender</b>	
<b>Male</b>	
<b>Female</b>	

<b>b) Age</b>	
<b>&lt;25</b>	
<b>26 - 35</b>	
<b>36 - 45</b>	
<b>&gt;46</b>	

<b>c) Position in Company</b>	
<b>Project Manager</b>	
<b>Project Engineer</b>	
<b>Site Safety Supervisor</b>	
<b>Mechanical Engineer</b>	
<b>Electrical Engineer</b>	
<b>Quantity Surveyor</b>	
<b>QAQC Engineer</b>	
<b>Site Supervisor</b>	
<b>Consultant / Subcon</b>	
<b>Admin</b>	
<b>Other:</b>	

<b>d) Work Experience</b>	
<b>&lt;2 years</b>	
<b>3 - 5 years</b>	
<b>6 - 10 years</b>	
<b>&gt;10 years</b>	

**SECTION B: EFFECTIVENESS USING THE SITE SUPERVISION APP**

Question 1 to question 7 for respondents, tick  one chosen to answer each question in the table below:

No	Effectiveness Categories	Issus Related to Existing Method	Scale				
			Strongly Disagree	Disagree	Slightly Agree	Agree	Strongly Agree
			1	2	3	4	5
1.	View tasks	Site Supervision App manage tasks easily to view					
2.	View events	Site Supervision App easily to inform events					
3.	Zoning area	Site Supervision App easily to view person in charge zoning area					
4.	Proper platform	Site Supervision App as an official platform					
5.	User-friendly	Site Supervision App friendly to user use					
6.	Multi-place can be used	Site Supervision App can be use everyway					
7.	Recommended	Site Supervision App very recommended to use					

**8. Recommendation/improvement for Site Supervision App**

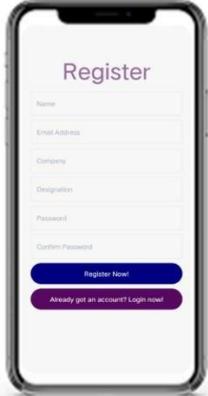
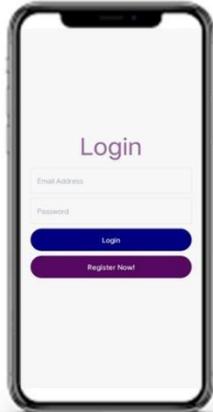
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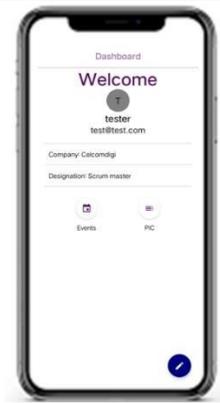


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## APPENDIX 4

### Manual User

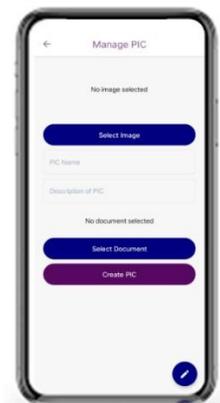
Interface	Manual
	<p>Click the Application icon to access VisiApp</p>
	<p>The first-time user can fill out the registration.</p>
	<p>Users who have registered can go directly to Log-in by entering their personal email and password.</p>



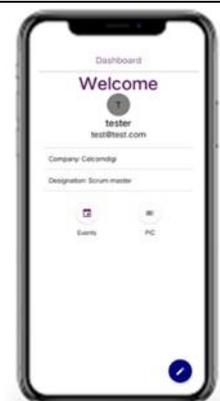
Here the main menu is displayed to the user, where the user can click the PIC icon for the user's tasks with the relevant PIC.



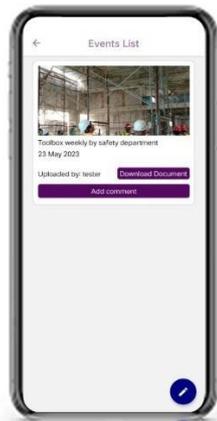
Button at the bottom, the user can add who is the PIC on duty that day according to zoning.



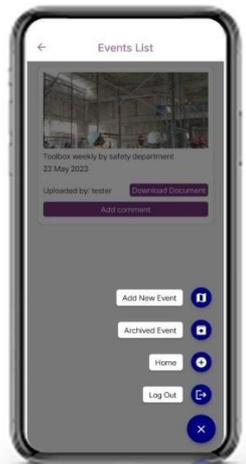
Users can enter a picture and put a description about the PIC of the day.



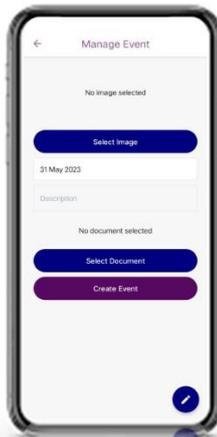
Users can click on the events icon when they want to inform about any activities that will be carried out.



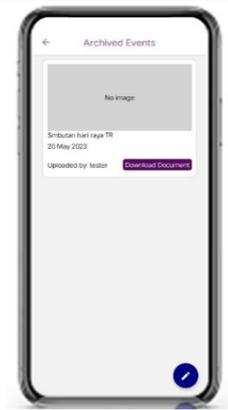
Displayed events or new activities that are ongoing or about to be implemented.



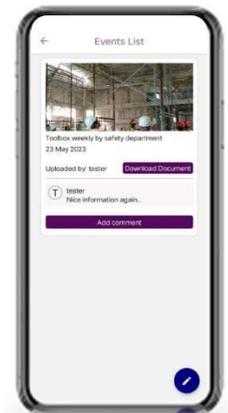
Any addition of activities or events, the user can click the icon on the bottom right.



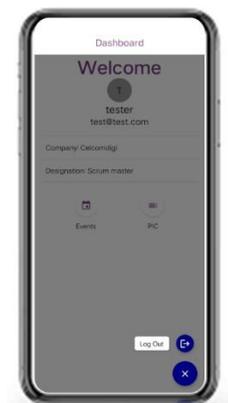
Users can upload a picture, enter a description, and set the date of the posted activity.



Users can archive every activity that has been completed.



All users involved can enter comments on the displayed events or activities.



The Log-out button is at the bottom right of the main menu.