MODELING OF AUDIO SYSTEM ASSEMBLY LINE ACTIVITIES USING SIMULATION

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ABSTRACT

The manufacturing sector has become an essential sector in Malaysia. This sector needs to be efficient and sound in facing great competition. Reducing costs will ensure that manufacturing companies remain competitive in the market. This study was conducted in a manufacturing company that produces audio systems by using simulation technique. Simulation technique would help the management team in making the right decisions. The objectives of the study are to identify the problems arising in the system and to forecast the throughput based on several scenarios. The aim of these scenarios is to see the system performance. System performance is determined by looking at total output and cycle time. Besides that, the percentage of resource utilization, waiting time and queue time is also taken into consideration. After that, three scenarios were built in order to see the performance of the system after the throughputs are increased. ARENA@ software was used in modeling the system.

Keywords: Simulation, Manufacturing Systems, System Performance, Assembly Line

ABSTRAK

Sektor pembuatan merupakan sektor yang semakin penting di Malaysia. Persaingan yang hebat menyebabkan sektor ini perlu lebih efisien dan mantap dalam urusan pengurusan. Kos pembuatan perlu dikurangkan supaya dapat bersaing di pasaran. Kajian menggunakan teknik simulasi dijalankan di sebuah kilang mengeluarkan sistem audio. Teknik simulasi dapat membantu pihak pengurusan membuat keputusan yang lebih efisien. Objektif kajian ialah untuk mengenalpasti masalah yang terdapat di dalam sistem dan meramalkan output berdasarkan beberapa senario. Senario dijalankan untuk menguji keupayaan sjstem. Keupayaan sistem ditentukan dengan melihat kepada nilai hasil dan kitaran masa. Di samping itu, peratusan penggunaan sumber, masa menunggu dan bilangan menunggu juga diambil kira. Kemudian, tiga senario dibangunkan untuk melihat keupayaan sistem apabila nilai output ditambah. Model ini dibina menggunakan perisian ARENA?

Kata Kunci: Simulasi, Sistem Pembuatan, Keupayaan Sistem, ***Assembly*** *Line*

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Chapter 1

Introduction

1.1 Background

Malaysia, once known as an agricultural country has now been transformed into an industrialized country, with more than one-third of its Gross Domestic Product (GDP) emanating from the manufacturing sector. Since 1987, manufacturing has overtaken agriculture as the leading growth sector of the economy. In terms of exports, manufacturing provides about 80% of Malaysia's total trading, and is now the engine of growth for the economy (www.matrade.gov.my). It has become the main agenda of the manufacturing sector to produce cost effective products so as to stay competitive in business. One of the actions taken is to increase efficiency at production lines and encourage greater productivity. Simulation is a technology that could lead to the achievement of this aim.

Simulation is one of the most powerful tools available to decision-makers responsible for the design and operation of complex processes and systems (Shannon, 1998). The idea of simulation applies to many fields of study such as manufacturing, medical, business and economy. One of the largest application areas for simulation modeling is that of manufacturing systems, with the first uses dating

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