



SHYENA
TECH YARNS

A Data Science Company

AI

Case Study

An AI Powered Demand Forecasting Platform

About the Client

- The Client is a leading player in Consumer goods, especially water heaters
- They sale the water heaters world wide.
- They have variety of water heaters for each Geography

Water
Heater
excellent product quality



Business Problem

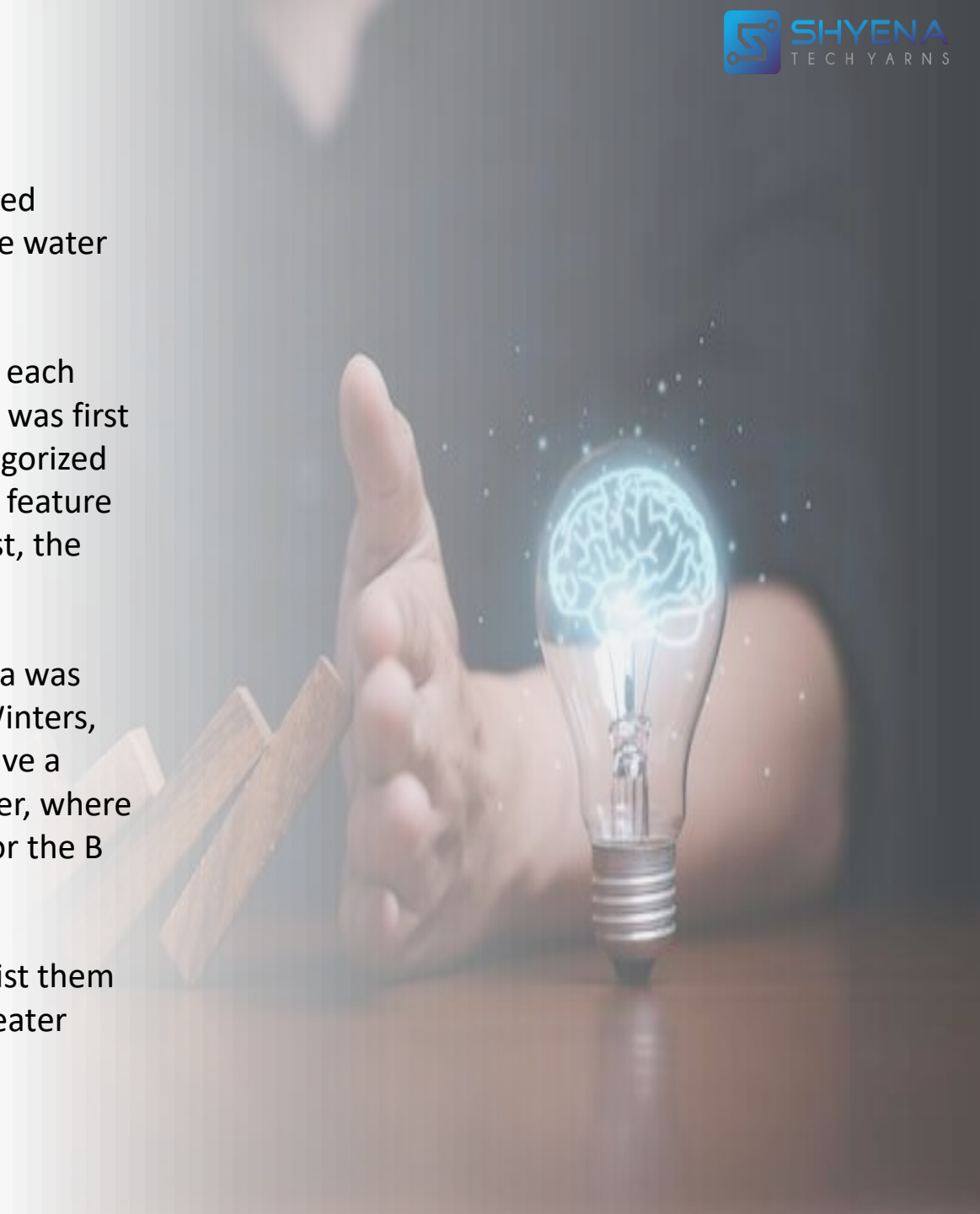
SALES

- The Client manufactures and sale water heaters of various sizes and capacities. Based on the regional need, they sale certain models of the water heaters in that region
- The Client was using rule based sales forecasting model in Excel which was giving an average demand forecasting accuracy around 50-60% for different water heater models
- The Client was looking for a machine learning based forecasting model for better demand forecasting accuracy for different models of the water heater taking the regional biases into consideration.
- A more accurate forecasting model would allow them to plan the production and distribution of the water heaters, more accurately and also avoid piling up of inventory



Solution

- After understanding the Client's problem we proposed them an AI Powered Forecasting platform. The platform would have capabilities to forecast the water heater demand more accurately for 4 months in the future
- We received historical water heater sales data at day level granularity for each model and region. The historical sales data was for past 3 years. The data was first tested to check missing values and outliers. The water heaters were categorized based on the historical monthly sales data into A, B & C categories. Using feature engineering, the missing values were treated first. Using Dickey-Fuller test, the data was tested for Non Stationarity
- The data did have trends, and seasonality, which was treated and the data was made stationary. Later, various time series algorithms like ARIMA, Holt-Winters, XgBoost & LSTM were applied to the data. The Holt-Winters algorithm gave a demand forecasting accuracy of over 90% for the A Category Water Heater, where as XgBoost gave a demand forecasting accuracy in the range of 75-85% for the B and C categories of water heaters
- We build a full stack web-based Forecasting platform for the client to assist them in accurately forecasting the water heater sales according to the water heater model and the region. The platform also had a mechanism to retrain the forecasting models, periodically, to improve the accuracy further



Outcome

- With the AI Powered Demand Forecasting Platform, the Client can now make more accurate demand forecasting for different water heater models according to the region
- The more accurate demand forecasting allowed the client to better plan the production of the water heaters
- It also mitigated their current challenge of over production of water heaters. This bought them significant savings and avoided inventory piling.





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