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An Undergraduate Internship on Project Techtroiz

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An Undergraduate Internship on Project Techtroiz

By

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Autumn, 2022

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January 24, 2023

Dissertation submitted in partial fulfilment for the degree of
Bachelor of Science in Computer Science

Department of Computer Science & Engineering
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Attestation

I hereby attest that I, Mahdia Faiza – 1731635 an undergraduate affiliate of Independent University Bangladesh have completed the report and submitted it in partial fulfilment of the requirement for the Degree of Computer Science and Engineering from Independent University Bangladesh (IUB). I have been guided by my respected faculty Sabrina Alam. I also clarify that all my work is authentic and are based on my own research and experience gained from my internship. I declare that the statements mentioned above is true and accurate to my acknowledgement.



Signature Date 23/01/2023

Mahdia Faiza

Acknowledgement

First and foremost, I would like to thank Almighty Allah for giving me the strength and making me capable enough to complete the internship under British American Tobacco Bangladesh. I would like to thank all my faculties at IUB for always supporting me throughout my undergraduate career. I would also like to thank my supervisor at IUB, Ms. Sabrina Alam, for her constant support and encouragement throughout the internship period. I would like to thank my organizational supervisor, Mr. Nazran Zubaer for his support and guidance.

I would like to thank the entire British American Tobacco Bangladesh Operations team who have supported and helped me throughout my internship period. With this opportunity, I was able to work under real professional work environment, that allowed me to learn and gain interest in corporate world. I have gained confidence in myself and my capability. Lastly, I would like to thanks to my parents who have always stood beside me and continued to provide their best for me.

Thanks, and regards,

Mahdia Faiza
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Letter of Transmittal



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To Whom It May Concern

We are pleased to certify that Ms. Mahdia Faiza, a student of Independent University, Bangladesh, has successfully completed her internship at BAT Bangladesh from 01 October 2022, to 31 January 2022. During her internship, she worked under the supervision of Mr. Nazran Zubaer, Process Engineer, in the Operations Department.

Throughout the tenure, she was found to be sincere, hardworking, and compliant. She has successfully completed the tasks that were assigned displaying utmost diligence. Furthermore, she has consistently exhibited a proactive approach and an unrelenting eagerness to learn and excel.

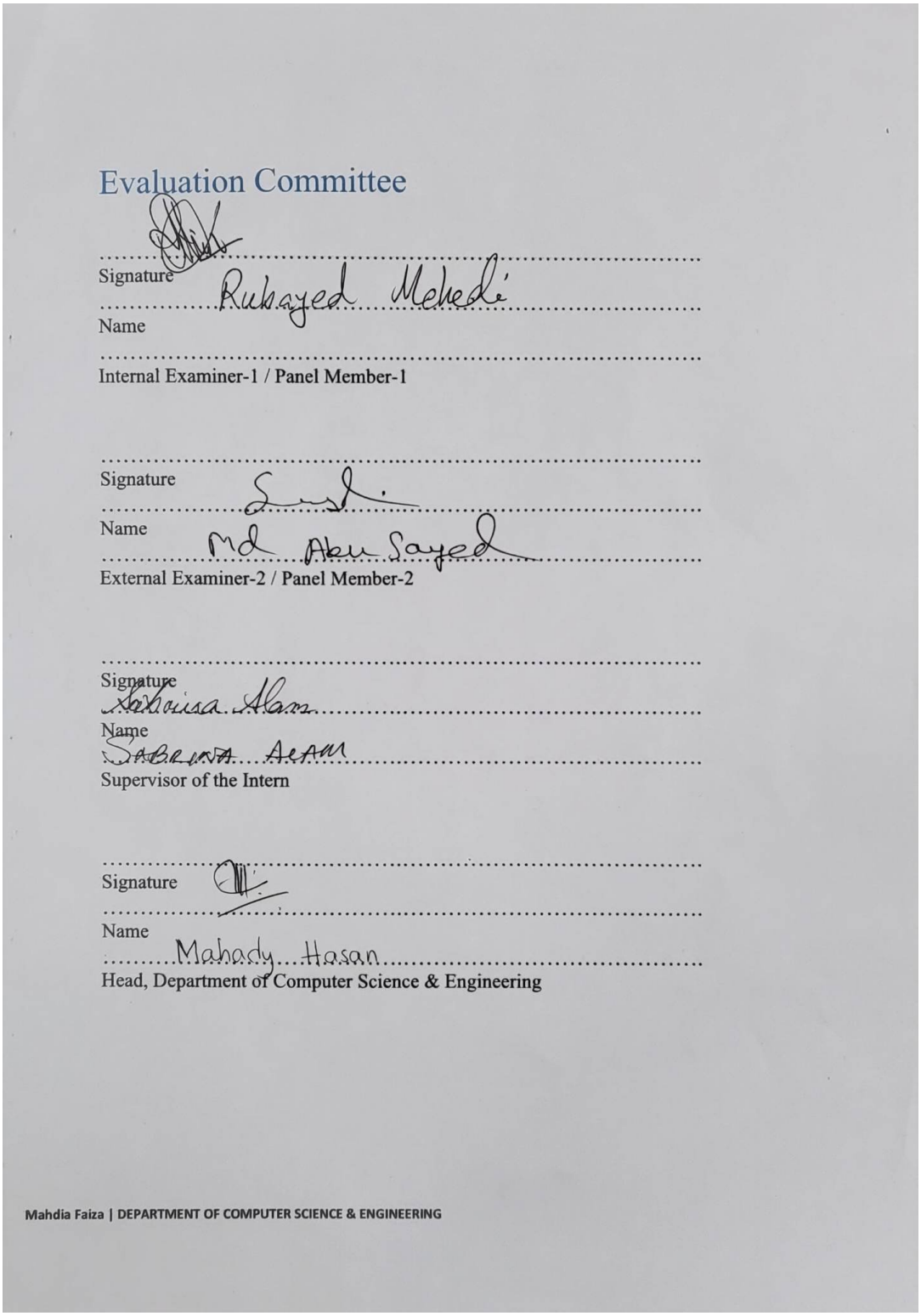
We wish Ms. Mahdia Faiza all the best in her future endeavors.

Sincerely Yours,

Raiyan Ahmed
Senior HRBP – Marketing & Talent
Human Resources Department
British American Tobacco Bangladesh

British American Tobacco Bangladesh Company Limited | New DOHS Road, Mohakhali, Dhaka-1206, Bangladesh

Evaluation Committee



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Supervisor of the Intern

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Abstract

The following report of my internship consists of the entire document of my project at British American Tobacco Bangladesh (BATB). I have included everything related to my internship at the company. I have also made sure to add the outlines of this internship that includes object, scope, background, project management, and the methodology for this project. The analysis made before and after the project deployment has been explained thoroughly in this report with detailed description. The future works and further scopes and intended integrations have also been stated in this report.

This report also includes the experience that I have achieved during my internship period which includes, new set of skills and new applications. As an Intern, I have learned how to use Microsoft Excel, Microsoft Power BI, and Microsoft PowerApps. I have managed to intake every little detail and new information on how a multinational company is being run in Bangladesh. I hope this report inspires others to explore every opportunity that may arrive at their doorstep and utilize their opportunity to the fullest. The world of possibilities are endless, and it doesn't only end with the chosen major. As a computer science and engineering student, I would admit that the option for us to improve and learn are unlimited.

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Chapter 1

Introduction

Microsoft PowerApps is an application by Microsoft Office 365, its practical usage is inside an organization's native network. It requires low codes, which is a term to describe the very limited amount of coding it requires compared to programming language code such as Python, Java, C++ etc. Microsoft Power BI (Business Intelligent) is also such application that allows an organization to have an easier outlook at set of data, it can be used to visualize and track an organization's data and to analyzing them. Microsoft Excel is also a great tool to use as there are variety of purposes that it can contribute to when an organization is looking to analyze their data. Microsoft PowerPoint is not only handy for presentations rather, but Microsoft has also created tools such as Power BI, which can be used to show case direct finding and data sets are relevant to the presentation. As I was introduced to these applications, I was able to see beyond the purposes that I thought it was created for. When I started to get familiarized with these tools, I was able to see past the limited uses I thought these contributed as applications. I also learned how I can utilize these applications with one another to create a proper data analyzing source. These are a good tool to use for anyone who is working with data analyzing. This report provides an overview of the user interface designs for my internship and the experience of working as an intern.

1.1 Overview/Background of the work

In this report, I am presenting my work experience as an intern and my experience with working in a team. We are developing various of ways of visualizing data and using them for various reasons such as to keep track, overview of the progress and predictive maintenance report etc. I was introduced with different application of Microsoft and the way the company utilized these tools.

For developing the app "Techtrioz", we have used Microsoft PowerApps. It is mainly based on 'low code' instead of programming language. This application can be used in a browsers and mobile phones. The purpose of developing this application was to keep track of the maintenance cost and also to be able to keep track of finance in general since everything was manual, it was harder to understand if they were giving away expenses for petty reason. The practicality of the application is so that vendors will not be able to cheat anyone regarding maintenance cost, since the company already had an excel file named '*Rate Card*', that has the amount finalized with the vendors that go along with the maintenance that they were providing the company. The company worries that the vendors were paraphrasing the type of maintenance they were providing the company, and they were charging differently for the same maintenance that already existed in the *Rate Card* file. The manual way was very inefficient for the company which is why they needed an application that could track and keep all the records in an organized manner. Since they were using paper, it was easy to lose track of things. The company initially wanted to use PowerApps for the whole process, but the application has limits which is a drawback for the company and the developers. Therefore, I had always be in check during the collection of data and the process of developing the application. I had to learn how to assemble the type of data that can be used to create such application. By overseeing the application, I was able to learn how to plan, collect the relevant data, sort, and apply.

1.2 Objectives

Objectives for Microsoft PowerApps:

In general, the project objective describes the outcome of a project but in a specific manner. The objective of a project is specific, must meet time, budget and the most importantly is to meet the client's requirements. The objectives of this application "Techtrioz" are described below:

1. **Help admin to keep track of the requests:** The application creates request as per the user's request.
2. **Create description of the type of maintenance:** The application allows users to create description and also input their desired price.
3. **View status:** It allows users to track their request and the status of the request.
4. **Update price request:** This allows the admin to change the request price for the type of description the users input for the maintenance.
5. **Admin search:** The application allows the admin to check in the search box to see the closest result of the request description of the users.
6. **Admin approval:** This allows the admin to either approve or reject request.
7. **Track the request:** It allows the admin to keep track of the requests that were accepted and rejected.

Objectives for Microsoft Power BI:

The idea is to utilize set of data for analyzing purposes. The application is great for visual purposes, it allows user to analyze data with chats and general remarks that is required for overviewing any kind of project. For this case, we utilized it to overview the amount of breakdowns, costing, the amount of time the breakdown occurred, and the specific breakdowns for each module to predict future breakdown. The analysis was initially created so that the organization has a better concept of when, how they can expect breakdown to occur in each module.

1. **Allow user to track:** Users easily visualize the amount of financial was required in a week, month, and year. It also allows user to analyze the amount of breakdowns they can expect in the future aka predictive analysis.
2. **Visualize:** It allows users to visualize data set with charts and understand how much financing is required for each breakdown. This can be visualized for week, months, and years.

1.3 Scopes of the project

Features that are available to user in this application in Microsoft PowerApps:

1. Home or Main page, of "Techtroiz".
2. Place Request page, that allow users to place requests.
3. Create Request page, that allow users to create the type of description and price they want to request for.
4. Status page, that allows the users to see the status of their requests.
5. Pending page, that allows admin to either approve or reject a request.

6. Custom Request page, that allows the admin to check requests, also search the results of the nearest type of maintenance request and its price and edit the price if needed.

Features that are available to user in this application in Microsoft Power BI:

1. Dashboard
2. Track finance with breakdown for each module
3. Track Total breakdown, major breakdown, and repeated breakdown
4. Technology wise and module wise breakdown
5. Number of hours the breakdown occurred for each cell
6. In-depth analysis

The pages are broken down for a more specific visualization purpose:

1. Overview (Month)
2. Major Breakdown (Month)
3. Breakdown Cost (Month)
4. Downtime (Month)
5. Causes & Countermeasures
6. Overview (Week)
7. Major Breakdown (Week)
8. Breakdown Cost (Week)
9. Downtime (Week)
10. Overview (Year)
11. Major Breakdown (Year)
12. Breakdown Cost (Year)
13. Downtime (Year)

Company Profile

Background of the organization

British American Tobacco Bangladesh

Tagline: to build A Better Tomorrow

About the company

British American Tobacco Bangladesh is a part of a leading global multi-category consumer goods business that operates in over 180 markets. The company makes high quality tobacco products that meets the diverse preferences of our consumers and are one of the few companies that undergoes a 'crop to consumer' operation. British American Tobacco Bangladesh known as BATB has been committed to be a partner in the sustainable development of the country. The company embarks on a transformational journey with a clear purpose of building A Better Tomorrow for all our stakeholders.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

CSE-303 Database Management

In this course I first got introduced designing and planning on a project. The course covers a variety of strategy to follow like planning and strategy practices such as Rich picture, Entity Relationship diagram, Business Process Model and Notation Diagram and the basic concept of how to begin the initial stage of a project.

CSE-307 System Analysis

In this course, I was able to grasp on how to think like users to be able to create a user-interface. As I was creating the user-interface, I had to think of all the possibilities of problems a user may face, I also had to think of how to make the system user friendly by putting myself in their shoes. This strategy really helped me, develop, and understand exactly what the users may expect to see. It truly helped me utilize the knowledge and understanding I received from this course.

CSE-309 Web Application

This course truly helped me understand UI/UX, and how to initially plan it. Since I was free to create my own web application for this course, I was able to explore my own taste and create something that I would want to see in my own web application. This course gave me a better understanding of the course Database and System Analysis, as I was able to apply what I've learnt from those two courses. The individual project has helped me develop and work on the mistakes that I previously had made, since I was solely responsible for my own project, I learned the sense of responsibility and learned to deliver on time. Since I was working alone, I had made a lot of mistakes and also learned from them, which truly helped me understand how a front-end truly works and how important is the role of a front-end in an application.

2.2 Related works

1. There was a study particularly on such a problem, but Microsoft themselves has put up articles regarding such issues. There is particular website that shows questions that are frequently asked and therefore this site, helps answer or at least get an idea about how to tackle the issue. https://www.clearpeaks.com/how-to-handle-data-errors-in-power-bi/

This particular site helps resolve the most common issues that comes with using Power BI. This answer for this particular issue can be resolved using ‘Figure 4: Errors in Records’ and ‘Figure 5: Reasons for errors. These two reasonings can be used to identify the issue related to the problem.

2. There haven’t been any study on security for large companies like BAT. As these large companies use their own resources for security purposes, therefore there haven’t been many studies made on such issues.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

The work Breakdown structure is a structured tree of work phase distribution among various stages of the development. It involves our Project's Planning, managing schedules and costs along with any changes to code base level. As the Project is currently at its initial stage The tree is not that elaborative but by the final report this should be fully structured with all information. The first phase of the project is distributed as such.

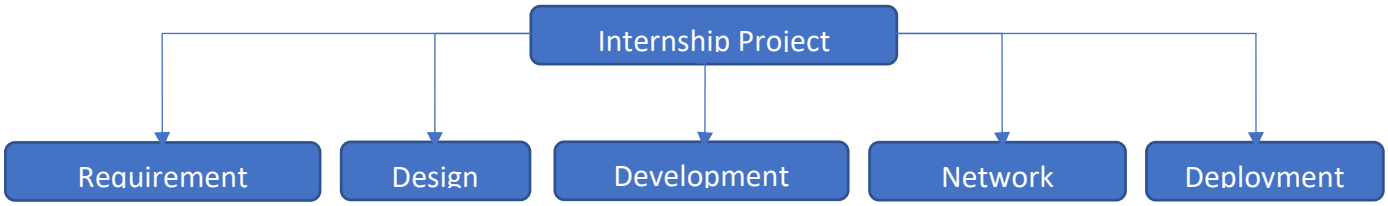


Figure 3.1 Breakdown Structure

3.2 Process/Activity wise Time Distribution

Estimated Time Distribution per Process and Implementation of Segments is stated below

Note: These durations are tentative

Task	No. working Days
Requirement Analysis	**12**
Design Layout	**12**
Development Phase	**30**
Testing Phase	**13**
Future development	**5**
Total	**Around 73 days**

Table 3.2 Activity wise time distribution

3.3 Gantt Chart



Figure 3.3 Gantt Chart

3.4 Process/Activity wise Resource Allocation

A proper network analysis is crucial for the project as British American Tobacco BAT, takes their security very seriously. A proper understanding is required in order come up with a proper system plan that allows the application to work for both parties without having any security breach.

The following Allocations of Resource were reserved for these Processes:

Analysis Segment: The understanding of network of the company plays a major role to come up with a proper plan on how to execute the project or it could lead to a failure. The main focus is to figure out a way to make an application using which ever means is required and works best for the company so that the user and the vender can have an application that is user friendly and looks professional.

Priority List

Task	Priority
Requirement Analysis	**30%**
Design Layout	**15%**
Development Phase	**35%**
Testing Phase	**15%**
Future development	**5%**
Total	**100%**

Table 3.4 Priority List

Requirement Analysis

1. **The understanding of the company's networking system**
2. **Using the networking analysis to make a secure transaction of data between the vender and the company**
3. **Allow the venders input data while making sure not to breach any security system that could allow the possibility of hackers to try and break the security system by using other network other than the company's network.**
4. **Identifying each case scenarios**
5. **Features of the system**
6. **Feasibility of the system**

3.5 Estimated Costing

The project requires some specific importance, one being network breach or a more secure platform that doesn't involve other networking medium except for the company. The costing has been separated as such:

Segments	Cost (BDT)
Network Security	20,000
Design/layout	35,000
Front-End	42,000
Backend	55,000
Testing and Debug	25,000

Total Estimation: 1,77,000

Table 3.5 Costing

Problem statement:

1. Solve error made in excel.
2. Work on UI/UX.
3. Secure system idea between the company and contractors.
4. Option of Approval

Chapter 4

Methodology

1. There is an existing excel sheet that is connected with Power BI, which has some bugs that needs fixing for future inputs. The idea is to figure out the issue that's causing the data of excel to be read on Power BI dashboard until August. The data stopped showing after a certain month from the excel sheet even though there are many data inputs after the month that is shown in Power BI.

2. A dashboard for a system needs some UI/UX changes that looks professional and visually pleasing. In a way that the dashboard does not look messy using Power Apps.

3. The concept is to bring a solution or a way that can allow the company to make orders to the contractors and a system that does not breach any of the company's security system. As the company's priority is to keep the company's data safe and have no way of breaking the firewall system when making such transaction of data between the placement of orders and when the contractors are inputting the data in the system.

4. The system that allows the company and the contractors to input data and place orders, need to go through 2-3 approvals before it happens. Once everything is approved that means that they can place the order to the contractors and hence the contractors can also view the orders in the system.

Development tools:

- Microsoft Excel
- Microsoft PowerApps
- Microsoft Power BI
- Microsoft PowerPoint
- SharePoint

Agile Project Management



Chapter 5

Body of the project

5.1 Work Description

At the initial phase of this program, I was learning how the company was moving towards automation from manual. I was learning how to develop charts and show readings for different data that is extracted from a file. In the initial stage, I was given spreadsheet to work with some data in order to display in a dashboard. I was taught how I can use excel in ways that could help multinational companies keep track of the important aspect of maintenance. The application platform that I have used to display such data automatically was Microsoft Power BI (Business Intelligence). Microsoft Power BI is the leading data analytics, business intelligence and reporting tool. Power BI is also one of the most used data analytics tools used by professionals. It was used for business analytics and data analytics; these are all data management solutions that are used to understand contemporary data and create insights for maintenance at BAT (British American Tobacco Bangladesh).

I have also worked with Microsoft Power Apps to create applications for the company. I have also learned how to pull data from a file and store and use them for many functionalities in an application. Microsoft Power Apps is used to make applications that is used within the company for secure purposes. This application is also intertwined with SharePoint which is also by Microsoft. It works as a database to store data that was used through this application. I have worked on the UI/UX which is known as front-end of the application. I have also been given the responsibility by my line manager to work as team on few testing applications using Microsoft Power Apps. I was able to connect that data which was stored in either Microsoft Data verse such as SharePoint or extract data from a stored file. The coding language for Microsoft Power Apps is a low-code programming language that is based on spreadsheet-like formulas. This taught me how this application is used in multinational companies to secure their data while using applications. I have also learned how to automate data using Microsoft Power Automate. Network access control policies are preferable as it gives you the control to choose who can have access to any data assets and who cannot. This makes the use of the system very secure as there is no worry of hacking the application from a different network.

This also protects the data storage location since no one outside the company can have access to it. The environment can block access to a site from within the network by blocking the sign on page in order to prevent connections to that site. That really opened my eyes into understanding networking a little more.

I have been given a project, to incorporate a system that allows vendors from outside the company to input data to store and track finances. The idea is to have vendors place orders through the application and have the data automated to show the cost of the maintenance that the vendors will do for the company machines. This system can have the vendors place multiple order requests but the catch here is that the orders must go through three approvals before they can go ahead with the maintenances. This way the company can keep track of the type of maintenance the company receives and use these data to make prediction for future maintenance. The system requires three things, one is to have the vendors place the order, second is that depending on the order request the vendor places along with the finance that is required to fix the machines, the request need to go through a specific approver that looks at the order and if they approve it via their designated email then and only then the approval request will be passed on to the other approver. And the last one is that the system should be able to detect the request from the saved database and suggest it to the approver to save time. This way the approver doesn't have to go through pools of data to find the given request from a stored database file.

MAIN FEATURES

- User friendly interface
- The admin can track financial aspects of maintenance
- Secure data system for the company
- Users can negotiate with the approvers if the request is not on the stored data
- Multiple user support and allow only with people who have access to the system can use it.
- The approval will be made through their designated email address

GENERAL FEATURE

- This application is for people who are within the company's networking system
- Universal Application, it can be used for Phones and Computers
- Users can easily extract data and input them

5.2 Requirement Analysis

5.2.1 Rich Picture

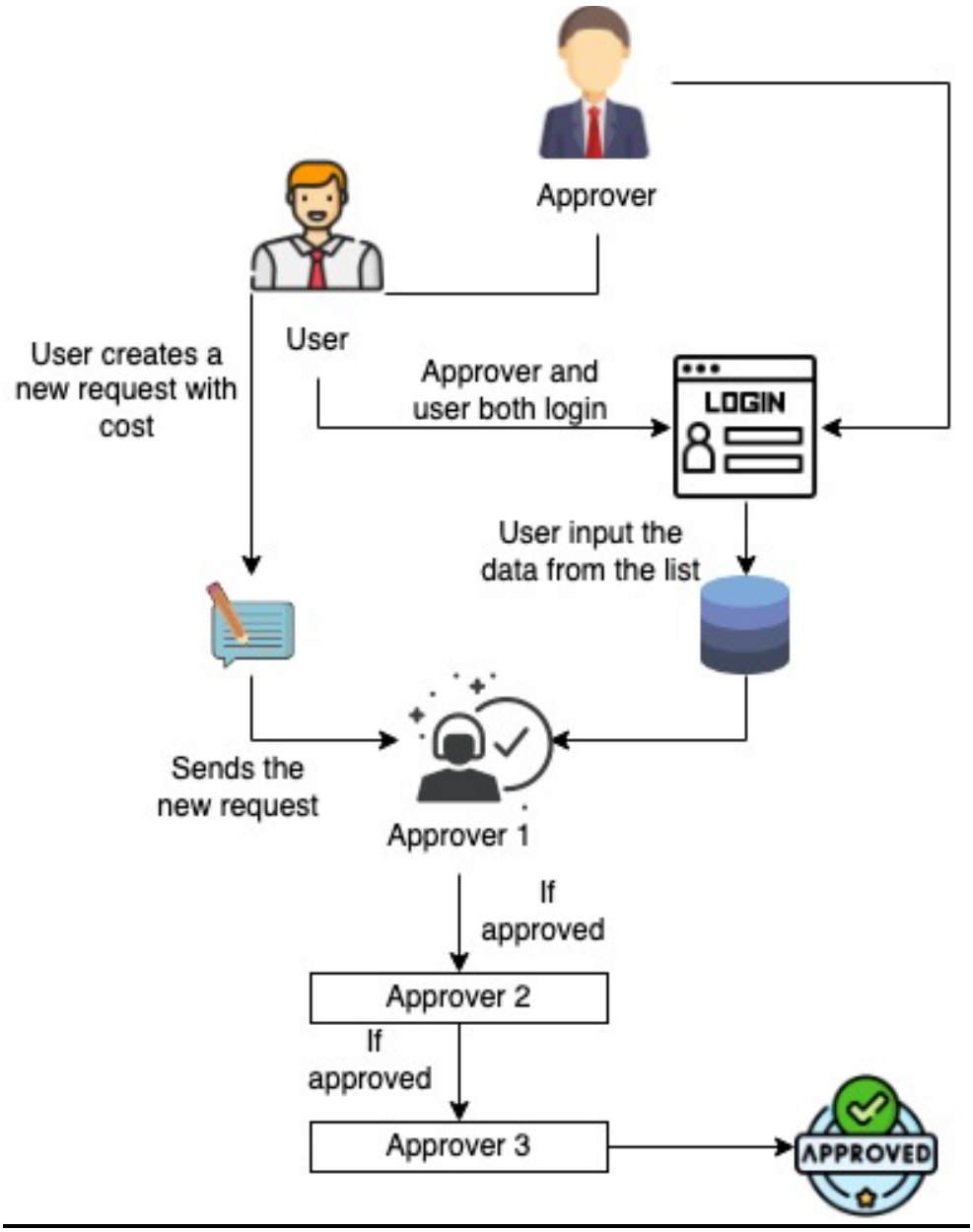


Figure 5.2.1 Rich Picture

5.2.2 Functional and Non-Functional Requirement

Functional Requirements: 'Techtrioz' has the following functional system requirement:

- Login: Only users of company employee email will be used to be able to login to the system.
- Authentication: Users has to be someone from the company, and the system will only accept the user email if it is the company email address.
- Search Items: Users have the automation functionality in the system. Users can choose from the options in the dropdown box and have the cost automatically added once they choose.
- View Item: Upon choosing an item they are requesting for; users can see detailed information of the item they may wish to make the order for.
- Place Order: Users can easily choose from the options as it is already in the database system. Hence they don't need to go through the trouble of writing specific request to make the order unless the request is not in the database system.
- Edit Order: Users can edit request after they click the 'submit' button.
- Delete Request: This feature allows admins to remove any wanted request from the system.

Non-Functional Requirements: 'Techtrioz' has the following non-functional system requirement:

- The system will be fast, providing the users will the best performance
- The system will be secure as only authorized users can access the system
- The system will be responsive
- The system will allow the users to have an easy navigation in the system

5.3 System Analysis

5.3.1 Six Element Analysis

Process	Six Element Analysis					
	Human	**Non-Computer Hardware**	**Computing Hardware**	**Software**	**Database**	**Communication and Network**
Login	Users: Users and Approvers need to login the system before they can do anything	Pen and Paper to keep track	Desktops, Laptops, Smartphones	Web Browser, Microsoft PowerApps, SharePoint, and Excel: To access data from Excel to SharePoint and then have the data also show in PowerApps	BAT Database: Fetch User Data	BAT LAN and Email: For work and communication
Search Items	Users: User can search items from stored data	Pen and Paper to keep track	Desktops, Laptops, Smartphones	Web Browser, Microsoft PowerApps, SharePoint, and Excel: To access data from Excel to SharePoint and then have the data also show in PowerApps	BAT Database: Fetch items	BAT LAN and Email: For work and communication
Place Order and Edit	Users: Users can place order and edit the request	Pen and Paper to keep track	Desktops, Laptops, Smartphones	Web Browser, Microsoft PowerApps, SharePoint, and Excel: To access data from Excel to SharePoint and then have the data also show in PowerApps	BAT Database: Fetch data and store input data	BAT LAN and Email: For work and communication
Approval Button	Admin: Approvers can click	Pen and Paper to keep track	Desktops, Laptops, Smartphones	Web Browser, Microsoft PowerApps, SharePoint, and Excel: To access data from Excel to SharePoint and then have the data also show in PowerApps	BAT Database: Fetch data	BAT LAN and Email: For work and communication
Delete Request	Admin: Approver can delete stored request	Pen and Paper to keep track	Desktops, Laptops, Smartphones	Web Browser, Microsoft PowerApps, SharePoint, and Excel: To access data from Excel to SharePoint and then have the data also show in PowerApps	BAT Database: Delete user document	BAT LAN and Email: For work and communication

Figure 5.3.1 Six Element

5.3.2 Feasibility Analysis

Feasibility study is one the most important phases for any requirement analysis model and it determines if the proposed system is worth it. The focus of this study is to check if the system contributes to the organizational objectives, if the system can be integrated with other systems used by them and if the system can be created using current technology and with the given budget. If the system is acceptable to the management, then it will be used to examine the feasibility of the system. They are categorized as such, Technical Feasibility, Legal Feasibility, Economic Feasibility and Operational Feasibility.

Technical Feasibility - Technically, this system is secure and easy to use. It doesn't require expensive hardware but only a secure software system. The system of the approval is also made easy as they just need to click on approval button, which they will receive in their email address.
Legal Feasibility – This system only requires one to have license to Microsoft software.
Economic Feasibility – Usually, it is hard to keep track of every single person who worked for the company. Therefore, this system will help keep track of the people and how much money is being given out for the work. The system will also make it impossible for the user to place extra money or any extra maintenance fee which was a problem. Therefore, the system fixes the problem of paying twice for the same work.
Operational Feasibility – This system helps solve problems of keeping exact track of costing and maintenance system from a manual (using paper) to a more automated system and have it stored in a safe database. This system will help companies have a more organized track of everything related to costs to the number of people they have worked with. It is especially perfect for companies who outsource their resources.

5.3.3 Problem Solution Analysis

For Microsoft PowerApps-

During the development stage, I had encountered a communication issue with the client. The concept was done in a short briefing period but due to the communication issue, the client couldn't properly convey the needs for the application. It was also hard to have the client due to time constraints. The timing didn't match with each other hence it took time to gather all the needed information. Once we were able to communicate properly, we were able to come up with a plan to execute the application. Some of the problems that we faced were:

The client had a vision when we initially started the project, the ideas were very simple, but I had to make sure that the system was made easy and efficient for the client and the user. The difficult part was coming up with an idea that would make the system very secure for the company as the client did not want to have the user access it from anywhere else other than the company network. Therefore, we decided on the kind of software we needed to use in order to meet the requirement of the client. The decision was to use PowerApps, as it was the most used application for the company. It was also very useful since PowerApps was not compatible with external system and it only runs on PowerApps App Player. Power Apps created for the use of inside a company, that can be shared with external users outside of the organization as well. External users require the same licensing as internal users but there is a different method to set them up vs. internal users. According to the developers, PowerApps is fully encrypted. Power Apps do not provide users with access to any data assets that they don't already have access to. Users should only have access to data that they really require access to. Network Access control policies can also apply to Power Apps and Power Automate, which makes it secure.

The client also wanted to make sure that the system was professional in terms of the UI/UX of the application. It was a requirement that needed to be fulfilled, there I had to do a lot of research on the type of professional applications that were already made using PowerApps. The research opened my eyes to a lot of options but as PowerApps has design limitations, they end up looking the same. This was a huge challenge personally, since it was made important to make it look as professional looking as possible even with the design limitations on the application.

As for the part of the initial stage, the client wanted to add negotiation option for the user as they were allowed to create a new request if they initial request was rejected. That was a brain-scratcher moment, where I couldn’t add a communication tab. This was necessary as it would save a lot of time for the user and approver to have the approval on time. So, we decided to add a chat box option where the user can chat with the approvers. It has not been confirmed yet by the client hence we have not been able to implement it just yet.

According to the client’s requirement, the client wanted a specific amount of money request to be sent to a specific approver. That means that if the total amount would mound up to 1lac Taka, then it would need to be approved by a Approver 1. If the total sums up to 10lac Taka, then it would need to be approved by approver 2. And if the total summed up to 50lac Taka,

then it would need the approval from Approval 3. Each Approver played an important role on the approval portion therefore, the last approver would be the Approver 3 (Head of the Department). The client did not approve this portion of the system just yet, so we did not implement it yet.

The client required an easy way to make the approval for the request. We put a lot of thought into it and decided to go with email. This means that the approval request will automatically be sent through email. Using this method is a good option because the approver could be anywhere in the country or the world, and since email can be access from anywhere in the world, the approver does not need to be physically present at the office to be able to make the approval.

Upon the request on the client, we needed to figure out a way to give a single red line on the requests that has been cancelled and show the new request beside it. This is very tricky as PowerApps has limited functionality. We are trying to figure out a way to implement it in the system.

For Microsoft Power BI-

During the learning phrase of this application, it was difficult to understand how to mathematically figure out ways to calculate and showcase. After many attempts, I was finally able to create a dashboard that was useful for the line manager to use. It took a lot of questioning to figure out how they calculate values, as the calculations weren't as straight forward.

5.3.4 Effect and Constraints Analysis

The system allows the manual data to be automated, which saves paper and time. But since the client have not confirmed the other two important features of the application: the approval intervals and the chat box. Once the client confirms these two features, then we will be able to implement them into the system. We hope to add some extra features depending on the user's using capability. Since the current system is a service for building and using custom business apps that connect to your data and work across the web and mobile - without the time and expense of custom software development, this system is being made to make the system user friendly for everyone.

5.4 System Design

5.4.1 UML Diagrams

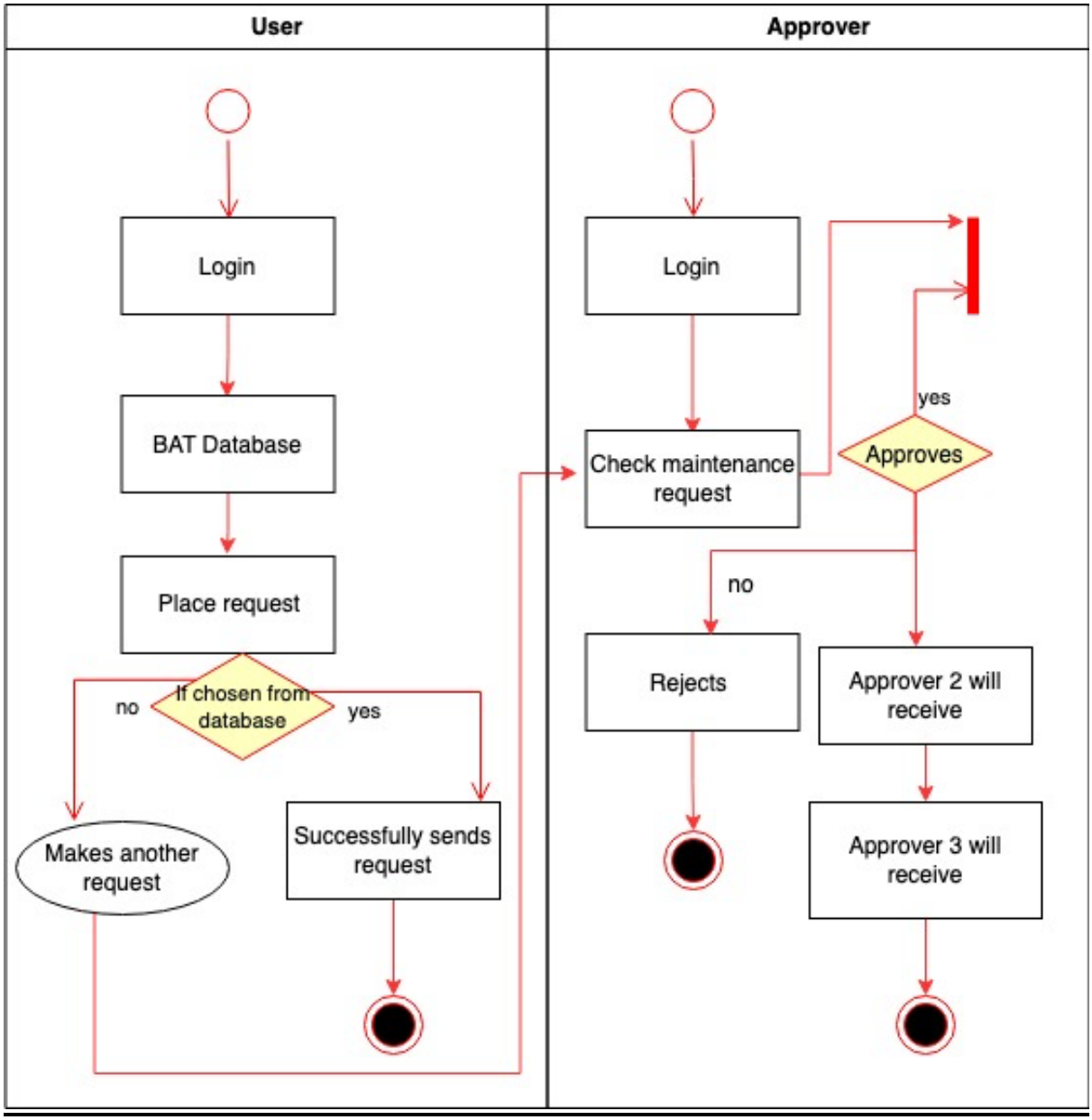


Figure 5.4.2 UML Diagram

5.4.2 Architecture

"Techtrioz" doesn't have a proper architecture.

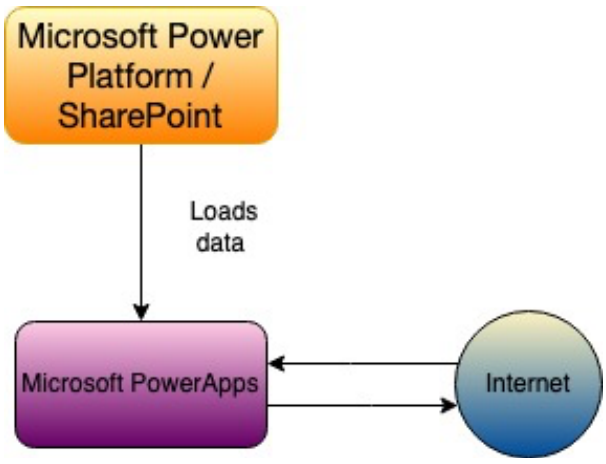


Figure 5.4.2 Architecture of the system

5.4.3 Use Case Diagram

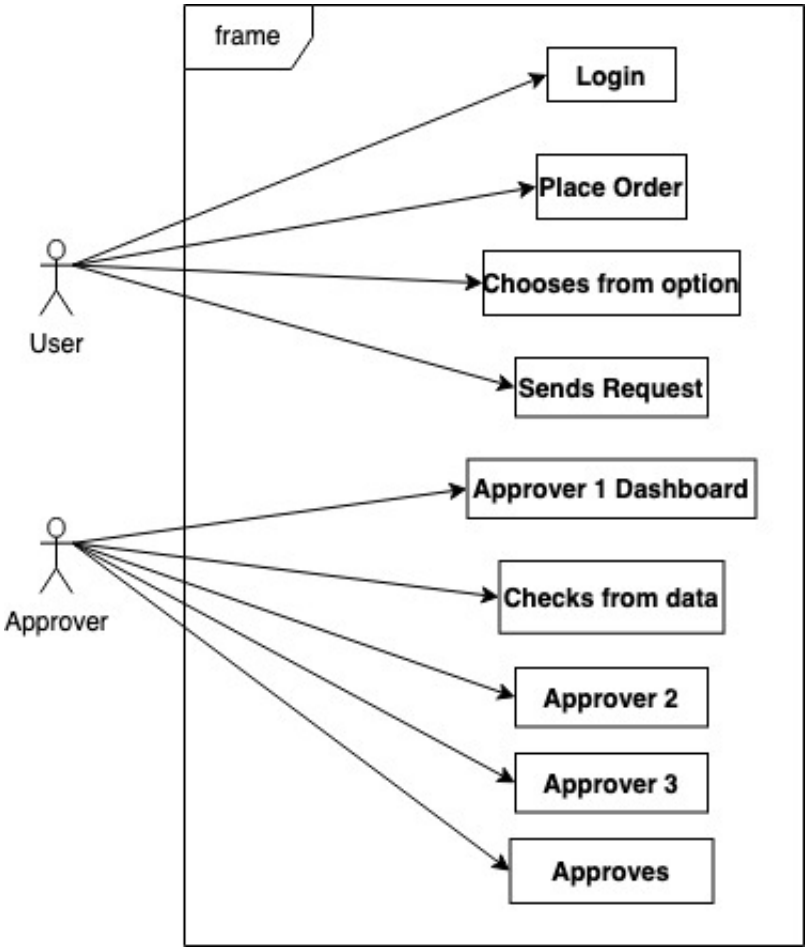


Figure 5.4.3 User Action

5.5 Implementation

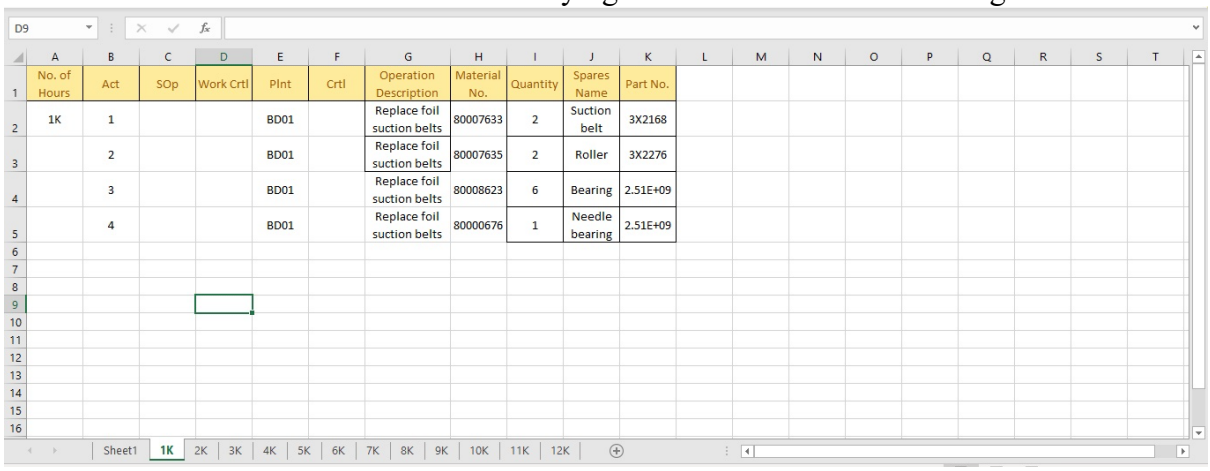
The implementation stage for PowerApps, required analyzing and sorting data. All the previous versions of the beginning stage of learning PowerApps is on the organization's laptop, and I have lost the data since I have completed my internship. So here are some of the testing phrases of data sorting and analyzing for PowerApps application.

5.6 Testing

The testing applications for Microsoft PowerApps are in the company's network that I no longer have access, but I will add the testing of data sorting. And I have a screenshot of the first dashboard that I created in Microsoft PowerApps. I do have some testing screenshots of the Microsoft Power BI application.

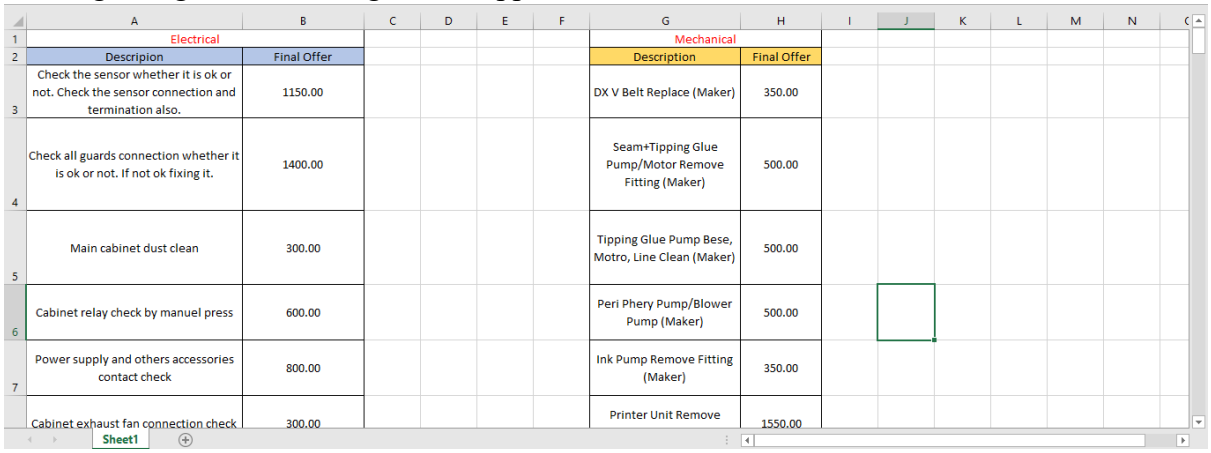
5.6.1 Input

I was learning to use Microsoft Excel to entry data and how to pull data from one excel file to another. I have learned a few tricks while trying to do this data sort for the organization.



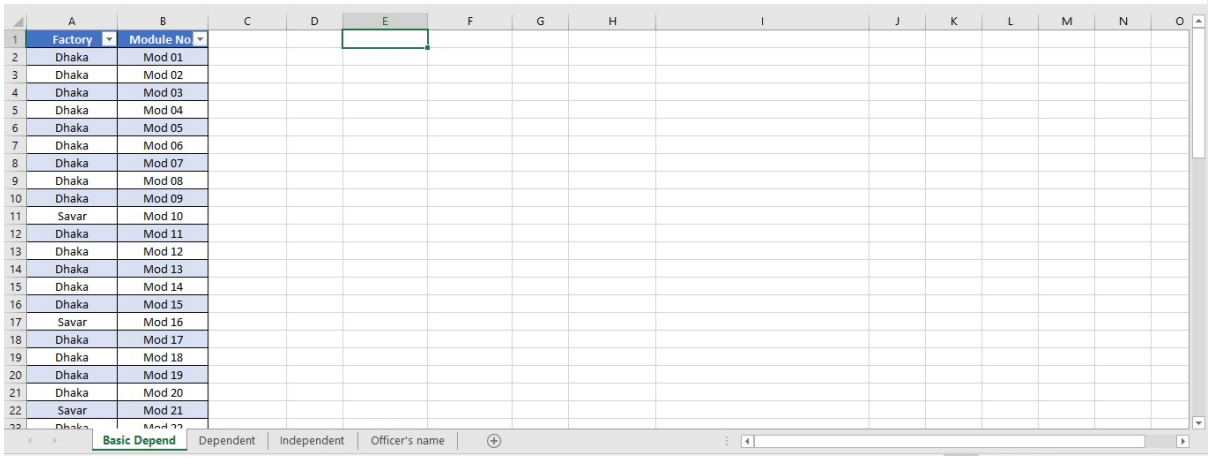
No. of Hours	Act	SOp	Work Crtl	PInt	Crtl	Operation Description	Material No.	Quantity	Spares Name	Part No.
1K	1			BD01		Replace foil suction belts	80007633	2	Suction belt	3X2168
	2			BD01		Replace foil suction belts	80007635	2	Roller	3X2276
	3			BD01		Replace foil suction belts	80008623	6	Bearing	2.51E+09
	4			BD01		Replace foil suction belts	80000676	1	Needle bearing	2.51E+09

The beginning of data sorting for the application.



Electrical		Mechanical	
Description	Final Offer	Description	Final Offer
Check the sensor whether it is ok or not. Check the sensor connection and termination also.	1150.00	DX V Belt Replace (Maker)	350.00
Check all guards connection whether it is ok or not. If not ok fixing it.	1400.00	Seam+Tipping Glue Pump/Motor Remove Fitting (Maker)	500.00
Main cabinet dust clean	300.00	Tipping Glue Pump Bese, Motro, Line Clean (Maker)	500.00
Cabinet relay check by manuel press	600.00	Peri Phery Pump/Blower Pump (Maker)	500.00
Power supply and others accessories contact check	800.00	Ink Pump Remove Fitting (Maker)	350.00
Cabinet exhaust fan connection check	300.00	Printer Unit Remove	1550.00

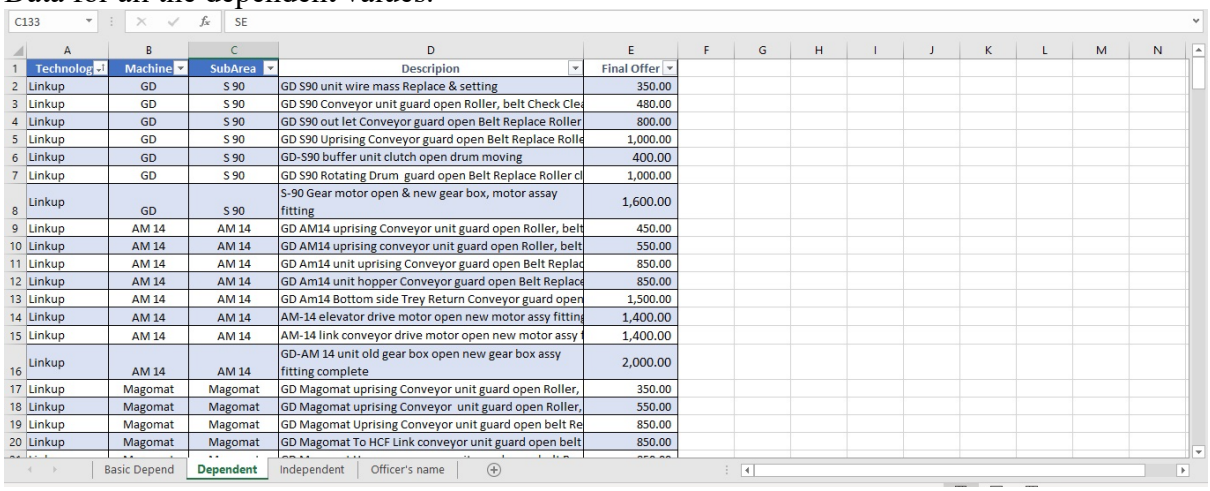
The main data sort that I have implemented in the application.



Factory	Module No
Dhaka	Mod 01
Dhaka	Mod 02
Dhaka	Mod 03
Dhaka	Mod 04
Dhaka	Mod 05
Dhaka	Mod 06
Dhaka	Mod 07
Dhaka	Mod 08
Dhaka	Mod 09
Savar	Mod 10
Dhaka	Mod 11
Dhaka	Mod 12
Dhaka	Mod 13
Dhaka	Mod 14
Dhaka	Mod 15
Savar	Mod 16
Dhaka	Mod 17
Dhaka	Mod 18
Dhaka	Mod 19
Dhaka	Mod 20
Savar	Mod 21

Basic Depend | Dependent | Independent | Officer's name

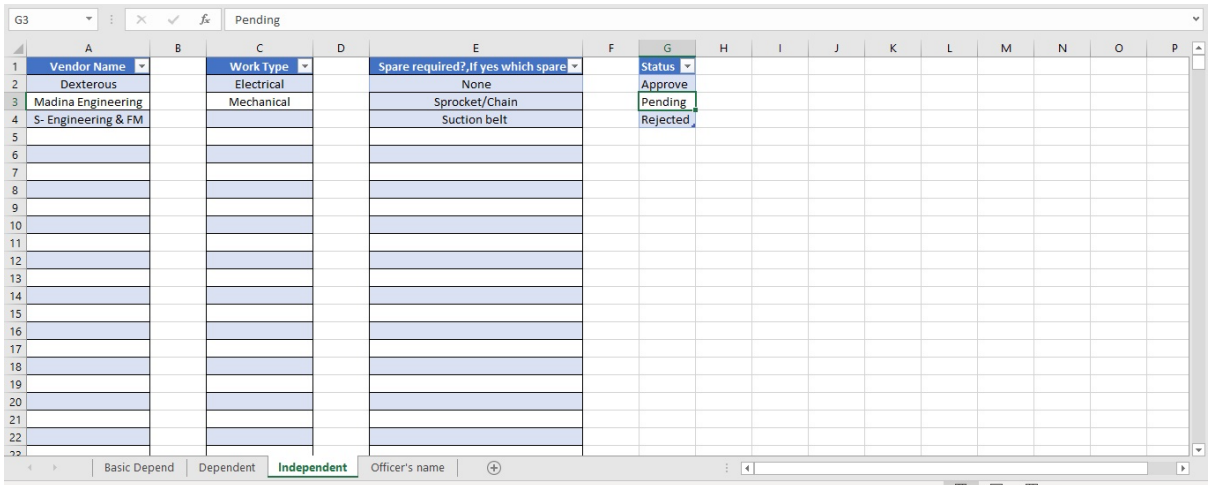
Data for all the dependent values.



Technolog	Machine	SubArea	Descripion	Final Offer
Linkup	GD	S 90	GD S90 unit wire mass Replace & setting	350.00
Linkup	GD	S 90	GD S90 Conveyor unit guard open Roller, belt Check Clea	480.00
Linkup	GD	S 90	GD S90 out let Conveyor guard open Belt Replace Roller	800.00
Linkup	GD	S 90	GD S90 Uprising Conveyor guard open Belt Replace Rolle	1,000.00
Linkup	GD	S 90	GD-S90 buffer unit clutch open drum moving	400.00
Linkup	GD	S 90	GD S90 Rotating Drum guard open Belt Replace Roller cl	1,000.00
Linkup	GD	S 90	S-90 Gear motor open & new gear box, motor assay fitting	1,600.00
Linkup	AM 14	AM 14	GD AM14 uprising Conveyor unit guard open Roller, belt	450.00
Linkup	AM 14	AM 14	GD AM14 uprising conveyor unit guard open Roller, belt	550.00
Linkup	AM 14	AM 14	GD Am14 unit uprising Conveyor guard open Belt Replac	850.00
Linkup	AM 14	AM 14	GD Am14 unit hopper Conveyor guard open Belt Replace	850.00
Linkup	AM 14	AM 14	GD Am14 Bottom side Trey Return Conveyor guard open	1,500.00
Linkup	AM 14	AM 14	AM-14 elevator drive motor open new motor assy fitting	1,400.00
Linkup	AM 14	AM 14	AM-14 link conveyor drive motor open new motor assy f	1,400.00
Linkup	AM 14	AM 14	GD-AM 14 unit old gear box open new gear box assy fitting complete	2,000.00
Linkup	Magomat	Magomat	GD Magomat uprising Conveyor unit guard open Roller,	350.00
Linkup	Magomat	Magomat	GD Magomat uprising Conveyor unit guard open Roller,	550.00
Linkup	Magomat	Magomat	GD Magomat Uprising Conveyor unit guard open belt Re	850.00
Linkup	Magomat	Magomat	GD Magomat To HCF Link conveyor unit guard open belt	850.00

Basic Depend | Dependent | Independent | Officer's name

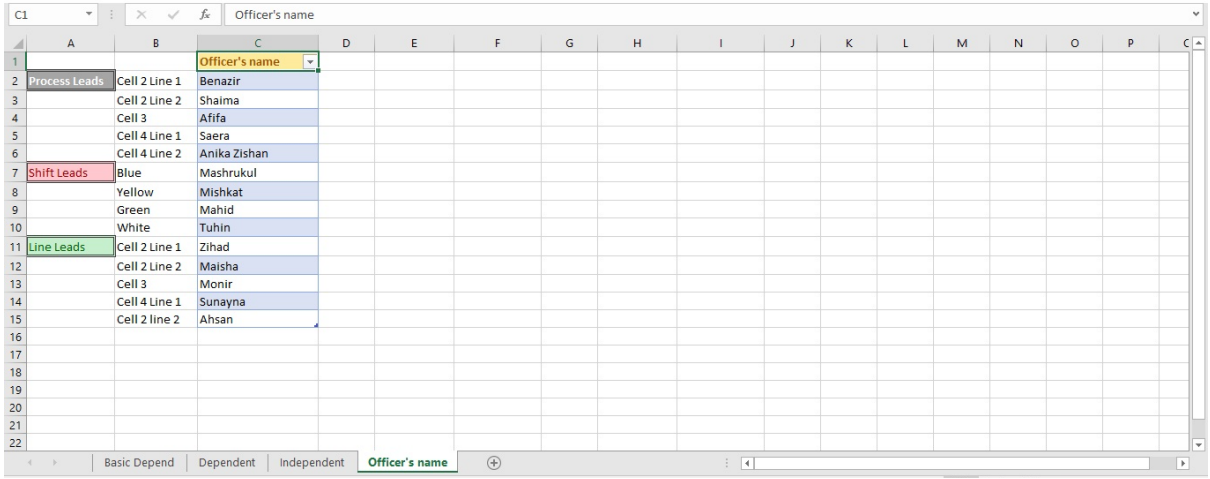
These are the independent data that can be chosen at any time and they don't depend on any other set of data.



Vendor Name	Work Type	Spare required?,If yes which spare	Status
Dexterous	Electrical	None	Approve
Madina Engineering	Mechanical	Sprocket/Chain	Pending
S- Engineering & FM		Suction belt	Rejected

Basic Depend | Dependent | Independent | Officer's name

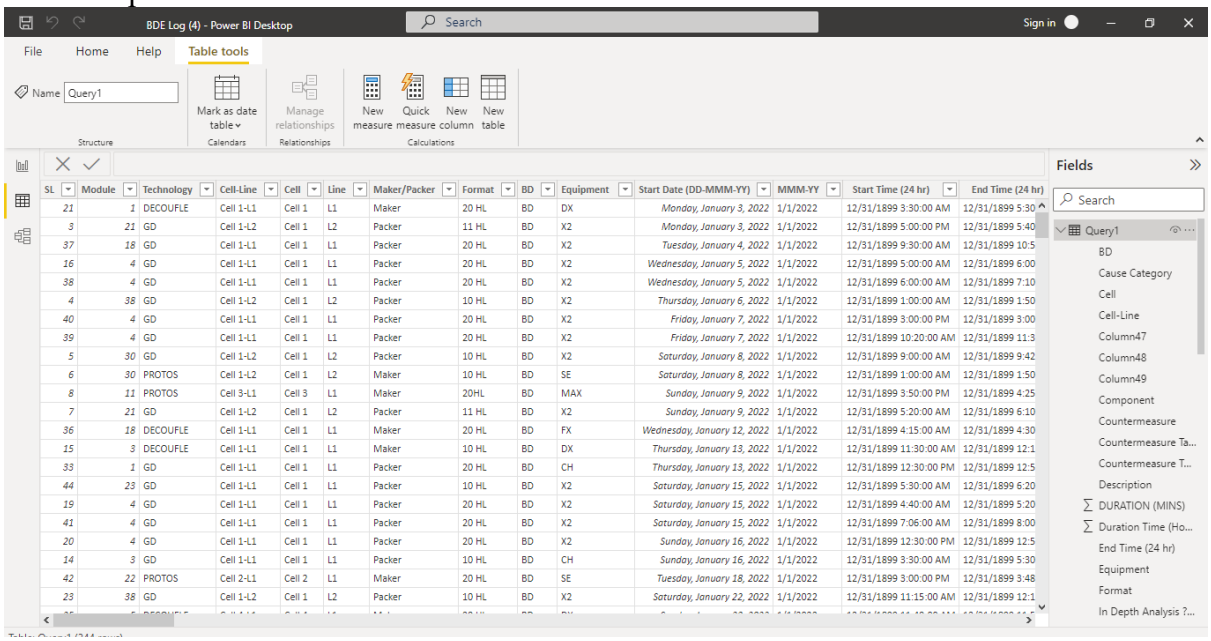
The other independent data that has to be chosen by the user as they officer's shift may vary or change.



	A	B	C
1			Officer's name
2	Process Leads	Cell 2 Line 1	Benazir
3		Cell 2 Line 2	Shaima
4		Cell 3	Afifa
5		Cell 4 Line 1	Saera
6		Cell 4 Line 2	Anika Zishan
7	Shift Leads	Blue	Mashrukul
8		Yellow	Mishkat
9		Green	Mahid
10		White	Tuhin
11	Line Leads	Cell 2 Line 1	Zihad
12		Cell 2 Line 2	Maisha
13		Cell 3	Monir
14		Cell 4 Line 1	Sunayna
15		Cell 2 line 2	Ahsan

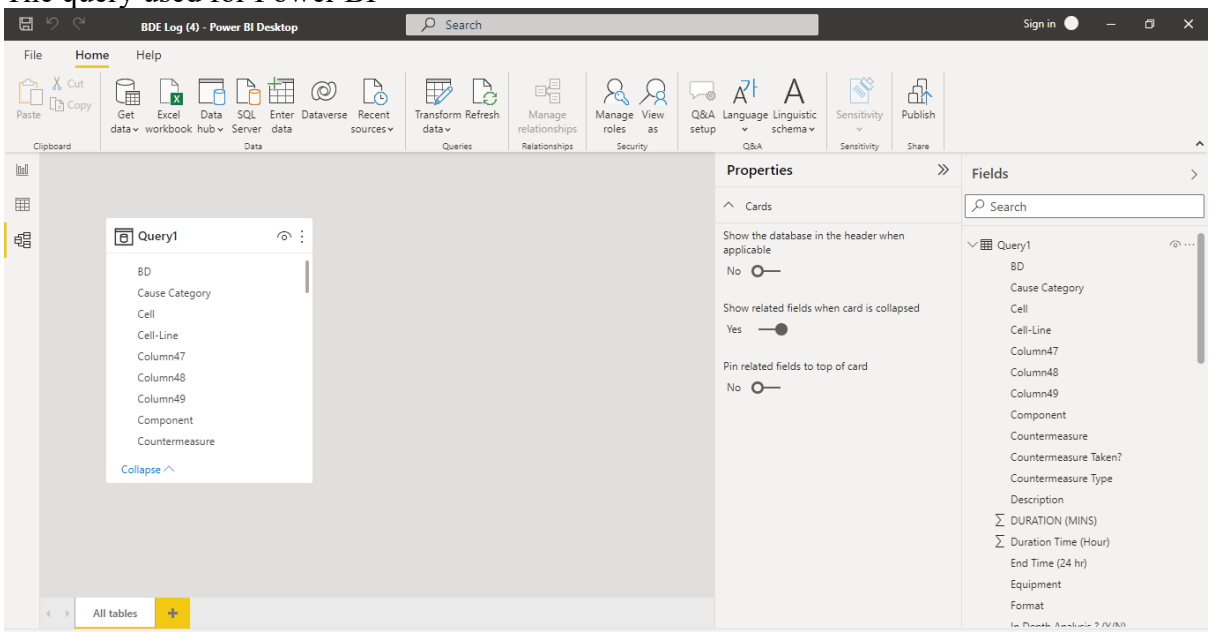
Basic Depend | Dependent | Independent | Officer's name

For the input for Microsoft Power BI-



SL	Module	Technology	Cell-Line	Cell	Line	Maker/Packer	Format	BD	Equipment	Start Date (DD-MMM-YY)	MMM-YY	Start Time (24 hr)	End Time (24 hr)
21	1	DECOUFLE	Cell 1-L1	Cell 1	L1	Maker	20 HL	BD	DX	Monday, January 3, 2022	1/1/2022	12/31/1899 3:30:00 AM	12/31/1899 5:30
3	21	GD	Cell 1-L2	Cell 1	L2	Packer	11 HL	BD	X2	Monday, January 3, 2022	1/1/2022	12/31/1899 5:00:00 PM	12/31/1899 5:40
37	18	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Tuesday, January 4, 2022	1/1/2022	12/31/1899 9:30:00 AM	12/31/1899 10:5
16	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Wednesday, January 5, 2022	1/1/2022	12/31/1899 5:00:00 AM	12/31/1899 6:00
38	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Wednesday, January 5, 2022	1/1/2022	12/31/1899 6:00:00 AM	12/31/1899 7:10
4	38	GD	Cell 1-L2	Cell 1	L2	Packer	10 HL	BD	X2	Thursday, January 6, 2022	1/1/2022	12/31/1899 1:00:00 AM	12/31/1899 1:50
40	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Friday, January 7, 2022	1/1/2022	12/31/1899 3:00:00 PM	12/31/1899 3:00
39	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Friday, January 7, 2022	1/1/2022	12/31/1899 10:20:00 AM	12/31/1899 11:3
5	30	GD	Cell 1-L2	Cell 1	L2	Packer	10 HL	BD	X2	Saturday, January 8, 2022	1/1/2022	12/31/1899 9:00:00 AM	12/31/1899 9:42
6	30	PROTOS	Cell 1-L2	Cell 1	L2	Maker	10 HL	BD	SE	Saturday, January 8, 2022	1/1/2022	12/31/1899 1:00:00 AM	12/31/1899 1:50
8	11	PROTOS	Cell 3-L1	Cell 3	L1	Maker	20HL	BD	MAX	Sunday, January 9, 2022	1/1/2022	12/31/1899 3:50:00 PM	12/31/1899 4:25
7	21	GD	Cell 1-L2	Cell 1	L2	Packer	11 HL	BD	X2	Sunday, January 9, 2022	1/1/2022	12/31/1899 5:20:00 AM	12/31/1899 6:10
36	18	DECOUFLE	Cell 1-L1	Cell 1	L1	Maker	20 HL	BD	FX	Wednesday, January 12, 2022	1/1/2022	12/31/1899 4:15:00 AM	12/31/1899 4:30
15	3	DECOUFLE	Cell 1-L1	Cell 1	L1	Maker	10 HL	BD	DX	Thursday, January 13, 2022	1/1/2022	12/31/1899 11:30:00 AM	12/31/1899 12:1
33	1	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	CH	Thursday, January 13, 2022	1/1/2022	12/31/1899 12:30:00 PM	12/31/1899 12:5
44	23	GD	Cell 1-L1	Cell 1	L1	Packer	10 HL	BD	X2	Saturday, January 15, 2022	1/1/2022	12/31/1899 5:30:00 AM	12/31/1899 6:20
19	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Saturday, January 15, 2022	1/1/2022	12/31/1899 4:40:00 AM	12/31/1899 5:20
41	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Saturday, January 15, 2022	1/1/2022	12/31/1899 7:06:00 AM	12/31/1899 8:00
20	4	GD	Cell 1-L1	Cell 1	L1	Packer	20 HL	BD	X2	Sunday, January 16, 2022	1/1/2022	12/31/1899 12:30:00 PM	12/31/1899 12:5
14	3	GD	Cell 1-L1	Cell 1	L1	Packer	10 HL	BD	CH	Sunday, January 16, 2022	1/1/2022	12/31/1899 3:30:00 AM	12/31/1899 5:30
42	22	PROTOS	Cell 2-L1	Cell 2	L1	Maker	20 HL	BD	SE	Tuesday, January 18, 2022	1/1/2022	12/31/1899 3:00:00 PM	12/31/1899 3:48
23	38	GD	Cell 1-L2	Cell 1	L2	Packer	10 HL	BD	X2	Saturday, January 22, 2022	1/1/2022	12/31/1899 11:15:00 AM	12/31/1899 12:1

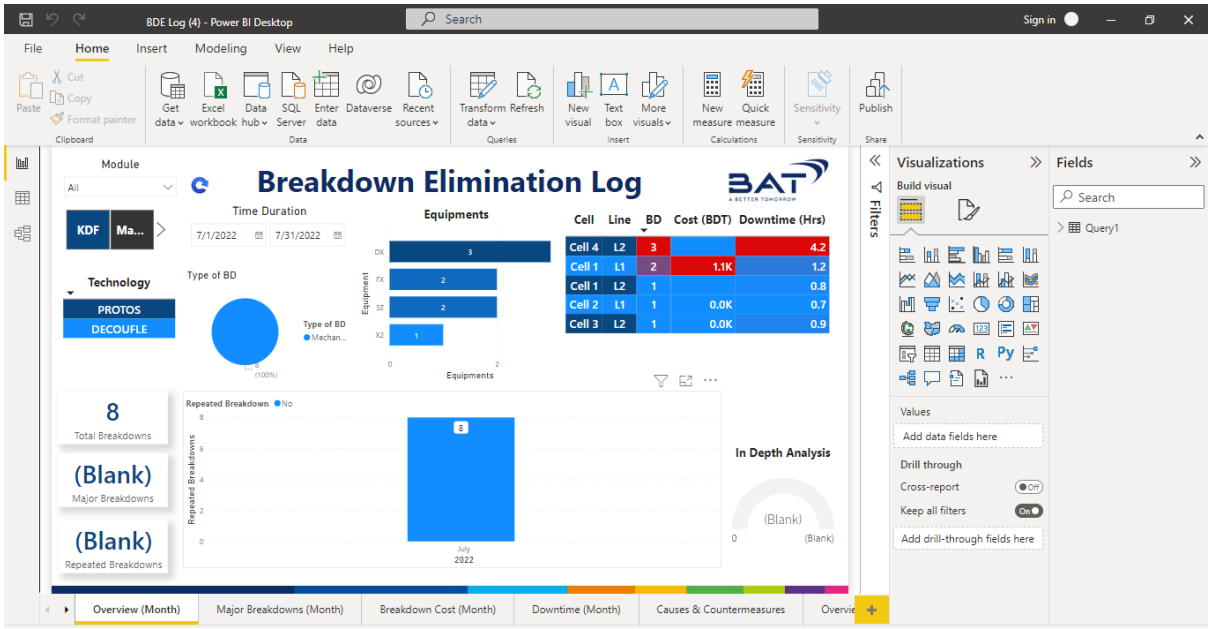
The query used for Power BI



5.6.2 Output

For Microsoft PowerApps, I lost the previous data of the testing phrase.

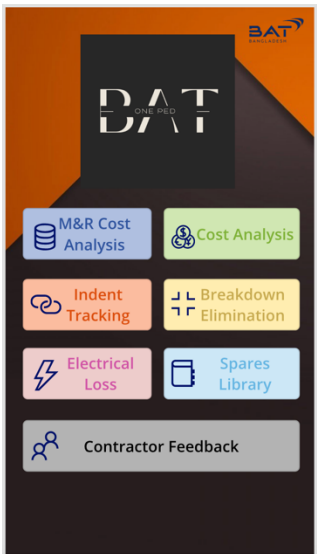
For Microsoft Power BI as follows:



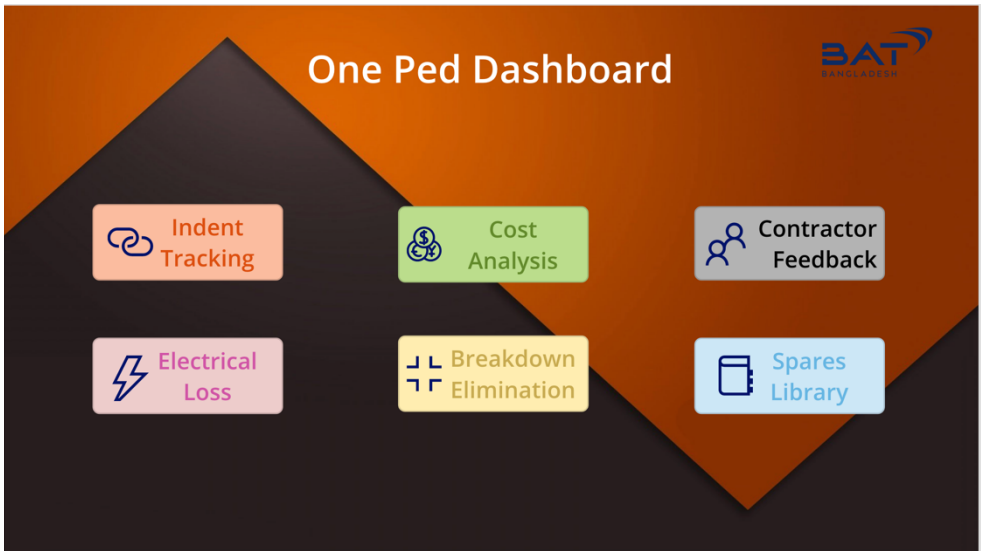
5.6.3 Designing Test Cases

The design phrase for the test case for Microsoft PowerApps, a dashboard. They needed a more professional looking dashboard. For Microsoft PowerApps:-

Mobile layout

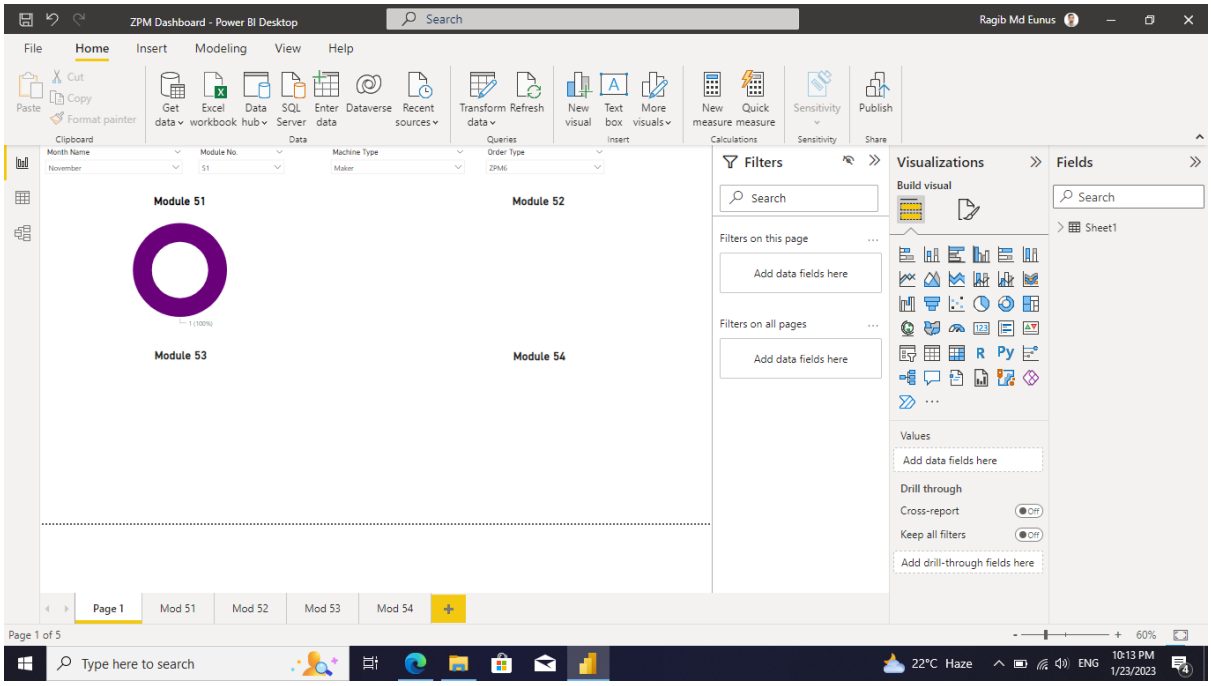


Tablet layout

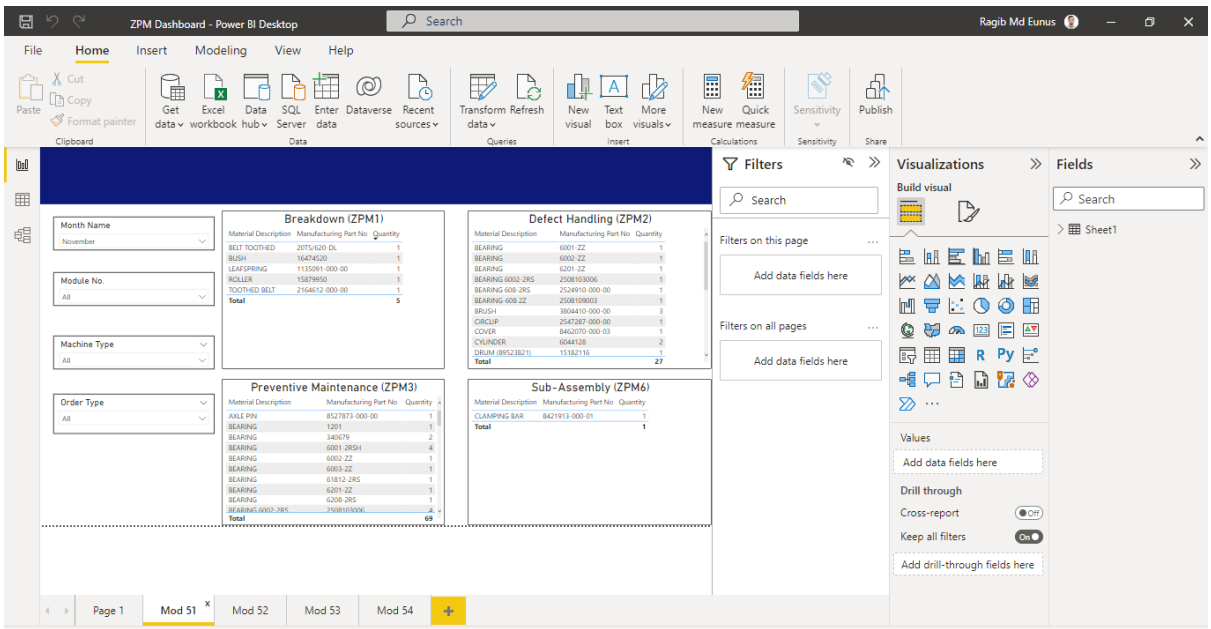


The output of the Microsoft Power BI, as the final product of sorting and analyzing the previous data. For Microsoft Power BI:-

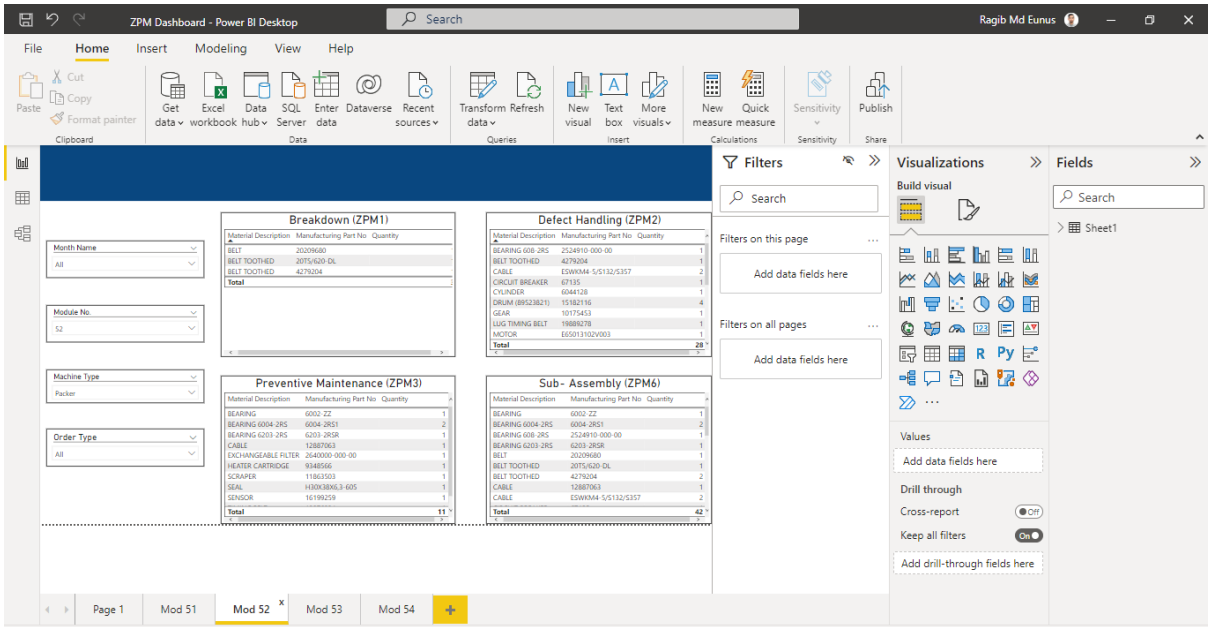
The output of Power BI testing phrase- it was for the Savar factory data set:-
The dashboard for overviewing purpose:



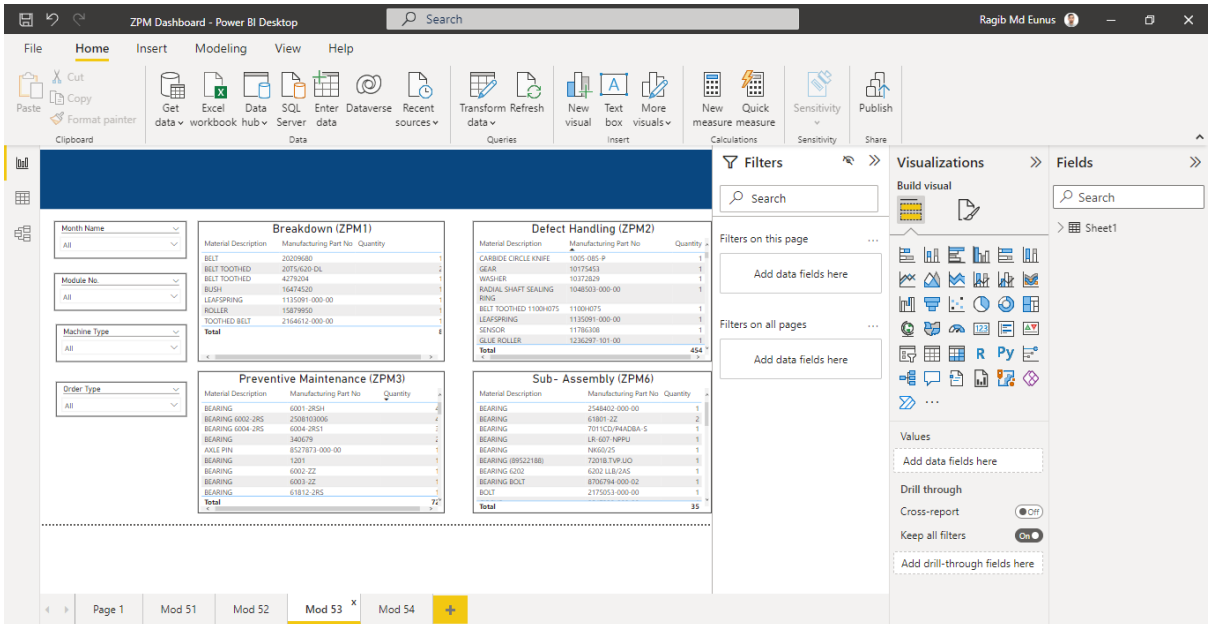
This page is for the Module 51



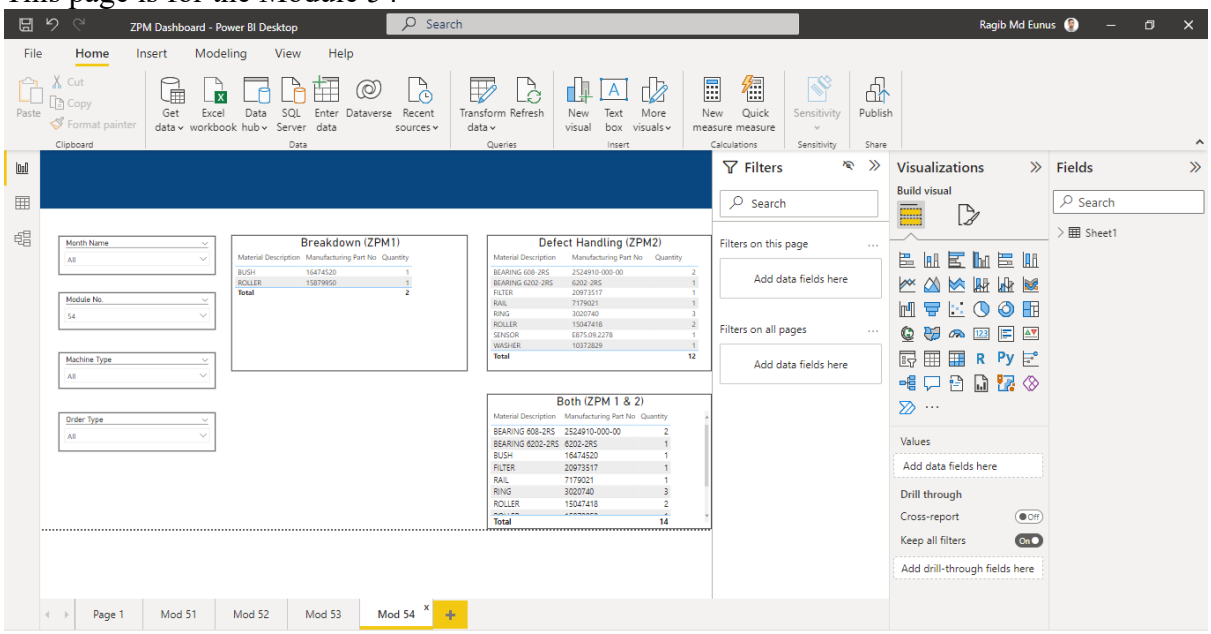
This page is for the Module 52



This page is for the Module 53

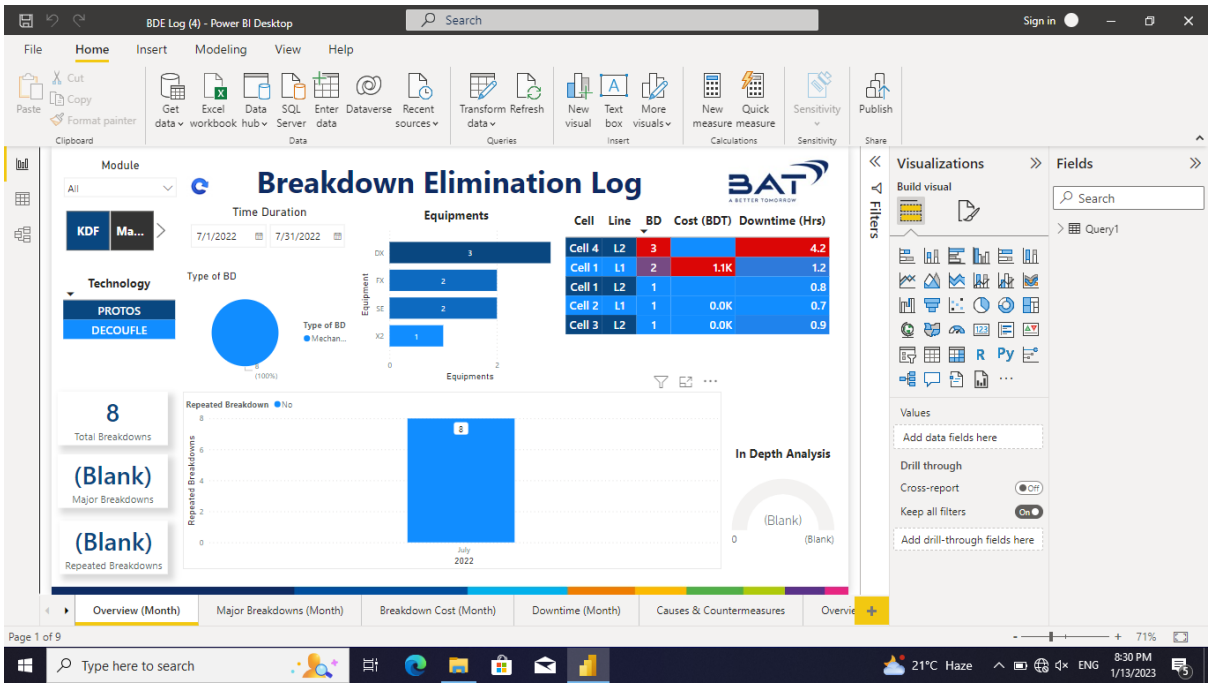


This page is for the Module 54



5.6.4 Test Results

After a lot of testing and playing around with different set of data, I was able to create this dashboard using Microsoft Power BI.



This was later used to analyze breakdown in general, the cost the breakdown required, the downtime of the breakdown for each module. The values change according to the ‘Module’, ‘Technology’, ‘Time Duration’, and ‘Machine’.

Chapter 6

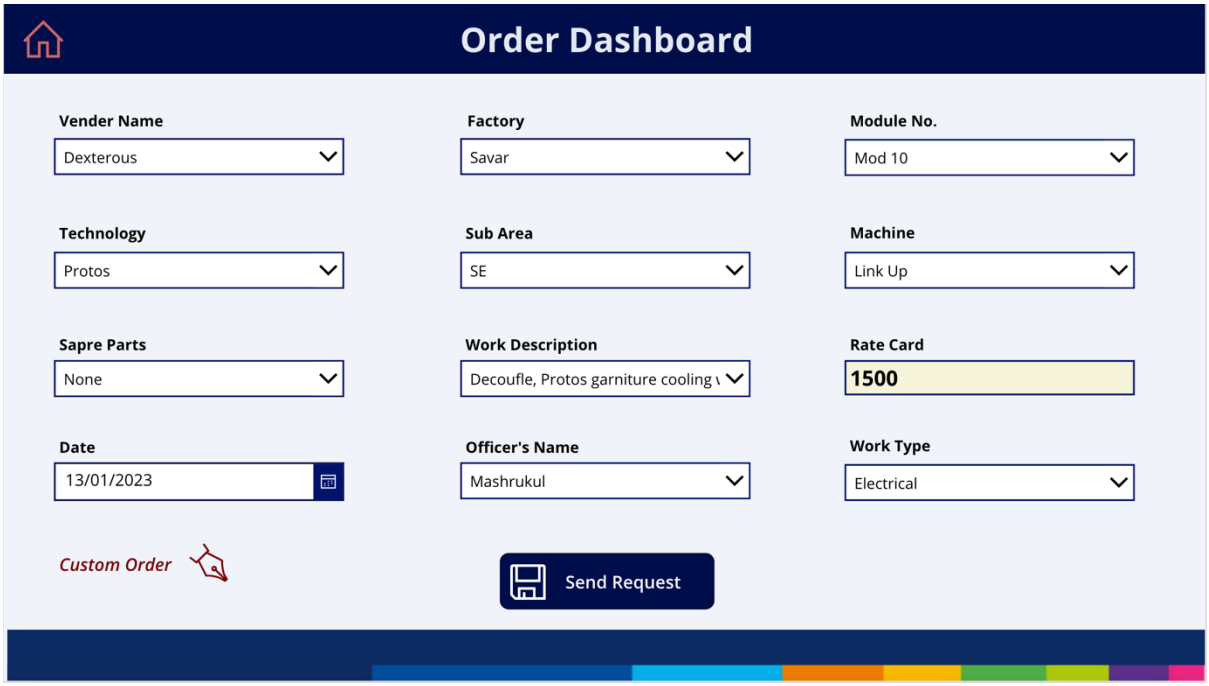
Results & Analysis

We had a specific goal in mind while working on this project, we wanted to create an application that would be effective for keeping track of expenses related to maintenance. However, due to time constrain, lack of data and restrictions of the application, we were not able to add few features to the application.

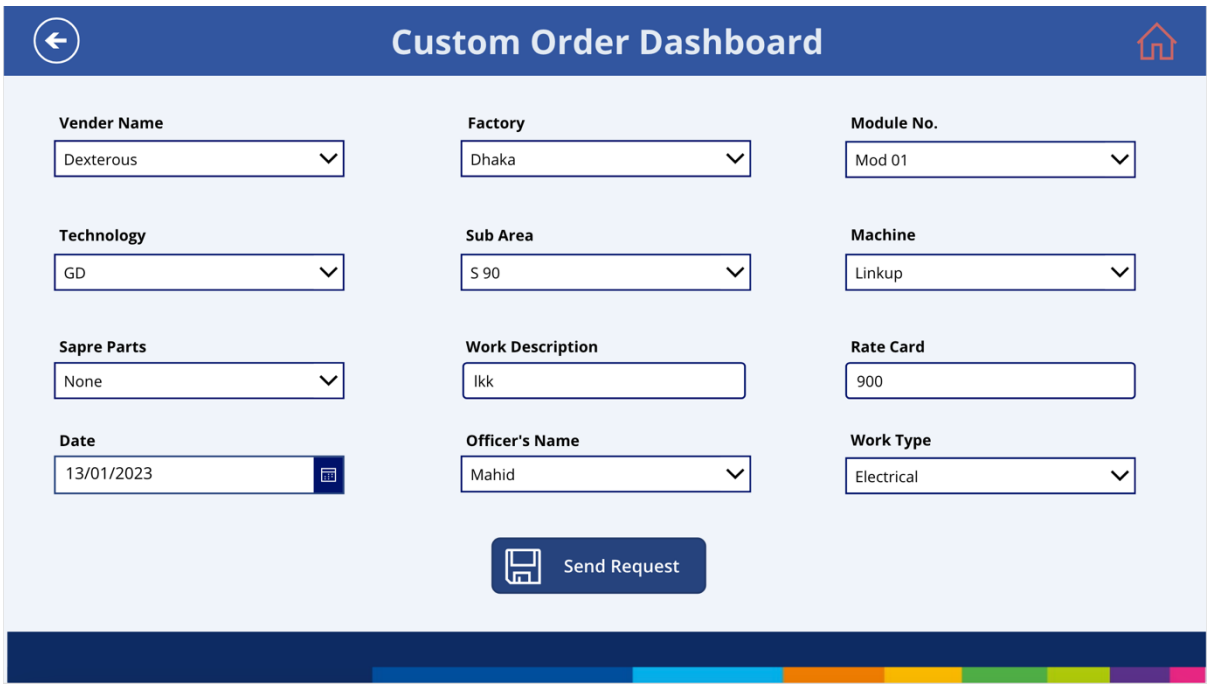
The application Dashboard



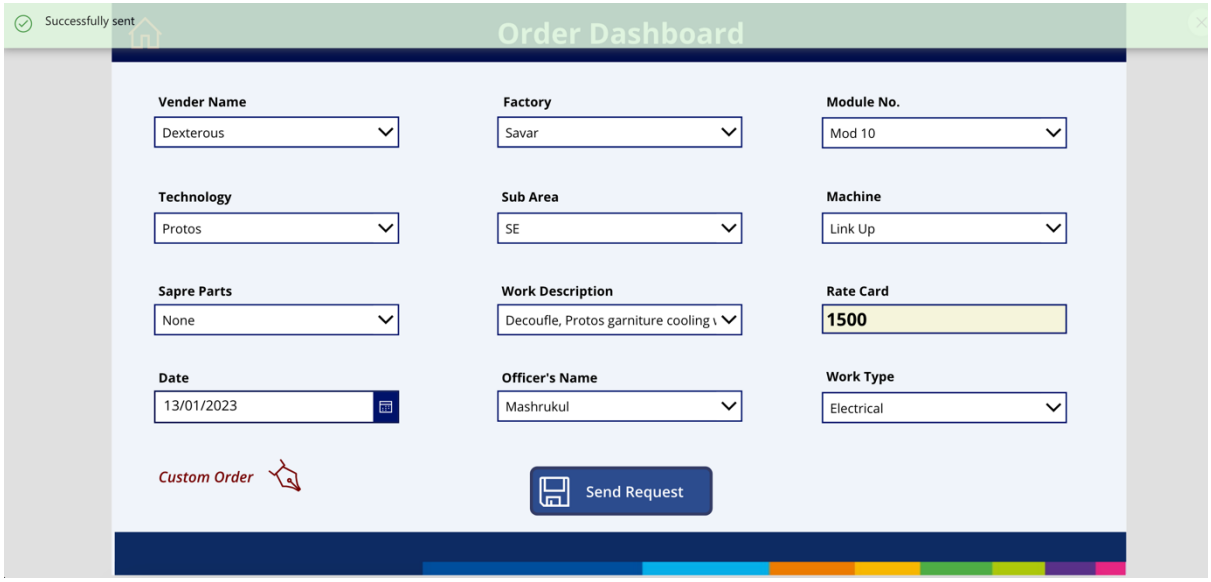
Place Request (order request page)



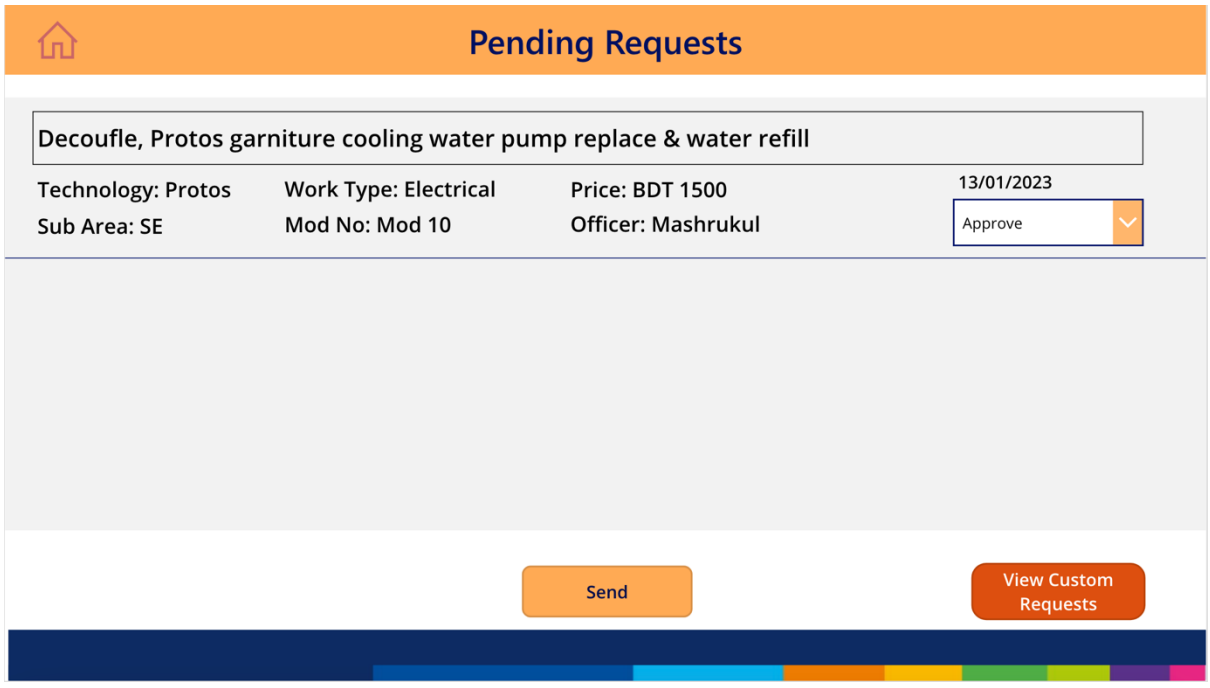
Custom Order Request (custom order page)



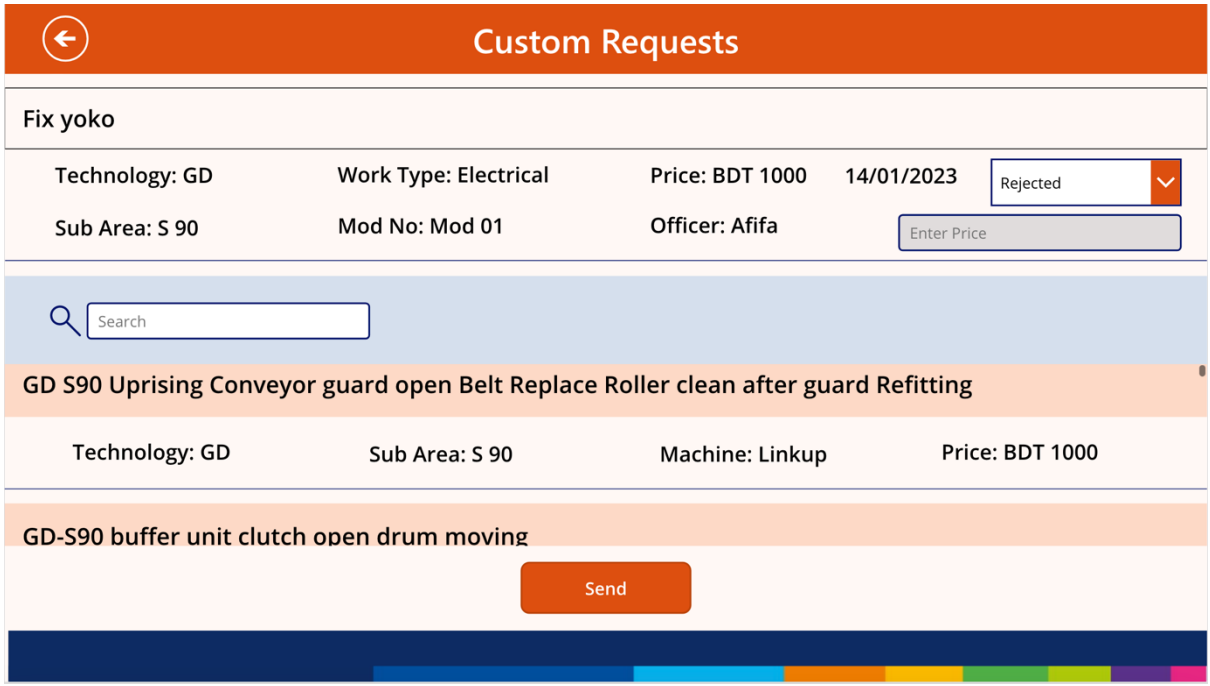
Order Request successfully sent notification



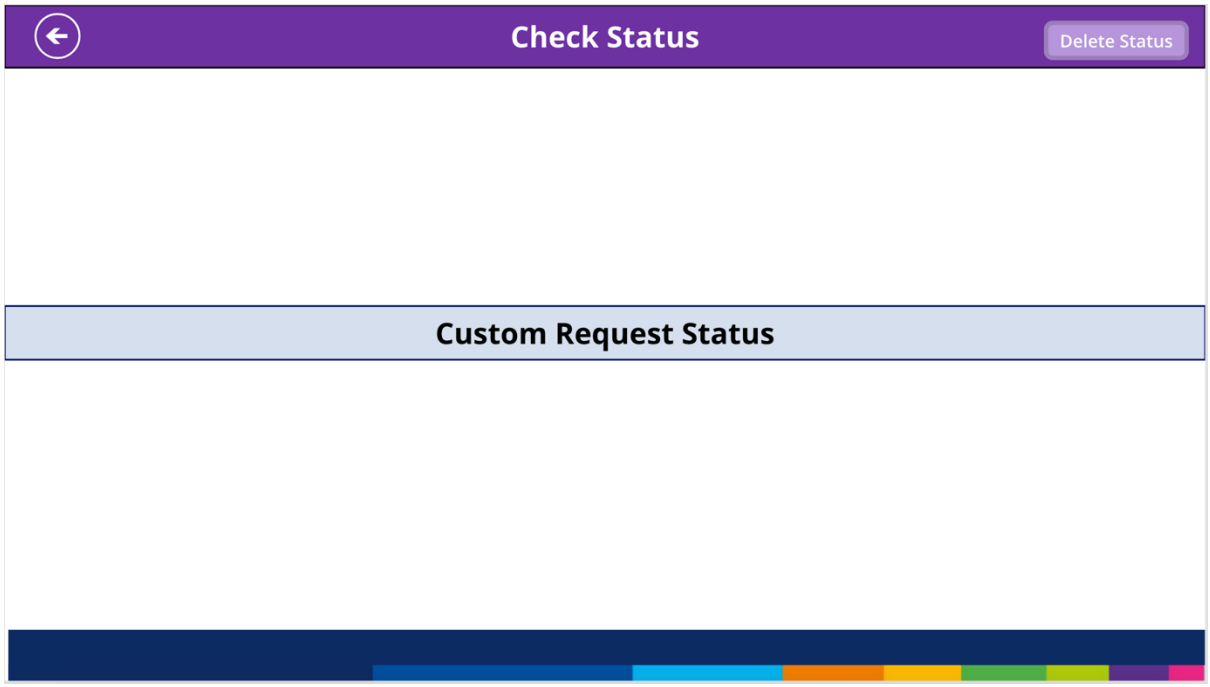
Pending Request Dashboard



Custom Pending Requests



Status Dashboard

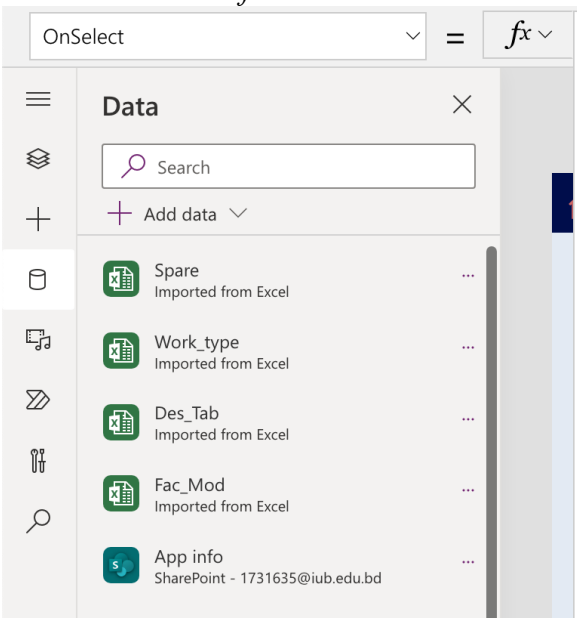


Low-codes for the application

For users to absolutely choose a vender or else, the 'send' button would not work

```
DisplayMode = fx If(vendor.Selected.'Vendor Name'="None",Disabled,Edit)
```

Send button codes for order collection




```
Collect(
    orderCollect,
    {
        Col_Title: vendor.Selected,
        Col_WorkType: WType.Selected,
        Col_Fac:factory.Selected,
        Col_ModuleNo: moduleNo.Selected,
        Col_Technology: tech.Selected,
        Col_SubArea: sub_Area.Selected,
        Col_WorkDes: work_Des.Selected,
        Col_SparePart: spare_parts.Selected,
        Col_RateCard: rate_Card.Text,
        Col_Date: DatePicker1.SelectedDate,
        Col_Officer:Offi_Name.Selected
    }
);
Notify("Success",Success)
```

Send button codes for custom order collection

```
Collect(
    customrequestCollect,
    {
        Col_Title: vendor_1.Selected,
        Col_WorkType: WType_1.Selected,
        Col_Fac:factory_1.Selected,
        Col_ModuleNo: moduleNo_1.Selected,
        Col_Technology: tech_1.Selected,
        Col_SubArea: sub_Area_1.Selected,
        Col_WorkDes: workInput.Text,
        Col_SparePart: spare_parts_1.Selected,
        Cus_RateCard: priceInput.Text,
        Col_Date: DatePicker1_1.SelectedDate,
        Col_Officer:Offi_Name_1.Selected
    }
);
Notify("Success",Success)
```

Send button code for status bar collection

```
Collect(
    Statusbar,
    {
        Double click to edit text e: vendor.Selected,
        Col_WorkType: WType.Selected,
        Col_Fac:factory.Selected,
        Col_ModuleNo: moduleNo.Selected,
        Col_Technology: tech.Selected,
        Col_SubArea: sub_Area.Selected,
        Col_WorkDes: work_Des.Selected,
        Col_SparePart: spare_parts.Selected,
        Col_RateCard: P_rateCard.Text,
        Col_Date: DatePicker1.SelectedDate,
        Col_Officer:Offi_Name.Selected,
        Col_Status:Stat.Selected
    }
)
```

Search code

```
Search(Des_Tab,searchInput.Text,"Descripion")
```

Status Collection Code

```
Collect(
    CustomorderStatus,
    {
        Col_WorkType: C_WT.Text,
        Col_ModuleNo: C_Mod.Text,
        Col_Technology: C_tech.Text,
        Col_SubArea: C_Sub.Text,
        Col_WorkDes: C_Desc.Text,
        Col_RateCard: C_NewP.Text,
        Col_Date: C_Date.Text,
        Col_Officer:C_Off.Text,
        Col_Status:Stat.SelectedText,
        Col_oldRateCard: rate_Card.Text
    }
)
```

Final offer price

```
If(Stat_1.Selected.Status="Rejected", true, false)
```

Results:-

These were the results and analysis achieved from the application, although as you can see from the screenshots above, we were able to achieve the requirements of the company as per instructions but due to the system of PowerApps, we were extremely restricted with many functionalities that could've made this application preferable.

Creating this application using PowerApps opened my eyes into the unlimited possibilities of many more application and systems that can be achieved using this application and Microsoft. PowerApps can be utilized with many functionalities like Power BI, Power Automate, PowerPoint and Microsoft Excel to achieve a much greater outlook into analyzing, tracking data, creating charts and much more. It truly is a powerful tool if it is used the way it is meant to be. Microsoft has made analyzing and creating charts easier for large companies like British American Tobacco Bangladesh (BAT) and many other multinational companies who deal with large data sets.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

The main goal of this ***application*** "Techtrioz", was to be able to utilize the application for sustainability for years to come. The system will help keep track of all the record of the financial aspect of the Operations department. This application will be used throughout the Department of Operations for record keeping and data analysis.

Community: Once the application is published for the company to use, it will make it easier for everyone to use it for their own reason. This application will make the user's pain of waiting for days to get approval for the rate card request as now using this application, they will get approval within few hours saving the agony of days. For the Process Engineer, it will become easier to track of the expenditure of the company finance.

Financial: The application is made initially to make things easier for both admin and user, this is not intended for any revenues for the company. The application requires a yearly charge along with the other Microsoft Applications.

Organizational: With this application, the admin will be able to input more data for the system in case they need to in the future. The application is flexible and can be used to add more features if needed.

The main concept of using ***Microsoft Power BI*** was to be able to organize set of data and visualize the data for a better analysis.

Community: It is a great way to see data in a organized fashion and a clear understanding of how to keep track of the relevant record keeping.

Financial: The application is made initially to make things easier for both admin and user, this is not intended for any revenues for the company. The application requires a yearly charge along with the other Microsoft Applications.

Organizational: With this application, the admin will be able to input more data for the system in case they need to in the future. The application is flexible and can be used to add more features if needed and calculation to make more relevant visualization.

7.2 Social and Environmental Effects and Analysis

Social Effect: The system promotes using company resources instead of outsourcing to a vendor. This will reduce the need for having vendors have access to data of the company. It allows the company to keep their records clean from the outside. It deducts the use of finance in this aspect.

7.3 Addressing Ethics and Ethical Issues

No Sharing or Selling of User Data: The data is protected inside the company network.

Data Security: Only the admin and the owner and the developer will have access to the database of the system, therefore it limits the possibility of data leakage.

No Ads: The best part of the system is that there is no ad while using the application.

No Discrimination Policy: The application is built in such a way that it does not discriminate any kind of user based on race, gender, sexuality, religion, colour, beliefs, political view or status, be it national or international.

Chapter 8

Lesson Learned

8.1 Problems Faced During this Period

My time as an intern at British American Tobacco Bangladesh has been very pleasant. I have learned many new things and had a very interesting experience overall. Even though it was an experience to remember, I have faced my fair share of difficulties. I have had to meet deadlines and learn to
get into the habit of waking up early at a certain time, get work done at a certain time while maintaining all the social norms from our day-to-day life. I have had to submit problems that I have fixed on Power BI, as I was very new to Power BI, I had to manage to teach myself how the application actually works and what exactly is it used for. It was also a challenge to try to get
information from many people throughout the company, which meant communication. It is really had to do a proper communication for the data that I needed as very one at the company is super busy with their own work, so it was a real challenge to get my data, assemble them and figure out
an application that would best suit the company's need. One of the greatest challenges for me, personally, was to learn how to work on your own. I had to figure out a way to adjust and learn everything on my own as no one had the time to sit down and explain. It was the time of audit; hence it was understandable. Which is how it should be, but it took time to sort things out for me.

Apart from these difficulties, I had to be punctual and also manage other work at the same time. It was really difficult to manage time and learn to cope with the circumstances that would come if I couldn't make it back on time. I had to learn to be responsible for the task that I was given, and without proper explanation, it seemed sometimes that I would still make mistakes. This was eye opening since I was not used to having someone take a second look at the work before I submitted my final draft. I had to learn it the hard way. Communication was a real issue as I was working with people that come from all walks of life. I had to figure out a way to adjust and learn to cope with my surroundings.

8.2 Solution of those Problems

I have had very valuable lessons through my problems, I have learned to be more responsible for my task and actions. I have learned to communicate with people by keeping an open mind. I have learned to manage time better. I have worked on how to communicate with people from different walks of life. I have learned to meet deadlines and make the least number of mistakes. I have fixed my biggest issue with communication, which was to ask questions, I broke out of my shell and learned how to ask questions and to communicate properly instead of being lost!

Chapter 9

Future Work & Conclusion

9.1 Future Works

The way the system is built will help developers or users of PowerApps to build more applications that are similar to this system. Other departments will need to keep records digitally instead of manually, hence they will be able to utilize the logic used in this system to build one that suits the department need. The possibility of utilizing this tool is endless but as it is limited, it still shouldn't stop everyone to try and add new features.

9.2 Conclusion

As privacy and protection is a main key to an organization, hence this system is the best use. We, as the developers of 'Techtrioz' adhered to all codes of conduct and privacy as we respect user's privacy. Overall, this application makes life easier for all users. It takes less amount of time and just a good amount to understand how to utilize the application to it's best. I have managed to fulfil the requirement of my client using Microsoft PowerApps, in the future, I will try to utilize the same application for a different purpose.

Bibliography

I have taken some helps from sites and YouTube:

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An Undergraduate Internship Project on

TECHTROIZ

At

British American Tobacco, Bangladesh

By

Mahdia Faiza

1731635

Autumn, 2022

Consent from Supervisor

The student modified the internship final report as per the recommendations made by her academic supervisor and panel members during and before final viva, and the department can use this version for archiving as well as the OBE course material for CSE499.

Sabrina Alam

(Signature of the Supervisor)

Sabrina Alam

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