

COVID-19: Its Implications with a Focus on the Aviation Industry and How CRM and BI Can Play a Role



Diwakar Singh

Abstract: COVID-19 is the infectious disease triggered by a coronavirus that was most recently identified. This latest virus and disease was unknown in December 2019, until the epidemic started in Wuhan, China. COVID-19 is now a global pandemic that affects many countries. The COVID-19 virus spreads through cough droplets, and hence, to curb the spread of the virus, countries around the world have taken measures such as lockdown and travel bans. These necessary measures have had implications on the economies and industries around the world. Many industries have been changed forever due to the coronavirus's implications, and one industry that is severely affected is the commercial aviation industry. As economies start to function again, there is a need to bring changes to the various industries to ensure profitability, growth, and the safety of the employees and consumers. Technology can play a significant role in battling the implications of COVID-19. This report discusses the various implications of the crisis with a focus on the aviation industry. It further presents how Customer Relationship Management and Business Intelligence with a focus on data mining can play a significant role in supporting the aviation industry through the COVID-19 crisis while ensuring growth and safety.

Keywords: COVID-19, Aviation Industry, Customer Relationship Management, Business Intelligence.

I. INTRODUCTION

The COVID-19 outbreak has grown into one of the most significant pandemics in history. As the world continues to fight the disease, calculations are still not complete on what impact it will have on the world as a whole. However, with the devastation the pandemic has already caused, experts estimate the economic and business implications of this crisis as vast and long-lasting. While some industries such as sanitary products, healthcare, and online retail have flourished, several sectors have been struck hard by the pandemic such as hospitality, tourism, and aviation. Civil Aviation, an industry that was already encountering several obstacles in the pre-COVID era, has been severely harmed by the pandemic and is now in a worrisome situation. With many countries imposing travel restrictions, the functioning of aviation has come to a halt, and companies are struggling to make ends meet with no source of income. However, in today's economy, the aviation industry is essential, and many

governments are providing local airlines with support and bailouts to ensure the survival of the airlines. As the airlines start to function again, they face several new challenges. These challenges need to be dealt with to help the aviation industry flourish while doing its part in the fight against the COVID-19 global pandemic. This report holds that Customer Relationship Management and Business Intelligence can play a significant role in improving the aviation industry's situation during the current crisis. The report begins by discussing the general business implications of COVID-19 and further focuses on the pandemic consequences in the aviation industry. It then provides a brief discussion on Customer Relationship Management and Business Intelligence and how they can assist the aviation industry by focusing on various CRM tools and their applications. The report further discusses Business Intelligence and how it can assist airlines during crisis with a focus on data mining and analytics.

II. WHAT ARE THE GENERAL BUSINESS IMPLICATIONS OF THE COVID-19 PANDEMIC?

COVID-19 pandemic is a major medical crisis that has affected millions around the world. Several governments around the world have used lockdown and social distancing measures to contain the spread of the coronavirus. Such measures, in most cases, have required the closing of workplaces and usual places of businesses. Retail outlets around the world are unable to open for business, and many people working in sectors such as banking, I.T., and similar industries have been told to work from home. Many manufacturing activities around the world are shut down and have led to shortages of various goods and services around the world. Due to the social distancing norms around the world, the catering and food industry is unable to function normally as eating outside is considered unsafe by the majority of the people, and people are avoiding visiting cafes and restaurants due to the fear of coming in contact with the virus. Eateries, cafes, and restaurants are focusing on taking away and delivering in order to make it through these tough times, and in some places, this is the only method they can use. Many governments have also imposed travel restrictions, and nonessential travel feels like a thing of the past. These measures have severely hit the hospitality and tourism industry.

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* Correspondence Author

Diwakar Singh*, Undergraduate Student, The Hong Kong Polytechnic University, Hong Kong.

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As many of the usual activities are not currently happening in most places, several businesses and organizations are unable to sell their products and services and hence, are unable to generate sufficient revenue. Due to insufficient funds, many companies are going into bankruptcy, and small businesses are shutting down.

Many businesses are forced to take steps such as furloughing and downsizing to ensure their survival. As many companies and organizations are either going out of business or undergoing drastic changes to ensure survival, the unemployment rates across the globe are increasing at a steep rate. Although several businesses are suffering due to the global crisis, many businesses have proved to be more beneficial to the consumers and have gained popularity. The sanitary products industry has benefited from the pandemic in a significant way. During times of disease and infection, people have become more careful about their hygiene and have started considering products such as hand sanitizers and cleaning equipment essential and have increased spending on them exponentially. As the number of Coronavirus cases globally continues to increase every day, industries that play a role in supporting the healthcare systems worldwide have become increasingly essential. The demand for medical equipment such as Personal Protective Equipment (PPE) has increased drastically, along with equipment such as ventilators and life support. Such industries have profited on their importance during a time like this. As people remain confined in their homes, online streaming services such as Netflix and Amazon Prime have become increasingly popular among consumers. Along with that, consumers have also switched to e-retail to meet their needs and satisfy their wants. As the uncertainty regarding the COVID-19 pandemic crisis remains high, it is still hard to estimate when things might be back to usual, but as the situation is evolving, many experts have maintained that several industries have changed forever to a new normal.

III. WHAT ARE THE IMPLICATIONS OF THE COVID-19 CRISIS ON THE AVIATION INDUSTRY?

As the coronavirus continues to spread daily, governments around the world have made substantial efforts and enforced several measures to try and curb this spread. These government-imposed measures and steps include flight bans and travel restrictions around the world. Where travel restrictions and flight bans are not extreme, consumers themselves avoid air travel to avoid coming in contact with other people and possibly contracting the coronavirus. People believe airports to be 'hotspots' for the spread of the coronavirus as airports are usually considered to be packed with people from all different places, backgrounds, and walks of life, and one can never be sure about being completely safe from the virus. Similar reasons concerning airplanes are dictating the current consumers' preferences and decisions. Airplanes are small, closed, and packed vessels with a high risk of spreading the virus due to the lack of air circulation and close to zero possibility of physical distancing to consumers of a community that is currently affected by the pandemic and its development. These factors, restrictions, and consumer preferences collectively have led to a drastic decrease in the number of passenger numbers and have eventually led to the cutting down of the majority of the air traffic. Thousands of flights are being suspended, cancelled,

and many routes closed indefinitely. The aviation industry requires substantial amounts of investment and workforce to function commercially. As the number of flights continues to decrease, the revenue of various commercial airlines continues to decrease with it. Unlike other industries, airlines are not capable of performing many actions to significantly reduce costs, especially on non-air activities, which constitute a substantial amount of the revenue and expenditure of airlines.

As the uncertainty about the future of the COVID-19 pandemic, the crisis, and its impact on the aviation industry remains to be high, it is safe to say that the commercial aviation industry is one of the most severely affected industries by the pandemic crisis and the estimation of the implications of the crisis remains unknown. Aviation is also one of the industries that have been changed forever by the pandemic crisis. Airlines need to change and evolve with the times and needs of the pandemic and the post-pandemic era to ensure their survival and growth. To support the views the report holds, it is necessary to describe Customer Relationship Management and Business Intelligence. It is also necessary to discuss how CRM and BI can play a significant role in the evolution and change required during the times of the ongoing crisis and also ensuring a safe and prosperous future for airlines and their consumers.

IV. CUSTOMER RELATIONSHIP MANAGEMENT: A DESCRIPTION

Consumers and their happiness and satisfaction are the most critical factors when a company's position and growth are discussed. To maintain healthy relationships with current customers and attract new potential customers, a company needs to establish a system and mechanism to interact with the customers and study their needs and wants. As the name suggests, Customer Relationship management is a system that a company or organization uses to record, manage, and examine its dealing and interactions with current, new, and prospective consumers. Customer Relationship Management is a strategic and systematic process that allows companies and organizations to understand their customers better and promotes a more informed and efficient decision making in matters and tasks related to them. At a glance, it allows companies to understand consumer needs and make decisions and devise plans to satisfy those needs.

Customer Relationship Management is an entire process that consists of several components within the company or organization. An integral part of this system is the implementation of proper CRM software or application. This CRM software or application retrieves and stores information and data from various sources, such as emails, social networks, websites, sales procedures, and marketing campaigns. The data collected and stored is further used by analytical and operational CRM applications that work on the data using pre-set methodologies and algorithms to classify and summarize data to promote efficient and informed decision making by companies and organizations.

To ensure that Customer Relationship Management is effectively implemented in a company or organization and implementation team, familiarized with the philosophies, features, and capabilities of the CRM application, it is necessary to derive conclusions and necessary interpretations from the processes and analysed data from the CRM applications.

A well-implemented CRM software or application along with a team of CRM specialists can play a crucial role in ensuring that mismanagement and misinterpretation of essential data do not take place and also provide insights which can be substantially beneficial in retaining and expanding the company's customer base and eventually, increasing revenue and profitability.

V. CUSTOMER RELATIONSHIP MANAGEMENT IN SUPPORTING AVIATION THROUGH COVID-19 AND BEYOND

As the face to face interactions have disappeared, companies and organizations need to work on new ways to maintain relationships with their customer base. The COVID-19 pandemic has created a feeling of uncertainty in consumers and service users, and now, more than ever, companies and organizations need to work on providing consumers with certainty and safety. In industries such as aviation, which have been profoundly affected by the crisis, there is a need to implement proper Customer Relationship management Strategies and Tools to ensure the return of consumers while ensuring their safety. Some of the methods in which airlines can implement CRM to defend themselves from further damage due to the crisis are:

• Marketing Campaigns

One of the most important reasons people choose not to fly during this time is their ideas and thoughts about the airports and planes being too packed, not sanitized, and not following proper physical distancing measures. However, proper marketing campaigns demonstrating the various steps airlines are taking to fight the spread of the virus such as proper sanitization routines, social distancing measures, and providing travellers with safety equipment can be useful in gaining the consumers' confidence in flying with the airlines again and hence attracting more customers. These can be conducted through mail lists, social media, and company websites.

For example, United airlines are promoting its plan of assisting in practicing social distancing where possible by not seating middle seat customers and enabling seat adjustments.

• Prioritizing Interactions

Airlines loyalty programs are one of the main sources of revenue and also their primary customer base. During times of social distancing, customer interaction teams contact these customers and help them plan their trips and travels during the COVID-19 pandemic and post the pandemic. This will help boost the confidence of the existing customers and will help in word of mouth marketing and attract more customers to the airlines and their loyalty programs. The loyalty customers can also be offered special offers and promotions based on the past travel data and be incentivized to fly with the airlines again.

• Using Social Media and similar Platforms to gather input

Airlines can consider using social media Platforms to ask customers and people about their needs and wants. They can use these to contact customers individually and in groups

hoping to collect their inputs and providing them a solution. As many consumers are currently in a state of confusion and have many doubts, data can be collected from sources and can be applied to making automated response machines and chatbots with databases of frequently asked questions and issues. This will promote accurate and quick responses to customers and assist them in making decisions.

• Automation of processes

Several processes such as the frontline dealing with customer can be automated and assistance of robotic technology and AI can be used in doing so. This will reduce contact between customers and frontline airline workers and reduce the risk of spread of the virus. Along with this, a dedicated mobile application can be used to give passengers updates about their usual flight processes such as security and baggage claim. This will allow passengers and airline workers to time their movements and avoid contact.

For example, Delta Airlines has a baggage tracking app which gives customers real time updates on the status of their luggage. Such an application can be upgraded to multiple process within the airport procedures. It can also be used to allow customers have access to seat allocation and make feasible changes, hence, improving comfort and safety levels. The aviation industry as a whole needs to rebuild its customer base and needs to assist the existing and past customers by regaining their confidence and attracting new customers by giving them offers and promotions to fly. A well-implemented CRM mechanism can be a crucial role player in rebuilding an airline's brand image.

VI. WHAT IS BUSINESS INTELLIGENCE?

Business intelligence (BI) uses software solutions to transform data into actionable insights that guide the strategic and tactical business decisions of an organization. BI tools analyse and interpret data sets and present analytical findings in reports, summaries, dashboards, graphs, charts, and maps to give users a detailed understanding of the business's position. Business Intelligence aims at promoting better business decision-making. Business Intelligence is a broad process involving several processes such as collection, storage, and analysis of data. These processes are carried out to promote information and data-based decision making in the various aspects of the day to day and overall functioning of the business. Proper Implementation of Business Intelligence can play a crucial role in boosting efficiency, productivity, and the quality of decision and planning.

In order to apply Business Intelligence to a business at its full capabilities, implementation of the various tools of Business Intelligence to the process is necessary. These BI tools are essential in converting raw data into actionable reports, graphs, statistics, and other visual tools. Some of the most prominent Business Intelligence tools are:

• Data Collection and storage: This involves the processes carried out to retrieve and store raw data and information from various sources.

• Data mining: is the process of analysing the stored data using several pre-assigned statistical and technical methods to uncover trends and key-points in data sets.



- Performance metrics and benchmarking: BI is used to set and compare trends in performance to pre-set benchmarks to promote informed decisions.
- Descriptive analytics: Usage of evaluated data to explain past incidents and their impact on company functions.
- Statistical analysis: Following descriptive analysis methods and further statistical exploration of the data to obtain logical reasons and increase operational efficiency.
- Data Visualization: Translating interpreted data into graphical aids such as diagrams and graphs to improve comprehension.

Proper Implementation of Business Intelligence strategies and accurate Business Intelligence tools can help companies and organizations improve their performance on time-related bases by identifying identity Key Performance Indicators, market trends, and performance benchmarks.

VII. DATA MINING: HOW CAN BUSINESS INTELLIGENCE BE USED BY AIRLINES TO FIGHT CRISIS?

Data Mining is one of the most prominent and commonly used Business Intelligence tools, along with data warehousing. It refers to the concept of data analysis in a system and retrieving knowledge that may be valuable to a business or entity. This may be used to detect new and essential data trends in broad data sets and forecast future occurrences relevant to data sets. Data mining mainly aims to identify useful information, trends, and relationships inside and across data sets. Technology and methods for data mining accomplish their aims by using pre-assigned algorithms and analytics in vast quantities of data. That is, Data Mining is capable of uncovering valuable knowledge from data storage called data warehouses. The valuable insights provided by data mining can be of extraordinary help to the business's growth by increasing customer satisfaction and revenue.

Data mining can be applied to assisting the civil aviation industry to counter the implications of the COVID-19 crisis in the following ways:

• Dynamic Decision Making and Load Forecasting

In order to increase the safety of the customers and the employees, airlines can use data analysis of data collected by various fronts of functioning daily and make decisions about deploying resources accordingly. By analysing and interpreting the trends in the activities, airlines can forecast loads at regular intervals and plan the deployment of resources and management of passengers and their belonging appropriately. This will assist in reducing the risk of the spread of the Coronavirus and will also assist airlines to reduce expenditure.

• Customer Preferences

Airlines can use collected data from various sources and analyse them to identify customer preferences. This can be done through social media, discussion forums, or by the airlines themselves through various methods. Identifying customer preferences can be substantially useful in identifying the changes that the pandemic crisis will bring in customer behaviour and will assist companies in taking early action. It can also help identify significant flight routes during the pandemic and post-pandemic period. Airlines can

also use this Data Mining to assist governments and citizens to plan and organize repatriation and evacuation flights across countries.

• Service Personalisation and Improvement in Customer Service

Airlines can use the analysis and mining of data about their customers and provide them with personalized service and experiences. After experiencing uncertainties about the future of the crisis and aviation, giving customers personalization in services can play a significant role in rebuilding the trust of the customer and also give them an exquisite experience to promote word of mouth marketing to attract more customers. Data mining and analysis can also be used by airlines to promote better customer services by providing frontline workers of the airlines with Business Intelligence dashboards, which provide them with information about the customer using past dealings and other sources. Employees can be trained to understand the interpretation and provide the customer with solutions and assistance. At the time, rebuilding trust, comfort, and relationships can be useful in battling the pandemic's effects. Although Data Mining can play a vital role in the aviation industry's plan of action against the implications of the COVID-19 crisis, several other tools of Business intelligence can be implemented to the cause as well.

For example, Data Visualisation can be used as a complement to data mining for better understanding and more efficient functioning and decision making.

VIII. CONCLUSION

As the situation of the Coronavirus pandemic continues to evolve and change regularly, there is much uncertainty in everyone's mind. However, the people of all countries, backgrounds, and walks of life are collectively walking towards the common goal of defeating this pandemic. As the medical crisis continues to be the main priority of many, there is a stage approaching shortly where life and economies will have to start functioning normally. This pandemic will have a long-lasting effect on lives and economies, but it is crucial to think of rebuilding all the damage this crisis has a cause and getting back on our feet as a community. Many industries have been severely hit by this pandemic, such as the Civil Aviation Industry. The Civil Aviation industry is one of the industries which will see some permanent changes as airlines need to start planning and taking action on the changes and start rebuilding. As the importance of technology grows every day, Customer Relationship Management and Business Intelligence are two processes, which if well implemented, can play a significant role in redeveloping the commercial aviation sector and can assist in moving towards a sense of normality during these unusual times. CRM and Business intelligence tools such as data mining can help airlines better understand the various key factors such as consumer behaviour and assist them in making more informed plans to tackle the implications of the COVID-19 crisis.

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AUTHORS PROFILE



Diwakar Singh, at the time of publication, is a Undergraduate Student at The Hong Kong Polytechnic University. He is studying BSc in Enterprise Information Systems. His current research areas include Customer Relationship Management, Business Intelligence, and Management along with their applications to the current developments in technology and circumstances.