Demand forecasting using Artificial Neural Network and demand pattern recognition: a study at Sony Mobile Communication

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Balancing demand and supply are one of the major challenges for various organizations. Overestimation of demand causes in extra stock keeping, which ties up excess inventory. On other hand, underestimation of demand leads to unfulfilled orders, lost sales and reduces the service level. Nowadays, customer behavior is influenced by many factors including, for example, marketing campaigns and weather, which makes it difficult for companies to predict the future demand. Demand forecasting is a field of predictive analytics, that aims to predict the future demand of customers. This is done by analyzing statistical data and identifying patterns and correlations.

Machine learning is considered as one of the most important new technologies for Big Data Analytics and a possible driver of economic growth. The ability of the technology offers possibilities to identify complex relationships in large data sets. Especially, the ability of the machine learning technology to handle large data volumes and to identify repeating patterns could support decision-making processes in organizations. As companies are relying more and more on the data they collect, traditional based forecasting methods are being replaced by data-powered and automated systems. Using big data demand prediction is enabling a wide range of organizations to leverage the potential of machine learning models.

In this study, a demand forecasting model has been developed to demonstrate an approach of using Artificial Neural Networks in the forecasting environment, where the aim was to reduce forecast errors and biases. Furthermore, the study investigated the necessary data requirements for a machine learning model. In combination with the machine learning technology – data quality and data volume are two of the major issues in the developing process of a forecasting model.

The results show that the Artificial Neural Network demonstrate a high accuracy of classifying different demand trends for a comparatively small data set and hence, reduce human made errors and biases. The model represents an initial step which needs further development in order to be suitable for a successful industrial application.