ASSET MAINTENANCE MANAGEMENT AND MONITORING WITH MICROSOFT POWER PLATFORM

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DEDICATION

To my beloved parents, I would like to thanks to them who gave me caring and plenty of love around me. They give their fully support to me throughout the project. When I face the difficulties, they give me advices and I have the perseverance in the face of obstacles.

ABSTRACT

Nowadays, asset maintenance management and monitoring play a crucial role in optimizing business operations, improving efficiency, and ensuring the security of valuable resources. This abstract explores the integration of Microsoft Power Apps and Automate as a powerful solution for asset tracking and monitoring. Microsoft Power Apps provides a low-code development platform that enables the creation of custom applications with rich user interfaces, seamless integration with data sources, and robust functionality. Combined with Microsoft Automate, which offers powerful workflow automation capabilities, organizations can build end-to-end asset tracking and monitoring systems without extensive coding expertise. By leveraging Power Apps, users can design intuitive mobile or web-based interfaces that enable real-time tracking of assets across various locations. These apps can capture and display crucial information such as asset details, location history, maintenance records, and user assignments. With the ability to integrate with external data sources, Power Apps can pull data from existing databases, ERP systems, or IoT devices, allowing for comprehensive visibility and control over assets. Microsoft Automate complements Power Apps by automating repetitive tasks and orchestrating complex workflows. This integration enables organizations to define rules and triggers that automatically update asset status, trigger notifications for maintenance schedules, or initiate workflows for asset requests and approvals. By streamlining these processes, Automate enhances operational efficiency and reduces manual effort, ultimately saving time and resources. The combined power of Microsoft Power Apps and Automate empowers businesses to track and monitor their assets effectively, minimize loss, streamline maintenance schedules, and improve overall asset utilization. With the ability to customize applications and automate workflows, organizations can tailor the solution to their unique asset tracking needs, regardless of industry or asset type.

ABSTRAK

Pada masa kini, Penjejakan dan pemantauan aset memainkan peranan penting dalam mengoptimumkan operasi perniagaan, meningkatkan kecekapan, dan memastikan keselamatan sumber yang berharga. Abstrak ini meneroka integrasi Microsoft Power Apps dan Automate sebagai penyelesaian yang berkuasa untuk penjejakan dan pemantauan aset. Microsoft Power Apps menyediakan platform pembangunan kod rendah yang membolehkan penciptaan aplikasi tersuai dengan antara muka pengguna yang kaya, penyepaduan lancar dengan sumber data dan kefungsian yang mantap. Digabungkan dengan Microsoft Automate, yang menawarkan keupayaan automasi aliran kerja yang berkuasa, organisasi boleh membina sistem penjejakan dan pemantauan aset hujung ke hujung tanpa kepakaran pengekodan yang meluas. Dengan memanfaatkan Power Apps, pengguna boleh mereka bentuk antara muka mudah alih atau berasaskan web intuitif yang membolehkan penjejakan masa nyata aset merentas pelbagai lokasi. Apl ini boleh menangkap dan memaparkan maklumat penting seperti butiran aset, sejarah lokasi, rekod penyelenggaraan dan tugasan pengguna. Dengan keupayaan untuk menyepadukan dengan sumber data luaran, Power Apps boleh menarik data daripada pangkalan data sedia ada, sistem ERP atau peranti IoT, membolehkan keterlihatan dan kawalan menyeluruh ke atas aset. Microsoft Automate melengkapkan Power Apps dengan mengautomasikan tugasan berulang dan mengatur aliran kerja yang kompleks. Penyepaduan ini membolehkan organisasi menentukan peraturan dan pencetus yang mengemas kini status aset secara automatik, mencetuskan pemberitahuan untuk jadual penyelenggaraan atau memulakan aliran kerja untuk permintaan dan kelulusan aset. Dengan memperkemas proses ini, Automate meningkatkan kecekapan operasi dan mengurangkan usaha manual, akhirnya menjimatkan masa dan sumber. Gabungan kuasa Microsoft Power Apps dan Automate memperkasakan pemiagaan untuk menjejak dan memantau aset mereka dengan berkesan, meminimumkan kerugian, menyelaraskan jadual penyelenggaraan dan meningkatkan penggunaan aset secara keseluruhan. Dengan keupayaan untuk menyesuaikan aplikasi dan mengautomasikan aliran kerja, organisasi boleh menyesuaikan penyelesaian kepada keperluan penjejakan aset unik mereka, tanpa mengira jenis industri atau aset.

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In the Name of Allah, the Most Gracious, the Most Merciful

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CHAPTER 1

INTRODUCTION

1.1 Background

Asset maintenance management and monitoring play a crucial role in modern organizations across industries such as manufacturing, logistics, healthcare, and facilities management. Efficient management of assets, including equipment, machinery, vehicles, and inventory, is essential for optimizing operational efficiency, reducing costs, and ensuring compliance with regulations. Traditionally, asset tracking and monitoring relied on manual processes, spreadsheets, and disparate systems, resulting in data inconsistencies, limited visibility, and operational inefficiencies. However, advancements in technology, coupled with the capabilities of Microsoft Power Automate, Power BI, and Power Apps, have opened up opportunities to streamline and enhance asset management processes. Microsoft Power Automate, formerly known as Microsoft Flow, is a powerful workflow automation tool that allows users to create automated processes across multiple applications and services. With Power Automate, organizations can design workflows and automate tasks related to asset tracking and monitoring, such as triggering notifications for maintenance tasks, capturing real-time data from sensors, and integrating with external systems for data exchange. Microsoft Power BI is a business intelligence and data visualization platform that enables organizations to gain insights from their data. Power BI allows users to connect to various data sources, including asset management systems, and create interactive dashboards and reports. By leveraging Power BI, organizations can visualize asset-related data, monitor key performance indicators (KPIs), and make data-driven decisions regarding asset utilization, maintenance, and optimization. Microsoft Power Apps is a low-code development platform that enables the

creation of custom mobile and web applications. With Power Apps, organizations can develop user-friendly interfaces for asset tracking and management, providing mobile access and offline capabilities. Power Apps allows for the seamless integration of data from various sources, enabling real-time updates and remote asset monitoring. By combining the capabilities of Microsoft Power Automate, Power BI, and Power Apps, organizations can build end-to-end solutions for asset tracking and monitoring. The integration of these tools allows for the automation of workflows, real-time data capture, visualization of asset information, and mobile access, empowering organizations to make informed decisions and optimize their asset management processes. The adoption of Microsoft's Power Platform in asset tracking and monitoring brings benefits such as improved visibility, streamlined maintenance processes, enhanced analytics, and increased operational efficiency. It allows organizations to move away from manual and disjointed processes and towards a centralized, automated, and data-driven approach to asset management.

1.2 Problem statement

Asset maintenance management is a critical process for organizations that need to keep track of their physical assets such as equipment, vehicles, and inventory. However, traditional manual methods of tracking can be time-consuming, error-prone, and inefficient, leading to lost or stolen assets and increased costs. To address this challenge, organizations need an automated and real-time asset tracking and monitoring system that can provide accurate information on the location, condition, and usage of their assets. Additionally, they need a system that can integrate with their existing business systems and provide actionable insights to optimize asset utilization and reduce operational costs. Microsoft offers a platform for asset tracking and monitoring that utilizes advanced

technologies such as power apps, power BI and power automate to provide organizations with real-time visibility into their assets. However, organizations may face challenges in implementing and customizing the Microsoft platform to their specific needs and integrating it with their existing systems. Therefore, the problem statement is how to effectively implement and customize Microsoft's asset maintenance management platform to meet the specific needs of an organization and integrate it with their existing systems to achieve optimal asset utilization and reduce operational costs.

1.2 Research Objective

a) Design and develop a centralized asset management system using Power Apps to register and track assets.

b) Utilize Power Automate to automate workflows for asset monitoring, preventive, corrective and event-triggered notifications.

c) Enable mobile and personal computer access capabilities through Power Apps for maintenance of equipment internet environments.

1.3 Scope of Project

- Implement asset registration functionality to capture and store asset information such as asset type, serial numbers, location, ownership, and maintenance history.
- Build mobile-friendly interfaces using Power Apps to facilitate asset tracking and management for lab faculty technician.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter present the review of literature based on previous literature of research. This chapter present the complexity of the desired application, integration requirements, user base, and specific business needs. For strategic planning and development of adaptation to the organizations by leveraging the capabilities of power apps and power automate , FTKMP Laboratory can planned and executed correctly, and in a timely and effective manner to unlock new opportunity, drive innovations, and transform the process to meet the evolving demands of the digital era.

2.2 Power automate

Microsoft Power automate is a cloud-based service that allows users to create automated workflows across multiple applications and services. "Work less, do more." Microsoft Flow provides features that help line-of-business users to improve productivity through automation. Previously, there was no way for these apps to communicate with each other; Flow provides a way to connect with multiple services and automate tasks. Flow allows power users to create flows based on certain triggers and actions on their own, all with zero coding skills. For example, you can save your email attachments to a SharePoint document library. Flow can be accessed via web browsers (it supports

Microsoft Edge and the current versions of Chrome and Safari) and mobile apps. (Vijai Anand Ramalingam,2018)

The Flow home page shows the keys features that are available such as templates, popular services, an overview of flow, and more, see Figure 1-1

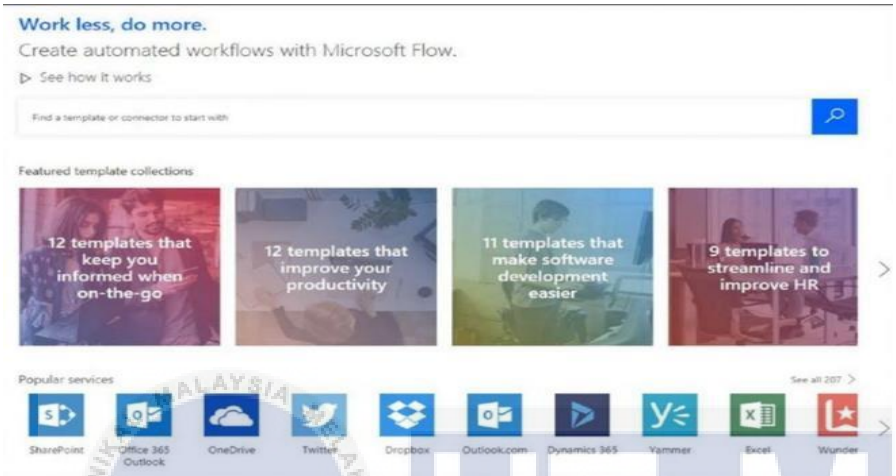


Figure 2. 1: Featured template and popular services

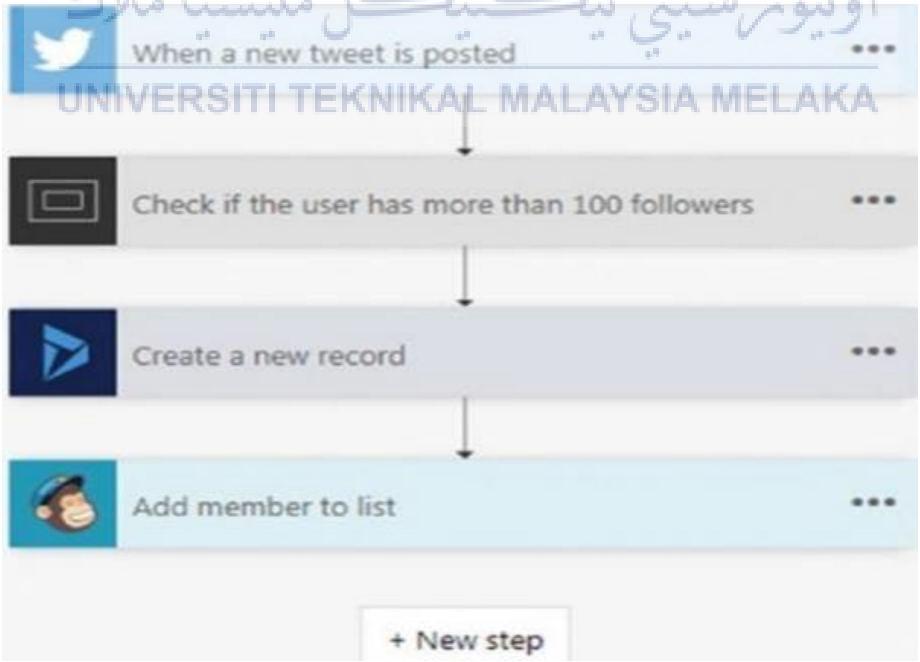


Figure 2. 2: Overview of a flow

This literature review provides an overview of the existing research and literature related to Microsoft Power Automate, exploring its features, applications, benefits, and challenges. Microsoft Automate, formerly known as Microsoft Flow, is a cloud-based service that allows users to create and automate workflows across various applications and services. It provides a low-code/no-code platform, enabling individuals and organizations to automate repetitive tasks and streamline their business processes without extensive programming knowledge. With Microsoft Automate, users can build workflows that connect different systems and services, such as Microsoft 365, SharePoint, Dynamics 365, Power Apps, and more. The platform offers a wide range of pre-built templates and connectors, allowing users to easily integrate and automate actions between different applications. By leveraging the visual workflow designer, users can create workflows by arranging predefined actions and triggers in a logical sequence. Triggers can be set up to initiate workflows based on specific events or conditions, such as receiving an email, creating a new record, or a scheduled time. Actions, on the other hand, are the specific tasks performed within the workflow, such as sending emails, updating data, generating reports, or posting to social media. Microsoft Automate also supports customization and extensibility through the use of custom connectors and expressions. Custom connectors enable integration with third-party applications or internal systems, allowing for greater flexibility and connectivity. Expressions provide advanced logic and data manipulation capabilities, empowering users to transform and manipulate data within their workflows. The platform offers various features to enhance automation capabilities, such as approvals, conditional branching, loops, parallel execution, error handling, and more. These features enable users to create sophisticated and dynamic workflows to meet their specific business needs. Microsoft Automate can be accessed through the Microsoft Power Automate platform, which offers different subscription plans, including free and

premium options, catering to different usage scenarios and requirements. Overall, Microsoft Automate provides a user-friendly and powerful solution for automating workflows and business processes, empowering individuals and organizations to increase productivity, efficiency, and collaboration by eliminating manual tasks and integrating diverse applications and services.

Figure 2. 3: Overview of a flow

2.2.1 Features and Functionality:

This section examines the features and functionality of Microsoft Power Automate. It explores the visual interface for creating workflows, the wide range of connectors available, and the triggers and actions that can be used to automate tasks. The review also discusses the integration of Power Automate with other Microsoft tools and services, such as Microsoft 365 and Power Apps.

Power automation provides a rich set of features and functionality that empower organizations to automate their processes and streamline operations. One key feature is the ability to create automated workflows. With power automation, businesses can design and configure workflows that orchestrate tasks, actions, and approvals across multiple systems and applications. This allows for seamless integration and coordination of activities, ensuring efficient and error-free execution. We can design any complex workflows with many conditions, loops, and approvals. (Sandeep Mirsha, 22 Nov 2022).

Another important functionality is the support for triggers and actions. Power automation enables users to define triggers, such as the creation of a new record or the receipt of an email, which initiate the automation process. Once triggered, a series of actions can be executed automatically, including data manipulation, sending notifications, generating reports, and interacting with external systems. This flexibility allows organizations to customize their automation workflows to meet specific requirements. (Mendes,l.,et al.2020)

Power automation also offers a wide range of connectors and integrations. These connectors enable seamless communication and data exchange between different applications and services. By leveraging connectors, organizations can integrate their existing systems, such as customer relationship management (CRM), enterprise resource planning (ERP), and human resources (HR) software, with power automation, creating a unified and connected ecosystem. This integration capability enhances data visibility, eliminates silos, and facilitates end-to-end process automation.

Additionally, power automation provides advanced logic and decision-making capabilities. Users can incorporate conditional statements, loops, and branching logic into their workflows, allowing for dynamic and intelligent automation. This means that the

automation process can adapt and respond based on specific conditions or variables, enabling more sophisticated and complex workflows.

Another noteworthy feature is the ability to handle approvals and notifications. Power automation enables organizations to automate approval processes, where requests can be routed to the appropriate stakeholders for review and authorization. Notifications can also be sent automatically to notify users about specific events or updates, ensuring timely communication and keeping everyone informed.

Furthermore, power automation offers robust monitoring and reporting capabilities. Users can track the progress and performance of their automated workflows, monitor the execution of individual tasks, and identify bottlenecks or issues. This visibility into automation processes allows for proactive management, troubleshooting, and continuous improvement.

Security and governance are also integral aspects of power automation. The platform provides features to enforce access controls, manage permissions, and ensure data privacy. It supports authentication and authorization mechanisms, integrates with existing identity management systems, and allows administrators to define granular security policies.

Overall, power automation combines a comprehensive set of features and functionality to enable organizations to automate their processes effectively. From workflow design and trigger-based actions to integration capabilities, advanced logic, approvals, monitoring, and security, power automation provides a robust and flexible platform for driving digital transformation and enhancing operational efficiency.

2.2.2 Use Cases and Applications:

Over the last 45 years, Louisiana-Pacific Corporation (LP) products have become a staple of professional and personal building projects. And LP is determined to stay at its industry's cutting edge. From the company's headquarters in Nashville, Tennessee, to its mills across the Americas, LP is using Microsoft Power Automate and Microsoft Power Apps to empower its employees and streamline and automate traditional paper-based processes. The results? Lower costs, Microsoft increased productivity, and more than USD1 million in net new pipeline opportunities (Louisiana-Pacific,2019) . " People in our mills—most with little IT experience— are using Microsoft Power Automate and Power Apps to digitize their paper processes, create alerts, and improve productivity. " (Daniel LeMay: DevOps Engineer,2019). Here, the focus is on the diverse applications of Microsoft Power Automate. The review explores how Power Automate can be used to automate repetitive tasks, streamline business processes, and improve productivity. Examples may include workflow automation for approvals, document management, data synchronization, and notifications across various systems and platforms.

Power Automate offers a wide range of use cases and applications that empower organizations to automate their processes, improve efficiency, and enhance productivity. One common application is the automation of repetitive and manual tasks. By creating workflows with Power Automate, organizations can automate mundane tasks such as data entry, file management, and email notifications. This allows employees to focus on more strategic and value-added activities, resulting in time savings and increased productivity.

Another use case is the integration of different systems and applications. Power Automate provides connectors to various services and platforms, enabling seamless communication and data exchange between them. Organizations can automate data

synchronization, trigger actions based on specific events, and create cohesive workflows that span multiple systems. This integration capability streamlines processes, eliminates silos, and ensures a more connected and efficient ecosystem.

Power Automate is also valuable in the realm of approvals and workflows. Organizations can design automated approval processes where requests are routed to the appropriate stakeholders for review and authorization. Power Automate allows for dynamic and customizable approval workflows, ensuring timely decision-making and reducing bottlenecks. Additionally, organizations can create complex workflows with conditional logic, branching, and parallel execution, enabling sophisticated process automation tailored to their specific needs.

Furthermore, Power Automate can be leveraged for data collection and management. Organizations can create forms and surveys using Power Automate, which can be distributed and filled out by employees, customers, or partners. The data collected can be automatically processed, stored, and analysed, providing valuable insights for decision-making and improving business operations.

Power Automate also offers extensive notification capabilities. Organizations can set up automated notifications for various events, such as task assignments, document approvals, or system alerts. These notifications can be delivered through multiple channels, including email, SMS, Microsoft Teams, or other collaboration platforms. Real-time notifications improve communication, ensure timely actions, and keep stakeholders informed (Lee et al.,2021)

Another key application of Power Automate is in data extraction and manipulation. Organizations can automate the extraction of data from different sources, transform it into desired formats, and load it into target systems or databases. This allows

for efficient data integration and enables organizations to harness the power of their data for reporting, analytics, and decision-making.

In summary, the applications of Power Automate are diverse and versatile. From automating repetitive tasks and integrating systems to managing approvals, data collection, and notifications, Power Automate empowers organizations to streamline their processes, enhance productivity, and drive digital transformation. The platform's flexibility, integration capabilities, and automation features make it a valuable tool for a wide range of industries and business functions.

2.2.3 Benefits and Advantages:

This section highlights the benefits and advantages of using Microsoft Power Automate. It discusses how the automation of workflows can lead to increased efficiency, reduced manual errors, improved collaboration, and time savings. The review also addresses the scalability and flexibility of Power Automate, allowing for customization and integration with existing systems.

Power automation offers numerous benefits and advantages that revolutionize the way tasks are performed and streamline operations across various industries. One significant advantage is increased productivity. By automating repetitive and mundane tasks, power automation eliminates the need for manual intervention, allowing employees to focus on more complex and value-added activities. This results in higher efficiency, faster turnaround times, and the ability to accomplish more within limited time frames (Ismail Sayyad, 22 march 2023).

Another advantage is improved accuracy and reduced errors. Power automation relies on pre-defined rules and workflows, minimizing human error and ensuring consistent and precise execution of tasks. With automated processes, organizations can significantly reduce the risk of data entry mistakes, miscalculations, and other common errors, leading to enhanced data integrity and overall quality. Manual posting of messages can be prone to errors, such as typos or posting to the wrong group or chat. With an automated flow, messages can be pre-configured and scheduled, reducing the likelihood of errors (Ismail Sayyad, 22 march 2023).

Cost savings is another compelling benefit of power automation. By automating manual processes, businesses can reduce labour costs associated with repetitive tasks, eliminate the need for additional manpower, and optimize resource allocation.

Additionally, automation minimizes the chances of costly errors and rework, saving both time and money. Overall, power automation enables organizations to operate more efficiently and achieve higher cost-effectiveness.

Power automation also enhances scalability and flexibility. Automated processes can handle larger volumes of work without compromising quality or increasing the need for additional resources. This scalability allows organizations to adapt to changing demands, easily ramp up or down their operations, and meet customer expectations more effectively. Furthermore, automation enables businesses to incorporate rule-based decision-making and respond to dynamic market conditions promptly.

Moreover, power automation contributes to improved compliance and regulatory adherence. By automating processes and ensuring consistent execution, organizations can reduce the risk of non-compliance, maintain accurate records, and generate audit trails easily. This simplifies the process of demonstrating compliance during inspections and audits, ultimately reducing legal and financial risks.

Lastly, power automation fosters innovation and enables digital transformation. By automating routine tasks, businesses can free up time and resources for more strategic initiatives. This promotes a culture of innovation, encourages employees to explore creative solutions, and drives continuous improvement across the organization. Furthermore, power automation can be integrated with other advanced technologies such as artificial intelligence, machine learning, and data analytics, creating a powerful ecosystem that drives digital transformation and unlocks new opportunities.

In summary, power automation offers a wide range of benefits and advantages, including increased productivity, improved accuracy, cost savings, scalability, compliance, and fostering innovation. By harnessing the power of automation,

organizations can optimize their operations, drive efficiency, and stay competitive in an increasingly dynamic and fast-paced business environment.

2.2.4Challenges and Limitations:

While Microsoft Automate offers numerous benefits and advantages, there are also some challenges and limitations that users may encounter. (Jas Shukla, 2020) Here are a few:

Microsoft Power Automate offers numerous benefits for streamlining processes and automating tasks. However, it is essential to be aware of the challenges and limitations associated with its usage. Firstly, Power Automate may struggle with automating complex workflows that involve intricate decision-making and branching logic. Representing such complexity accurately within the visual designer can be challenging, potentially leading to errors or limitations in achieving the desired automation. Secondly, Power Automate relies on connectors to integrate with external systems, and while there is a wide range of connectors available, limitations in functionality or compatibility with specific systems can arise. This may require custom development or alternative integration approaches. Thirdly, data security and compliance considerations are crucial when using Power Automate, as it interacts with various data sources and applications. Organizations need to ensure that sensitive data is handled appropriately and implement necessary access controls and permissions. Additionally, Power Automate operates in the cloud, making stable internet connectivity essential for reliable performance. Interruptions or unstable connections can impact automated workflows. Furthermore, Power Automate offers different licensing options, and organizations need to carefully evaluate their requirements and choose an appropriate

plan. The complexity of the licensing model and potential budget constraints can be limiting factors. Lastly, while Power Automate provides a user-friendly interface, creating advanced automations may require familiarity with the platform's features, connectors, and expressions. Users must invest time and effort in learning and understanding Power Automate's capabilities. Despite these challenges, Microsoft Power Automate remains a powerful tool that can significantly improve productivity and streamline processes. By understanding and carefully considering these limitations, organizations can make informed decisions about the suitability of Power Automate for their automation needs.

2.2.5 Adoption and Case Studies:

The literature review examines the adoption of Microsoft Power Automate in various industries and organizations. It explores case studies, success stories, and real-world examples of how Power Automate has been implemented to automate processes and improve business outcomes. The review may include insights into the adoption challenges, best practices, and lessons learned.

Microsoft Power Automate is a powerful tool that enables organizations to automate repetitive tasks, streamline workflows, and enhance productivity. Its adoption has been steadily increasing across various industries due to its versatility and ease of use.

One notable case study of Microsoft Power Automate adoption is in the healthcare sector. Many healthcare providers have implemented Power Automate to automate administrative processes such as patient onboarding, appointment scheduling, and billing. By automating these tasks, healthcare professionals can focus more on patient care, leading to improved efficiency and better patient outcomes.

Another industry that has embraced Microsoft Power Automate is finance. Financial institutions have leveraged the platform to automate manual processes such as data entry, invoice processing, and report generation. This automation has resulted in significant time savings and reduced errors, allowing finance teams to allocate their resources to more strategic activities like financial analysis and decision-making.

Additionally, manufacturing companies have benefited from the adoption of Microsoft Power Automate. They have automated various tasks in their production lines, such as inventory management, quality control checks, and order fulfilment. By integrating Power Automate with other Microsoft tools like Power BI, manufacturers can gain real-time insights into their operations, identify bottlenecks, and make data-driven decisions to optimize their processes

Beyond specific industries, Microsoft Power Automate has found widespread adoption across organizations of all sizes and sectors. Its intuitive interface and pre-built connectors to popular applications like Microsoft 365, SharePoint, and Salesforce make it accessible to both technical and non-technical users. The platform's ability to automate processes spanning multiple systems and its support for advanced capabilities like AI and machine learning further enhance its value proposition.

In conclusion, the adoption of Microsoft Power Automate has been on the rise, with organizations from healthcare, finance, manufacturing, and various other sectors leveraging its capabilities to automate repetitive tasks, streamline workflows, and improve overall productivity. With its user-friendly interface and extensive integration options, Power Automate has become an indispensable tool for organizations seeking to drive efficiency and innovation in their operations.

2.3 Power apps

Power apps is an ever-growing part of the Microsoft Office 365 ecosystem, where developers and business users alike are empowered to create apps. (Matthew Weston, 2019). PowerApps is Microsoft's service for building "apps" that can run on mobile and web platforms, especially those targeting businesses and enterprises. In PowerApps, there are 2 different types of apps that we can create – "canvas apps" and "model-driven apps". Both are managed from the PowerApps web page, and each has a different design mode that is selected from the bottom left of the screen. (Carl de Souza, 2018). Power Apps enables rapid application development through its intuitive user interface design, seamless integration with various data sources, and flexible deployment options across multiple devices (Johnson and Anderson ,2021). Furthermore, Power Apps promotes collaboration and empowers citizen developers, individuals within organizations who possess domain expertise but may not have formal programming backgrounds, to participate in the development process (Urdaneta et al., 2020)

2.3.1 Benefit of power apps.

One of the key advantages of Power Apps is its ability to streamline and automate processes, enhancing efficiency and productivity within organizations (Rautenbach et al., 2021). The implementation of Power Apps and Power Automate for the HR email workflow in the city's employee portal on SharePoint brings numerous benefits. Firstly, it offers cost and time benefits by providing a faster and more efficient way to connect applications to data sources and create simple forms, eliminating the need to build an app from scratch (Hassan et al., 2020). With Power Apps and Power Automate, even complex

workflows can be developed within a few weeks, significantly reducing development time. Additionally, the use of familiar tools and environments enhances the chances of adoption and success. Since Power Apps serves as the interface to the data residing in SharePoint lists, which employees are already familiar with, there is minimal training or ramp-up time required (Mendes et al. ,2020). This straightforward architecture simplifies the user experience and promotes a smooth transition to the new HR email workflow. Moreover, Power Apps and Power Automate offer benefits in terms of easier testing and sustainment. Testing becomes more streamlined as the focus is primarily on data connections and overall flow, reducing time spent on debugging. In terms of sustainment, non-developers within the city can manage and update the application as requirements evolve, eliminating dependency on a single individual. Finally, the integration with Office 365 provides built-in security management, leveraging existing user accounts and offering an easy audit trail without additional development efforts. Overall, the use of Power Apps and Power Automate streamlines the HR email workflow, offering cost savings, ease of use, simplified testing, enhanced sustainment capabilities, and robust security features. (Jas Shukla, 6 Jan 2020)

2.3.2 Use Cases and Application

Power Apps finds application in various domains, including business process automation, data collection, project management, and customer relationship management (Alqhtani & Yahya, 2020). Organizations leverage Power Apps to streamline workflows, automate repetitive tasks, and enhance collaboration among team members (Hassan et al., 2020). Power Apps offers various forms to capture metadata for different types of document artifacts. These forms enable the collection of essential information such as the

title, subject matter tags, reviews by date, and document type, including contracts, purchase orders, floor plans, budgets, or project plans. Similarly, Power Apps provides forms specifically designed for capturing metadata related to product catalogues. These forms include fields for the product name, price, category, description, reviews, and attributes such as colour, weight, or size. Additionally, Power Apps facilitates the review and approval of content management lifecycle changes through dedicated forms. These forms allow users to change the status of a document from draft to final or to approve or reject entries in a product catalogue. Furthermore, Power Apps can enhance existing forms or create new ones for various business applications like ERP, CRM, warehouse management systems, and content management apps. This is particularly valuable when the content management app operates in a headless manner, without native user interface forms. Finally, Power Apps Portal enables the creation of personalized websites, enabling scenarios such as partner management, customer self-service, product support, and frequently asked questions (FAQs). The Power Apps Portal is designed to provide secure and anonymous access to data stored within the Microsoft Dataverse, formerly known as the Common Data Service, for third-party users (Jonathan Bordoli 27 JUL 2021).

2.3.3 Limitations and Challenges

Research identifies certain limitations of Power Apps, such as the need for more advanced customization options and greater extensibility to meet complex business requirements (Chhibber et al., 2020). The scalability of Power Apps for larger enterprise-level applications also warrants further investigation (Alqhtani & Yahya, 2020). While Power Apps offers powerful and comprehensive functionality, organizations should be aware of its limitations. Firstly, licensing is constrained within the Microsoft 365

ecosystem, restricting Power Apps forms to the licensed business domain. However, content sharing is possible with colleagues and guest users who possess Active Directory accounts and Power Apps licenses. Power Apps Portal also allows for third-party and anonymous access. Secondly, the licensing model for Power Apps can be complicated, with multiple plans that users may find challenging to navigate. Furthermore, Microsoft 365 licensing imposes restrictions on certain connectors, limiting their availability to higher-tier plans. Cost is another consideration, with Power Apps priced at $120 per user annually for an individual app or $10 per user monthly for one app. Alternatively, organizations can opt for the unlimited app plan priced at $40 per user monthly. However, as of October 2021, Microsoft has decreased these prices to $5 and $20, respectively. When scaling up to accommodate hundreds or thousands of users requiring access to specific apps, cost considerations become crucial. Power Apps Portal is licensed differently, with a cost of $200 for 100 monthly logins and $100 for 100,000 monthly webpage views for authenticated external users. Internal Portal users have per-app or unlimited licensing options. While Power Apps offers low-code services for quick and simple form building, complex forms with intricate business logic or evolving requirements can present challenges due to limited code management and change tracking capabilities. The Power Apps integrated development environment (IDE) operates solely on the web, meaning users must design forms through a web browser, lacking the convenience of an offline or desktop application. Web-based IDEs generally lack the advanced features of their desktop counterparts. Power Apps has limited support for multiple device sizes and screen orientations, necessitating the development of multiple app versions. While responsive forms can scale to some extent, compromises are often required. For instance, an app optimized for phones and tablets would require separate versions for each device. A 2,000-item limit exists for connected data sources like

SharePoint, SQL, or Oracle within Power Apps. Throughput limits within the connector ecosystem can vary, leading to potential failures when attempting to read or write large quantities of items from sources such as SharePoint lists, SQL databases, or Excel workbooks. Each connector has its own throughput limits, which can be complex to navigate. Attachment control in Power Apps is limited to SharePoint or Dataverse, excluding platforms like OneDrive or SQL as target document stores. Additionally, the maximum upload size is restricted to 50 MB. Lastly, Power Apps does not support shared functions or shared code. Each app requires the same business logic to be built and maintained individually, leading to challenges when managing complex forms with embedded programming logic that may require frequent adjustments to meet evolving business requirements (Jonathan Bordoli ,27 JUL 2021).

2.4 How the power apps and power automated work

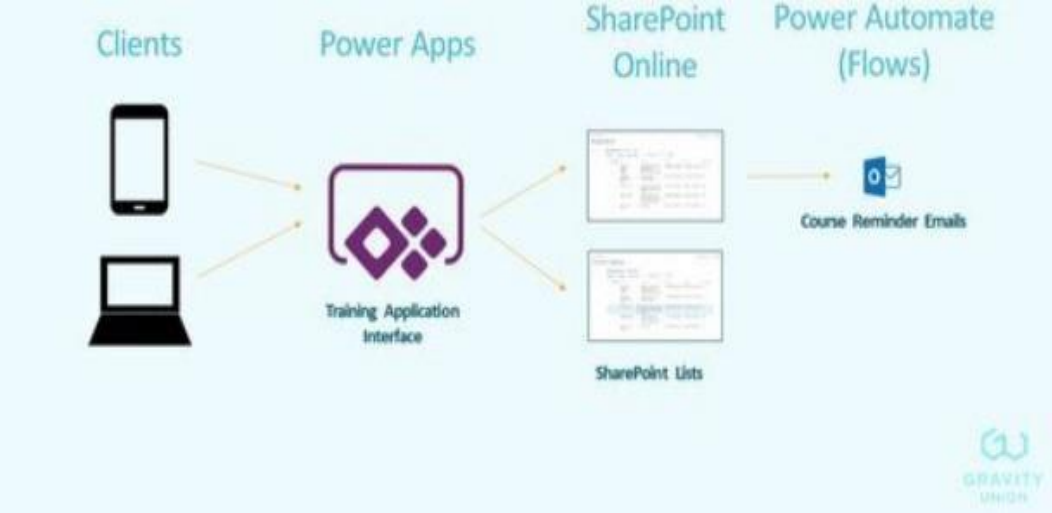


Figure 2. 4: show how power apps and power automated work

Users access the app from their mobile device or computer. This directs them to the Power App, which is the interface to the training application itself. Here's how it all works

The Power Apps component serves as the user interface for the course registration system. It allows City of White Rock employees to access and interact with various features. Users can view available courses, see the courses they have already signed up for, register for additional courses, and withdraw from courses if needed. The app is designed to be compatible with both smartphones and computers, ensuring accessibility for all employees.

To store and manage the course data and registration information, several SharePoint lists are utilized. These lists include a Courses list, which keeps a historical record of all courses offered, a Course Catalogue list that displays the currently available courses, and a registration list that stores user registrations and waitlist information.

Power Automate Flows are employed to automate and streamline processes within the app. These flows are triggered by changes or can run at regular intervals. In this case, a flow is used between the Courses list and the Course Catalogue list to synchronize course data automatically. Admins can make adjustments to course information as needed. Another flow sends reminders to registrants a few days before a course starts, ensuring participants are informed in a timely manner.

In addition to these key components, there are other features that enhance the functionality of the app. Confirmation emails are sent to employees when they successfully register or withdraw from a course. Employees can view detailed information about courses in the catalog and choose to self-register or join a waitlist. The "My Courses" section provides a personalized view for employees, displaying their registered courses and waitlisted courses. A calendar view allows them to add courses directly to their calendars.

Admins have access to specific views and list functionality within SharePoint to manage the data effectively. If a course is full and a high-priority request arises, admins can make adjustments, including removing a participant if necessary. Changes trigger email notifications to relevant parties. Admins have overall control of the system, with the ability to manipulate data at the list level, while Power Apps provides the user-facing interface for employees and their course registrations.

To provide support and address common questions, the app includes a FAQ section that offers guidance on how the app functions and addresses key concerns.

Overall, the course registration system combines Power Apps, SharePoint lists, and Power Automate Flows to deliver a user-friendly interface, efficient data management, and automated processes. It caters to the needs of City of White Rock

employees and provides a streamlined experience for course selection, registration, and administration. (Jas Shukla, 2020)

2.5 Research Findings on Data Usage in Power Apps and Power Automate

For this study, Forrester conducted four interview with power apps and automate customers. Interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEE	THE POWER SOLUTIONS
Industrial equipment servicing	North America	VP of IT and purchasing	430
Beverage distributor	US regional	Cloud services manager	1,600
Power generation	North America and Australia	Enterprise architect	2,200
Financial services	UK	Head of CRM solutions	3,500

Figure 2. 5: Show table of data four company

During the interviews, the companies highlighted several common challenges they faced, which revolved around delivering modern IT, accommodating the needs of a growing user base, and managing escalating costs. One major challenge was the increasing demand for IT support from firstline and mobile workers. As these employee segments expanded, the companies needed to provide efficient and accessible IT solutions tailored to their specific requirements.

Another significant hurdle was the prevalence of manual and paper-based processes in key business operations. The reliance on outdated methods not only consumed valuable time but also introduced errors and inefficiencies. The organizations recognized the need to digitize and automate these processes to enhance accuracy, streamline workflows, and boost overall productivity.

Additionally, the existing IT systems were found to be inadequate in meeting the organizations' current needs. However, limited budgets constrained their ability to implement substantial changes or adopt new solutions. Consequently, the companies sought cost-effective alternatives to modernize their IT infrastructure and effectively address evolving business demands.

The interviews revealed key results stemming from the investment in Power Apps and Power Automate. Firstly, the adoption of these platforms facilitated the streamlining of processes and enabled transformative changes within the organizations. Leveraging the capabilities of Power Apps and Power Automate, the companies automated manual tasks, eliminated paper-based processes, and optimized workflows, leading to improved operational efficiency and business outcomes.

Furthermore, developing solutions using Power Apps and Power Automate proved to be a financially advantageous approach. The low-code nature of these platforms enabled the companies to create applications and automation workflows swiftly and at a fraction of the cost compared to traditional development methods. This resulted in significant cost savings and a higher return on investment for the organizations.

Moreover, the investment in Power Apps and Power Automate enhanced the responsiveness of IT organizations to business needs. With the ability to rapidly develop and deploy solutions, IT teams became more adept at addressing the evolving requirements of various departments and stakeholders. This increased responsiveness fostered innovation, promoted collaboration, and established a more agile and adaptable business environment.

In conclusion, the interviews demonstrated that the utilization of Power Apps and Power Automate addressed key challenges related to modern IT delivery, user support,

and cost management. The outcomes encompassed streamlined processes, cost savings, and heightened IT responsiveness, enabling business transformation and setting the stage for sustained growth. (Jonathan Lipsitz, October 2019)

Analysis Of Benefits

QUANTIFIED BENEFIT DATA AS APPLIED TO THE COMPOSITE

Total Benefits

REF.	BENEFIT	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Reduced IT effort	$90,000	$738,000	$1,602,000	$1,890,000	$4,320,000	$3,504,861
Btr	Retired third-party applications	$0	$22,500	$45,000	$45,000	$112,500	$91,454
Ctr	Streamlined business processes	$0	$362,578	$1,885,406	$4,568,484	$6,816,469	$5,320,173
	Total benefits (risk-adjusted)	$90,000	$1,123,078	$3,532,406	$6,503,484	$11,248,969	$8,916,488

Figure 2. 6: Table above show total benefit (The total economic impact of Power Apps and power automate. (n.d.).https://saglobal.com/downloads/brochures/Brochure_The-Total-Economic-Impact-of-Power-Apps-and-Power-Automate.pdf)

Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Dtr	Development costs	$84,000	$420,000	$714,000	$630,000	$1,848,000	$1,529,229
Etr	Corporate IT solution and code management	$12,600	$77,805	$140,805	$266,805	$498,015	$400,154
	Total costs (risk-adjusted)	$96,600	$497,805	$854,805	$896,805	$2,346,015	$1,929,383

Figure 2. 7: Table above shows the total of all costs

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	($96,600)	($497,805)	($854,805)	($896,805)	($2,346,015)	($1,929,383)
Total benefits	$90,000	$1,123,078	$3,532,406	$6,503,484	$11,248,969	$8,916,488
Net benefits	($6,600)	$625,273	$2,677,601	$5,606,679	$8,902,954	$6,987,105
ROI						362%
Payback period						< 3 months

Figure 2. 8: Table above shows cash flow

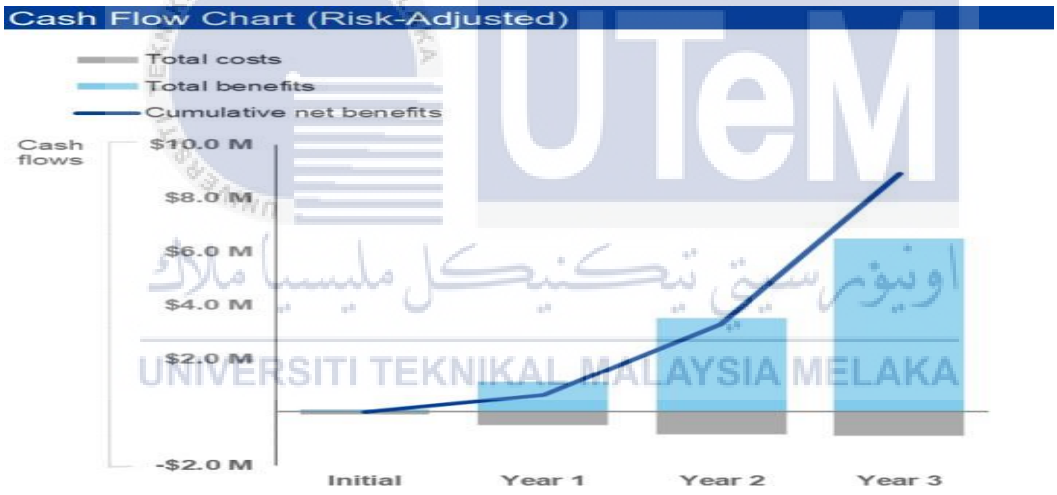


Figure 2. 9: **Figure above show** cash flow chart

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, the overall methods which are used to achieve the objective of the project were shown. The main objective of the project Design and develop a centralized asset management system using Power Apps to register and track assets. The methodology for leveraging Power Apps and Power Automate starts with defining the project scope and identifying the business processes that can benefit from these tools. Furthermore, design and prototype the application or workflow, determining the user interface, data sources, and actions required. Then develop the app or automation flow using the visual designers provided by Power Apps and Power Automate. Testing and validation are crucial steps to ensure the application or workflow meets the requirements and delivers the expected results.

3.2 Planning of study

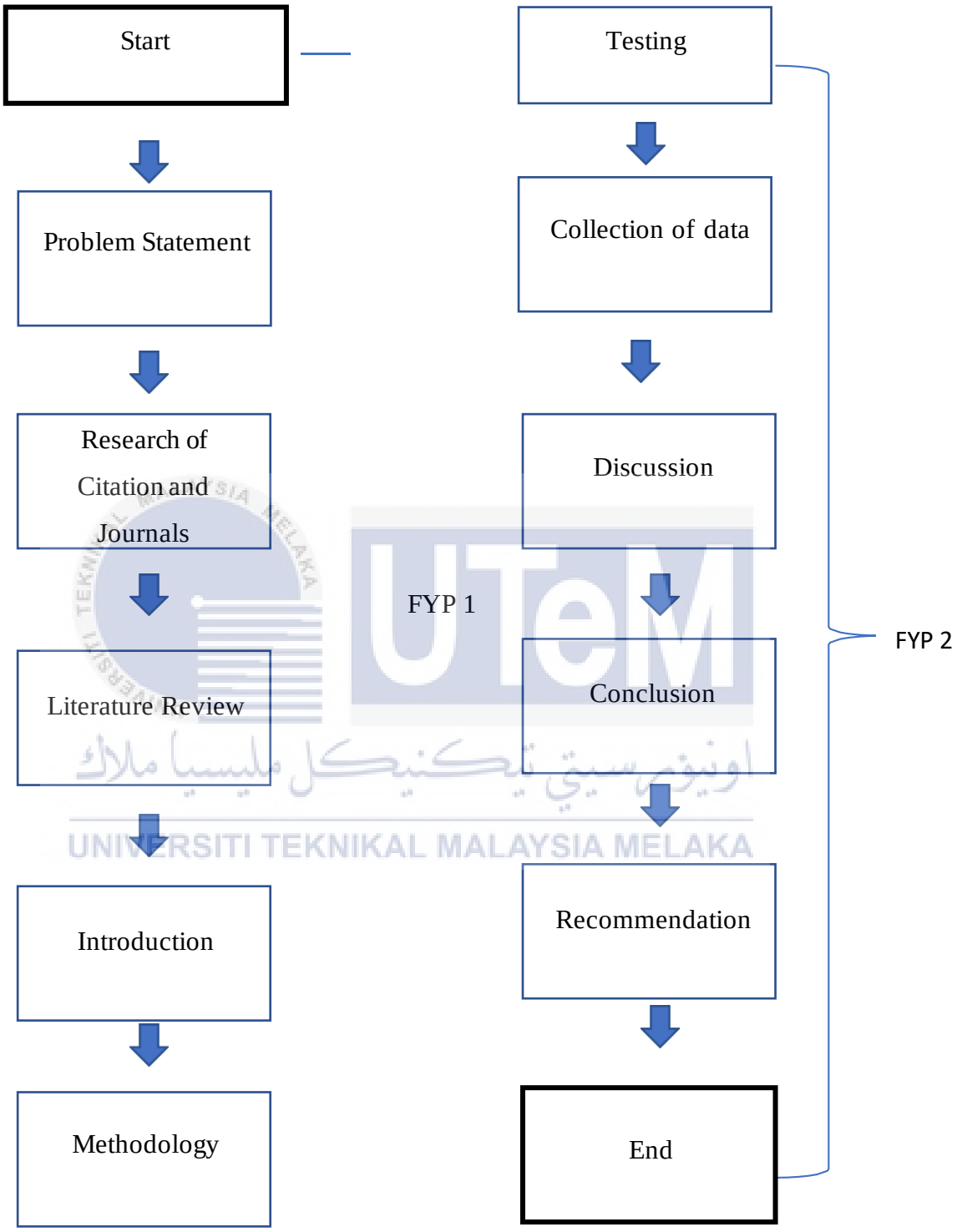


Figure 3. 1: Flow chart of planning of study for final year project stage 1 and stage 2

3.3 Apps development flow chart of power automate and power apps

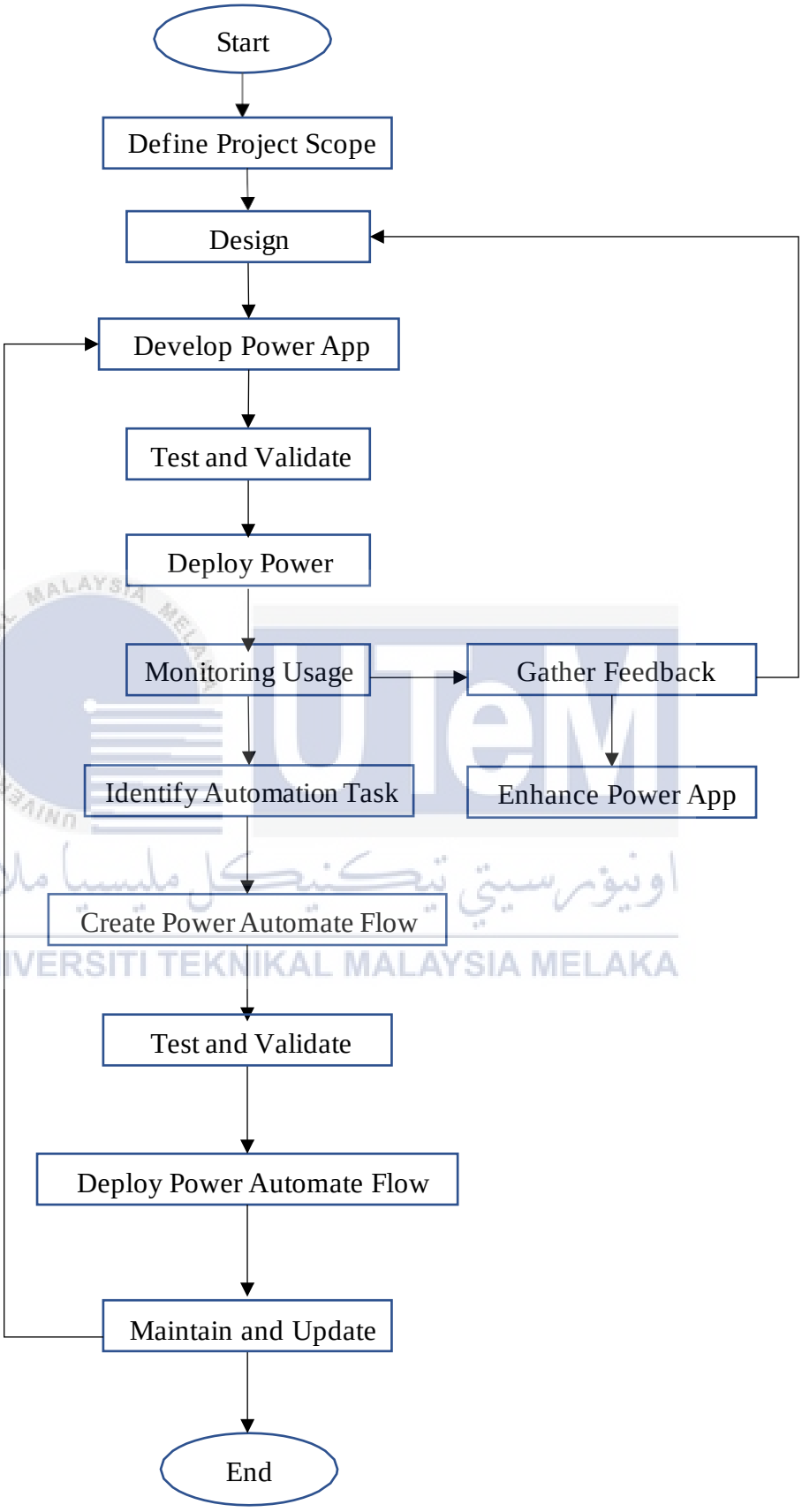
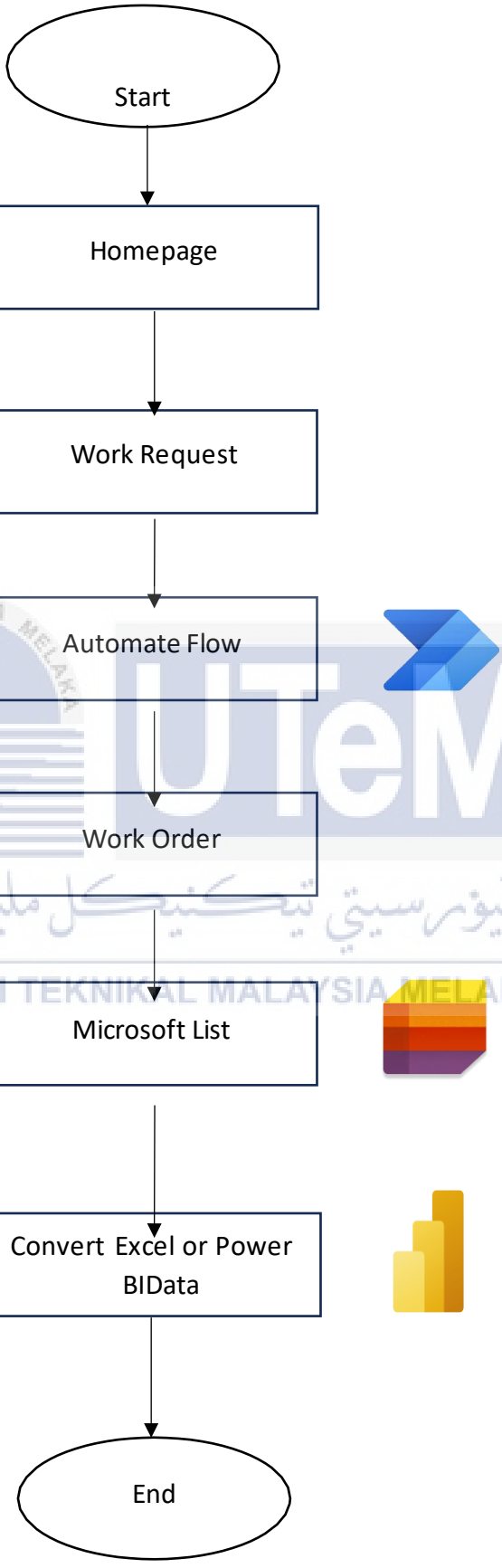


Figure 3. 2: Apps development flow chart of power automate and power apps

3.4 Design application and develop power app

Designing a tracking and monitoring facility using Power Apps involves several key steps. First, identify the specific requirements and objectives of your facility tracking and monitoring system. Understand the key data points need to track, the devices or sensors involved, and the desired functionalities. Next, create a new app in Power Apps or select a suitable template related to tracking or monitoring. This provides a starting point and pre-built components that can be customized to suit your needs. Design the user interface by adding screens and components that will display the relevant data. For example, can include screens to view real-time data, historical trends, and analytics. Use the drag-and-drop interface to add components such as charts, graphs, maps, and data tables. Connect the app to the data sources or devices that provide the tracking and monitoring data. Power Apps supports integration with various sources, such as IoT devices, databases, or APIs. Establish the connection and configure the necessary settings to retrieve the data. Implement logic and functionality to handle data processing and visualization. Use formulas and functions to calculate metrics, apply filters, and generate insights. For instance, can create formulas to calculate average values, set thresholds for alerts, or perform conditional formatting based on certain criteria. Consider incorporating real-time updates and notifications to keep users informed. Power Apps allows to set up triggers or timers to fetch and display the latest data automatically. You can also configure alerts or notifications to be sent when specific conditions or thresholds are met. Ensure that tracking and monitoring facility app incorporates appropriate security measures. Implement authentication and authorization mechanisms to control access to sensitive data and features. Power Apps provides security features to manage user roles and permissions.

3.5 Power apps framework design



3.5.1 Home page

The homepage serves as the central interface for users, featuring three key sections: Work Order, Work Request, and FAQ. In the Work Order segment, only administrators have access due to a synchronized email system established by the admin. This restricted access ensures a controlled environment for managing and processing work orders, maintaining security and efficiency. On the other hand, the Work Request section is accessible to all users, providing a straightforward channel for reporting damage on facilities or equipment. It serves as a user-friendly platform for initiating maintenance or repair requests. Additionally, the FAQ section functions as a knowledge-sharing platform, allowing users to pose questions and find answers related to varioustopics, such as workflow processes or reporting guidelines. Overall, the homepage aims to streamline user interactions, prioritizing secure administrative functions while facilitating open communication and information retrieval for all users.

3.5.2 Work Request

The Work Request page is designed to enable anyone to report damage on facilities or equipment with a comprehensive set of fields and features. Users can access this page to provide essential information, enhancing the clarity and efficiency of the reporting process.

1. Location of Equipment: Users are prompted to specify the exact location of the damaged equipment. This information ensures that maintenance teams can swiftly locate and address the reported issue.

2. Date of Reporting: The date of reporting is automatically recorded, offering a timestamp for when the damage was reported. This timestamp can be crucial for tracking the timeline of reported issues.
3. Asset Number of Equipment: Users input the asset number of the equipment affected. This unique identifier helps streamline the identification and tracking of specific assets within the facility.
4. Requested From (Reporting by Email): The reporting user is linked to their university email address, specifically from Universiti Teknikal Malaysia Melaka. This linkage ensures accountability and facilitates communication with the reporter.
5. Problem Description: Users provide a detailed description of the damage on the equipment. This description is essential for maintenance teams to understand the nature and extent of the issue.
6. Work Priority: Reporters can select the priority level of the reported problem. Options include Urgent, Normal, Emergency, Routine, and Safety, allowing for a classification that aligns with the severity and urgency of the reported damage.
7. Work Type: Reporters can specify the type of work needed, choosing from options like Breakdown, Predictive, Corrective, and Inspection. This categorization aids in organizing and prioritizing different types of maintenance tasks.
8. Damage Image: Users have the capability to take pictures of the damaged equipment and upload them directly on the platform. Visual documentation through images enhances the understanding of the reported issue and aids in more accurate assessment and resolution.

3.5.3 Automate Flow

The automated workflow is designed to streamline the process of reporting equipment damage through the Work Request page. When a user submits the reporting form on the Work Request page, a series of automated actions are triggered to enhance efficiency and communication. Here's a detailed breakdown:

1. User Submission: When a user completes and submits the reporting form on the Work Request page, providing details such as location, date, asset number, description, priority, work type, and any attached images of the damage, the system registers this submission.
2. Automated Email Trigger: Upon form submission, an automated email is triggered by the system to notify the designated technician. The technician is identified based on the selection made by the user in the "Assign To" section of the Work Request page.
3. Technician Assignment: In the Work Request form, the user specifies or selects a technician in the "Assign To" section. This information is crucial as it determines which technician will receive the automated email notification.
4. Email Content: The automated email sent to the designated technician includes a summary of the work request submitted by the user. This summary encompasses key details such as the equipment's location, asset number, description of the damage, priority level, work type, and any attached images.
5. Prompt Response: The technician, upon receiving the automated email, is promptly informed of the reported issue and the details needed to address the problem. This timely notification enhances response times and ensures that the designated technician can initiate the necessary actions efficiently.

3.5.4 Work Order

The Work Order page is a restricted access area accessible only to administrators, providing a comprehensive platform for the management and resolution of reported equipment damage. This section encompasses various critical elements to ensure a systematic and efficient workflow:

1. Access Restriction: Only administrators have the authority to access and open the Work Order page. This restriction ensures that sensitive information and critical actions are limited to authorized personnel.
2. Auto-fill from Work Request: The Work Order page is designed to automatically populate certain fields based on the information provided in the corresponding Work Request. This automation minimizes redundant data entry and maintains consistency across the reporting and repair processes.
3. Assignment to Technician: Administrators are required to select and assign a technician to address the reported issue. This information is crucial for directing the repair task to the appropriate personnel.
4. Start Date and End Date: The Work Order includes fields for specifying the start and end dates for repairing the equipment. These dates establish a timeframe for completing the repair task, aiding in scheduling and tracking progress.
5. Fixed Approval: Administrators are responsible for choosing the person in charge of inspecting the repaired equipment. This approval step ensures that a designated authority confirms the completion and quality of the repair work.
6. Inspection Comment: Upon inspection, the designated person provides comments regarding the repair work. This feedback is essential for documenting the evaluation and ensuring that any necessary adjustments are made.

7. Cost Fix: The Cost Fix field captures the financial aspect of the repair process, indicating the total cost incurred for fixing the equipment. This information is vital for budgeting and financial tracking.
8. Damage and Fixed Image Upload: The Work Order page allows for the upload of images depicting the damage (submitted by the reporter) and images showing the completed repair work (uploaded by the administrator or technician). Visual documentation enhances communication and understanding throughout the repair process.
9. Attachment Section: An optional attachment section is provided for uploading any additional files or documents related to the repair. This flexibility accommodates the inclusion of supplementary information provided by the technician.

3.5.5 Microsoft List

1. Data Tracking and Organization: Microsoft Lists serve as a centralized repository for storing and managing data. It allows users to create lists that are tailored to specific needs, such as tracking issues, managing tasks, or organizing information.
2. Integration with Power Apps: Microsoft Lists seamlessly integrates with Power Apps, which is a platform for building custom applications. Power Apps allows users to create customized solutions, including forms and apps for data entry.
3. Power Apps Data Submission to Lists: When users interact with a Power App and submit data (for example, reporting equipment damage or submitting a work request), the data can be sent to a Microsoft List for storage and further processing.
4. Structured Data with Columns: In Microsoft Lists, data is organized in columns, similar to a spreadsheet. Each column represents a specific attribute or field of the

data. For example, columns could include "Location," "Date," "Asset Number," and other relevant information.

5. Customizable Views: Microsoft Lists offer customizable views, allowing users to display the data in a way that suits their needs. Views can be filtered, sorted, and formatted to present information in a meaningful way.
6. Collaboration and Sharing: Lists support collaboration, enabling multiple users to access and contribute to the data. This collaborative environment is particularly beneficial for teams working on shared projects or tasks.
7. Mobile Accessibility: Microsoft Lists are accessible from various devices, including mobile devices. This ensures that users can view and update information even when they are on the go.
8. Notifications and Alerts: Lists can be configured to send notifications and alerts based on specific conditions or changes in the data. This feature helps users stay informed about updates and changes relevant to their responsibilities.
9. Data Insights and Analysis: Microsoft Lists can be connected to other Microsoft 365 apps, such as Power BI, for advanced data analysis and visualization. This integration allows users to derive insights from the stored data.

3.5.6 Convert Excel or Power BI Data

Export to Excel: Microsoft Lists provides a straightforward option to export data directly to Excel. This feature is beneficial when you need to perform additional analysis or share the data with others who prefer working in Excel.

Steps:

1. Open the desired Microsoft List.
2. Click on the "Export to Excel" option.
3. The data will be exported as an Excel file, preserving the structure of columns and rows.

Power BI Integration: Microsoft Lists can be integrated with Power BI, a powerful business analytics tool. This integration enables you to create dynamic reports and dashboards based on the data stored in your lists.

Steps:

1. Open Power BI Desktop.
2. Connect to the Microsoft List as a data source.
3. Define relationships, create visualizations, and build reports based on the list data.
4. Publish the Power BI report to the Power BI service for sharing and collaboration.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

In this chapter, the outcomes of developing asset maintenance management with Microsoft Power Platform were covered in this chapter. The outcomes of creating an application with Power BI, Power Automate, and Power Apps were displayed. This chapter will also describe how the applications function, as well as demonstrate how Power BI displays real-time monitoring data and how Power Automate functions in Power Apps.

4.2 Result Develop Application Using Power Apps

4.2.1 Home Page Layout

Figure 4. 1: Show a layout of home page

The application's homepage features three key buttons, each leading to distinct sections of the platform. The first button, labeled "Work Process," is your gateway to the report page. This section is tailored for submitting, viewing, and analyzing reports with an intuitive design to facilitate a seamless reporting process.

The second button, "Work Order," provides a quick transition to the update report page. Here, users can effortlessly modify existing reports, add new details, and track changes in a streamlined manner. Maintain control over the data and keep reports current with just a few clicks.

Last but not least, the "FAQs" button directs you to a comprehensive document answering frequently asked questions. Whether you're a new user seeking guidance on application features or an experienced user looking for advanced tips, the FAQ section offers valuable insights to enhance your understanding of the application.

4.2.2 Work Request Page Layout

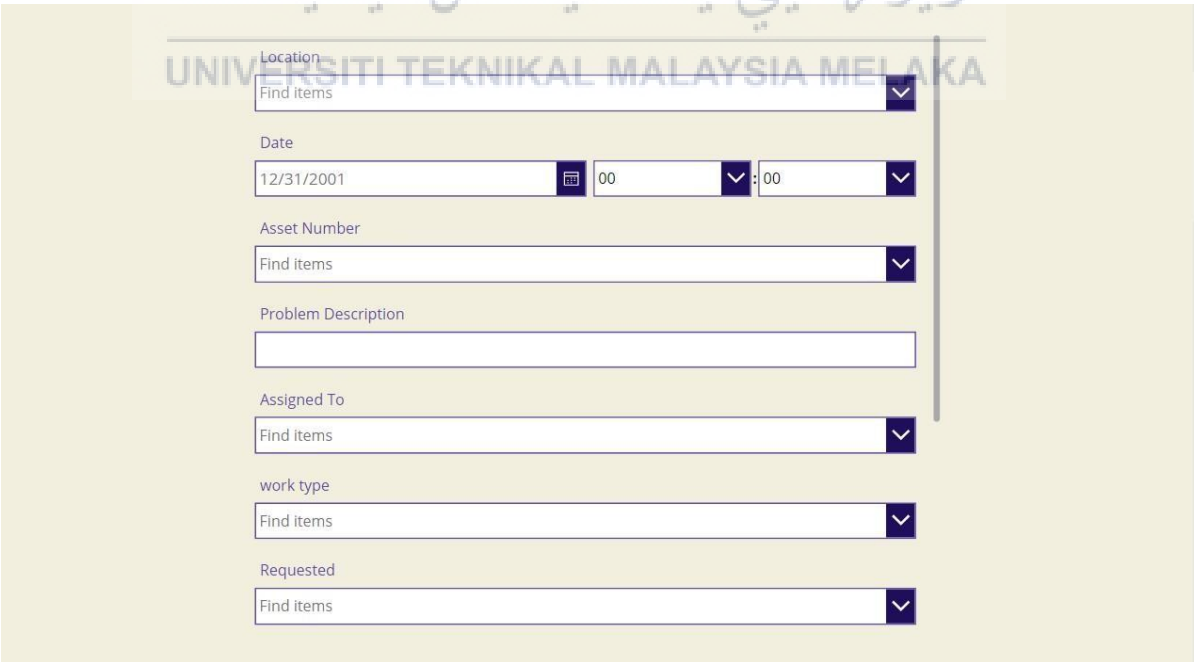


Figure 4. 2: Show a layout of work process page

Upon selecting the "Work Process" button, users are seamlessly directed to a purpose-built report page designed to facilitate the efficient reporting of facilities in need of repair. This user-centric interface is thoughtfully organized, guiding users through a seamless experience. The page encompasses a range of essential fields, including location, date, asset number, problem description, assigned to, work type, key-in email, and damage image upload.

Users can accurately specify the location of the facility, input the date of the issue occurrence, and streamline identification by entering the asset number associated with the facility. The problem description field allows users to provide a comprehensive overview of the issue, whether it's a malfunction, damage, or other concerns. The "Assigned To" feature enables users to designate or select the individual or team responsible for addressing the reported issue, facilitating the swift routing of requests to the appropriate personnel for prompt resolution. Users can also categorize the nature of the required work using the "Work Type" field, whether it involves routine maintenance, urgent repairs, or other types of service, aiding in prioritizing and efficiently managing maintenance tasks. The "Requested" field allows users to input their email address, providing a point of contact for communication regarding the reported issue. This enhances the communication flow between users and the maintenance team, ensuring updates and resolutions are efficiently conveyed.

To provide additional context, an image upload feature allows users to attach photos documenting the damage or issue, aiding the maintenance team in assessing the severity and planning the necessary repairs. This comprehensive approach to the reporting process, coupled with the updated "Requested" field, emphasizes a collaborative and efficient method for users to communicate and manage facility repair requests seamlessly.

4.2.3 Data Report Page Layout

Figure 4. 3: Show a layout of data report page

This page is collect and to edit the data that has been report by user . in this page only admin has access to this page due to synchronized email admin. Before to go Work Order page admin need to choose data from this page to edit and assigned email to the technician for solving the problem . The Data Management and Editing page plays a pivotal role in the efficient handling of reported issues by users. This exclusive section, accessible only to administrators with synchronized email credentials, serves as a centralized hub for collecting and editing the data associated with facility repair reports. Before proceeding to the Work Order page, administrators utilize this interface to select

and modify the relevant information, ensuring precision in assigning tasks to technicians for problem resolution.

Upon gaining access to the Data Management and Editing page, administrators are presented with a comprehensive repository of reported issues, systematically organized for ease of navigation. Each entry contains vital details, including the location, date, asset number, problem description, and the email of the user who initiated the report. This detailed dataset empowers administrators to make informed decisions and efficiently allocate resources for timely resolutions.

Administrators can selectively choose data from this repository, cherry-picking the reports that require attention or modification. The synchronized email system enhances security, guaranteeing that only authorized administrators can access and edit the data, thereby maintaining the integrity of the information. The editing capabilities extend beyond mere content adjustments. Admins can assign or update the email of the technician responsible for addressing a specific facility issue. This dynamic feature streamlines the workflow, ensuring that each repair request is routed to the most suitable technician based on their expertise and workload.

Moreover, the Data Management and Editing page acts as a strategic bridge to the Work Order page. Administrators meticulously choose and modify data before transitioning to the Work Order page, where the actual tasks and assignments are generated. This meticulous process guarantees accuracy and precision in the delegation of responsibilities. As administrators progress through the Data Management and Editing page, they can also input additional instructions, notes, or updates related to the reported issues. This ensures a seamless flow of information between administrators and technicians, fostering effective collaboration.

In essence, the Data Management and Editing page is more than just a prelude to the Work Order page; it's a critical administrative tool. It empowers administrators to oversee, modify, and optimize the entire facility repair process, ensuring that each reported issue is addressed promptly and efficiently. Through synchronized email access, the system upholds security and accountability, creating a robust framework for managing user-reported facility concerns

4.2.4 Work Order Page Layout

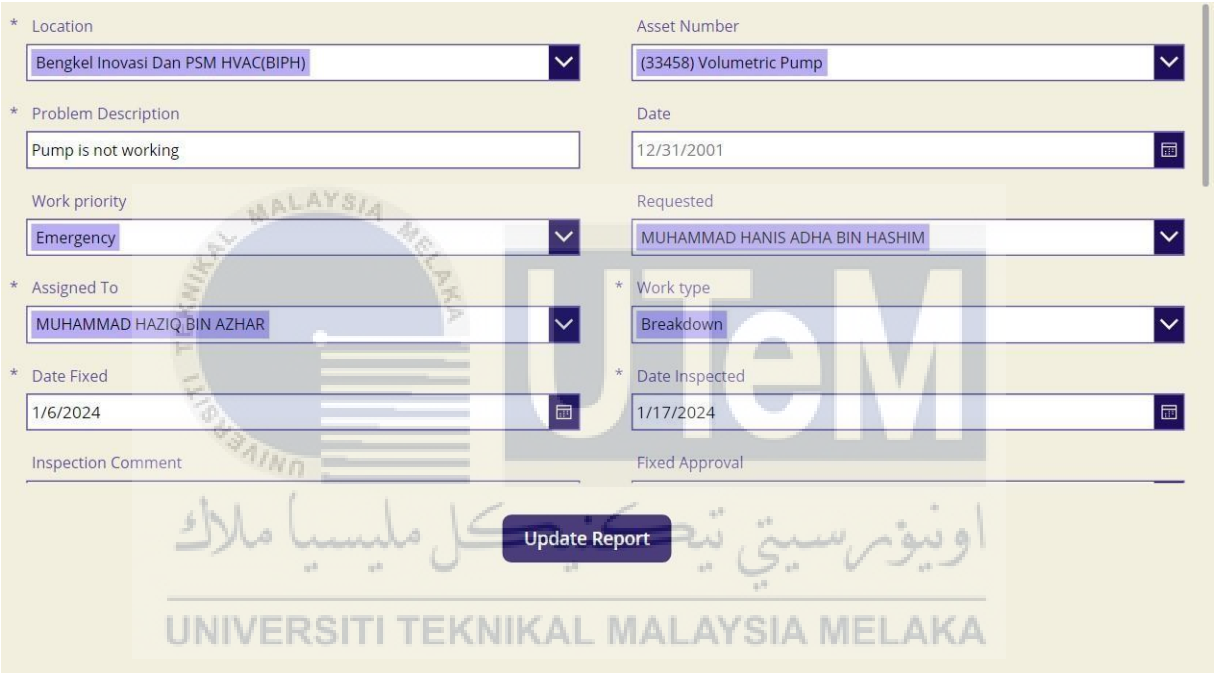


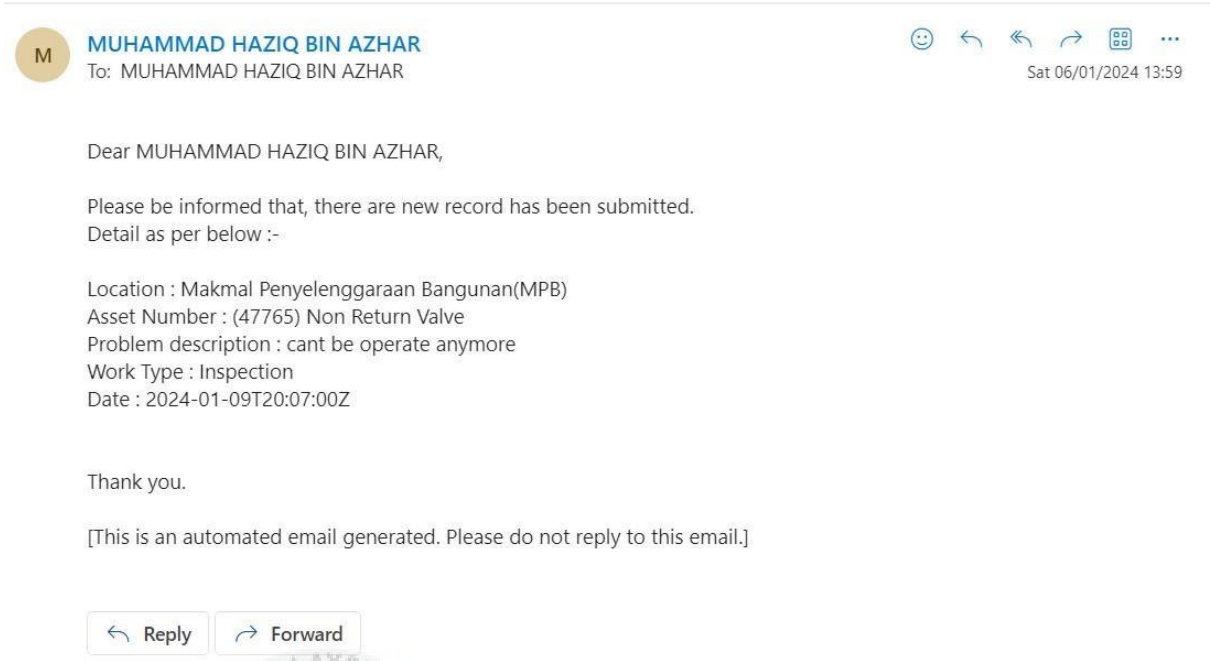
Figure 4. 4: Show a layout of work order page

Upon accessing the Work Order page, administrators are presented with a comprehensive overview of all submitted reports, each meticulously logged and associated with assigned email addresses. The synchronized email system guarantees that only authorized personnel can make edits, reinforcing data integrity and security.Admins have the capability to not only edit the content of reports but also reassign or update the technician assigned to address a particular facility issue. This dynamic feature enables

administrators to optimize the allocation of resources, ensuring that each repair request is efficiently handled by the most suitable technician.

Furthermore, the Update Report page acts as a real-time progress tracker. Admins can input updates on the work completed by technicians, providing a transparent and up-to-date status for each reported issue. This functionality ensures that stakeholders, including staff and students who initiated the reports, stay informed about the progress of the repairs. To streamline communication, the synchronized email system serves as a bridge for notifications. Admins can effortlessly communicate with technicians, providing additional instructions, clarifications, or acknowledgments directly through the synchronized email platform. The Update Report page is not merely an editing interface; it's a robust administrative tool that empowers administrators to oversee, manage, and optimize the entire facility repair process. By leveraging synchronized email access, the system ensures accountability, security, and seamless communication between all parties involved.

4.3 Result Automation Email From “Assing To” and “Requestor”



M

MUHAMMAD HAZIQ BIN AZHAR
To: MUHAMMAD HAZIQ BIN AZHAR

Sat 06/01/2024 13:59

Dear MUHAMMAD HAZIQ BIN AZHAR,

Please be informed that, there are new record has been submitted.
Detail as per below :-

Location : Makmal Penyelenggaraan Bangunan(MPB)
Asset Number : (47765) Non Return Valve
Problem description : cant be operate anymore
Work Type : Inspection
Date : 2024-01-09T20:07:00Z

Thank you.

[This is an automated email generated. Please do not reply to this email.]

Reply Forward

Figure 4. 5: Show of a auto generate email as "Assign To".

M

MUHAMMAD HAZIQ BIN AZHAR
To: TS. AZRIN BIN AHMAD

Dear TS. AZRIN BIN AHMAD,

Please be informed that, there are new record has been submitted.
Detail as per below :-

Venue : MATH
Asset Number : (65744) Shut Off Valve
Damage Observe : Valve is broken
Work Type : Breakdown
Date :

Thank you.

[This is an automated email generated. Please do not reply to this email.]

Figure 4. 6: Show a auto generate email as "requestor".

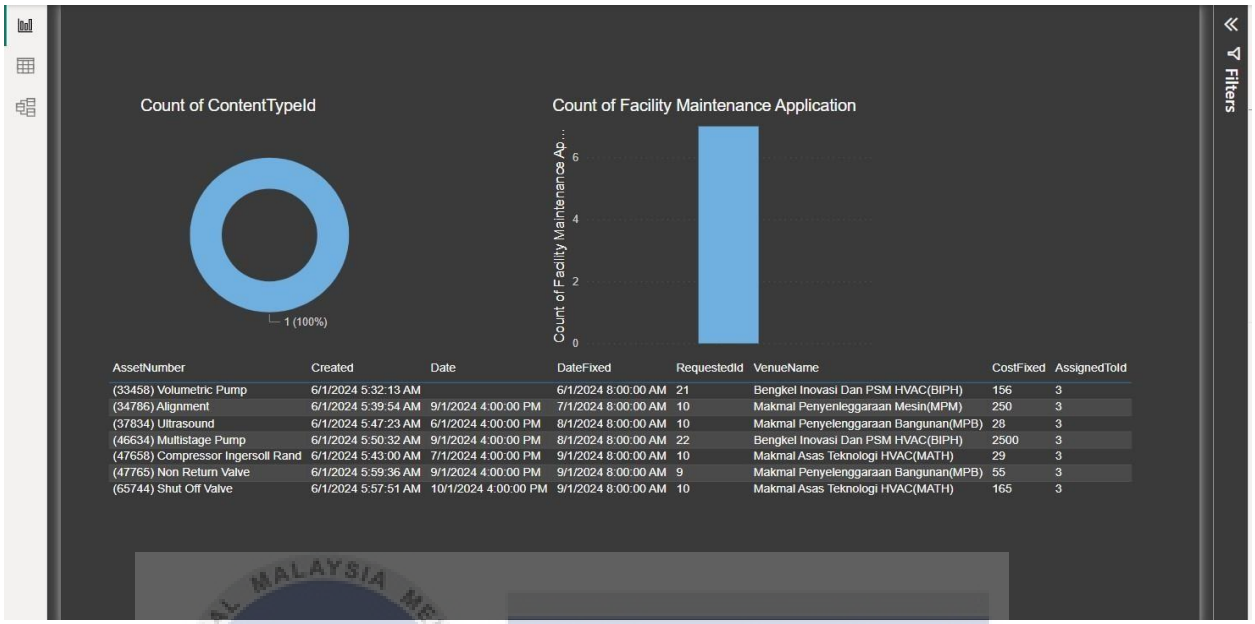
The application's automated email system, powered by the seamless integration of Power Apps and Power Automate, ensures efficient communication in the facility repair workflow. When a user ("requestor") selects their email on the Work Process page, or when an administrator designates an email for the assigned technician, the system automatically generates and triggers an email.

When a user, known as the "requestor," fills in their email ID to submit a report, the system automatically generates and sends an email confirmation. This email serves as a confirmation that the report has been successfully submitted. This straightforward process ensures that the "requestor" is promptly notified of the successful completion of their report, adding a layer of clarity and assurance to the user experience. Similarly, when administrators assign a technician to a task, the designated email ensures swift communication, facilitating quick problem resolution.

The synchronized operation between Power Apps and Power Automate minimizes errors, enhances real-time communication, and improves overall workflow efficiency. The generated emails serve as comprehensive records, fostering transparency and accountability in the repair process. This automated system not only tracks issue progress but also provides valuable reference material for future assessments and improvements.

4.4 Result Power BI

4.4.1 Monitoring Real Time Data From Desktop And Mobile Phone.



AssetNumber	Created	Date	DateFixed	RequestedId	VenueName	CostFixed	AssignedToId
(33458) Volumetric Pump	6/1/2024 5:32:13 AM		6/1/2024 8:00:00 AM	21	Bengkel Inovasi Dan PSM HVAC(BIPH)	156	3
(34786) Alignment	6/1/2024 5:39:54 AM	9/1/2024 4:00:00 PM	7/1/2024 8:00:00 AM	10	Makmal Penyenleggaraan Mesin(MPM)	250	3
(37834) Ultrasound	6/1/2024 5:47:23 AM	6/1/2024 4:00:00 PM	8/1/2024 8:00:00 AM	10	Makmal Penyelenggaraan Bangunan(MPB)	28	3
(46634) Multistage Pump	6/1/2024 5:50:32 AM	9/1/2024 4:00:00 PM	8/1/2024 8:00:00 AM	22	Bengkel Inovasi Dan PSM HVAC(BIPH)	2500	3
(47658) Compressor Ingersoll Rand	6/1/2024 5:43:00 AM	7/1/2024 4:00:00 PM	9/1/2024 8:00:00 AM	10	Makmal Asas Teknologi HVAC(MATH)	29	3
(47765) Non Return Valve	6/1/2024 5:59:36 AM	9/1/2024 4:00:00 PM	9/1/2024 8:00:00 AM	9	Makmal Penyelenggaraan Bangunan(MPB)	55	3
(65744) Shut Off Valve	6/1/2024 5:57:51 AM	10/1/2024 4:00:00 PM	9/1/2024 8:00:00 AM	10	Makmal Asas Teknologi HVAC(MATH)	165	3

Figure 4. 7: Show a real-time data from desktop

AssetNumber	Created	Date	DateFixed	RequestedId	VenueName	CostFixed	AssignedToId
(33458) Volumetric Pump	6/1/2024 5:32:13 AM		6/1/2024 8:00:00 AM	21	Bengkel Inovasi Dan PSM HVAC(BIPH)	156	3
(34786) Alignment	6/1/2024 5:39:54 AM	9/1/2024 4:00:00 PM	7/1/2024 8:00:00 AM	10	Makmal Penyenleggaraan Mesin(MPM)	250	3
(37834) Ultrasound	6/1/2024 5:47:23 AM	6/1/2024 4:00:00 PM	8/1/2024 8:00:00 AM	10	Makmal Penyelenggaraan Bangunan(MPB)	28	3
(46634) Multistage Pump	6/1/2024 5:50:32 AM	9/1/2024 4:00:00 PM	8/1/2024 8:00:00 AM	22	Bengkel Inovasi Dan PSM HVAC(BIPH)	2500	3
(47658) Compressor Ingersoll Rand	6/1/2024 5:43:00 AM	7/1/2024 4:00:00 PM	9/1/2024 8:00:00 AM	10	Makmal Asas Teknologi HVAC(MATH)	29	3
(47765) Non Return Valve	6/1/2024 5:59:36 AM	9/1/2024 4:00:00 PM	9/1/2024 8:00:00 AM	9	Makmal Penyelenggaraan Bangunan(MPB)	55	3
(65744) Shut Off Valve	6/1/2024 5:57:51 AM	10/1/2024 4:00:00 PM	9/1/2024 8:00:00 AM	10	Makmal Asas Teknologi HVAC(MATH)	165	3

Figure 4. 8: Show a real-time data from mobile phone

Utilizing Power BI, we have implemented a real-time monitoring system for the data generated within the Power Apps application we developed. This monitoring dashboard allows us to observe key metrics, including the number of users accessing our application. Additionally, it provides a comprehensive overview of all data submitted by users, encompassing details such as asset numbers, creation dates, fixed dates, request IDs, locations, and the associated fixed costs. This integrated monitoring solution enhances our ability to track user engagement and analyze the submitted data, contributing to a more informed and data-driven decision-making process.

4.4.2 Data Flow Usage From Power Automate .

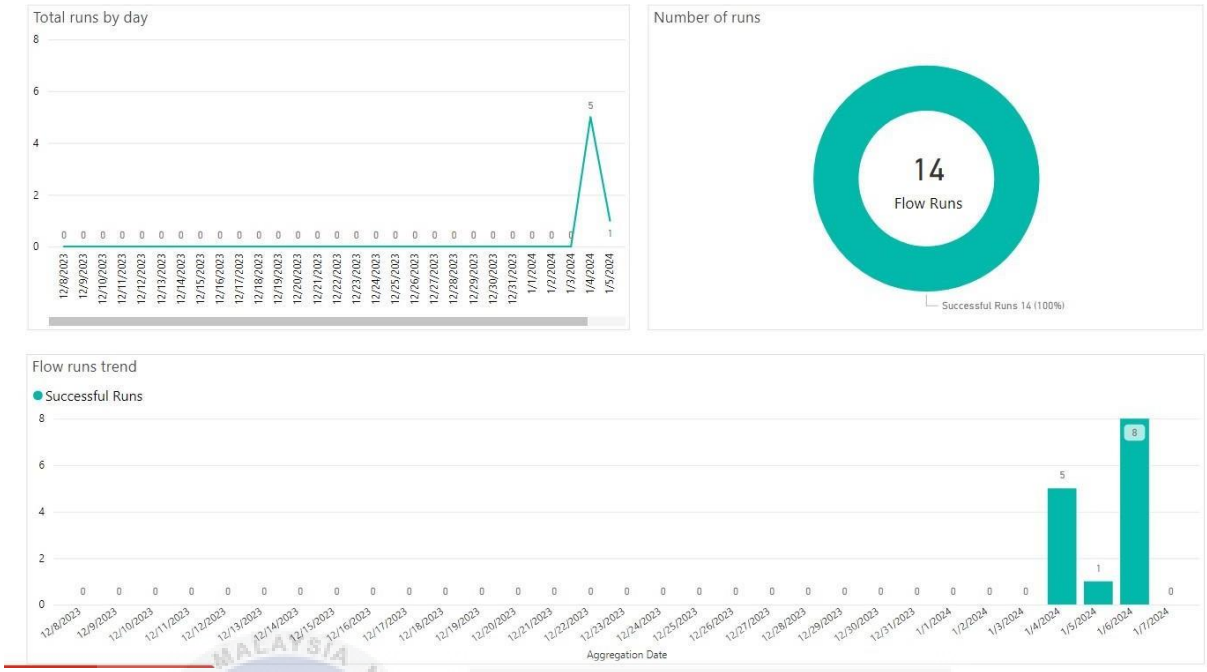


Figure 4. 9: Show real-time data using power BI in automate flow

We use Power BI to keep an eye on the data generated by our Power Automate workflows in real-time. With this system, we can see and count how often users trigger automated processes. It's like having an instant view of how well our automated tasks are working. We can also look back at past data to see if there are any patterns or changes over time. This helps us make smart decisions to improve and optimize our automated workflows for better performance.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter will discuss about the conclusion and recommendation of the overall project which is Asset Maintenance Management using Microsoft power platform. The accomplished of the objective from the project will be discuss. Furthermore, the recommendation for the future study about Asset Maintenance Management using Microsoft power platform also will be proposed.

5.2 Conclusion

In conclusion, the proposed solution for the asset management system is designed to address the complex needs of maintaining and tracking assets within a centralized framework. By utilizing Power Apps as the primary platform, the system not only offers a user-friendly interface for asset registration but also ensures a seamless and integrated experience for users across different devices. The choice of Power Apps provides a robust foundation for creating a scalable and customizable asset management solution.

The integration of Power Automate workflows is a key component of this solution. It enables the automation of asset monitoring, maintenance processes, and notifications triggered by specific events. This automation not only reduces the manual workload for maintenance personnel but also ensures that critical tasks are executed promptly. The use of Power Automate enhances the overall efficiency of the asset management system, leading to improved reliability and reduced downtime.

Furthermore, the emphasis on mobile and personal computer accessibility through Power Apps aligns with the modern work environment, where users are often on the

move. This flexibility ensures that stakeholders can access the asset management system from their preferred devices, promoting collaboration and timely decision-making. The responsive design of Power Apps facilitates an optimal user experience, regardless of the platform, enhancing the overall usability of the system.

The implementation of this centralized asset management system is not just a technological upgrade but a strategic move toward a more proactive and data-driven approach to asset maintenance. The real-time monitoring capabilities, coupled with automated workflows and accessibility features, create a comprehensive solution that empowers organizations to maintain their equipment effectively in an internet-based environment.

In summary, the proposed asset management system leverages the strengths of Power Apps and Power Automate to create a centralized, efficient, and user-friendly solution. By embracing modern technologies, organizations can expect to enhance their asset management processes, reduce operational challenges, and ultimately prolong the lifespan of their valuable assets.

5.3 Recommendation

In the pursuit of optimizing our asset management system, the integration of cutting-edge features promises to revolutionize our operational efficiency and decision-making processes. One pivotal enhancement involves the incorporation of QR barcode scanning functionality into our Power Apps interface. This innovative addition streamlines the retrieval of machine details, assigning unique QR codes to each asset. With the simple scan of a QR code using the Power Apps mobile interface, users can access comprehensive information encompassing maintenance history, specifications, and real-time status updates. This not only accelerates data retrieval, minimizing manual

input errors, but also fosters a more user-friendly experience, as it intuitively aligns with the demands of our dynamic workflows.

In summary, these advancements in QR barcode scanning integration represent significant strides toward a more efficient, user-friendly, and data-driven asset management system. By implementing these features, we are not only streamlining our operations but also fostering a culture of continuous improvement and informed decision-making. As we embrace these technological enhancements, our asset management system evolves into a strategic asset itself, aligning seamlessly with our organizational goals and industry best practices.

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ABOUT CARL DE SOUZACarl de Souza is a developer and architect focusing on Microsoft Dynamics 365, Souza, A. C. D., Carl de Souza is a developer and architect focusing on Microsoft Dynamics 365, Useful Links Dynamics 365 – D365Notes says:, & says:, R. S. (2018, June 19). *PowerApps, canvas apps, model driven apps, common data*

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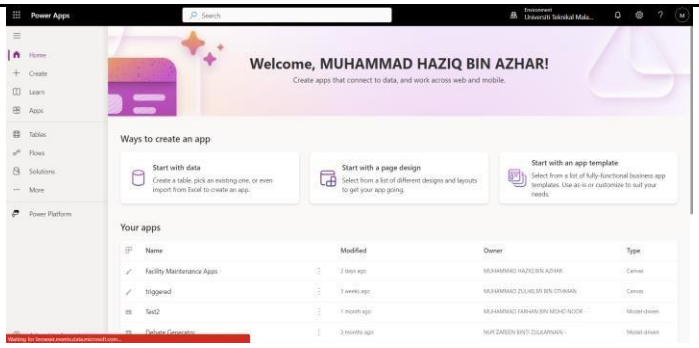
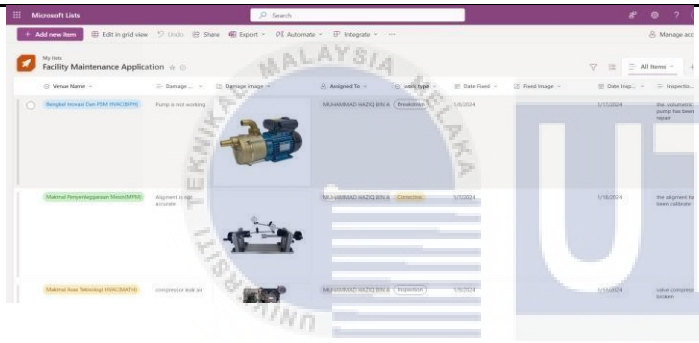
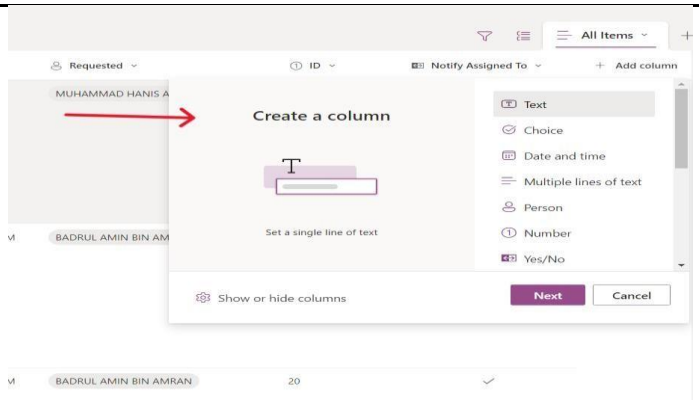
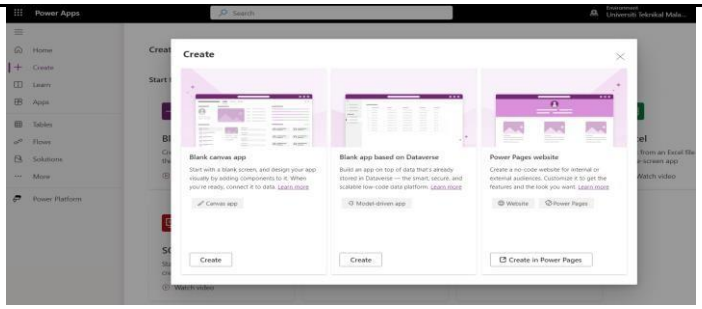
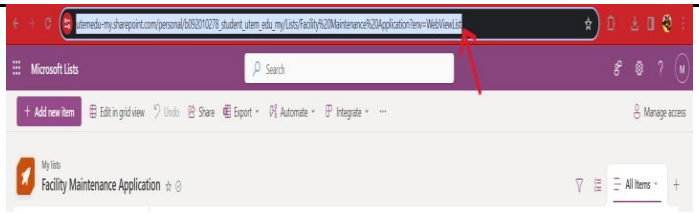
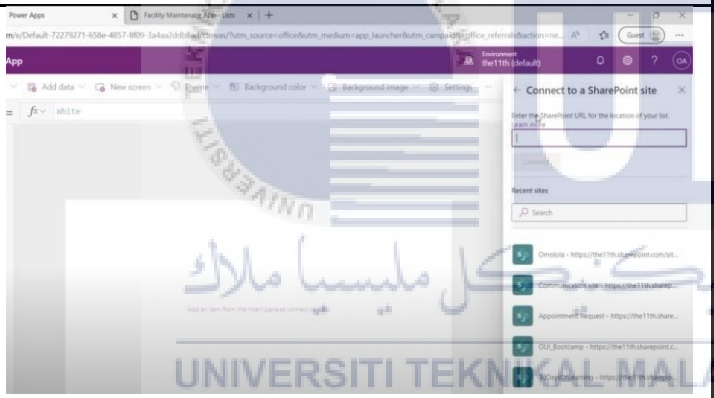
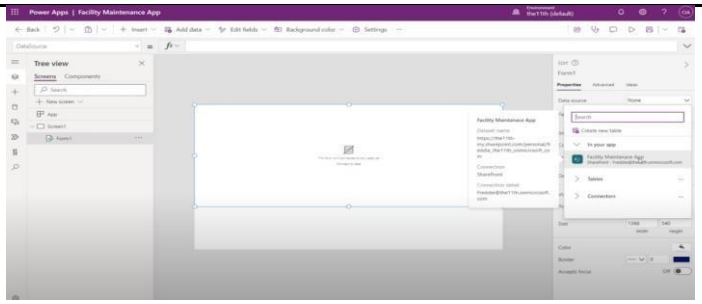
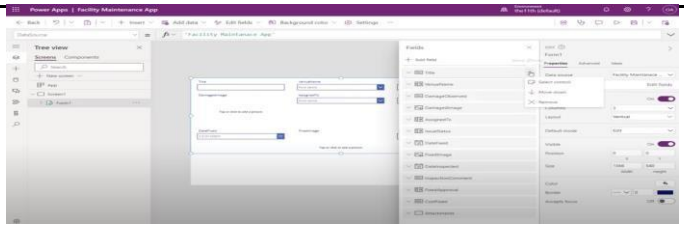
APPENDICES

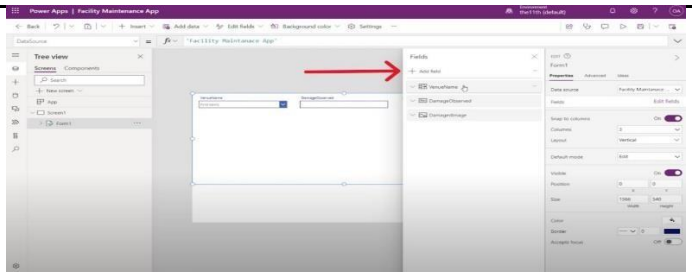
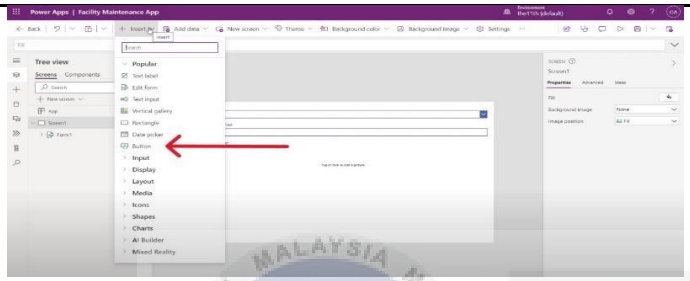
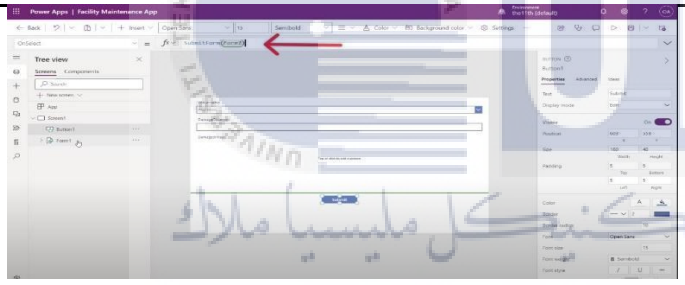
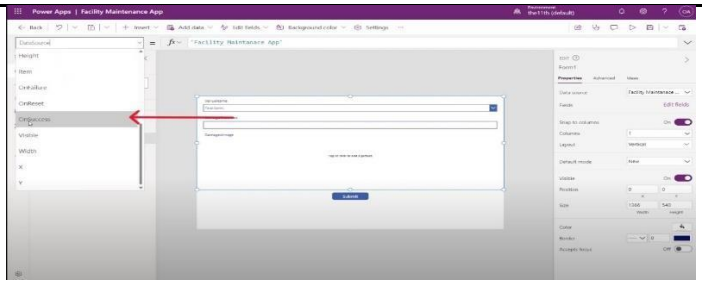
APPENDIX A How to create table data in power list

No	Picture	Description
1		Need to login Microsoft 365 using student email and choose power automate and Microsoft List.
2		Create table data in Microsoft List to link into Power apps. There a lot option to create or transfer data of table. Such as Dataverse, Sharepoint and excel.
3		Please select "Add Column" and input data fields including venue name, observed damage, damage image, assigned to, work type, fixed date, inspection date, inspection comments, approval for fix, fixed cost, creation date, work priority, and requested date.
4		Before to create a data, select column type based on the creativity.

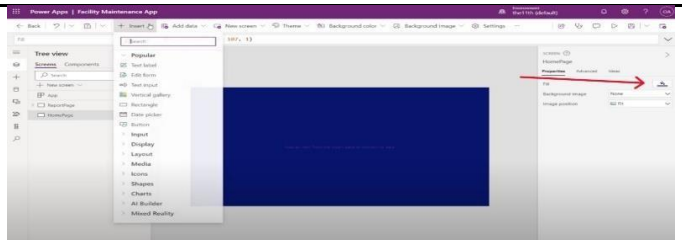
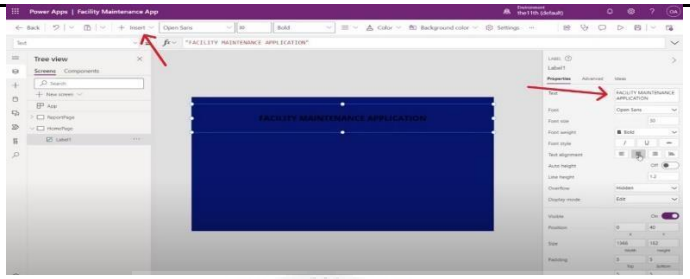
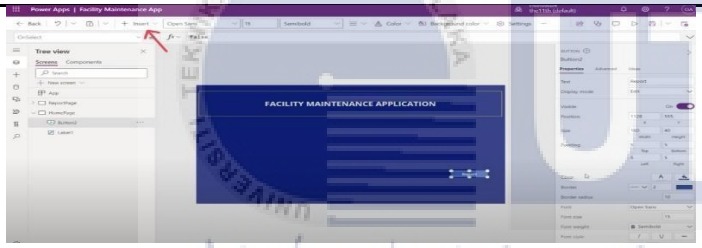
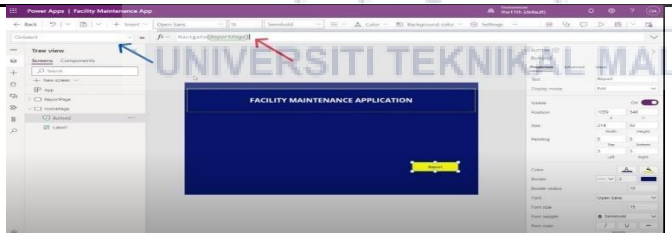
APPENDIX B How to transfer data list into power apps

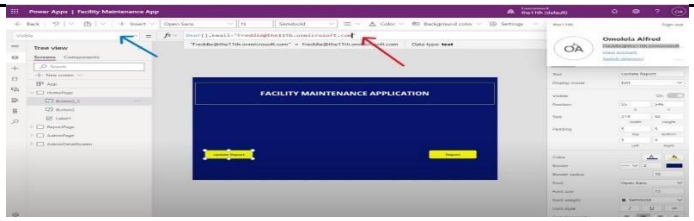
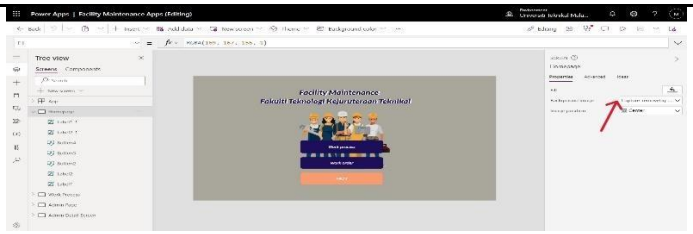
No.	Picture	Description
1		Open power apps and choose create blank template for create a new application.
2		Copy URL in the Microsoft list
3		Click on "Insert" and select SharePoint. Next, paste the copied URL from Microsoft List into the SharePoint site.
4		After linking the Microsoft List data into the Power Apps template, go to "Insert," then click on "Data source" and switch to SharePoint. The Power App will generate a table based on the SharePoint data that we inserted.
5		Following that, select the required data in Form 1 template and modify the data according to our creative preferences.

APPENDIX C How to create a work process page

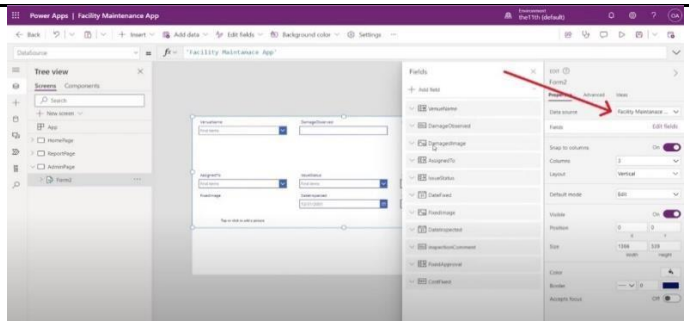
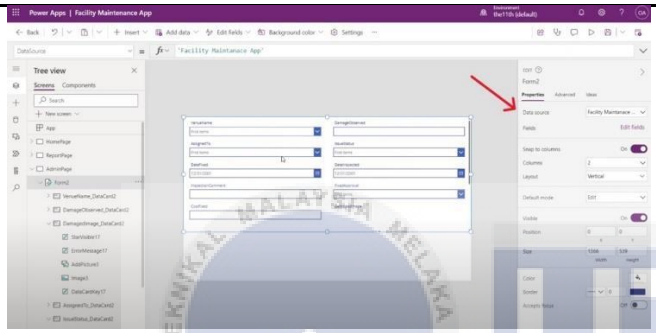
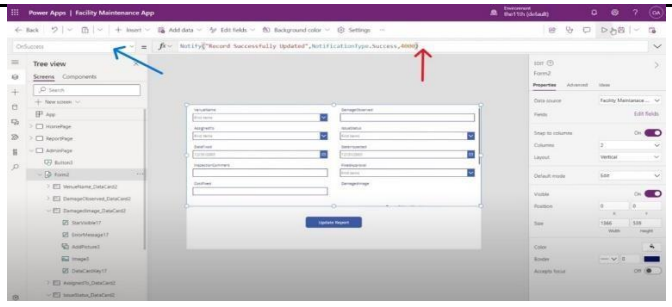
No.	Picture	Description
1		Access the data source and choose the SharePoint linked to Microsoft List using the student email. Then, click on "Edit Fields" to remove or add any necessary data.
2		To generate a toggle, select "button" in the data source. Next, formulate a formula to control the button's navigation. Following this, rename the button to "submit."
3		To navigate the button, populate the formula "SubmitForm(Form1)" in the column with the red arrow.
4		To create a notification “successfully submitted” after submit a form.,Choose “OnSuccess” on the red arrow and enter a formula “Notify Form Successfully Submitted ,Notification Type Success 800”).

APPENDIX D How to create a Home Page

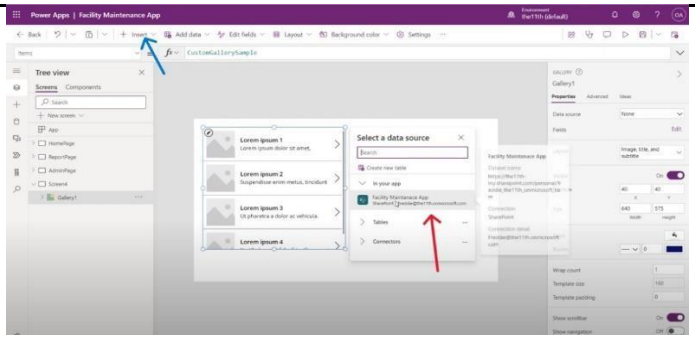
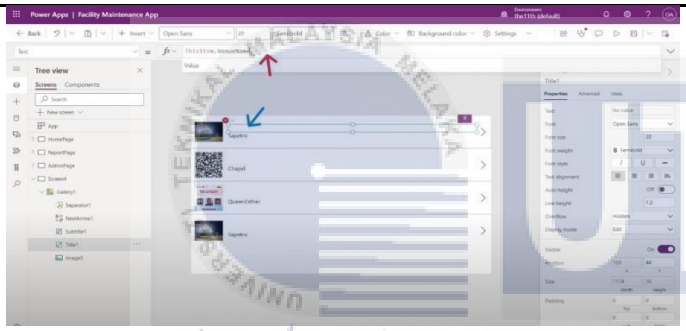
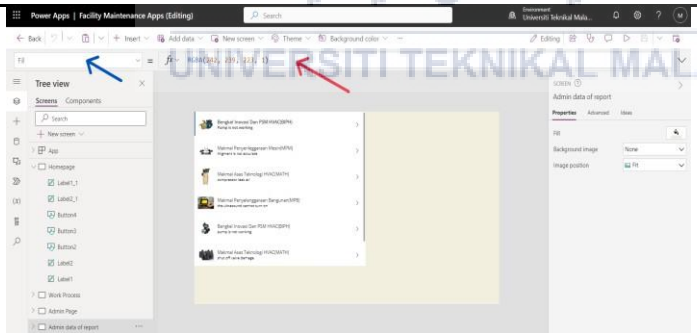
No.	Picture	Description
1		Initially, add a new page, and to modify the background color of the homepage, you can select the option in the red arrow section.
2		Select "Insert Text" to add text to the homepage. For renaming, resizing the font, and coloring the text, utilize the "Edit Properties" option.
3		Select "Insert" and choose a button. Afterward, rename the button to "Work Process."
4		To direct the button, enter the formula in the designated formula section. Start by selecting "OnSelect" in the blue arrow. Next, input the formula "Navigate(ReportPage)" in the red arrow section.

6		To access the work order button, select "visible" using the blue arrow, and input the formula "User().Email = 'B092010278@student.utem.edu.my'" in the red arrow. This configuration ensures that only administrators can access the page, as it is synchronized with the specified email.
7		To add a wallpaper, simply click on the background image option and upload a creatively chosen wallpaper.

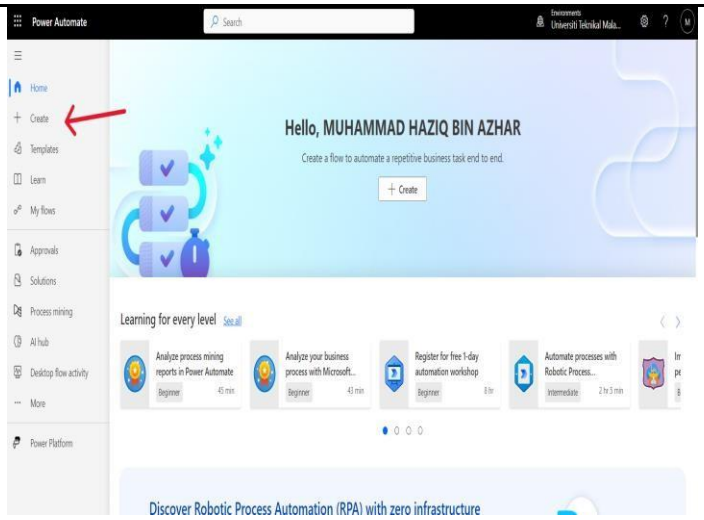
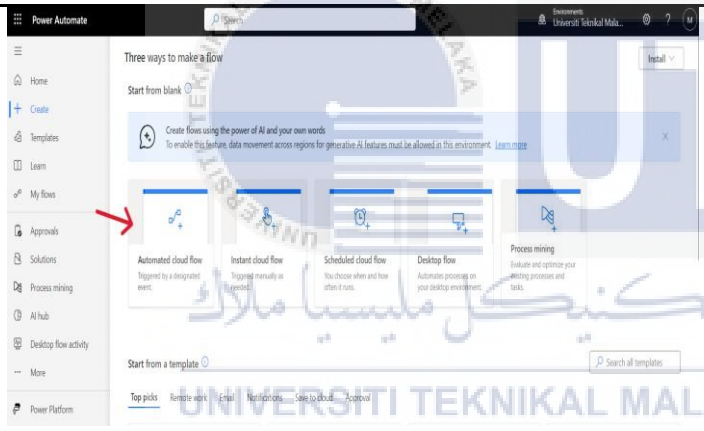
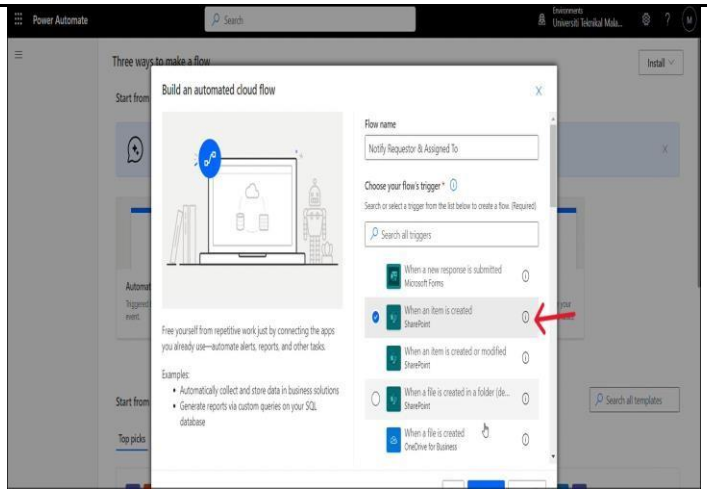
APPENDIX E How to create a work order page

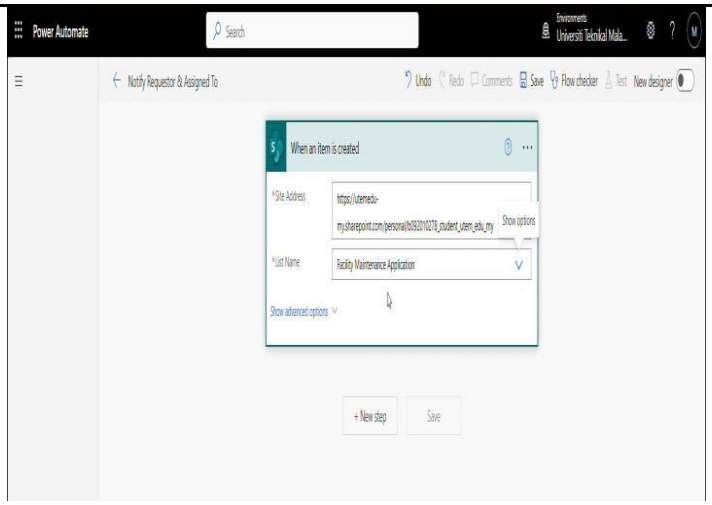
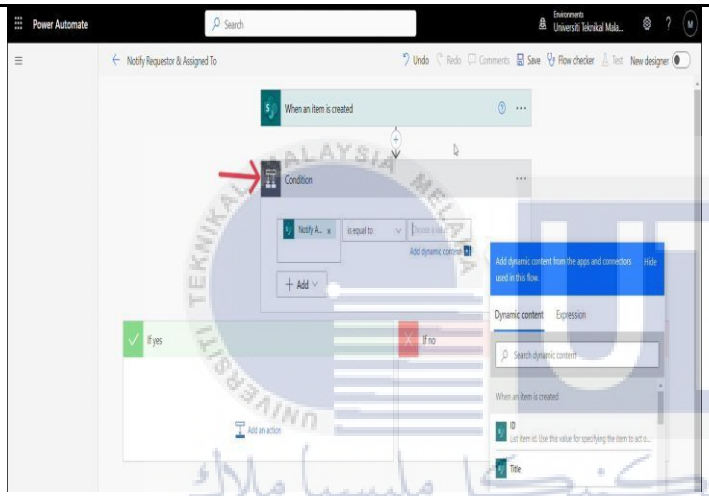
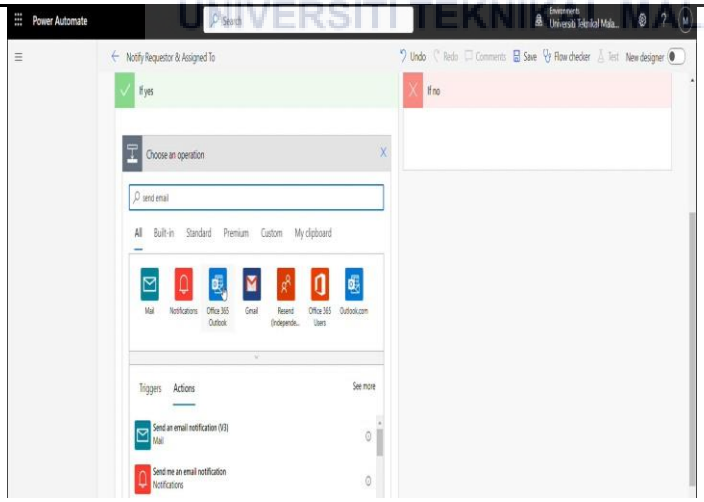
No.	Picture	Description
1		Navigate to the data source, select SharePoint linked to Microsoft List using student email. Proceed to the edit field to customize and manage the data as needed. Access to this page is restricted to administrators only, enforced by the synchronized email setup we implemented.
2		Subsequently, we customized the layout and background color according to our creative preferences within the edit properties section.
3		Add a button, select the "onSelect" option in the red arrow, and input the formula "SubmitForm(Form2); NewForm(Form2)" in the blue arrow.
4		To generate a notification stating "Successfully submitted" after submitting a form, choose "OnSuccess" in the red arrow, and enter the formula "Notify('Form Successfully Submitted', NotificationType.Success, 800)".

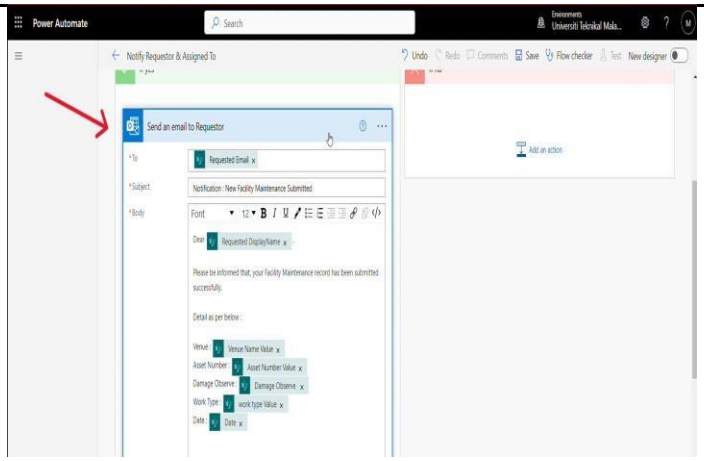
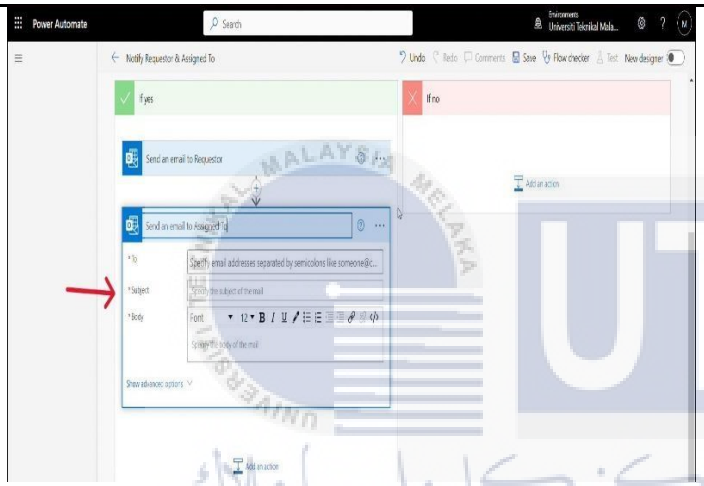
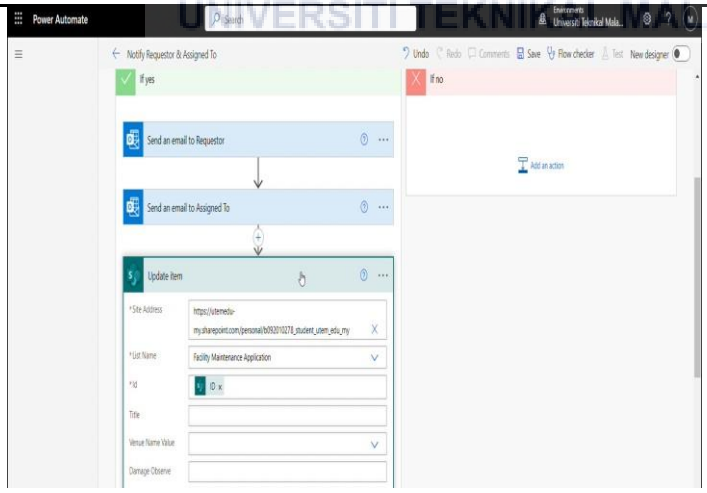
APPENDIX F How to create a Page report of data

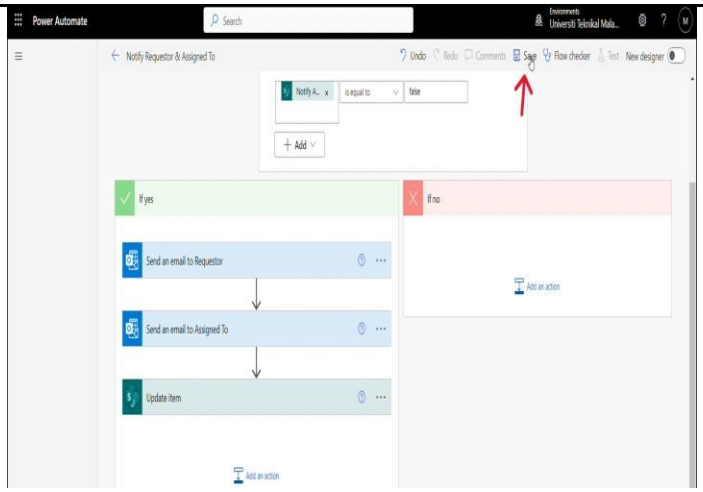
No.	Picture	Description
1		To create a new screen and select "Insert," then choose a vertical gallery. Subsequently, click on SharePoint in the red arrow to establish a link with Microsoft List for data integration.
2		To create a tittle problem description in the blue arrow text need to key in the formula “ThisItem.VenueName.Value” in the red arrow section.
3		To navigate the page, select "onSelect" in the blue arrow, and enter the formula "Navigate(AdminPage)" in the red arrow.

APPENDIX G How to create a power Automate into Power apps

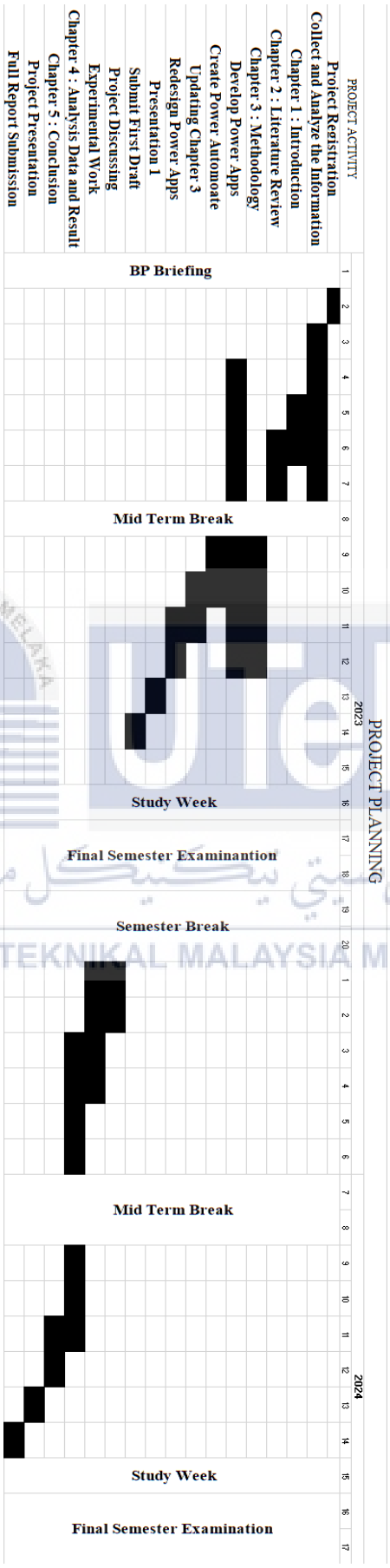
No	Picture	Description
1		Initially, open the Power Automate window, then choose "Create" in the section indicated by the red arrow.
2		Select "Automated cloud flow" to initiate the creation of a trigger.
3		Name the file as "Notify Requestor & Assigned To" and choose the flow trigger in the section marked by the red arrow.

4		Copy the database URL from Microsoft List and paste it into the site address. Select the appropriate database from the list name.
5		Add a second flow and opt for a conditional flow. Select the data you wish to automate, such as "Assigned To."
6		Subsequently, include a section in the "YES" column and select "Send Email V2" in the Search section.

7		Customize the email template according to your creative preferences in the "Send Email Flow Requestor" to generate an automated email.
8		Add another flow to create an automation for "Assigned To." Repeat the same process as outlined in steps 6 and 7.
9		Integrate another flow and select "Update Item." Copy the database URL from Microsoft List and paste it into the site address. Then, choose the database in the list name and select the relevant ID.

10		Upon completing the edits in the automated flow, click on "Save" in the section indicated by the red arrow to save the configured data.

APPENDIX H



APPENDIX I

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