

INTISARI

PENERAPAN *ECONOMIC MODEL PREDICTIVE CONTROL* PADA MASALAH *SUPPLY CHAIN MANAGEMENT*

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Peranan *supply chain management* bagi perusahaan industri adalah untuk mengatur kebijakan barang. Kebijakan ini meliputi pengiriman bahan baku, produksi, distribusi, dan pengendalian barang di gudang penyimpanan. Salah satu teknik kendali yang dapat digunakan untuk mengendalikan aliran barang di dalam sistem *supply chain management* adalah *Model Predictive Control* (MPC). Pada Tesis ini, digunakan MPC dengan fungsi multiobjektif, yaitu gabungan antara fungsi objektif *tracking* (*Tracking MPC*) dan fungsi objektif ekonomi (*Economic MPC*). Dua fungsi objektif tersebut digabungkan dengan metode *Weighted Sum*. Multiobjektif MPC memperhatikan dua unsur penting bagi sistem *supply chain management*, yaitu kemampuan meminimalkan total biaya ekonomi dan kemampuan mengendalikan pergudangan, sehingga sistem dapat memenuhi permintaan. MPC dengan fungsi multiobjektif diaplikasikan untuk model *supply chain* yang terdiri dari multi-supplier, multi-echelon, dan multi-produk. Pada model ini diasumsikan terjadi pembusukan barang di gudang penyimpanan. Gangguan sistem *supply chain* diberikan dalam bentuk permintaan barang dari pembeli yang memenuhi fungsi sinus.

Kata Kunci: *Economic MPC*, Kendali Inventori, Pembusukan Barang, *Supply Chain Management*, Metode *Weighted Sum*.

ABSTRACT

APPLICATION OF ECONOMIC MODEL PREDICTIVE CONTROL FOR SUPPLY CHAIN MANAGEMENT PROBLEM

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The role of supply chain management for industrial companies is to regulate goods policies. It includes the shipment of raw materials, production, distribution, and control of inventory in the warehouse. One control technique that can be used to control the flow of goods in a supply chain management system is the Model Predictive Control (MPC). In this thesis, we use MPC with a multi-objective function, which is a combination of the tracking objective function (MPC tracking) and economic objective functions (Economic MPC). These functions are combined with the Weighted Sum Method. Multiobjective MPC concerns two important elements for supply chain management: the ability to minimize total economic costs and the ability to control the stock level of inventory so that the system can respond to the demand. Multiobjective MPC is applied to the supply chain model with multi-suppliers, multi-echelon, and multi-products. In this model, products are assumed to be able to decay in a warehouse. Supply chain disturbance given is demand from a customer which satisfies the sinus function.

Keywords: Economic MPC, Inventory Control, Perishable Goods, Supply Chain Management, Weighted Sum Method