**Informatics Institute of Technology**

In Collaboration with

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# "iInventory"
# Machine Learning based Inventory Forecasting System

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# Abstract

Inventory forecasting aims to predict, demand of a specific product in future, and reserve the amount of products, based on the forecasting results. An accurate and reliable inventory prediction can avoid product overstocking and greatly reduce the maintenance cost. There are many factors which cause a direct or indirect impact on the accuracy of inventory forecasting. But researchers have taken only one or two aspects into consideration when implementing inventory forecasting systems. In this project, four major economic and meteorological factors are analyzed, namely as; rainfall, temperature, exchange rate and inflation rate that directly affect customers' demand for expendable goods in supermarkets and a fair attempt is made to summarize, all related researches done in the domain along with the inputs of experts in the field. Also, a novel forecasting solution is proposed based on those major factors, which has been developed as an accurate machine learning based inventory forecasting system for supermarkets to fill the gaps in existing solutions. The developed solution analyzes the mathematical relationships between the customer demand and the four factors and using the mathematical modelling build up based on the analysis, the system predicts the customer demand. The project has been tested on five consumable products in a UK supermarket and the accuracy of the predictions were observed to be improved by more than 1% compared with the outputs from traditional algorithms.

Based on the results it can be concluded that, studying on the influence of environmental and economic factors over customer demand, can be used to improve the forecasting accuracy of inventories, which in return can make a significant difference in liquidity and the stability of businesses.

***Keywords:*** inventory forecasting, customer demand, accuracy, machine learning