Supply Chain Optimisation through Geographical Network Modeling

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Abstract : Supply chain optimisation requires multiple factors as consideration or constraints. These factors are including but not limited to demand forecasting, raw material fulfilment, production capacity, inventory level, facilities locations, transportation means, and manpower availability. By knowing all manageable factors involved and assuming the uncertainty with pre-defined percentage factors, an integrated supply chain model could be developed to manage various business scenarios. This paper analyse the utilisation of geographical point of view to develop an integrated supply chain network model to optimise the distribution of finished product appropriately according to forecasted demand and available supply. The supply chain optimisation model shows that small change in one supply chain constraint is possible to largely impact other constraints, and the new information from the model should be able to support the decision making process. The model was focused on three areas, i.e. raw material fulfilment, production capacity and finished products transportation. To validate the model suitability, it was implemented in a project aimed to optimise the concrete supply chain in a mining location. The high level of operations complexity and involvement of multiple stakeholders in the concrete supply chain is believed to be sufficient to give the illustration of the larger scope. The implementation of this geographical supply chain network modeling resulted an optimised concrete supply chain from raw material fulfilment until finished products distribution to each customer, which indicated by lower percentage of missed concrete order fulfilment to customer.

Keywords : decision making, geographical supply chain modeling, supply chain optimisation, supply chain

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