

GNG 1103
Design Project User and Product Manual

MyPoints Loyalty Program User Manual

Submitted by:

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December 8, 2021

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List of Acronyms and Glossary

Table 1. Acronyms

Acronym	Definition
BOM	Bill of Materials

1 Introduction

This User and Product Manual (UPM) provides the information necessary for financial institutions, businesses, and consumers to effectively use the MyPoints Loyalty Program and for prototype documentation. This document enables its reader to effectively use our system as well as shows the procedure to create this system. The MyPoints Loyalty program is a loyalty program which enables the participation of small businesses by using our platform MyPoints with the existing loyalty point programs. Our system has a fully connected, operating front end which is the app interface using the Microsoft power apps and it also has a back end which shows the customer trend data to the business and the banks with the help of Power Bi. This document consists of the following:

- An overview which would provide the information regarding the current situation of loyalty program, the user needs, difference between our product and other products and key features of our product.
- A getting started page which provides a general walkthrough of the system.
- A Using the system page which provides the instruction on how to use the app.
- A Troubleshooting & support page which provides all recovery and error correction procedures.
- A Product documentation page which consists of every documents of the system.
- A Conclusions and recommendations for future work page which summarizes our lessons learned and our work related to our prototype and it also shows if we had more time what things we would integrated in our system.
- Our system is just a demonstration prototype and it does not have any type of security.

2 Overview

Current loyalty programs are specific to each financial institution and have a restricted set of partners. The closed nature of those programs makes it that their customers don't redeem all their points meaning they don't interact with businesses as much. Zafin wants to create a service that allows multiple financial institutions and businesses to engage in a linked loyalty program. Financial institutions and businesses want to increase their customer base and interactions. Customers want a simple, efficient way to save money and earn rewards for their positive engagement with their frequently visited banks and businesses. They want to be able to use their rewards towards businesses they frequent.

We have created a fully connected, operational and easy-to-customized system that links current loyalty programs through the conversion of points. We allow the participation of small businesses and businesses that are not part of any existing loyalty program. Customers can earn, redeem, transfer, and track points all in one simple app. Our product also offers updated information on customer trends to banks and businesses, allowing them to make marketing decisions, tailor their products, and more.

⏪ Louis

Air Miles: 80

PC Optimum: 516

Subway Tokens: 50

MyPoints: 100

Convert points

Transaction History

Mock Transaction

Send Points

Figure 1. User interface

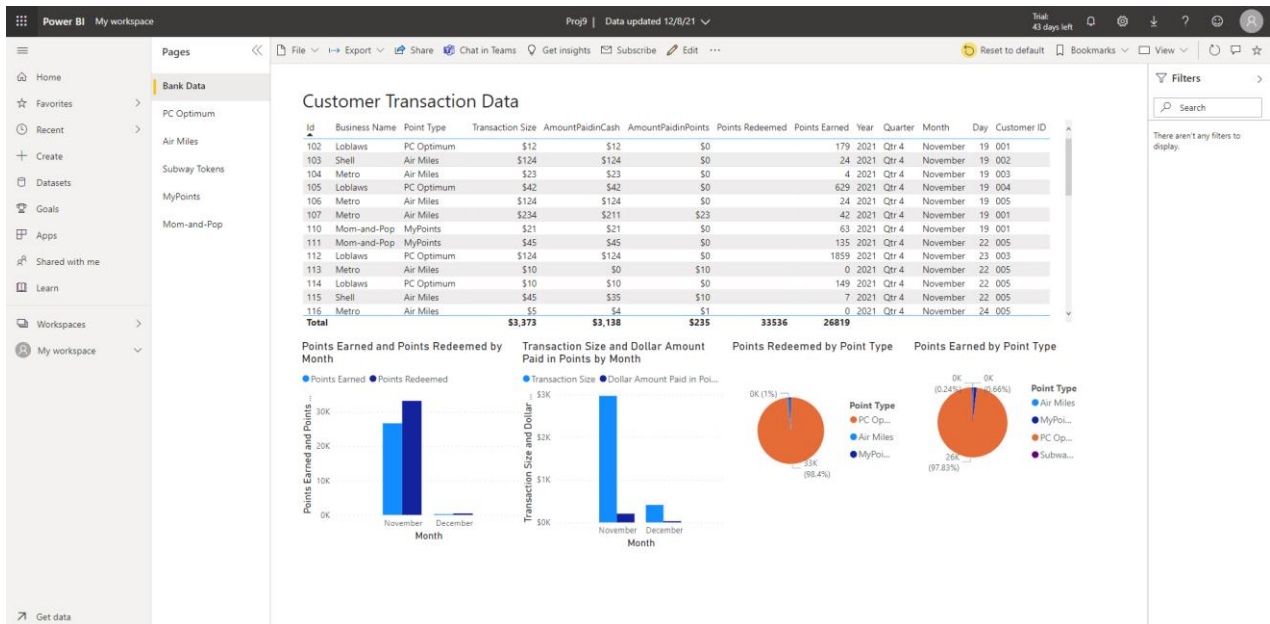


Figure 2. Bank and business interface

Customers can interact with our system through an application created in Microsoft Power Apps. Banks and businesses can view personalized customer trend data created in Microsoft Power BI. All customer transaction data is stored in SharePoint.

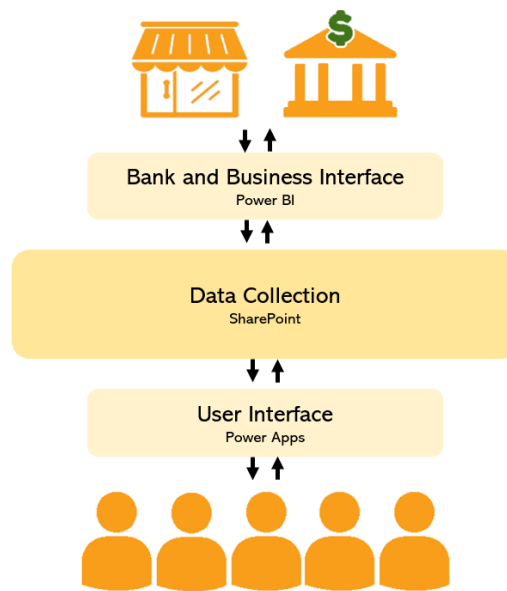


Figure 33. System flow chart

2.1 Cautions & Warnings

A Microsoft 365 account is required to access all data and services mentioned in this manual. Data recorded using the app is shared on a SharePoint page that can be accessed by any administrators or users.

The free student version of Microsoft 365 was used, so some functions are not available. (see full disclaimer in section 5.1).

3 Getting started

3.1 Set-up Considerations

Our loyalty program is a system based on Microsoft Power Apps, so users need an official Microsoft Power Apps account. After logging in to Power Apps and our system, users can manage their points in their personal accounts, and the system provides immediate feedback on their actions.

3.2 User Access Considerations

Our system is built on Microsoft Power Apps, so users need to log in Microsoft Power Apps and get access to the system (Figure 4). The administrator will help you get access to the system.

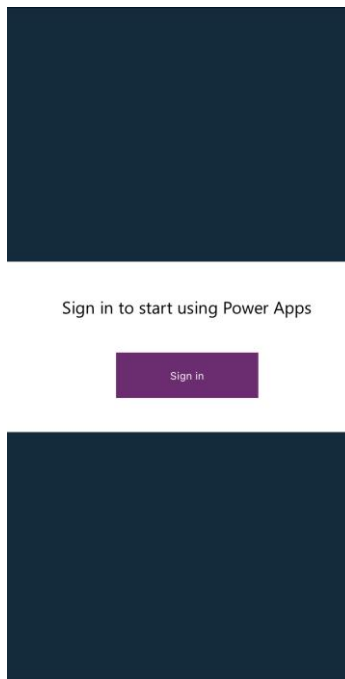


Figure 4. Power apps login

3.3 Accessing the System

Each user needs to have their own account and password to log in (Figure 5). Therefore, you must contact the administrator to obtain your login account and password. The administrator will create a private account for you. When you log in to Power Apps, have system permissions, and get your account and password, you can start using the system.

Form 1 (Left)	Form 2 (Right)
Please enter your username and password	
Username	Louis
Password	password1
Login	Login

Figure 5. Login page

3.4 System Organization & Navigation

The system consists of a login screen, a balance screen and four different functions. In the Login screen, you need to provide your own account number and password to Login to your account, and you will see how many points you have in the balance screen. The four buttons on the balance screen correspond to four functions (Figure 6): Convert Point, you can convert points to other business points or your personal points. Transaction History, you can check the history of Transaction. Mock Transaction, you will make a transaction with points and cash, and you will

also receive points as a reward. Send Point, you can send your point to each of your friends. You can use these four functions to manage your points at any time.

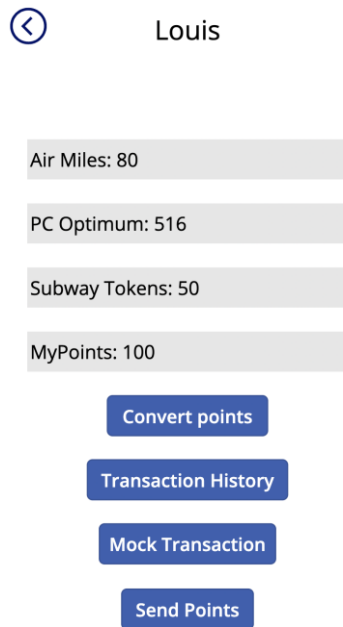


Figure 6. Balance page

3.5 Exiting the System

The system saves changes to your points, so you can exit the system without worrying about losing your points. The next time you log in, you only need to enter your account and password to enter the system.

4 Using the System

4.1 Login screen

When the power app is first opened you will see the login page which consists of a username textbox a password textbox and the login button. If a username and the correct password associated Account is entered, you will be able to press the login button. If the username or password is wrong a message will appear informing you so and letting you try again (Figure 7).

Please enter your username and password	Please enter your username and password	Please enter your username and password
Username	Louis	Loui
Password	ysgdufvu	password1
Login	Login	Login
	Wrong username or password. Please try again.	Wrong username or password. Please try again.

Figure 7. Incorrect login

Username and password for this example is username: Louis & password: password1

4.2 Balance screen

If the credentials of an account are entered properly and the login button is pressed you will move to the points balance screen (see Figure 6). This screen allows you to see the balance of all your different point systems and is the point where you can access all the other features of the application. There are five buttons on the screen at the top left corner is an arrow that went

pressed brings you back to the login screen where you can log into another account, the second button is the convert points, the third transaction history, the fourth mark transactions, the fifth send points.

4.3 Convert points

When clicking the convert point but in it will bring you to the convert point screen (Figure 8). This screen allows you to convert your points from one point system to the other. Using the first dropdown menu you choose from what point you want to convert from and from the second dropdown menu you choose to what point system you want to convert (prohibits you from converting a point system to itself). Under the first dropdown menu there is a text box labeled “Amount of points to convert”, this is where you enter a number of points that will be converted from the first point system to the other. Once an amount is entered you will see the final conversion at the bottom, this amount may not be the exact amount you entered depending on the conversion rate between the two points systems. For example, in this situation where 500 PC optimum points is converted to Air Miles, but conversion is 121 to 1. Therefore, the final conversion is 484 PC Optimum Points to four Air Mile points (it will never convert more points than the amount you entered). If you now press the convert button and the conversion was successful it will bring you to a page informing you so. Pressing the only button on that screen the at the top left will bring you back to the points balance screen where you see your updated points balance. Going back to the points conversion screen an entering a number of points you do not have in your account will pop up a message informing you so and prohibiting you from executing the conversion. If you desire to go back to the point balance screen from the point conversion screen, there is an arrow button at the top left corner that will bring you back.

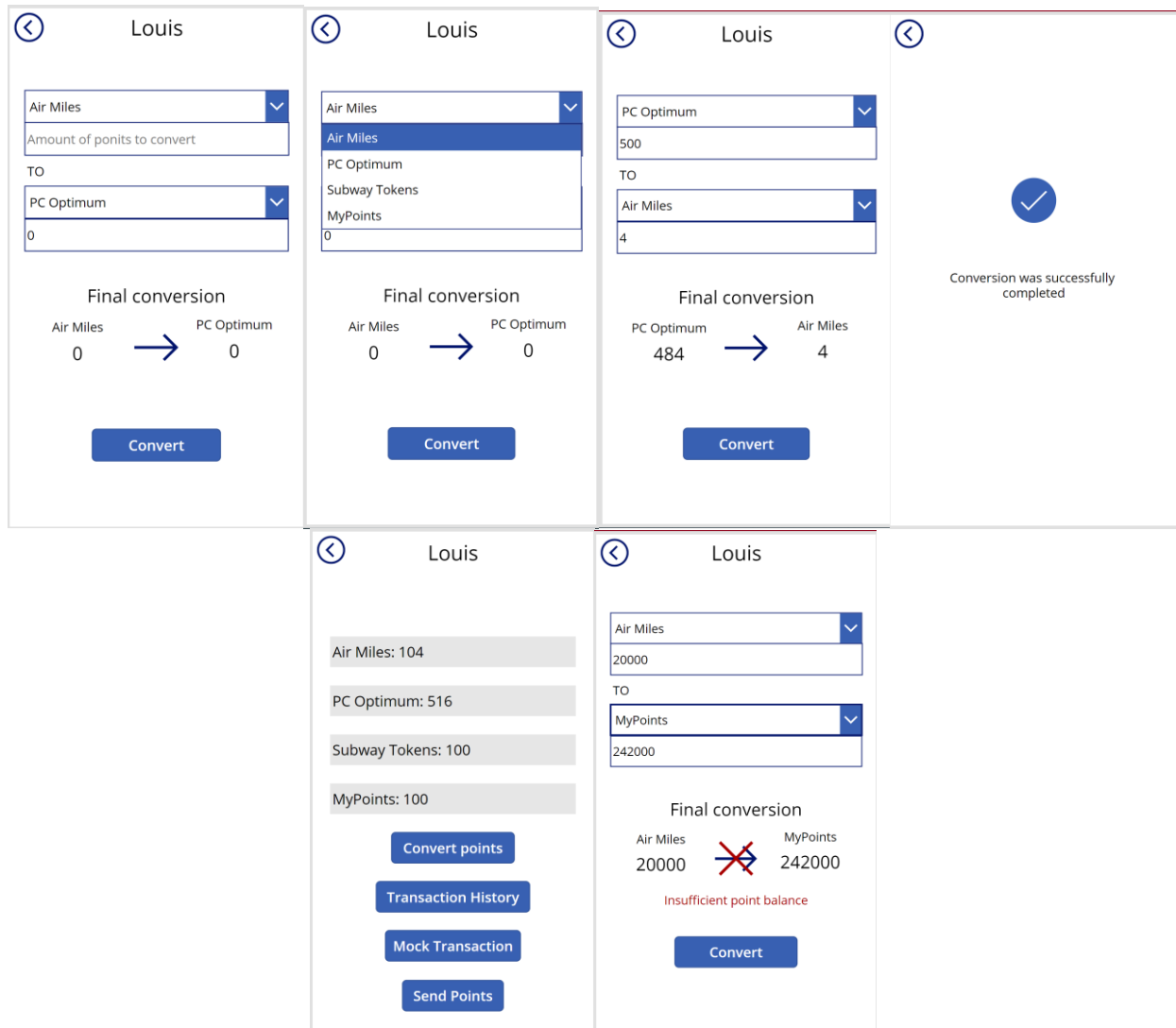
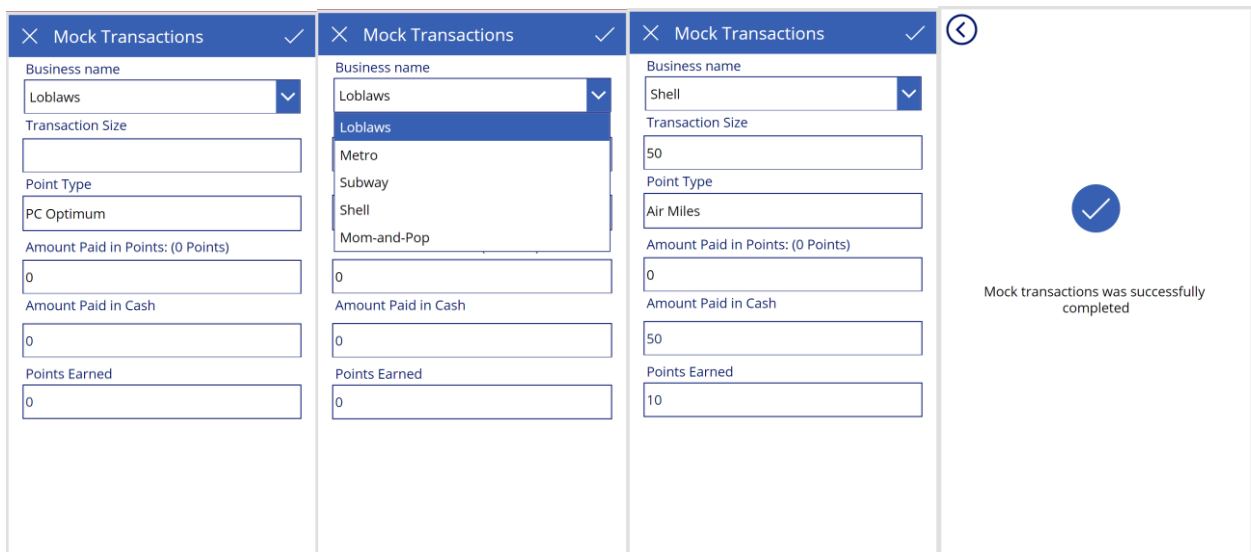


Figure 8. Converting your points

4.4 Mock Transaction

From the point balance screen, you can press the Mock Transaction button which will bring you the mock transaction screen (Figure 9). This screen is used to simulate going to a store and purchasing something. You select the business you are shopping at from the dropdown. This will automatically change the point type used. You then enter the total amount of the transaction in the

“transaction size” box (Figure 9). In this example we put fifty dollars as the transaction size. When this is done you will see the amount paid in cash change to 50 (the total amount) and the points earned to 10 (the number of points that will be earned off this transaction). Now if you press the check mark button at the top right of the screen it will bring you to the “transaction successful” screen (Figure 9). Click the top left arrow icon to bring you back to the balance screen where you can see your updated balance (Figure 9). Going back to the mock transaction page and reentering the same amount but changing the points amount to 50 (it stops you from entering a larger amount the total). If you then press the check mark the transaction will not happen and a message will appear indicating that you do not have enough points in your balance (Figure 10). You can see the number of points needed next to that same label, it’s 414 points but you only have 114 points in this account. But its not all or nothing when it comes to paying in points. Let’s change the amount to five dollars paid in points and see what happens (Figure 11). This will cost 42 points and the other 45 will be paid in cash. You will also earn nine points for the portion paid in cash. Clicking the check mark, it will bring you to the transaction successfully completed screen, then click the arrow icon which will bring you back to the balance screen where you see your updated. The only things you can edit on the mock transaction screen are the business, the transaction size and the amount paid in points, the other boxes are filled automatically.



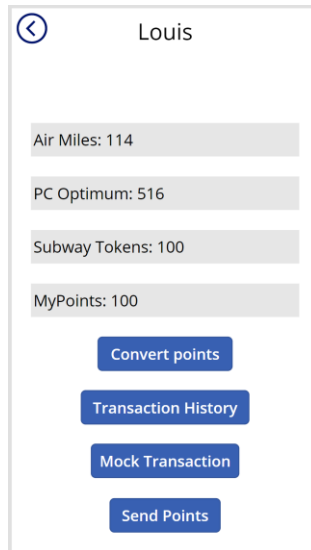


Figure 9. Successful mock transaction

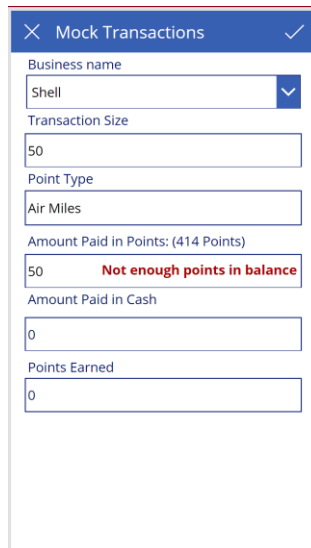


Figure 10. Unsuccessful mock transaction

The image shows two overlapping mobile application screens. The left screen is titled 'Mock Transactions' and contains several input fields: 'Business name' (Shell), 'Transaction Size' (50), 'Point Type' (Air Miles), 'Amount Paid in Points: (42 Points)' (5), 'Amount Paid in Cash' (45), and 'Points Earned' (9). The right screen is titled 'Louis' and displays point balances for different programs: Air Miles: 81, PC Optimum: 516, Subway Tokens: 100, and MyPoints: 100. Below these balances are four blue buttons: 'Convert points', 'Transaction History', 'Mock Transaction', and 'Send Points'.

Figure 11. Transaction partially paid in points

4.5 Transaction History

From the point balance screen, click on the “Transaction History” button. This brings you to the transaction history screen. This screen allows you to scroll through all your transactions and view information about them (Figure 12). The transaction history is automatically updated each time a mock transaction is completed. To return to the point balance screen click the arrow icon in the top left.






Louis	
	Loblaws Total Transaction Size: 12\$ Amount Paid in Points: 0\$ Points Earned: 179 PC Optimum November 19, 2021 3:59 PM
	Metro Total Transaction Size: 234\$ Amount Paid in Points: 23\$ Points Earned: 42 Air Miles November 19, 2021 4:00 PM
	Mom-and-Pop Total Transaction Size: 21\$ Amount Paid in Points: 0\$ Points Earned: 63 MyPoints November 19, 2021 5:00 PM
	Metro Total Transaction Size: 130\$ Amount Paid in Points: 0\$ Points Earned: 26 Air Miles November 24, 2021 7:00 PM
	Metro Total Transaction Size: 54\$ Amount Paid in Points: 3\$ Points Earned: 10 Air Miles November 25, 2021 12:57 AM
Mom-and-Pop	

Figure 12. Transaction history page

4.6 Send Points

The last feature of this app is the send points function. It is accessed by clicking the send points button in the points balance screen. This brings you to the send points screen (Figure 13). Using the drop-down menu, choose the points system you want to use, then enter the number of points you want to send. Then enter the username of the recipient in the indicated box. If the user is not found a message will appear informing you and nothing else will happen (Figure 14). If the user is found and you click the send point button, the points will be deducted from your account and added to the recipients. And it will bring you to the points successfully sent screen (Figure 15). From there click the top left arrow icon to go back to see the updated balance screen. Going back to the send points screen and trying to enter a number of points you do not have will make a message appear and stop you from sending the points (Figure 16). For the send points screen you are also able to go back to the point balance screen by clicking the top left arrow icon.

The figure shows two side-by-side screenshots of a mobile application interface titled "Louis".

The left screenshot displays the "Air Miles" selection screen. It features a dropdown menu set to "Air Miles", a text input field for "Number of points", and another text input field for "Name of recipient". Below these fields, a summary shows "Air Miles from You" with a right-pointing arrow. At the bottom is a blue button labeled "Send Points".

The right screenshot displays the "Subway Tokens" selection screen. It features a dropdown menu set to "Subway Tokens", a text input field containing the number "50", and a text input field for "Name of recipient". Below these fields, a summary shows "50 Subway Tokens from You" with a right-pointing arrow. At the bottom is a blue button labeled "Send Points".

Figure 13. Send points page

The figure shows a single screenshot of the mobile application interface titled "Louis", representing an error state.

The screen displays the "Subway Tokens" selection screen. The dropdown menu is set to "Subway Tokens", and the "Number of points" field contains "50". The "Name of recipient" field contains the placeholder text "fhjfhfj". To the right of this text, a red error message reads "User not found". Below the recipient field, a summary shows "50 Subway Tokens from You" with a right-pointing arrow pointing to the recipient name "fhjfhfj". At the bottom is a blue button labeled "Send Points".

Figure 14. Invalid recipient

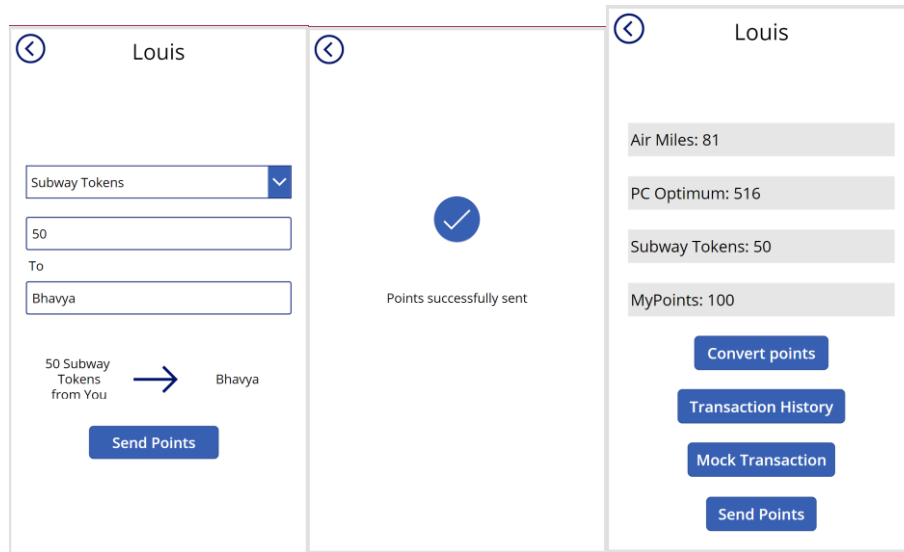


Figure 15. Points successfully sent

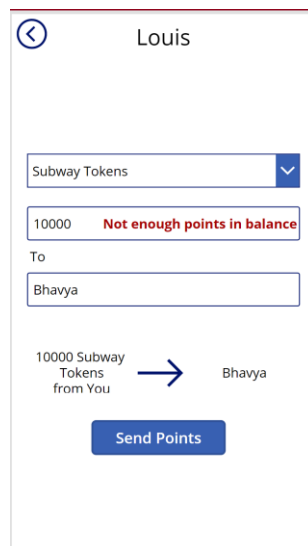


Figure 16. Insufficient points message

4.7 Bank and Business Interface

The following sub-sections provide detailed, step-by-step instructions on how to use the various features of the bank and business interface. Customer trend data can be viewed by banks and businesses through the Power BI online service. Information presented in the shared, online

report is refreshed and published from the Power BI desktop app. Please refer to section 5.1.2 for the sharing and editing restrictions.

4.7.1 Viewing your data

Go to the Power BI service website: <https://powerbi.microsoft.com/en-ca/> and sign in using your Microsoft account username and password. The site will take you to your dashboard as shown in Figure 17.

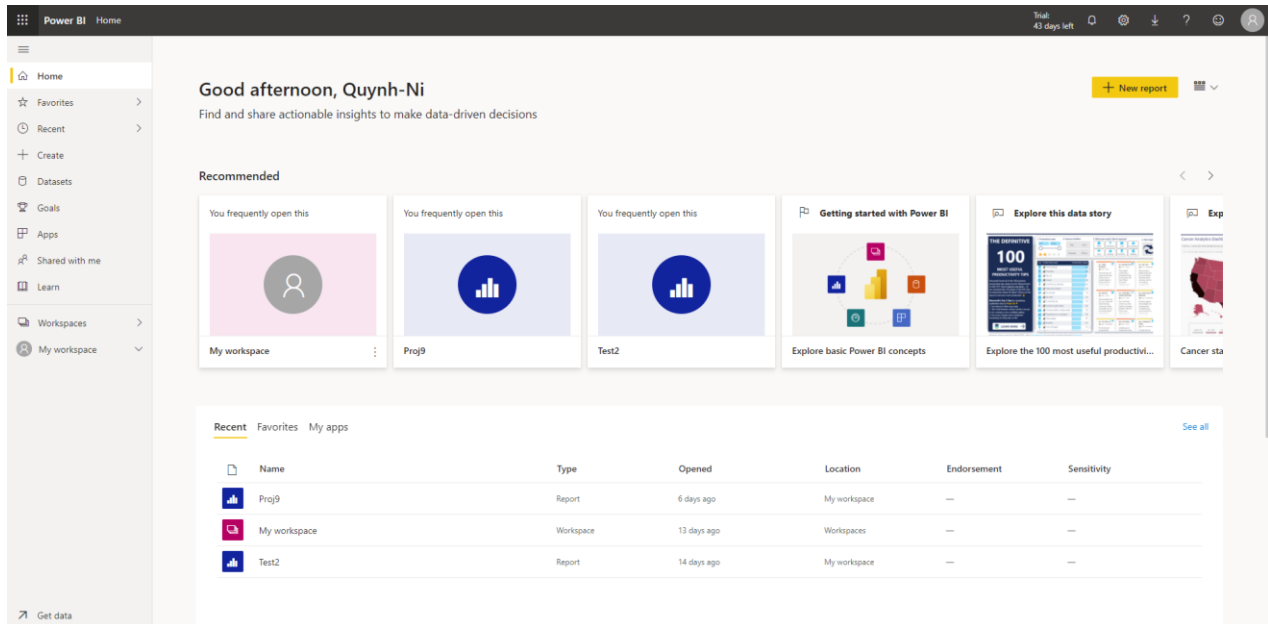


Figure 17. Power BI online dashboard

Using the navigation bar on the left-hand side, go to “Shared with me” and click on your report. Once opened, your report should resemble the figure below.

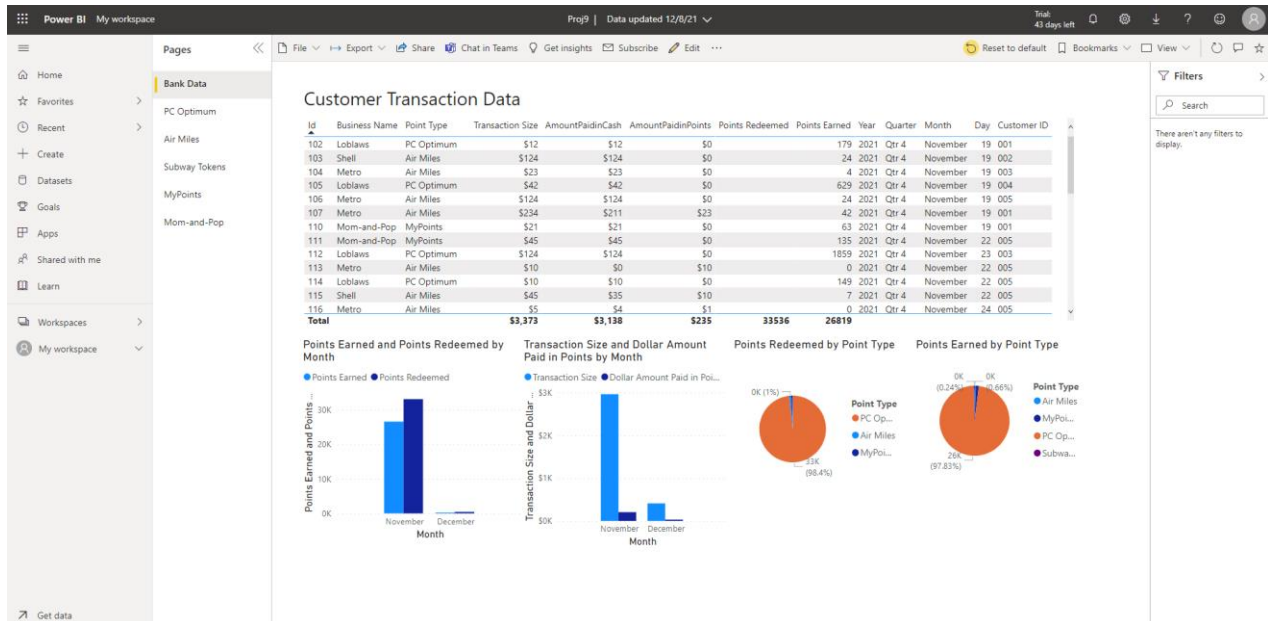


Figure 18. Online report

Navigate using the Pages column to your business' or loyalty program's page to view your personalized data.

4.7.2 Publishing and updating your data

Data must be updated through the Power BI desktop app due to restrictions outlined in section 5.1.2. When new data is entered in the Customer Transaction Data SharePoint list, you can refresh your dataset using the toolbar at the top of the page.

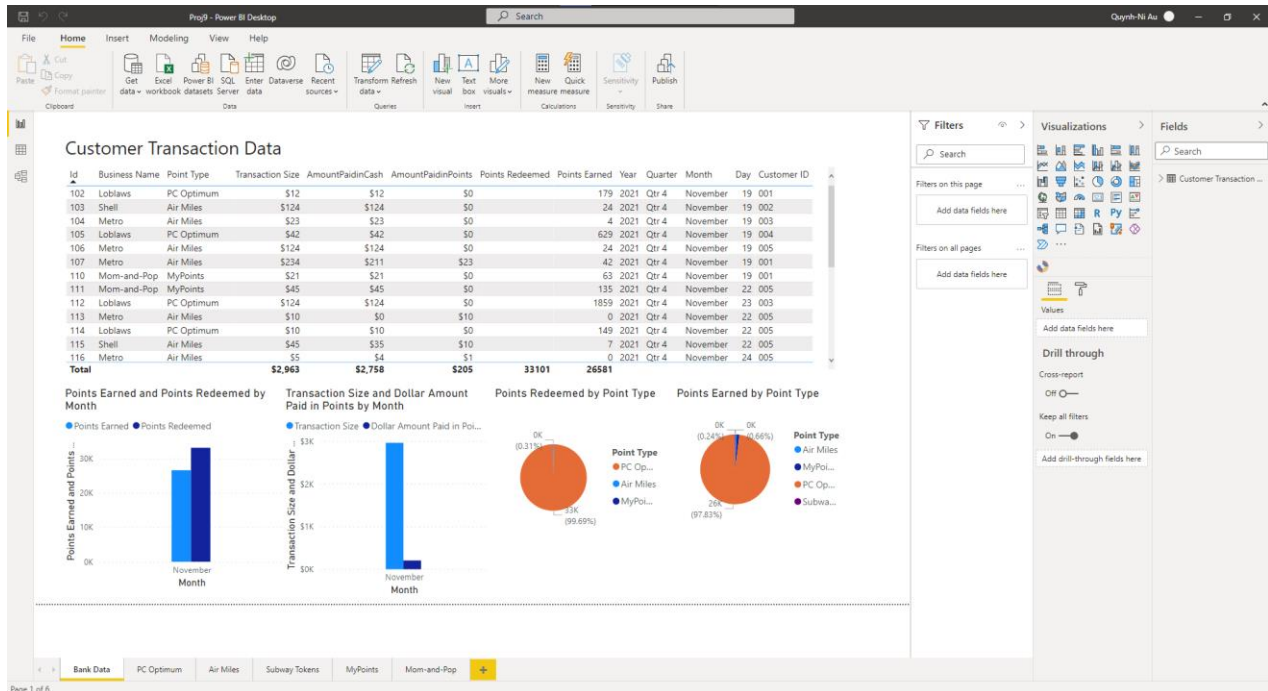


Figure 19. Desktop app report

Navigate to Home>Queries>Refresh.

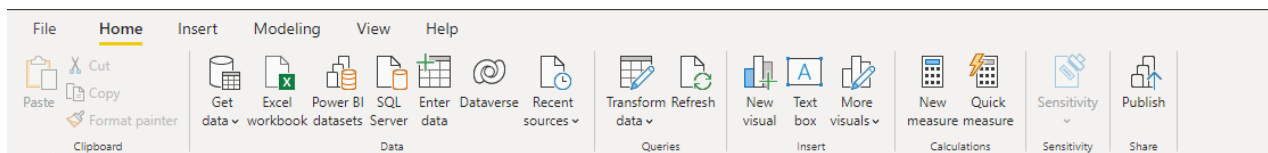


Figure 20. Toolbar

Once your dataset has been refreshed, you must publish the new dataset so your peers can view the changes. Do this by selecting Home>Share>Publish. It is recommended to publish your dataset after refreshing to maintain an accurate representation of your data.

4.7.3 Filtering your data

Filters can be created and customized to provide businesses with a variety of information (see section 6.3.3). These filters can also be applied by the viewers so they can view data from a specific month, quarter, business and more.

To view and apply filters for a specific representation, click on the representation and a column on the right-hand side of the page with present all filters available (these can be edited, see section 6.3.3).

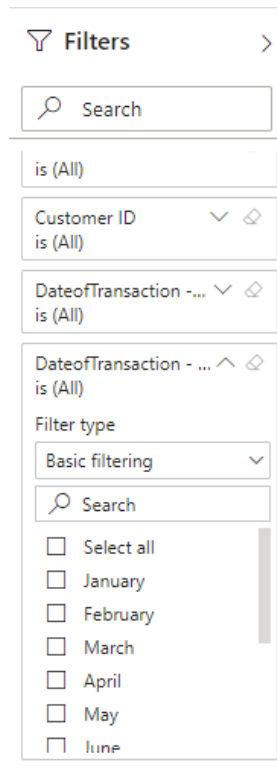


Figure 21. Filters side bar

Click on the drop-down menu for the filter of your choosing and specify what information you would like included or excluded from the representation. You can clear the filter by clicking the

eraser icon in the top right corner of the filter. Minimize the filter toolbar by selecting the right-pointing arrow in the top right of the bar.

4.7.4 Customizing your data

New representations can be created, and existing ones edited through the Microsoft Power BI. See section for 6.3.3 for more details, and section 5.1.2 for restrictions.

5 Troubleshooting & Support

This section will go over the special considerations, errors, and program failures that may occur during the use and creation of the prototype.

5.1 Special Considerations

This prototype was created using the free student Microsoft 365 account. The following features are not available:

- Creation of a Team on Microsoft Teams and a SharePoint page
- Creation of a collaborative workspace on Power BI

5.1.1 Creating a Team and SharePoint page

Reach out to your administrator or educator to create a Microsoft Teams page for your team.

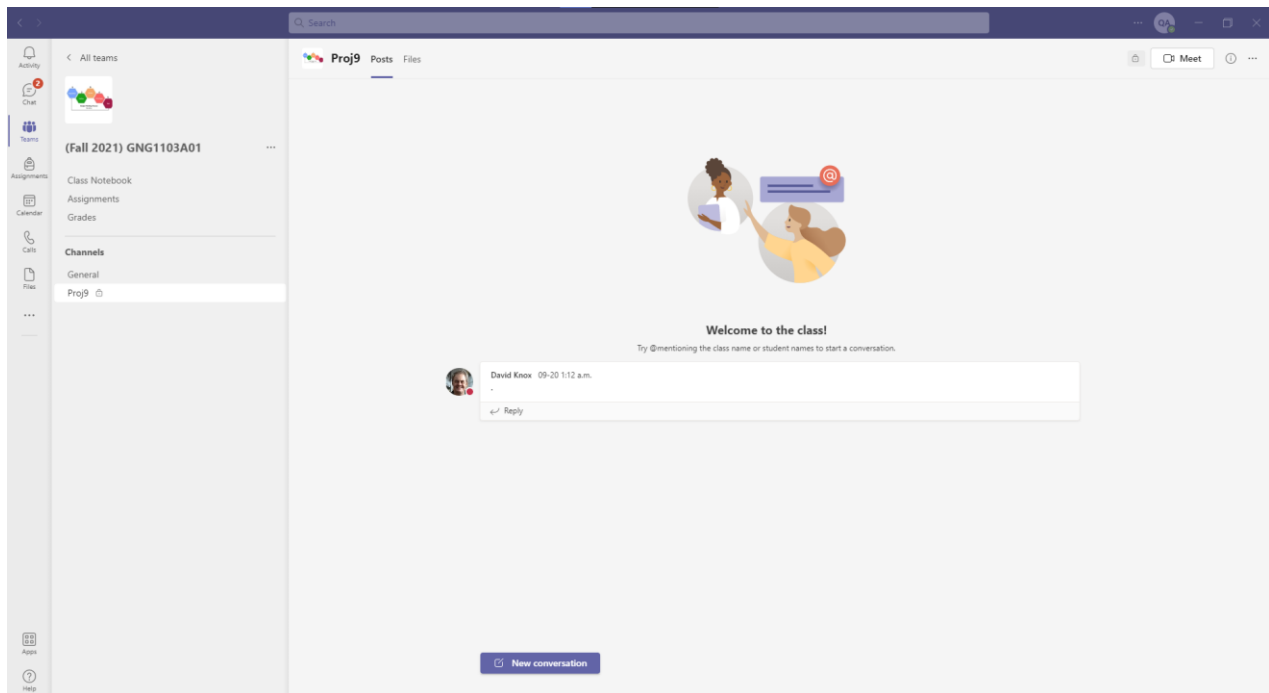


Figure 22. Microsoft Teams page

From here, you will be able to access your team SharePoint page as described in section 6.1.

5.1.2 Collaborating on the Power BI

Only one user can create, edit, and refresh the Power BI document through the Power BI desktop app. This document must then be published to the Power BI online service and will be accessible in the creator’s online workspace. The report can then be shared to other team members by clicking the “Share” button in the top toolbar of the report.

Edits made to the online version of the report will not be saved to the original document and are unable to be refreshed when the dataset it updated. Other members will only be able to view the refreshed data once the creator has refreshed the original document and published it to the online workspace.

5.2 Maintenance

To ensure that all datasets and representations are accurate and up-to-date, refresh and publish the Power BI regularly or set up the automatic publishing feature.

5.3 Support

Consult the Microsoft Power Apps website (<https://powerapps.microsoft.com/en-ca/>) or Power BI website (<https://powerbi.microsoft.com/en-us/>) for more information and support. Also visit the Microsoft Support page for more general help (<https://support.microsoft.com/>).

6 Product Documentation

6.1 Data collection

This section describes how to create the SharePoint lists used to store customer data.

6.1.1 BOM

This prototype requires the use of Microsoft Teams, and Microsoft SharePoint.

6.1.2 Instructions

See section 5.1.1 for information on how to create a Team on Microsoft Teams. This is how all members of your team will be able to access the SharePoint page. Once you have set up your Team, select the three dots in the upper right-hand corner and select “Open in SharePoint”

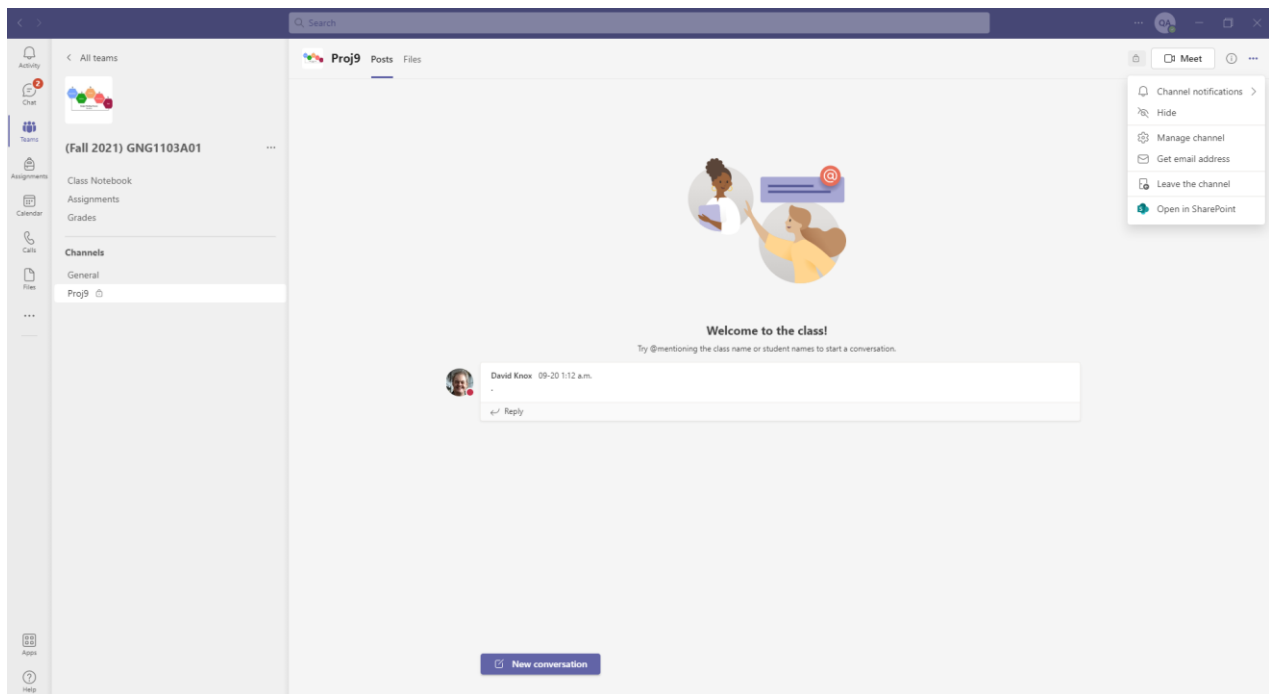


Figure 23. Opening your SharePoint page

This will take you to your team SharePoint page. To create your lists, navigate to the Home page, and select New>List.

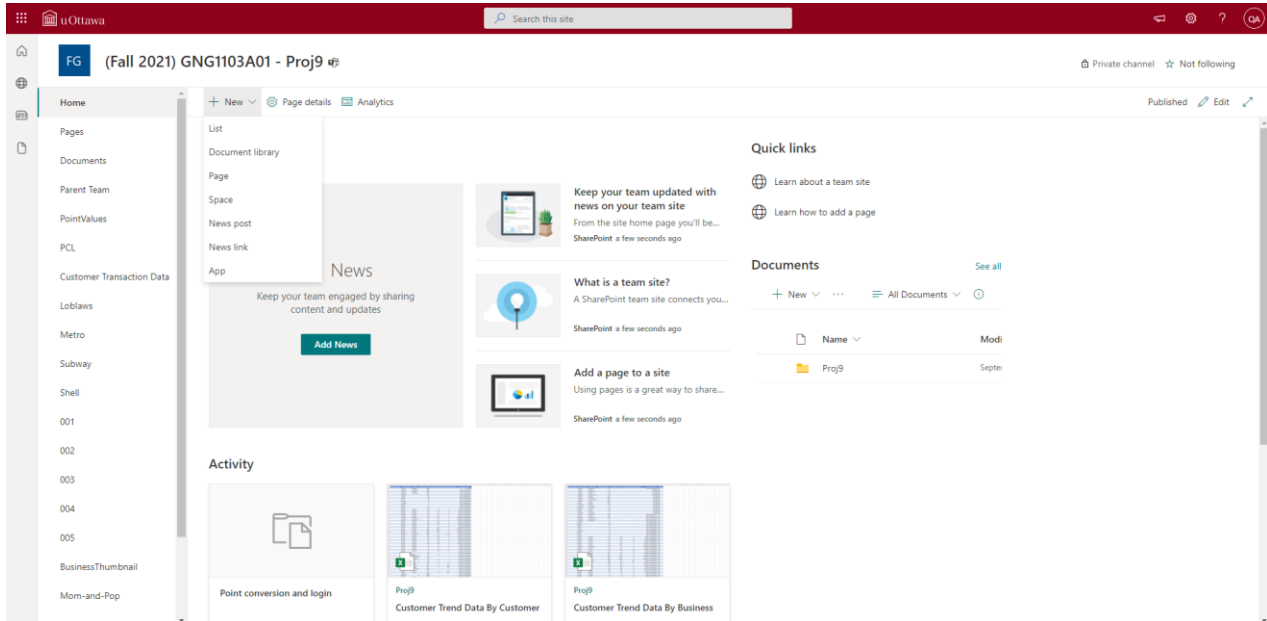


Figure 24. Creating your SharePoint lists

The following subsections will describe how to create the lists required.

6.1.2.1 Customer Transaction Data

This list will store all the customer transaction data generated in the app. It features ten columns described in Table 3. To add new columns, click on the “+Add column” button on the far right of the columns. The drop-down menu allows you the select what type of data stored in that column.

Table 2. Customer Transaction Data column description

Column Name	Description	Type/Units	Entry Type
ID	The unique transaction identification number	Number	Automatic
Business Name	The name of the business where the transaction occurred	Text	Selected from menu

Point Type	The type of point used during the transaction	Text	Automatic based on Business Name
Total Transaction Size	The dollar amount of the total transaction	Currency (\$)	Entered by customer
Amount Paid in Cash	The amount of the total transaction paid in cash recorded in a dollar	Currency (\$)	Calculated from Total Transaction Size and Amount Paid in Points
Amount Paid in Points	The amount of the transaction paid in points	Currency (\$)	Entered by customer
Points Redeemed	The number of points used	Number	Calculated from Amount Paid in Points
Points Earned	The number of points earned from the transaction	Number	Calculated from Amount Paid in Cash
Date of Transaction	The date of the transaction	Date	Automatic; set to today's date
Customer ID	The unique identification number of the customer	Text	Automatic based on user login

To create the ID column, select +Add column>Show/hide columns and select the box for ID so it is green. Then select "Apply". This is a preprogrammed column that gives each item in the list a unique identification number.

Rename the Title column to "Business Name". This column is required and stores text.

To create the Point Type column, select +Add column>More. Enter "Point Type" as the column name and select "Calculated" as the information type and "Single line of text" as the data returned. In the formula box, use the sample below to create your formula.

```
=IF(Title="Loblaws","PC Optimum",IF(OR(Title="Metro",Title="Shell"),"Air Miles",IF(Title="Subway","Subway Tokens","MyPoints"))))
```

Refer to the following links on how to write IF and OR statements:

<https://support.office.com/client/if-function-0a4ad187-dba3-48ae-abe9-bbe3aa6aebca?NS=SPOSTANDARD&Version=16&AppVer=SPO160>

<https://support.office.com/client/or-function-9a2a1cca-696f-4d19-a959-3943babd076f?NS=SPOSTANDARD&Version=16&AppVer=SPO160>

To create the Total Transaction Size, Amount Paid in Points, and Amount Paid in Cash columns, select + Add column>Currency. Add the column name and description according to Table 3. Set the number of decimal places to two, and the currency format to dollars.

To create the Points Redeemed and Points Earned columns, select + Add column>Number. Add the column name and description. Set the number of decimal places to zero, and the default value to zero.

To create the Date of Transaction column, select +Add column>Date and time. Add the column name and description and set the default value to Today's date.

To create the Customer ID column, select +Add column>Single line of text. Add the column name and description.

You will also need to create a hidden column called Business Name Drop-Down which will be used for the app, but not shown in the list. Select +Add column>Choice and fill in the column name and description. Edit the choices so each is the name of a business. Default value can be left at none or set to one of the choices. To hide this column, select +Add column>Show/hide columns and unclick the Business Name Drop-Down box. Select Apply.

To edit the column settings after creating them, click the gear icon in the top right corner of the page banner, and select "List settings". Select the column you would like to edit and make the necessary adjustments before selecting "OK" in the bottom right corner. Navigate back to the SharePoint list using the navigation bar on the far left.

6.2 User Interface

The first the first step in creating the app is making a SharePoint list containing the account information. This requires a column for the name of the user, the password, the user ID and one

we called token, which contains the point balances (Figure 25). Then create a Power App. Add a textbox for a username and one for the password. Add a button that searches for the username in the SharePoint and then looks at the password to see if it matches. If it does, make it navigate to the point balance screen. If the username and password do not match, then make a label informing the user. Also, add a label in the middle of the screen asking for the username and password. See Figure 5 for how it's supposed to look.

Name ▾	Pass ▾	UserID ▾	Token ▾
Louis	password1	001	Air Miles: 81,PC Optimum: 516,Subway Tokens: 50,MyPoints: 100
Bhavya	password2	002	Air Miles: 5039,PC Optimum: 66750,Subway Tokens: 40005,MyPoints: 275
Yimming	password3	003	Air Miles: 164,PC Optimum: 345219,Subway Tokens: 39811,MyPoints: 200
Runxing	password4	004	Air Miles: 231,PC Optimum: 423763,Subway Tokens: 41421,MyPoints: 200
Quynh-Ni	password5	005	Air Miles: 82,PC Optimum: 423888,Subway Tokens: 39941,MyPoints: 335

Figure 25. User accounts

For the balance, add a label at the top that displays the username that was entered in the login screen. Add a button at the top left that navigates back to the login screen. create four additional labels which will be used to display the four different point balances. They will obtain the point balance by looking at the name label and obtaining the balance for that account. Add four buttons with the names convert points, transaction history, mock transaction, and send points (Figure 26). Make each of those buttons lead to a new screen associated with the same name.

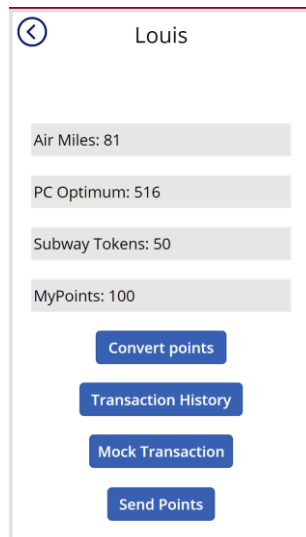


Figure 26. Home screen with four buttons

For the convert points screen add a button in the top left that navigates back to the points balance screen and add a label displaying the username of the account being used. Create a new SharePoint with three columns: PointNames, PointValue, DollarForPoint (Figure 27). Use the associated information of the point system and in the conversion screen of the power app add two dropdowns that refer to the different point systems as their output. Add a text box under the first one which will be the number of points you'll convert. Add a label under the second one which is a number of points you will convert to with a new point system (Figure 28). It obtained that number by converting the amount of points to dollar and then back to the new point system using the values given in the share point. Create a set of labels that display the final conversion (because you can't have half a point). Make convert button, make it look in the share point list of the proper account to see if there's enough points in the balance of that point system if not make it toggle to the visibility of a label that informs the user of the lack of points. If there are enough points, use the final conversion values to edit the balance of user. Make a function so that if the convergent passes it also navigates to a screen that shows label informing the user of the successful conversion period (Figure 29). Also add a button in the top left to navigate back to the balance screen.

PointValues ☆

PointNames ▾	PointValue ▾	DollarForPoint ▾
Air Miles	0.121	5
PC Optimum	0.001	0.06667
Subway Tokens	0.01	.25
MyPoints	0.01	.333333

Figure 27. Point Values SharePoint list

← Louis

Air Miles ▾
Amount of points to convert
0

TO
PC Optimum ▾
0

Final conversion
Air Miles 0 → PC Optimum 0

Convert

Figure 28. Convert points page

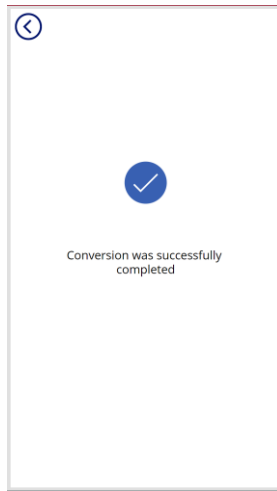
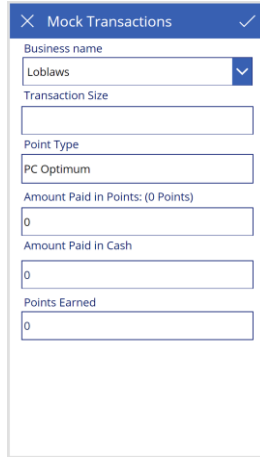


Figure 29. Conversion completed notification

For the mock transaction screen you will have to create a new SharePoint list called customer transaction data (see section 6.1.2.1). In the mock transaction screen, create a form that will edit that SharePoint. Include the fields business name, transaction size, point type, amount paid in points, amount paid in cash, and points earned (Figure 30). Make the business name field a drop-down menu with the different businesses obtained from a new SharePoint you will create name business some nails. Make a column for the business name, image link, PointSysUsed (Figure 31). Add the proper information for the businesses you will include. Make the transaction size field editable by the user. Make the point type field automatic using the SharePoint just created. Make the amount paid in points field editable. Make it so you can't pay more in points than the whole transaction size and in the label show the number of points that dollar amount equals to. Make the amount paid in cash field, the total amount minus the amount paid in points, also make it non editable. Make the points earned field automatically calculate the amount of points earned of the amount paid in cash using the points value SharePoint and the appropriate point used at the store, make it non editable. Create a button at the top right and make it submit the form including the user ID but in an if function so that if there aren't enough points in the balance of the user it does not pass through and if it does then it edits the point balance according to the info collected. The button should also navigate you to a transaction complete screen if the

transaction passes (Figure 32). Also add button in the mock transaction screen at the upper left corner to bring you back to the balance page.



A screenshot of a mobile application form titled "Mock Transactions". The form contains several input fields and a dropdown menu:

- Business name:** A dropdown menu with "Loblaws" selected.
- Transaction Size:** An empty text input field.
- Point Type:** A dropdown menu with "PC Optimum" selected.
- Amount Paid in Points: (0 Points):** A text input field containing "0".
- Amount Paid in Cash:** A text input field containing "0".
- Points Earned:** A text input field containing "0".

Figure 30. Mock transaction page

BusinessThumbnail ☆





BusinessNT	BusinessImage	ImageLink	PointsSysUsed
Loblaws		https://pbs.twimg.com...	PC Optimum
Metro		http://www.metro.ca/u...	Air Miles
Subway		https://www.logodesig...	Subway Tokens
Shell		https://encrypted-tbn...	Air Miles
Mom-and-Pop		https://media-exp1.lic...	MyPoints

Figure 31. Business Thumbnail list

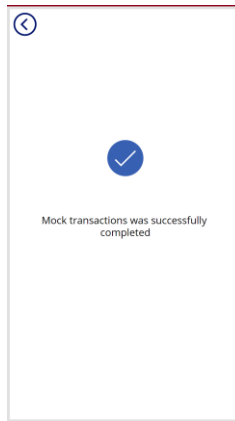


Figure 32. Transaction successfully completed

For the transaction history screen create a button at the top left to return back to the balance screen and a label with the username at the top the screen (Figure 33). Create a gallery that displays the customer transaction data filtered by the user ID obtained from the username. Add the following elements business, total transaction size, amount paid in points, points earned, and the date. Using the business name for that specific transaction, use a lookup function to search in the business thumbnail, share point also obtains the thumbnail image which will be displayed next to the information.

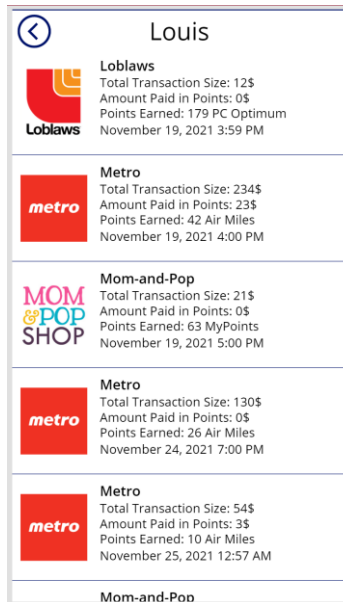


Figure 33. Transaction history page

For the send points screen add a button to navigate back to the point balance and a label with the username at the top, dropdown displaying all different point types. Add a text box used for the input of points. Add a text box for the input of the recipient (Figure 34). Add a label and a icon to display the amount of what points you will be transferring to who. Create a button called send points, when pressing this button it will check if there is enough points of that point system in your account and will check if the user is found for the recipient, if both of those are approved then points will be deducted from the account and added to the recipients using his SharePoint list of user information. If not enough points are in your balance than a message shall appear and if the recipient is not found a message will also appear.

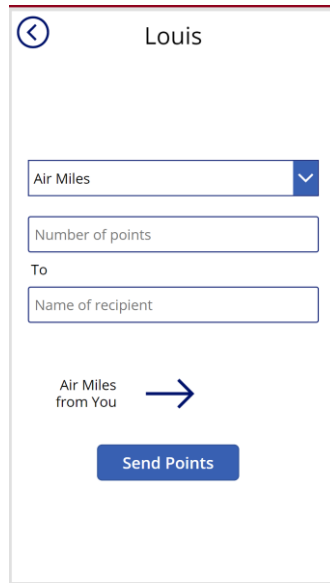


Figure 34. Send points page

6.3 Bank and Business Interface

This section describes how to set up the bank and business interface where the information on customer trends is filtered and represented using graphs and tables.

6.3.1 BOM

This prototype is created through Microsoft Power BI.

6.3.2 Linking the Power BI to SharePoint

First, download the Power BI desktop app and create a new document. Select “Get data from another source”. Search for SharePoint in the search bar and select SharePoint Online List.

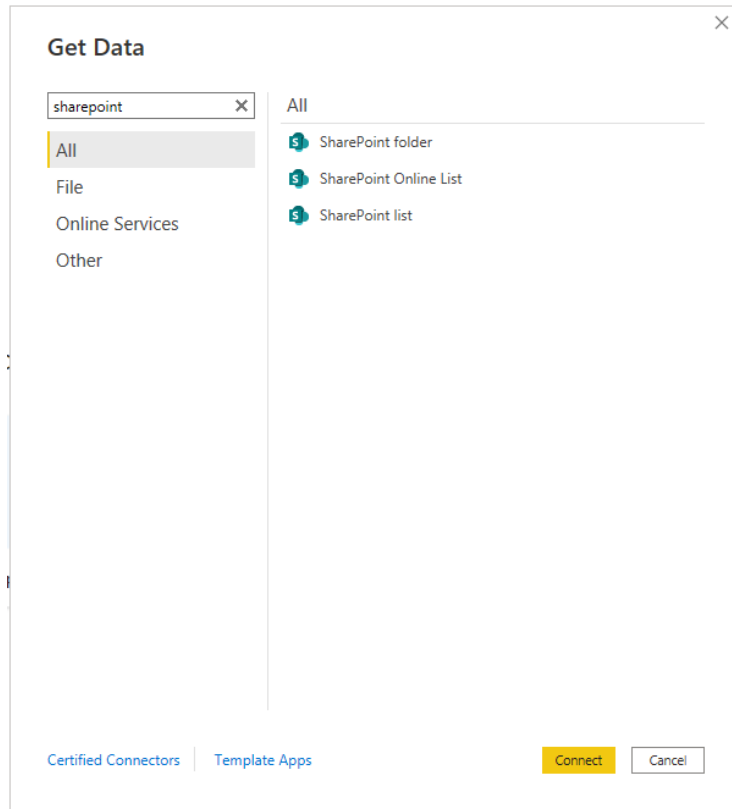


Figure 35. Get data

Copy and paste the URL of the home page of SharePoint site and select OK.

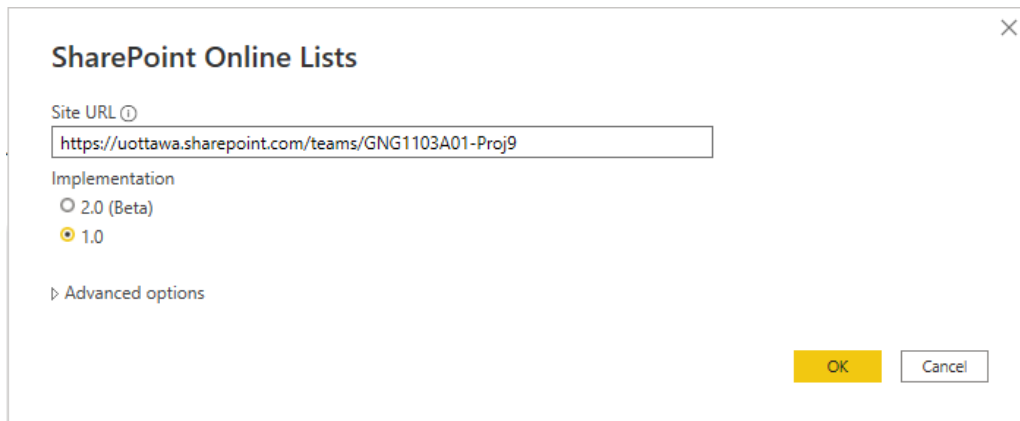


Figure 36. Connect SharePoint by URL

From the navigator, select Customer Transaction Data and click Transform. From here, you can edit what information you would like to be included in your representations and format them accordingly.

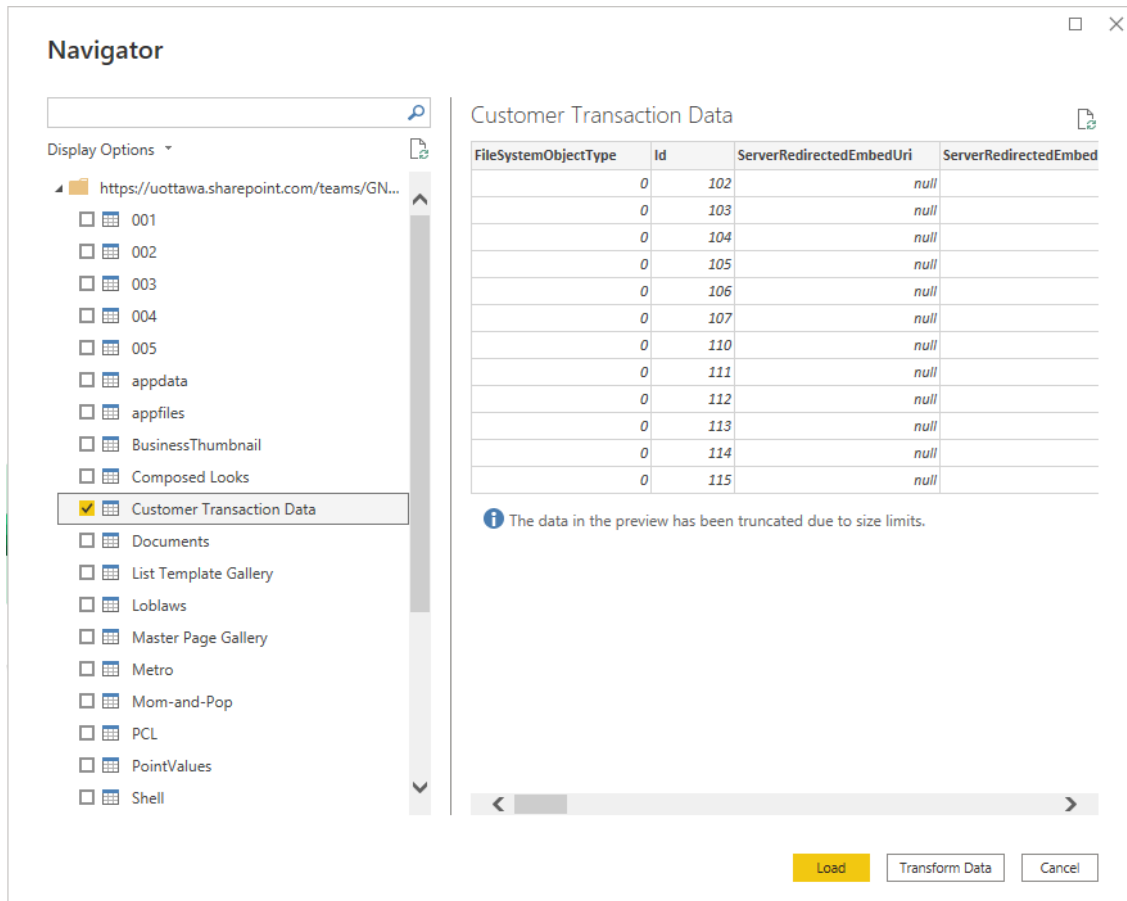


Figure 37. Selecting your SharePoint list

All columns will show up in the dataset, even the hidden ones that are automatically created by SharePoint. Delete these columns until you are left with the columns outlined in Table 3. Next, the columns must be formatted so they can be represented properly. Select the title of the column that you want to format and using the top toolbar, go to Home>Transform>Data Type. Select the proper data type from the drop-down menu. The default is “Any”. Use Table 4 as a guide for how each column must be formatted.

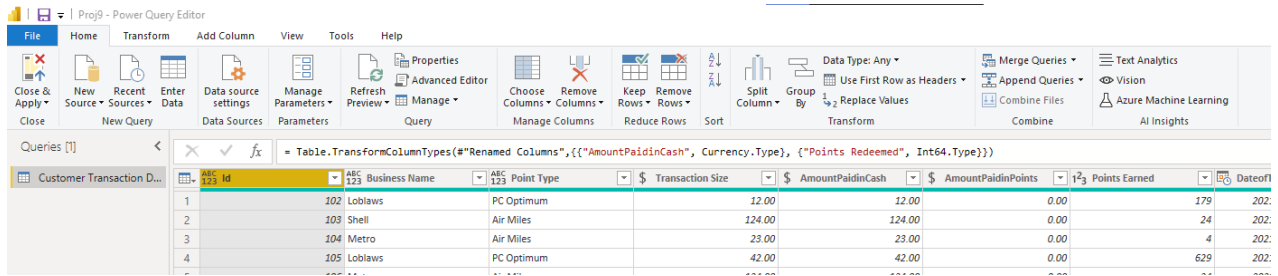


Figure 38. Power BI taskbar

Table 3. Formatting columns for Power BI

Column	Format
ID	Default
Business Name	Default
Point Type	Default
Total Transaction Size	Fixed decimal number
Amount Paid in Cash	Fixed decimal number
Amount Paid in Points	Fixed decimal number
Points Redeemed	Whole number
Points Earned	Whole number
Date of Transaction	Date/Time
Customer ID	Default

Select Close & Apply from the top right corner when you are finished formatting.

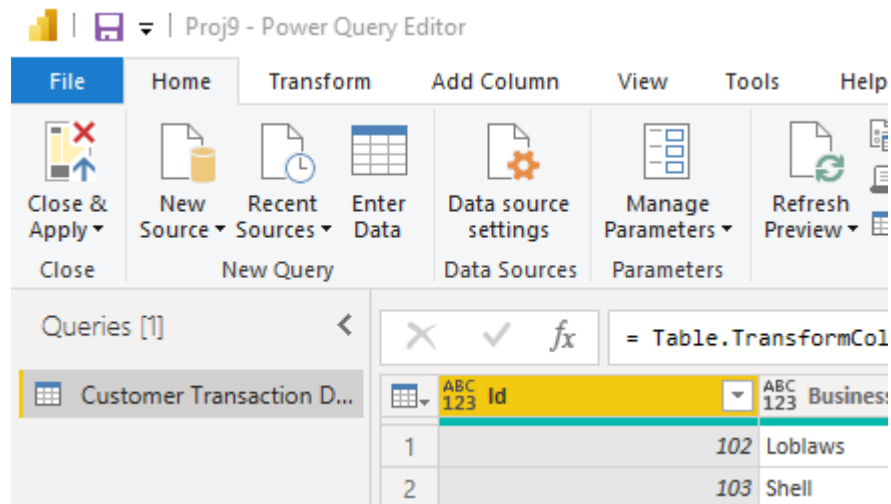


Figure 39. Close & Apply button

6.3.3 Creating Representations

Now that your dataset is linked to your SharePoint list and properly formatted, you can begin creating your representations. This section will demonstrate how to create a representation and add filters.

From the top toolbar, select New Visual.

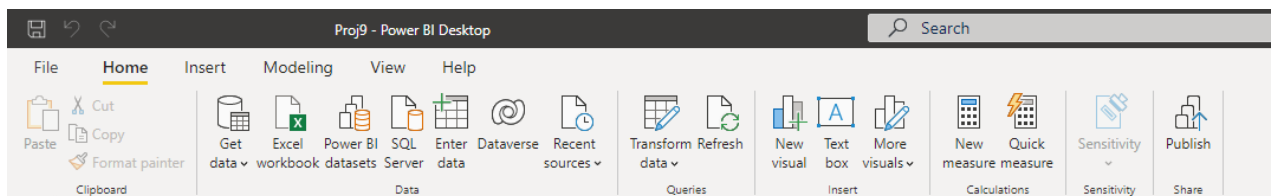


Figure 40. Create a new visual from toolbar

Your visual will now appear in your workspace and the following menus will appear on the right.

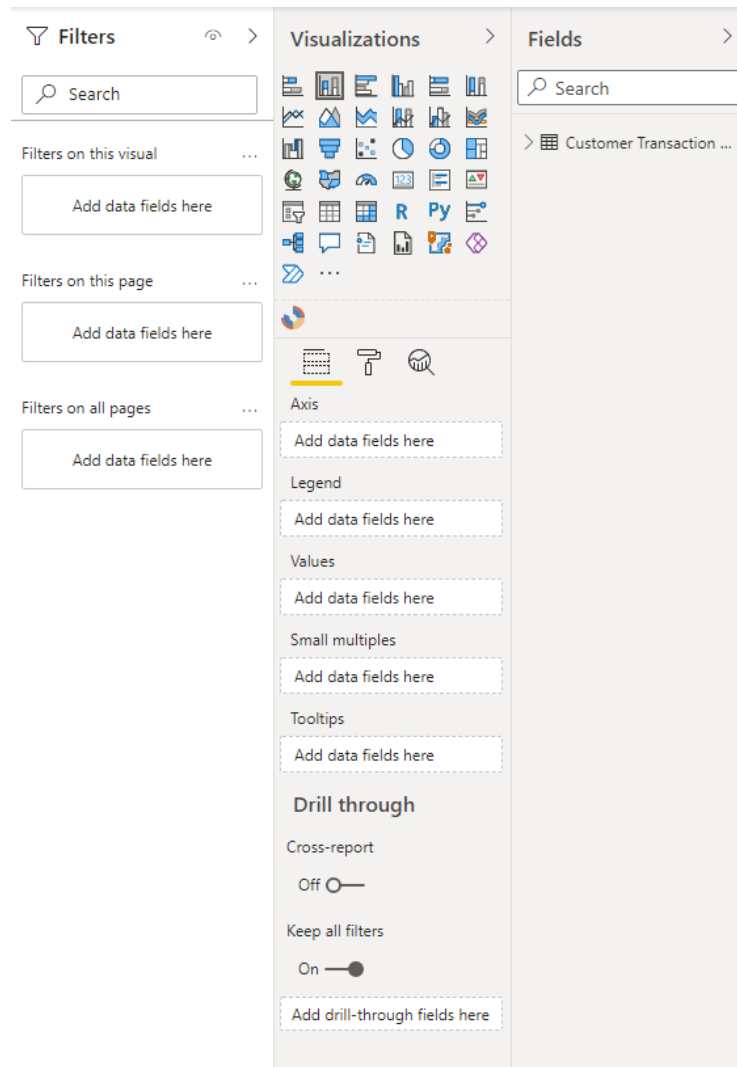


Figure 41. Graph formatting menu

Select the drop-down menu for your dataset and drag-and-drop or select values to add to the representation.

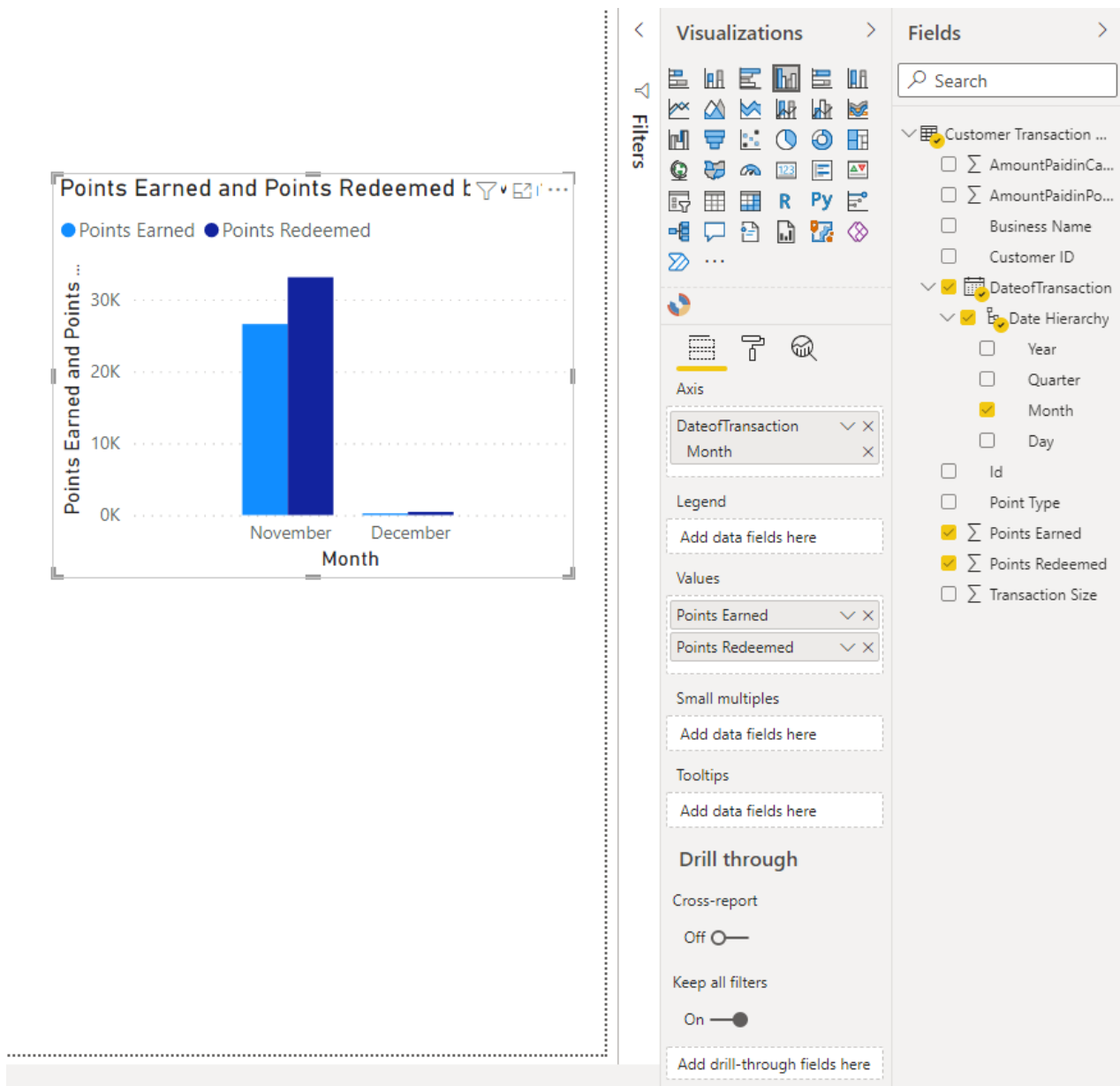


Figure 42. Add data to graph

You can change the type of graph using the icons under Visualizations, and customize axes, titles and more under the paint roller icon.

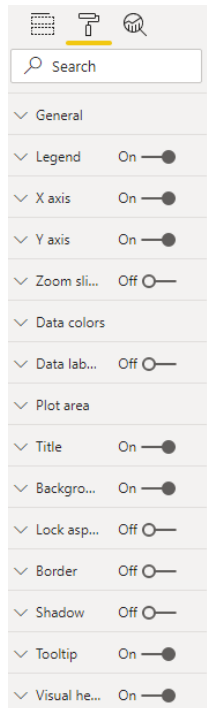


Figure 43. Graph formatting menu

To set filters, expand the Filters menu to the left of the Visualizations menu. Select which representation you want to filter and select from the menu, which filters you want to use. You can also lock filters using the lock icon in the upper right corner, which disables changes made to this filter.

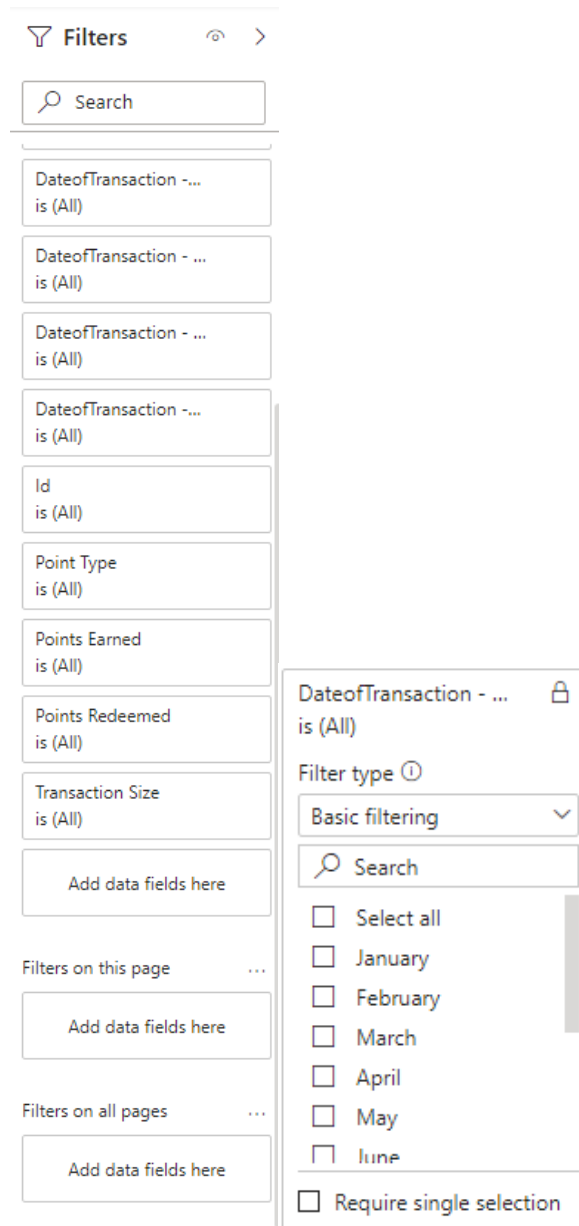
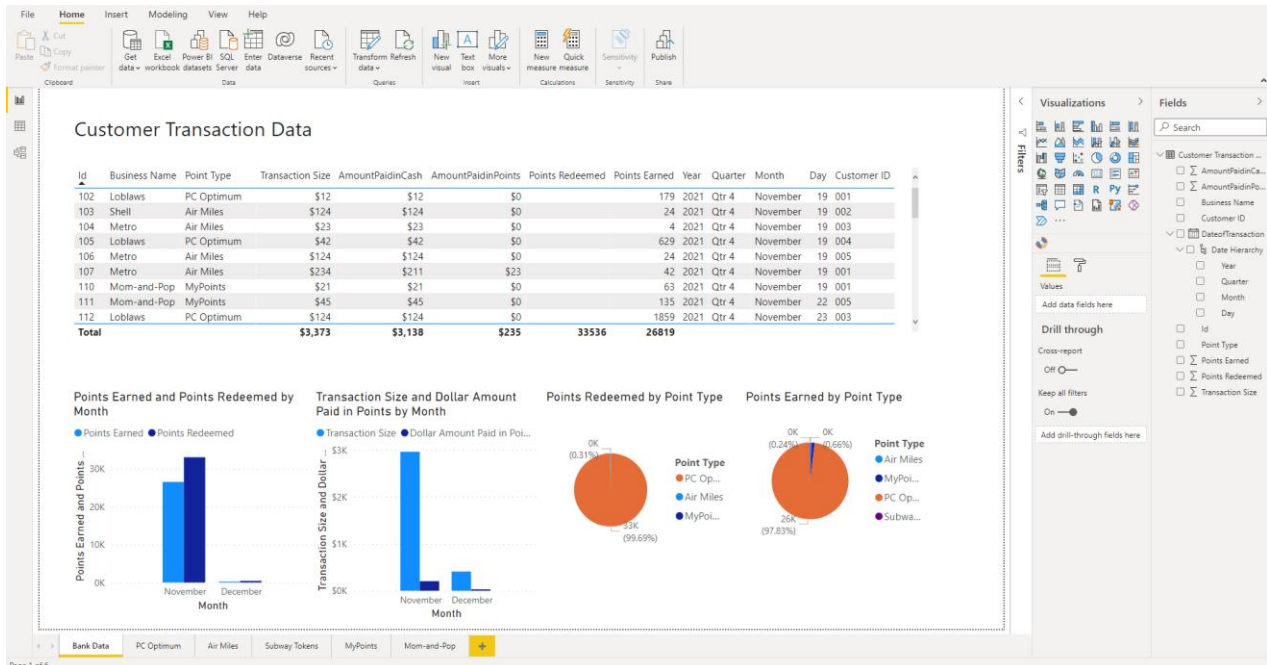


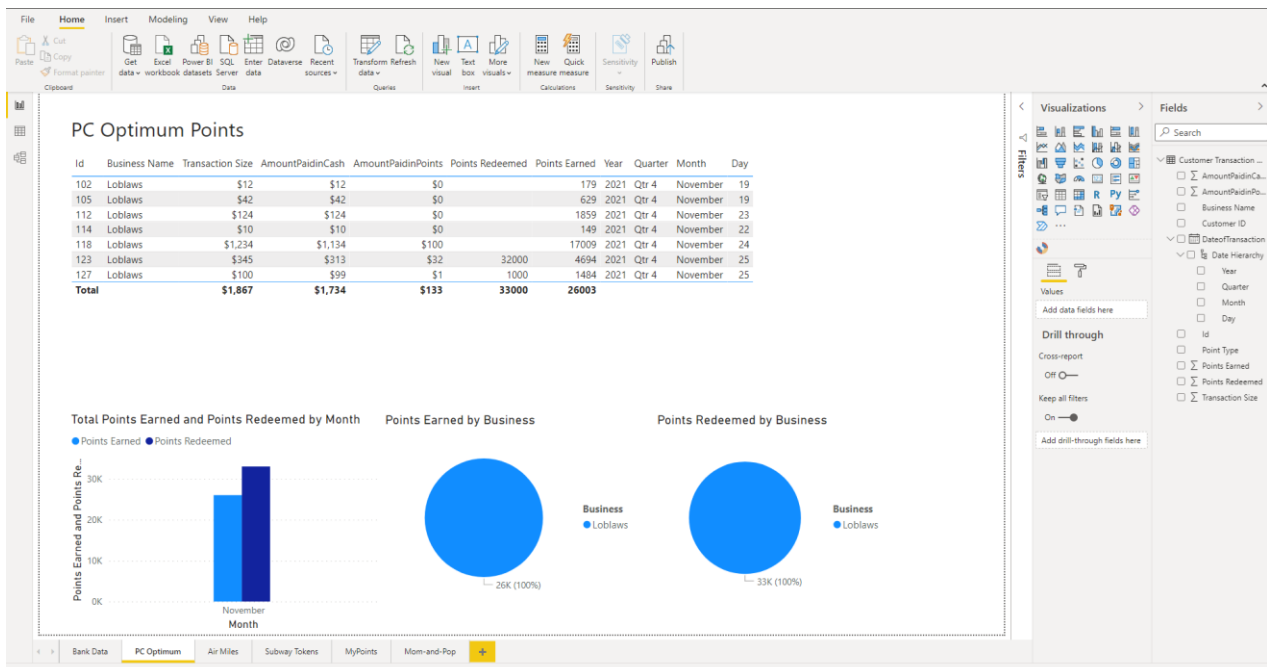
Figure 44. Creating filters

Drag-and-drop additional filters the same way you do so for creating the representations.

You can also create different pages for each business or loyalty program. By selecting the yellow + button at the bottom of the page.



Page 1 of 6



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Figure 45. Creating pages

The Power BI workspace is completely customizable; you can add additional fonts, colors, and graphs to represent your data in the best way.

6.4 Testing & Validation

To test the final prototype, comprehensive prototype, we performed all the functions available in the app—mock transaction, transaction history, convert points, send points to a friend—and recorded the output to the user and to the back end. For all functions, the appropriate error or success message was presented, the new transaction was recorded in the SharePoint list instantly.

The original prototypes of the Power BI were not capable of refreshing the data once a change was made to the SharePoint list (Figure 46). We were unable to find the root of the problem and resorted to recreating the Power BI using the method described in section 6.3.

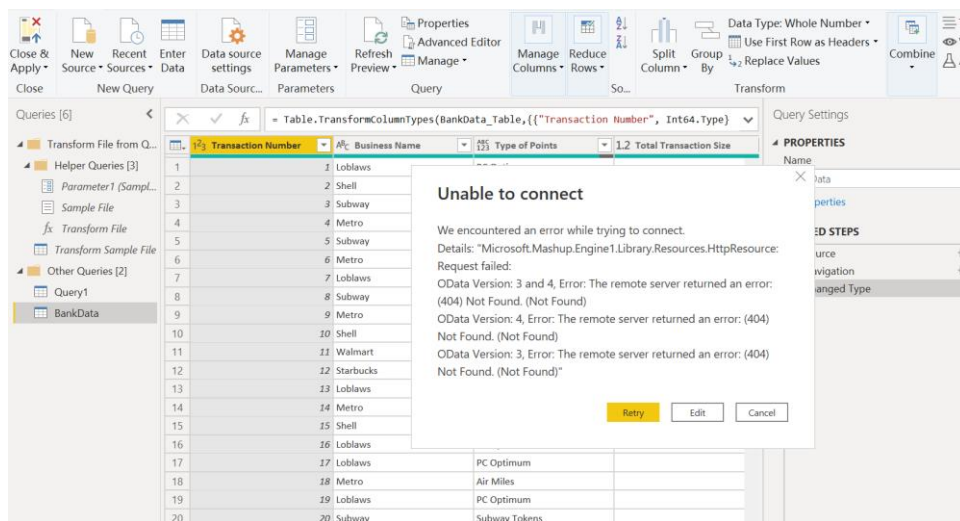


Figure 46. Power BI early prototype error

All attempts to refresh the final prototype through the desktop app were successful, and the representations were updated properly. Unfortunately, we were unable to refresh the shared online

version of the Power BI directly. Any attempt to edit the online version, would not share the updates to the original document or be viewable by others. We figured out that this was because of the collaborative restrictions of the online Power BI platform explained in section 5.1.2. This meant, that we could only have a single person, edit, refresh, and publish the report.

7 Conclusions and Recommendations for Future Work

In our project, we organized two meetings a week to discuss how was every member's works going on (like testing the prototype, linking the data to Power BI) and to share the ideas and suggestions with each other. In this process, we also found that we lack experience of some specific skills, for example, we don't have any coding experience, which made the project a bit more difficult for us; so what we learned from this is that we have to perceive our shortages and make a more detailed problem statement, and then overcome it with alternative methods.

We are going to make our app to be more functional if we had more time. For example, we wanted to add a searching function on the transaction history page of our app, so that the customers can view their trades more conveniently; but we gave it up because it was time-consuming and too complex for us.

8 Bibliography

Collaborate in a classic workspace - Power BI. (2021). Retrieved 8 December 2021, from <https://docs.microsoft.com/en-us/power-bi/collaborate-share/service-collaborate-power-bi-workspace>

Data refresh in Power BI - Power BI. (2021). Retrieved 8 December 2021, from <https://docs.microsoft.com/en-us/power-bi/connect-data/refresh-data>

Get started formatting Power BI visualizations - Power BI. (2021). Retrieved 8 December 2021, from <https://docs.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-customize-title-background-and-legend>

Hassan, S. (2021). Integrating SharePoint Online and Power BI (Part 1) - Flyview. Retrieved 8 December 2021, from <http://www.flyview365.com/2018/02/15/integrating-sharepoint-online-and-power-bi/>

Hassan, S. (2021). Integrating SharePoint Online and Power BI (Part 2) - Flyview. Retrieved 8 December 2021, from <http://www.flyview365.com/2018/02/22/integrating-sharepoint-online-power-bi-part-2/>

How to Create PowerApps Login Form. (2020). Retrieved 8 December 2021, from <https://www.youtube.com/watch?v=wpxpWavYV1w>

IF function. (2021). Retrieved 8 December 2021, from <https://support.office.com/client/if-function-0a4ad187-dba3-48ae-abe9-bbe3aa6aebca?NS=SPOSTANDARD&Version=16&AppVer=SPO160>

OR function. (2021). Retrieved 8 December 2021, from <https://support.office.com/client/or-function-9a2a1cca-696f-4d19-a959-3943babd076f?NS=SPOSTANDARD&Version=16&AppVer=SPO160>

Power BI - Get Data From SharePoint List / Library. (2021). Retrieved 8 December 2021, from <https://community.powerbi.com/t5/Service/Power-BI-Get-Data-From-SharePoint-List-Library/td-p/280109>

Troubleshooting refresh scenarios - Power BI. (2021). Retrieved 8 December 2021, from <https://docs.microsoft.com/en-us/power-bi/connect-data/refresh-troubleshooting-refresh-scenarios>

APPENDICES

9 APPENDIX I: Design Files

Table 42. Referenced Documents

Document Name	Document Location and/or URL	Issuance Date
PCL SharePoint	https://uottawa.sharepoint.com/teams/GNG1103A01-Proj9/Lists/Point%20conversion%20and%20login/AllItems.aspx	08/12/2021
PointValues Sharepoint	https://uottawa.sharepoint.com/teams/GNG1103A01-Proj9/Lists/Test%20List/AllItems.aspx	08/12/2021
Customer Transaction Data Sharepoint	https://uottawa.sharepoint.com/teams/GNG1103A01-Proj9/Lists/Customer%20Transaction%20Data/AllItems.aspx	08/12/2021
BusinessThumbnail Sharepoint	https://uottawa.sharepoint.com/teams/GNG1103A01-Proj9/Lists/BusinessThumbnail/AllItems.aspx	08/12/2021
UserInterface PowerApp	https://make.powerapps.com/e/Default-d41fdab1-7e15-4cfd-b5fa-7200e54deb6b/canvas/?action=edit&app-id=%2Fproviders%2FMicrosoft.PowerApps%2Fapps%2Fc2edcae9-984d-4aac-a497-256fba33f80f	08/12/2021
MakerRepo A9 MyPoints	https://makerepo.com/quynhni/1062.a9-mypoints	08/12/2021