**Introduction to Data Analytics using Power BI**

**Learner’s Guide**

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# Case Study Introduction

Introduction to the Business Case

Today, you will be working with financial loan data provided by the loans department of an American financial institution. The financial head of that institution has contracted you, a business analyst, to create a summary report on Power BI from the data, to gain a visual insight into what the data is talking about. You are tasked to:

* Understand the data
* Create relevant metrics for monitoring
* Create relevant charts for the financial head to get a summary

The data

The data consists of around 20 columns, and close to 100k rows of data from 10 days of March 2017. Each row of data is a loan taken by a customer and consists of details related to the loan taken, account information and demographic information of the customer.



What does the Finance Head want to see in the summary?

As part of the summary report, the financial head wants to know the following:

* Total Loan Amount
* Remaining Outstanding Amount
* Loan Amount Take up Trend
* Loan Status Distribution
* Loan Purpose Distribution
* Distribution of loan amount by state and further by home ownership

**Let us get started!**

# Module 1: Importing and shaping the data

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| 1. Make sure you have **Power BI** Desktop opened up and you see the following window. |  |
| 1. Click on the “**Get Data**” button as highlighted and wait till it opens up a Get Data dialogue box. |  |
| 1. On the Get data dialogue box, select **Text/CSV**.   This is because, we can proceed to connect to the “**Loan Data.csv**” file. |  |
| 1. In the File Select Dialog Box which follows, select the relevant file, and **press Open.** |  |
| 1. Once the file has been selected, a preview of the file pops up.   Click  to **“Transform Data”** in the Power Query editor where we will clean and get the file ready for analytics. |  |

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| * The Power Query Editor is a tool used to clean data efficiently and automate the cleaning process. * The top panel has the various cleaning and transforming options. | |  |
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| 1. The panel on the we have **“Query Settings”** in that **(“Applied Steps”)** is there , where any transformations done recorded. |  |
| In this data, we do not have a lot of exhaustive cleaning to do. There are two issues that we have to deal with:   * Changing the **issue date** to the right format. * Replacing all blanks in the **emp\_title** column with Others. |  |

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| Let us start shaping the above data first. |  |
| 1. First, let us change the **issue\_date** from its current numeric data type to date data type by selecting the column and then clicking on **Data Type: Date.** 2. On the subsequent screen click **Add New Step**. |  |

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| 1. You will notice that once the change has been done, the issue\_date is correct, and a step is added to the Applied Steps. You can right click and rename the step to something more comfortable. |  |
| 1. Next let’s try and fix the second issue. Right-click on column name **emp\_title** and click on **Replace Values**. |  |

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| 1. This will open up a window. Leave **Value To Find** as blank and enter **Others** in the **Replace With.**   Press **OK** once done. |  |
| 1. This will replace all the blanks with Others and record a step in the Applied Steps panel. Rename the step accordingly. |  |

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| 1. Now that we have finished all the data cleaning, we can load the data for visualization. Click the **Close and Apply** button on the top left of the Power Query. |  |

Module 2: Building the report

As part of this module, we will see how to create the report using the data that was loaded in at the end of Module

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| 1. Once the data has been loaded in, you can see all the columns in **Data** panel as shown in the figure.   Now let us start building our report!  Metrics – Seeing the big picture.   1. The financial head should be able to see the important data in big numbers on the report. These are the metrics that the financial head would monitor from time to time closely. Here, let us create two metrics.     - Total Loan Amount  - Total Outstanding Amount |  |
| 1. For the **Total Loan Amount**: 2. Click on the **Card Visualization** 3. Drag the **loan\_amnt** to the Data area as shown   You will see a visual as you see on the canvas area in the figure. |  |

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| 4. In its current state, this visual does not give us the correct information and is not formatted as desired. We will use the format option available for the visual to add more value to it! |  |
| 5. In Visualizations go to **Format visual** and do the following formatting:  - Switch off **Category Label**  - Switch on the **Title** and enter the title as **Total Loan Amount**. Align it to the **centre** and change the font size to **18**.  - In the **Callout value**, change the **display units** to **millions**, **decimal places** to 2 and **font size** to 36.  - Add a **border** to the visual by switching **Visual boder** on and selecting the **Rounded corners** as 6.  You will notice that the visual looks much better now |  |

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| 6. Similarly, let us create another card visual for **Outstanding Principal Amount.**  - Click on the **Card Visualization**  - Drag the **out\_prncp** to the Field area as shown  - You will see a visual as you see on the canvas area in the figure  - Use the same formatting steps as for the previous card visual. |  |
| **Loan Trend – Knowing the take up of the loans over date & time**  It is important for the financial head to know the trend of how loans are being taken up. |  |

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| 7. We will use a line chart in order to showcase the trend.  - Click on the **Line Chart Visualization.** Adjust the size accordingly.  - Drag the **issue\_date** to the **X-** **axis.**  - Drag the **loan\_amnt** to the **Y-axis.**  - Add the required formatting options to make the visual look better. |  |
| Enable **Data Label** with **units** in **millions** and **3 decimal places**.  - Change the **title** to **Loan Amount Trend**.  - Add a **border** to the visual.  - You will see a visual as you see on the canvas area . |  |

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| 8. Using the drill down and up buttons on the top right of the visual, you can toggle between the different **levels** of the **issue\_date** – **year, quarter, month, day** |  |
| 9. From this chart, the movement across the days can be clearly seen. |  |

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| **Loan Status Distribution**  **– Knowing the status of the loans taken up** |  |
| It is important for the financial head to know which loans are current, delayed in payment and so on and will help avoid loans going into non- performing status. |  |

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| 10) To do this, let us create a **Clustered Column Chart.**  - Click on the **Clustered Column Chart Visual.** Adjust the size as required.  - Drag the **loan\_status** to the **X-axis**  - Drag the **loan\_status** to the **Y-axis**  - Drag the **term** to the  **Legend**  Add the required formatting options to make the visual look better.  - Enable **Data Label**  with **units** in **All**.  - Change the **title** to **Loan Status Distribution.**  - Add a **border** to the visual.  - You will see a visual on the canvas area as shown in the figure.  **Interaction between the charts in PowerBI**  11) All the charts plotted within PowerBI and inherently interactive with each other. All you need to do is click on the element that you want to act like a filter and watch all the other visuals change accordingly. |  |
| 12) In this case, lets **click**  on the element corresponding to the **Loan Status Distribution chart**: the status of the **cu rrent** loans taken for a term of **36** months. |  |

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| 13) Notice that all the other charts have changed corresponding to what was clicked. |  |
| **Geographic View of the Loan Amount vs State vs Home Ownership using a Map Chart**  *Make sure that you are not under a firewall or VPN.*  The financial head wants to see the take up of loans across the different states of the US in order to better target sales and marketing efforts. |  |

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| 14) To do this, let us create a **Map Chart.**  - Click on the **Map Visual.** Adjust the size as required.  - Drag the **addr\_state** to the **Location**  - Drag the **loan\_amnt** to the **Bubble size**  - Drag the **home\_ownership** to the **Legend**  - Add the required formatting options to make the visual look better.  - Change the **title** to **Loan Amount by State.** |  |
| - Add a **border** to the visual.    - You will see a visual on the canvas area as shown in the figure.  Using the chart, one can analyse which states take the most loans and which do not. The analysis can also extend to which **type** of **homeowners** take up loans based on the different states.  **Why do people take loans? – Analysing using a tree map chart** |  |

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| 15) To do this, let us create a **Tree map Chart.**  - Click on the **Tree map Visual.** Adjust the size as required.  - Drag the **purpose** to the  **Category.**  - Drag the **purpose** to the  **Values.**  - Add the required formatting options to make the visual look better.  **Enable** the **Data Label**  - Change the **title** to **Loan Purpose Distribution.**  - Add a **border** to the visual.  You will see a visual on the canvas area as shown in the figure. |  |
| Using this chart, one can see why loans were taken  and focus on improving efforts to market the respective loans.  16) To complete the report page, lets add a title. To add a title, click on **Insert -> Text Box**  17) In the text box, type in **Loan analytics report**, change font size to **20**, **bold** and align to the **centre**.  18) You can further format this by adding a background and a border.  19) Overall, your report should now look like the figure shown!  **We have created our first Power BI Report! Well done!** |  |

Module 3: Some Power BI features

We need to learn about certain features which gives Power BI an edge above Excel and makes it a very powerful BI tool. In this module, we will look at some of those features.

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| **Making presentation to an audience easier.** |  |
| 1. **Focus mode**   Sometimes, while explaining a chart to the audience, we might want to take the chart into full screen mode to allow the audience to  completely focus on it without being distracted. |  |

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| The focus mode is available on the top right of every chart. Click on it to take the chart into full screen. | |  |
| **2) Spotlight**  If one does not want to take a chart into full screen mode but wants to still make the audience focus on a particular chart, spotlight mode can help!  - Click the **three dots** on the top right of any  chart and click  **Spotlight**. |  | |

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| **3) Analyse**  Power BI gives an intelligent feature which allows an analyst to analyse various things like increase and decrease in trend, different in distribution, and others. |  |
| Let us take our line chart from example. **Click on any point, click Analyse -> Explain this**  **increase/decrease**. |  |

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| You will notice after a few seconds, Power BI automatically gives you the various factors that could have been responsible for this. |  |
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**This is the end of the Power BI Learning Guide.**