

# Forecasting expected patient footfall for a healthcare organization



## Background

Our client had a chain of urgent healthcare centres throughout USA. As a healthcare service provider, they are a prominent touchpoint for health insurance companies

## Problem statement

The organization faced challenges with business planning, resource allocation, and operational preparedness due to lack of an accurate and reliable forecasting model to predict appointment volumes at an organizational level. This led to issues with aligning resources with patient demand, risking inefficiencies, patient dissatisfaction, and suboptimal use of organizational capacity.

## Solution

Navikenz was engaged to build a comprehensive predictive analytics solution on Azure. The core components included:

- Data Lakehouse on Azure Fabric: Centralized storage of historical data to enable seamless data access and processing.
- Fabric Notebooks: Utilized for model development and experimentation with machine learning techniques.
- Machine Learning Models: Implemented SARIMA, MSTL, and PyCaret Prophet models in an ensemble, with weights determined using linear regression to optimize accuracy.
- Power BI Reports: Developed to present three-month forecasts and model performance metrics in an intuitive and actionable format.

## Implementation

The implementation followed a phased approach:

- Data Collection and Preparation: Consolidated historical data into Azure Lakehouse (OneLake) and ensured data quality through automated pipelines.
- Model Development: Developed SARIMA, MSTL, and PyCaret Prophet models in Fabric Notebooks. Linear regression was employed to assign weights for ensemble predictions.
- Visualization: Created Power BI dashboards to showcase appointment forecasts, model accuracy, and insights.

## Outcomes

- The project delivered significant business value by enabling:
- Accurate forecasting of daily appointment volumes, reducing uncertainty in resource planning.
- Enhanced operational efficiency through data-driven decision-making.
- User-friendly Power BI dashboards that provided actionable insights into future demand and model performance.

## Conclusion

Navikenz helped the client by integrating machine learning models, automated data pipelines, and intuitive visualizations.

