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Onsite MSBA Applied Project Report
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W.P. Carey, ASU

Topic	Rolling Forecast Revenue Model
Team	Team 011
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Client information	MedAire Inc., Finance, Rob Miller, rob.miller@medaire.com

Executive Summary

MedAire Inc.'s revenue projections have remained static and unable to show real-time market fluctuation. The current methodology hinders the company's ability to accomplish accurate scenario analysis, taking into consideration the volatility with transactional revenue. In today's ever-changing marketplace, it's more important than ever to make smart data-driven business decisions, and develop effective financial budgets.

MedAire Inc. requires a flexible and accurate revenue forecasting model to minimize losses and take calculated risks that in turn will maximize profit. Our team developed a rolling forecast model using Excel, Python, and Power BI. The model utilizes transformed data from both the Invoiced Sales and Outlook EBIT files, which were cleaned and prepared for integration into Power BI. These datasets represent both contractual and transactional revenues.

The Power BI dashboard includes dynamic filtering and scenario analysis with key revenue levers like DNR rates, percentage price changes, percentage of new customers, and flat new customer additions. The rolling forecast model creates an accurate, month to month forecast based on historical trends from prior years and illustrates the impact of the different levers over time. This model provides MedAire Inc. with improved forecast accuracy and the ability for robust scenario analysis, enabling fact-driven decision making. As the market continues to evolve, it enables the company to stay in the forefront of changing circumstances and achieve their strategic objectives.

However, there are a few limitations to this model. Data transformation occurs between different tools in the model, which impacts scalability. The drill down analysis by region and line of business for example, is also restricted due to limitations in Power BI. In addition, the model is mathematically driven currently, but subsequent models can leverage machine learning for even better predictions.

Background

MedAire Inc. provides both medical and safety support services across a wide range of industries, including maritime and aviation. As a global provider, the company operates as a subsidiary of International SOS and delivers its services around the clock to clients worldwide. These offerings include remote medical and security assistance, as well as medical kits and other

essential safety resources tailored to meet the needs of travelers and crew members operating in high-risk environments.

MedAire generates revenues through two primary revenue streams: contractual and transactional. The contractual revenue stream consists of service agreements from monthly to a one year basis, giving clients indefinite access to the services of MedAire based on their length of contract. The transactional revenue stream consists of one-off payments such as medical kits and other individual products. Both revenue streams constitute as the financial backbone of the company's operations.

Accurately forecasting both streams with scenario analysis is crucial to helping MedAire make more reasonable business decisions. It enables the company to plan its resources better and will assist with unexpected financial shortages. However, the business's current forecasting technique is very rigid in nature, lacking the adaptability to adjust with the changing market conditions. This rigidity gives rise to the difficulties in quantifying how movement in key performance indicators such as price, client acquisition, or service requirements will drive revenue forecasts. MedAire has thus desired a need for an adaptive forecasting capability that reflects its high-speed global business environment.

Problem Statement

MedAire's current revenue forecasting model is extremely rigid and is unable to produce good rolling forecasts by the month. The model cannot respond to changing market conditions or account for the variety of key drivers of revenue. Hence, scenario analysis is extremely rudimentary or even non-existent. This does not enable it to easily factor in the implications of various drivers of revenue while factoring in alternate business choices.

It is essential to solve this problem because it has a huge financial impact on the business. Inaccurate forecasts can impede the business's capability to make sound financial decisions and put the business at risk. A more dynamic forecasting model with dynamic filtering can solve this issue and allow the business to react more efficiently in an ever-evolving market.

Financial analysts and top executives at MedAire will use the Power BI dashboard to enhance and predict revenue better. The Power BI dashboard supports scenario analysis, which allows leaders to monitor different trends in revenue within the company. The leadership can also adjust the company's strategic direction based on real-time changes in key drivers of revenue. The Power BI platform is simple to use and has access by several employees, enhancing organizational forecasting capabilities.

The model that we developed is a blend of contractual and transactional revenue streams, using historical Invoiced Sales and Outlook EBIT data. We assume that the data is accurate and reflects previous-year revenue trends and includes the most important business levers such as price moves, client additions, and renewals. The model is constructed on clean and normalized data inputs updated monthly so that it can remain current and function effectively.

Methods

We created a rolling forecast model to predict monthly revenue using previous year history data and main revenue performance levers. The model considers both contractual and transactional revenue streams to provide a holistic view of forecasting. In doing so, our team created an interactive Power BI dashboard with scenario analysis and a user-friendly interface. This approach was chosen because it is more versatile than the previous forecasting model and allows scenario testing in real time, which under the present continuously changing market circumstances is of paramount importance. The use of Excel and Python allowed seamless implementation into Power BI, which rendered the dashboard accessible to a wide range of stakeholders.

The model contains two primary datasets. The first is the Invoiced Sales Data, from the file titled "FY2425 A and M Inv Sales December YTD_v2," containing data for the contractual revenue stream. Only one sheet of this file was used: "Invoice Details FY2324 - FY2425." The second dataset is from the Outlook EBIT file titled "Outlook EBIT - incl Updated Interco allocation," which was utilized for the transactional revenue stream. The only sheet used from this file was "Do Not change - Revenue mapped." Both datasets were provided to the team at the start of the project and contain multiple years of historical monthly revenue data.

To prepare these files for forecasting, various data cleaning and data transformation tasks were required. This included removing columns not needed and eliminating null values so that calculations would be correct. Both datasets were cleaned and transformed to facilitate seamless integration into Power BI. A detailed explanation of the transformation process is provided in the appendix, with step-by-step instructions on how raw data was converted into structured datasets for modeling.

The rolling forecast model was the analytical model that was used. The reason this model was chosen was that it is simple, interpretable, and explainable which were key considerations for business stakeholders. Although our team did endeavor a machine learning-based approach to generate predictions at first, we switched to a rule-based linear model after receiving feedback from MedAire Inc. The model relies on past monthly revenue trends and includes adjustable levers such as DNR rates, percentage price changes, percentage new client growth, and flat additions of new clients. The current year projections are based on prior year information, with close alignment to actuals unless scenario levers are altered by the user.

Excel was used for initial data discovery and data cleaning. Python was used to perform more advanced data transformations and ensure the datasets were properly formatted for modeling. Power BI was used to produce the final dynamic dashboard, which supports dynamic filtering and real-time scenario creation. These tools were selected to provide scalability, efficiency, and accessibility for a range of end users.

Results and Conclusions

The single most significant outcome of this project was the completion of a successful rolling forecast model capable of accurately predicting MedAire's monthly revenue. The model integrates contractual and transactional revenue streams into a single solution, providing a comprehensive and flexible forecasting tool. The model incorporates key business levers such as DNR rates, price dynamics, and new customer acquisition and allows users to scenario different situations and assess their financial impact. In addition, the team built a dynamic Power BI dashboard that provides the ability to filter in real time by region, market and product line. The model predictions matched historical actuals closely, validating the model's reliability and accuracy.

These results have specific importance from a business context. The new forecasting instrument enhances MedAire's ability for smart, fact-based financial planning. It allows users to visualize the influence of different levers on prospective revenue, optimize resource allocation, allow for better budget planning, and reduces financial risk. In an uncertain, fast-moving global environment, this reactive and dynamic instrument allows the company to plan ahead, not behind, giving MedAire a competitive advantage.

The primary users of this solution are financial analysts, executives, and cross-functional teams within MedAire. Financial analysts can use the dashboard to monitor trends and confirm forecasting assumptions. Executives and managers can model strategic decisions, such as pricing adjustments or new product introductions, to examine their probable effect. The Power BI dashboard was intentionally designed to be user-friendly so that it would be usable by technical and non-technical staff across the organization, enabling company-wide usage and collaboration.

Although the solution has several strengths, it also contains weaknesses. It relies on historical revenue trends which may not always reflect future conditions, especially in unstable markets. The model being utilized is rule-based and has yet to be supplemented with predictive machine learning that would improve the forecast accuracy. Additionally, certain data transformation processes were performed manually with Excel and Python, limiting automation and scalability. The Power BI dashboard also contains limited drill-down functionality due to a lack of data granularity.

In the future, the team recommends automating the data pipeline to reduce manual labor and incorporating machine learning models to generate even more robust predictions. In addition, enabling more detailed forecasting by region, line of business, and integrating the forecast into MedAire's financial systems for real-time updates and strategic alignment.

References

Our team did not use any third-party journal articles, academic research papers, or publications throughout the project period. We also did not use any third-party code or pre-built forecast models. Everything was done in-house from scratch by the project team, including all the logic and model development. Artificial Intelligence Large Language Models (LLMs) were used merely to improve syntax of code that was used in data cleaning, transformation, and in the mathematical backbone of the Power BI model. Datasets for all were provided directly by MedAire Inc., along with business context and domain knowledge to achieve successful project implementation.

Appendix – Reproduction of Results

The original data files were provided to the team by MedAire Inc. The used data file in Power BI for contractual revenue is FY2425 A and M Inv Sales December YTD_v2.xlsx. In this data file, the sheet used is Invoice Details FY2324 - FY2425. This data file was cleaned and transformed using Python in a Jupyter Notebook to prepare it for Power BI. The notebook used to run this process is named InvoiceSalesDataTransformationSteps.ipynb. All the code cells are followed by text cells indicating what transformation step is being performed. This notebook requires only two user edits, which are both properly labeled with the caption "ACTION REQUIRED." All of these code cells have the entry where the "FILE PATH" should be changed to include the path for the dataset in the local system. Once these two changes have been made, the user can run the notebook entirely. The cleaned dataset will be saved as a CSV file, which can be imported into Power BI.

The second data file, Outlook EBIT - incl Updated Interco allocation.xlsx, was cleaned and transformed using Excel. The only sheet used from this data file is Do Not change - Revenue mapped. A Word document, OutlookEBITDataTransformationSteps.docx, contains step-by-step instructions for transforming the raw data into the proper format for use within Power BI. After both converted datasets are prepared, they can now be uploaded into the Power BI dashboard. Upon upload, the default dashboard visualization will then display the full rolling revenue forecast with dynamic filtering. The filters allow the user to adjust key business levers and do scenario analysis. A different tab in the dashboard provides exploratory data analysis, providing the user with further insight from the uploaded data.

All of the tools were completed locally on all members' personal computers, with no use of cloud environments. In order to run the Python script properly, users must place data files in the same directory where the Jupyter notebook is kept. They must install also necessary Python packages like pandas and numpy for example. Once the converted datasets are successfully imported into Power BI, users can develop all kinds of data-driven insights and conduct adaptive, scenario-based forecasting analysis.