# National College of Ireland

## Project Submission Sheet – 2020/2021

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| **Programme:** | MSC. IN DATA ANALYTICS **Year:**2020/21 |
| **Module:** | BUSINESS INTELLIGENCE & BUSINESS ANALYTICS |
| **Lecturer:** | PROF. VIKAS SAHNI |
| **Submission Due Date:** | 20-12-2020 |
| **Project Title:** | AMICA MUTUAL INSURANCE. Power BI SOLUTION |
| **Word Count:** | …… |

**I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.**
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**Signature:** Jignesh, Tushar, Ritika, Prathamesh

**Date:** 20-12-2020

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# Business Intelligence & Business Analytics Project Implementation Report


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## I.INTRODUCTION

We need to create a robust and scalable architecture for Amica to implement the specified details in the specification report. The implementation of the architecture consists of two aspects- I .technical which consists the data management and II. non-technical which involves the reports and dashboard creation. We are using Dynamic 365 CRM for tracking the team communication and request handling for the potential and existing clients. Also, we are using Power BI to generate reports and to transform data into rich visuals which eventually helps in decision making.

## II. DATA MANAGEMENT

Data plays the most crucial role in any company's growth. Being an insurance firm the value of data for Amica is much higher as it consists of many sensitive details from the customers. First, obtaining the proper data was the initial challenge for developing this architecture. As we did now have the data from Amica we have used the sample data which was obtained from the following data source. [https://www.kaggle.com/buntyshah/auto-insurance-claims-data]. We have added some extra columns into this dataset using Mockaroo[2] to add some more data for a better understanding of the architecture.

For storing this data, we need to have an easy and powerful database management architecture. As many companies opt for cloud storage as it is easy to manage, hence we have used the AWS cloud DB instance for storing our data. We have followed the following steps for the same.[4]

1. Generated the DB instance on AWS using AWS free tier account. – (**db-biba-grp4.cankk5yw9mac.eu-west-1.rds.amazonaws.com) (**fig 2.1)
2. Used Microsoft SQL server as our relational database. We have connected to our AWS DB instance using SQL server management studio. (SSMS).
3. Pushed the sample data to the database using SSMS using the SQL server's import wizard. (fig 2.2, fig 2.3)

The advantage of using a cloud-based database is we do not have to bother with the database backup and other daily hectic stuff. We must configure the backup schedule, log schedule, and other time-consuming tasks only once. This would reduce the labor cost and chances of manual errors significantly.

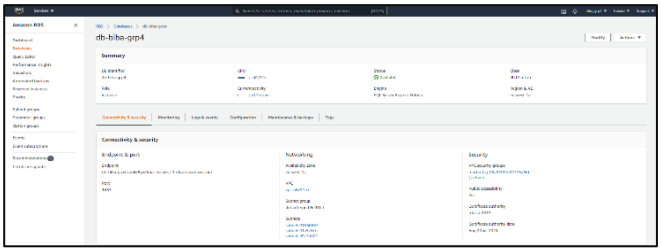

Fig 2.1- AWS DB instance.

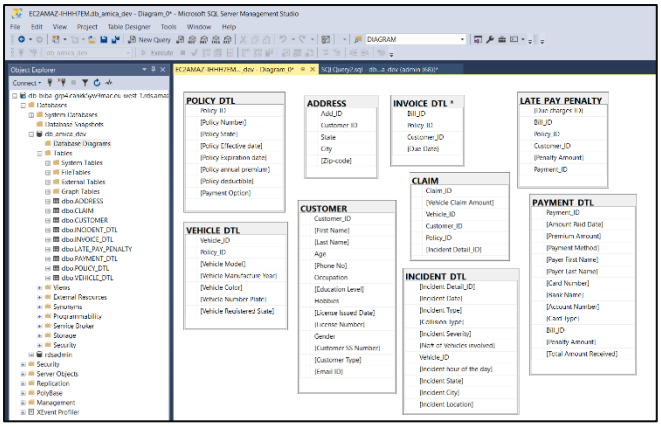


Fig 2.2- DB connection to AWS DB instance using SSMS.

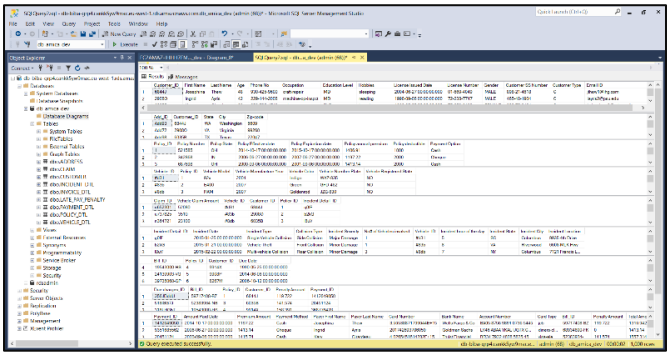

Fig 2.3- Data pushed into DB using SSMS import wizard.

While making the connection between all these tools we came across many technical difficulties which we eventually overcome. It signified the importance of employees with a strong technical background in an organization to reduce the dependency on third-party sources. ERP covers all these and helps to make the business successful for any company.

## III. SWOT ANALYSIS

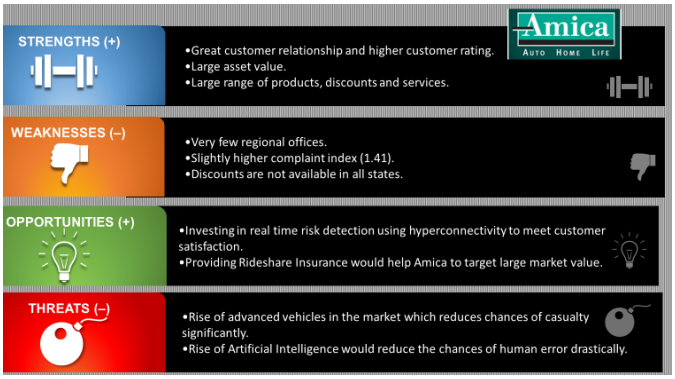


Fig 3.1- SWOT analysis for Amica.

*A. Strengths*: Amica has a great market reputation and customer rating. It was awarded 1st rank in customer satisfaction by J.D.Power and the first firm to obtain 50 of such customer satisfaction awards. Also, Amica has a large asset value in the market. At the end of 2019, Amica had an asset worth of $5.4 billion. Also, the company offers a large range of products and discounts on those products which directly makes an impact on customer satisfaction and customer choice of insurance.[3]

*B. Weakness:* Though Amica has a pretty good online platform, it has very few regional office premises throughout the states. Due to this customer faces issues while contacting the firm related to any concerns. Being one of the oldest insurance firms in states it has significant customers in the age group above the 50s who still prefers in-person communication instead of online interaction. Due to the lack of regional offices, there is a significant rise in the complaint index (1.41) for Amica. Also, Amica does not offer discounts on its products at all the locations which indirectly result in losing a significant amount of sale in particular areas.[3]

*C. Opportunities:* Currently Amica does not offer rideshare insurance products for the vehicles used for ride-sharing purposes like Uber or Ola. As there is a large surge in this sector, ignoring this product would be a mistake for Amica. Hence introducing such rideshare products would help Amica to fill the gap between it and its competitors. Also, with the increase of technology people are more familiar with real-time notifications and activity trackers. Investing in such technologies would enable Amica to not only attract more customers in the market but also lower the claim rates and fraud claims. This would help Amica to expand in the future.

*D. Threats:* As the advancement of Artificial Intelligence is proving to be a blessing for many industries, Auto insurance companies would face large challenges due to this in near future. As most of the vehicles would be enabled with an advanced driver assistance system, the margin for human errors would be very slight [1]. This would change the mindset of customers towards vehicle insurance. They would feel no need for vehicle insurance as the chances of the vehicle getting damaged would be very slight.

## IV. CUSTOMER RELATIONSHIP MANAGEMENT


Fig 4.1- CRM

Ensuring that existing and new customers are satisfied with your service is crucial for every organization. For today's companies to grow in this competitive

environment, customer relationship management is an important aspect. Customer relationship management system helps you to keep track of sales leads, marketing strategies and bring out insights as to how can the relationship management from the customers be carried out. In today's market, the most often used CRM tool is Microsoft CRM. It is a tool for streamlining and speeding up the company's customer support activities. We are using the same for implementing the proposed business model for Amica. It would involve following process flow.

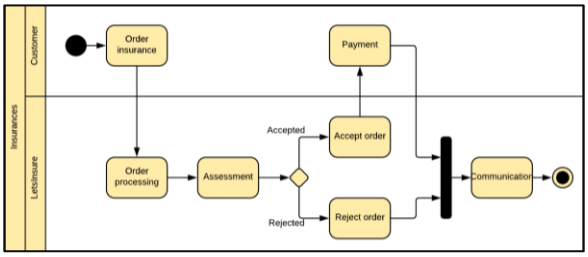


Fig 4.2- Insurance business flow

Business flow in CRM would consist of the following steps.

1. Lead creation
2. Qualify Lead or disqualify a lead
3. Opportunity
4. Create Quotes
5. Create Insurance
6. Create invoice

In the field of insurance, the business is highly dependent on the flow of the claim process. Every insurance firm would try to control the percentage of claims as it directly affects the profit for the firm. In general, the claim process flow for the firm looks like as given in fig 4.3.

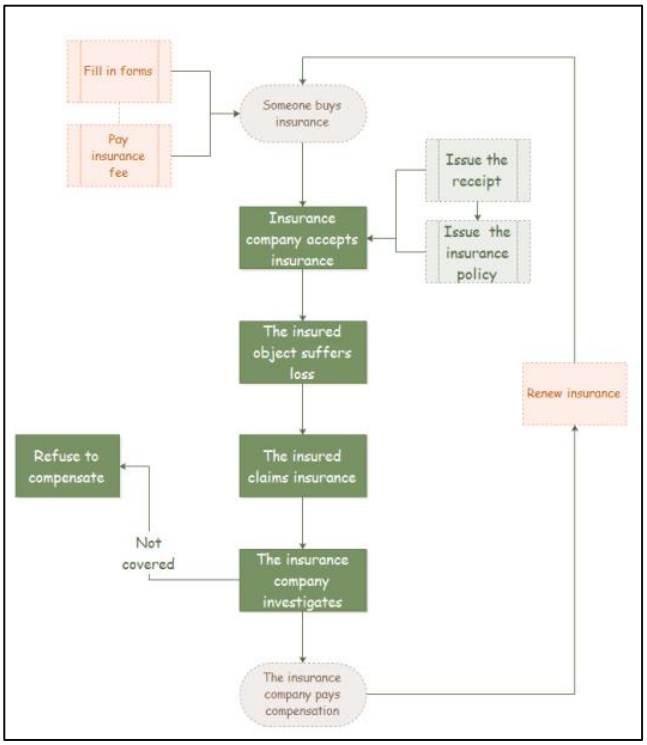


Fig 4.3- Insurance Claim flow

Apart from the regular insurance purchase and claim process, other miscellaneous services would be done in CRM. Some are mention below.

A. Phone Call Conversation with Customer:

There are several ways through which we can have a conversation in Dynamics 365 with the customer such as as-phone calls, email, fax, and appointments. When an employee clicks on the call the field is automatically occupied with the name of the customer, selected by an employee in the account or control field. The Direction option is set to Outgoing by default, we can even change it to Incoming in the direction list.

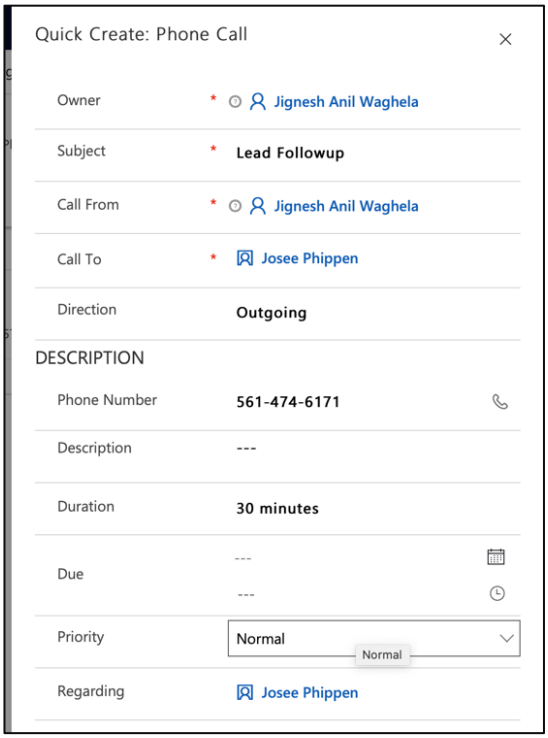


Fig 4.4- Call conversation in CRM

B. Active Policy Customer Contacts:

In the below figure, we can see all the contact details of the policy issued customer.

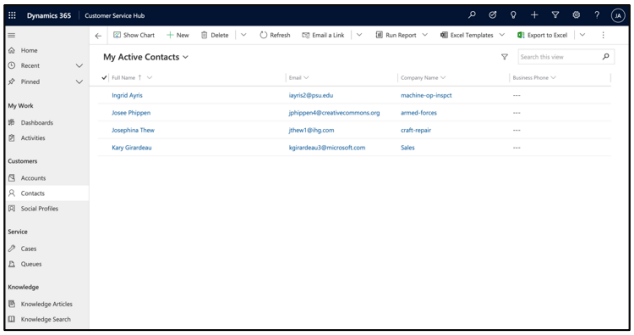


Fig 4.5- Customer contact in CRM

C. Case Creation:

In this field, an employee can create a case. The case type list has three options namely – Request, Problem, and Question depending on the description requirement we can set it. In the below figure we can see that the company employee has set a request type for the case mentioning that customer has still not submitted the required documentation to the company. It is mandatory to give to case a title that helps the customer to let him/her know the requirement. In

the below sample we can see that the case title is set to Document Pending.

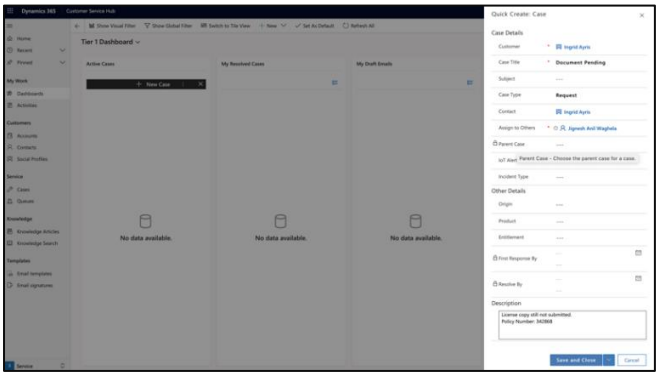

Fig 4.6- Case creation in CRM

D. Resolve Case:

Open the one which you want to resolve in the list of active cases. The below figure is the dialog box for Resolving the case. The resolution type list gives two options namely – Problem Solved and Information Provided. It is mandatory to select one option that how the case was resolved. Even it is compulsory to write a small explanation for resolution in the Resolution field.

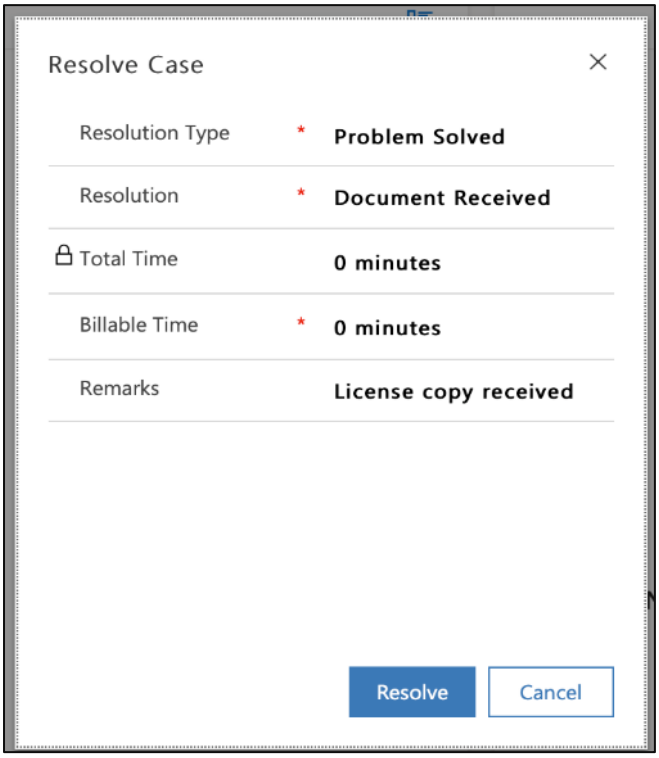


Fig 4.7- Case resolution in CRM

E. Dashboard for Active Cases and Resolved Cases:

In the below figure, we can see all the progress cases dashboards of the organization. We can notice the priority of the cases whether it is high, normal, or low based on this we can prioritize which cases should be resolved first. We can also identify the case type. In the figure, we are also able to see the Customer Resolved Cases dashboard.

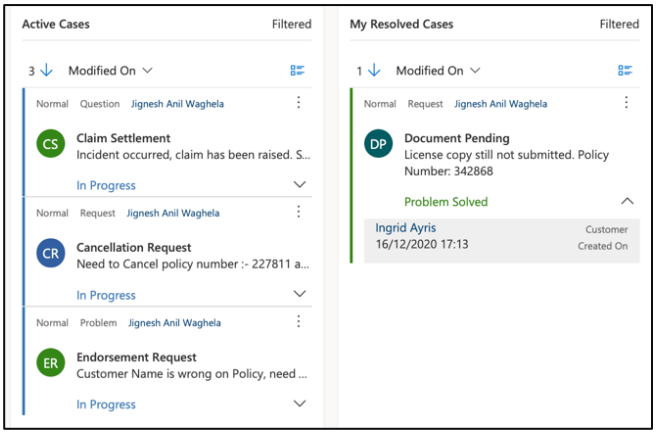


Fig 4.8- Brief of cases in CRM

F. Active Cases:

In the below figure, we can see all in-progress cases which are still not resolved.

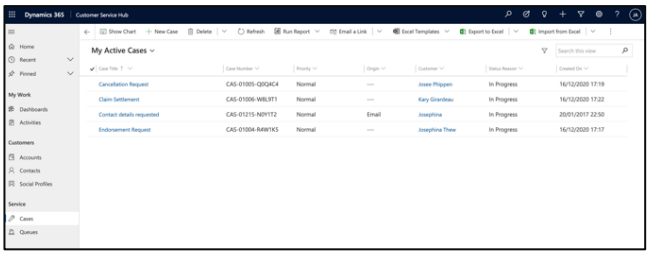

Fig 4.9- Active cases in CRM

G. Customer Request Progress View:

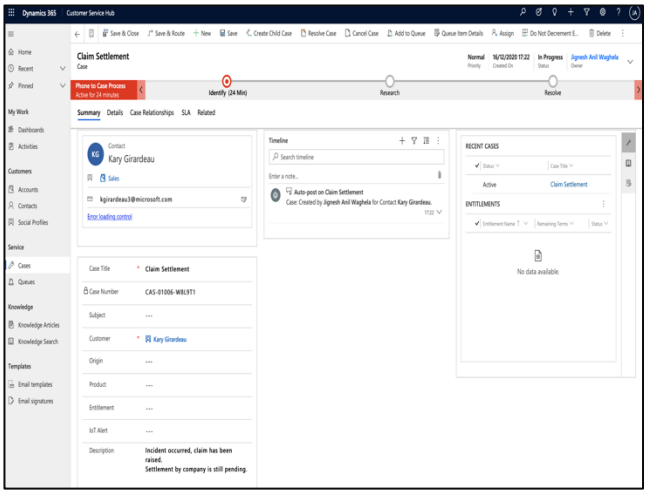

Fig 4.10- Request progress in CRM

H. All Cases Status:

In the below figure, we can see all the case's status which all are resolved, and which all are in progress.

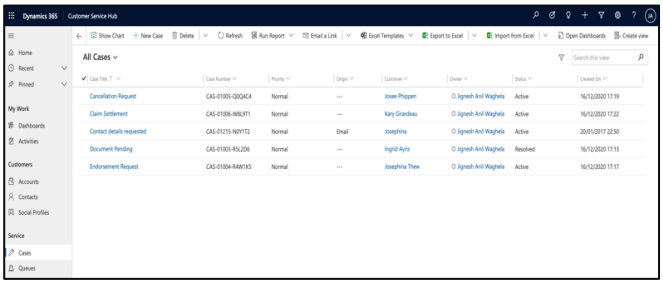

Fig 4.11- Case status in CRM

## V. REPORTS AND DASHBOARDS

Power BI is a Microsoft service for business analytics. It seeks to provide a simple enough interface for end-users to create their reports and dashboards with interactive visualizations and business intelligence capabilities, which is largely used across the corporate industry. Provided sufficient data, it can visualize the pattern and trend of any industry. Generating powerful dashboards is the most useful feature of Power BI. It is a single sheet that is used to express a story for the given data. Being only a single-page document, a well-calculated dashboard signifies the most important insights. Another powerful feature of Power BI is report generation. The Power BI report is a non-entity, but a multi-viewpoint view of a statistical set with visualizations that demonstrate various opinions and visions after that set of statistics. A report could be a solo picture or pages full of images.

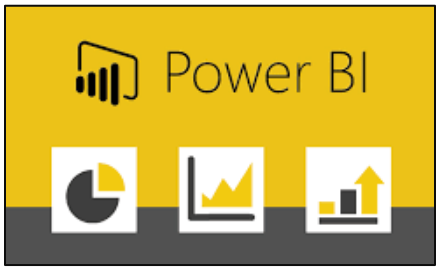


Fig 5.1- Power BI

For our project, we have pulled sample data from our relational database (SQL server) in Power BI to do analysis on it and create dashboards and reports.

We have created a ribbon on the top displaying the Total Number of Policies, Total Premium Charged, Total Premium Paid, Total Penalties charged, Total Number of Claims, Total Amount Claimed. These values change as and when any selection is made in the donut, pie, or bar chart.

**1. Overall Customer Dashboard:**

In this dashboard, the donut charts represent the distribution of policyholders based on various parameters which are as follows:

- Customers by Age Group: We observed that 40% of customers are from the age group 30 to 39
- Customers by State: The company has policyholders from IN, IL, and OH states, where 35.2% are from Ohio.
- Modes of Payment: We have observed that there is an almost equal distribution of customers based on their choice of payment mode. Be it offline (cash and cheque) or online (debit and credit cards)

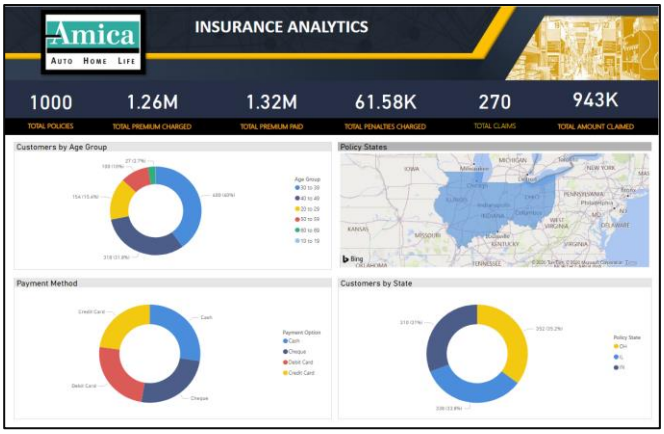


Fig 5.1- Overview Dashboard

**2. Incident Details Dashboard:**

In this dashboard, the pie charts represent the number of incidents that occurred based on different factors that are as follows:

- Incident by Type of Accident: We observed approximately 42% of incidents involved multiple vehicles.
- Incident by Type of Collision: We observed that 43.2% of incidents occurred due to Front Collision
- Incident by Severity: This shows the number of incidents based on their severity. 35.4% of the incidents involved minor damages followed by 28% involving total losses
- Incident by Number of Vehicles Involved: The majority of the incidents involved 1 vehicle.

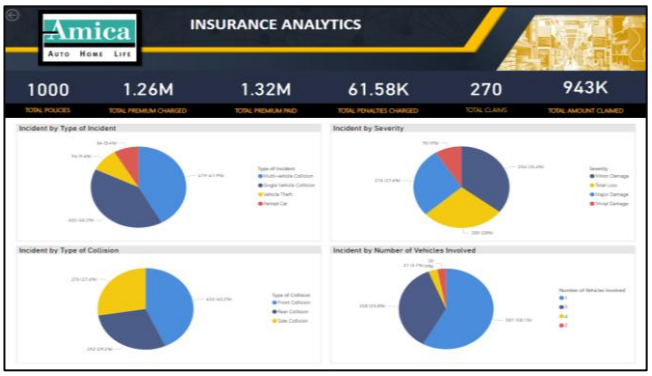


Fig 5.2- Incident Dashboard

**3. State-wise Dashboard:**

In this dashboard, we have created bar graphs for monthly data. We have provided a slicer on the top to filter the data based on the states in which the policyholders are present. The bar graph shows the following data:

- Count of policies by Month: The number of policies purchased per month.
- Total premium paid by the Month: The total premium paid by the policyholder per month.
- Total penalties charged by Month: The total penalties charged to the policyholder for late payment or failure to make payment per month.

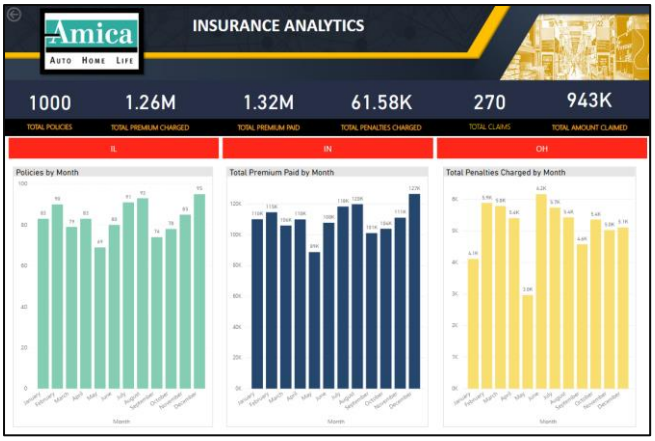


Fig 5.3- State-wise dashboard

Below are the screenshots of the dashboards when the state-selection is made on the slicer. The data on the ribbon also changes as and when the selection is made on the slicer.

Illinois (IL) State:

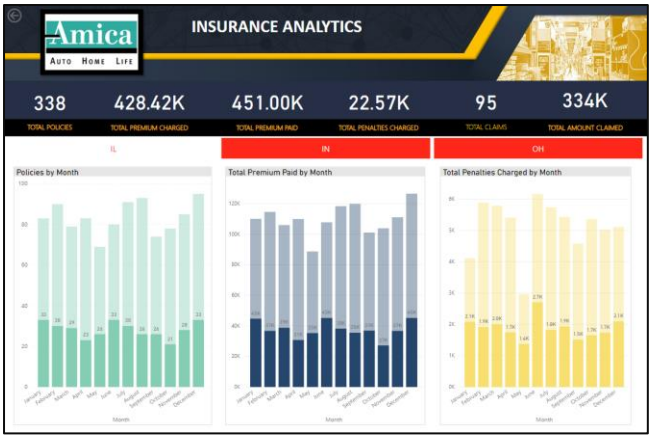


Fig 5.4

Indiana (IN) State:

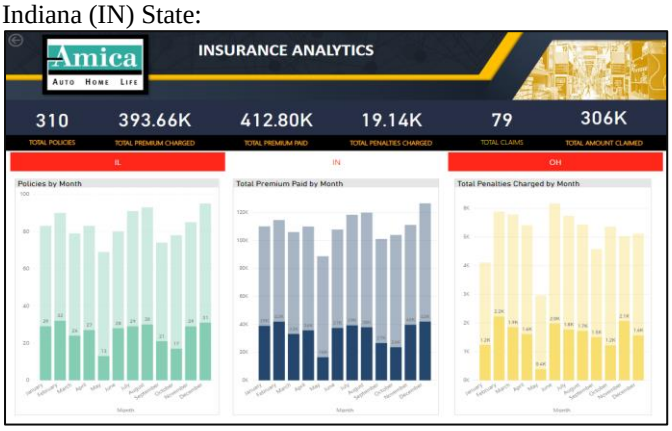


Fig 5.5

Ohio (OH) State:

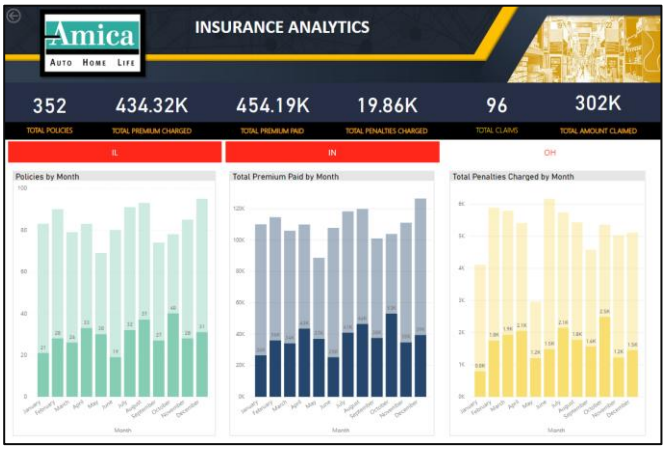


Fig 5.6

## VI. BUSINESS GOAL

We plan to implement a few ideas that would assist in growing their business and revenue to Amica in the market.

- For Amica, we are planning to provide more offers on insurance products at various locations where there are currently very low offers to attract potential customers.
- To increase the quality of customer service experience we are planning to open new office premises in the locations where there is no physical branch of Amica despite having a large number of existing and potential customers. For this analysis, we can dive deep into the data to locate such locations using Power BI reports and dashboards.
- To withstand the challenges in the future and to maintain the sustainable growth rate we are planning to gradually invest Amica's assets for the innovation and research in artificial intelligence and machine learning which would control the effects of future market trends.

## VII. TEAMWORK AND DISCUSSION

Our team had 4 members. It was our collective decision to choose 'Amica' as our project organization. Data Collection and correcting data, setting up SQL Server on AWS, and their connection to Power BI, ER diagram, SWOT analysis, CRM Implementation, Dashboards in Power BI, and report and presentation were the critical steps in our project. The completion of our project was the result of everyone's equal and collective contribution.

We have followed the Agile methodology throughout the project preparation. Arranging weekly meetings for task assignment and clearing doubts if any was major part of our planning for this project. All the group members helped to clear doubts if anyone were stuck at some point. Overall, everyone has equal participation in the completion of the project.

## VIII. REFERENCES

[1] https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2017/jun/Art11-Auto-insurance2.pdf

[2] https://mockaroo.com/

[3] https://www.amica.com/en/about-us/company-facts-and-history.html

[4] https://aws.amazon.com/