PERFROMANCE MEASURES AND FACTORS INFLUENCING THE PERFORMANCES OF SEAPORT CONTAINER TERMINAL'S OPERATION EFFICIENCY: THE CASE OF NORTH BUTTERWORTH COINTAINER TERMINAL (NBCT)

BY

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ABSTRAK

Dalam dunia kini, semua pelabuhan adalah unik dan tugasan untuk mengukur dan menganalisis prestasi tidak begitu mudah. Ia menjadi lebih sukar apabila pelabuhan gagal menegenalpasti pengukuran atau petunjuk-petunjuk dalam menentukan prestasi secara keseluruhan pelabuhan. Sehubungan itu, kajian ini bertujuan untuk mengenal pasti ukuran atau petunjuk-petunjuk yang digunakan oleh NBCT untuk mengukur prestasi operasinya dan tujuan kedua adalah untuk mengenal pasti faktor-faktor yang mempengaruhi prestasi NBCT dalam menentukan kecekapan operasi. Ini adalah satu kajian kualitatif yang menggunakan kaedah temubual dan kaedah pemerhatian dengan pakar-pakar yang terlibat dengan Operasi, Kontena Yard, dan Jabatan Statistik, Kualiti & Syariah di NBCT. Hasil kajian daripada kaedah temubual dan pemerhatian, telah mengenal pasti terdapat empat jenis Petunjuk Prestasi (PI) yang sedang digunakan oleh NBCT iaitu ukuran pengeluaran, ukuran produktiviti, pengukuran penggunaan, dan pengukuran perkhidmatan. Hasil kajian ini telah menunjukkan bahawa pencapaian prestasi NBCT untuk tahun 2013 adalah lebih rendah daripada prestasi sasaran kerana faktor-faktor dalaman dan luaran yang mempengaruhi prestasi seperti sasaran prestasi yang tinggi terutamanya bagi jumlah sasaran mengendalikan TEU, kekurangan tenaga kerja di terminal adalah sebab utama untuk tidak mencapai sasaran, dan kurang ketersediaan peralatan teknologi canggih, kurang sokongan daripada pihak pengurusan dan lain-lain. Secara kesimpulan, faktor-faktor dalaman dan luaran telah mempengaruhi kepada penurunan prestasi operasi di NBCT.Akhir kajian telah mengenalpasti faktor-faktor dalaman dan luaran telah memberi kesan ke atas penurunan prestasi operasi di NBCT.

ABSTRACT

In the world today, all ports are unique and the tasks to measure and analyse the performance is not so easy. It becomes more difficult when a port failed to identify the measurements or indicators in determining the overall performance of the container port. This study aims to identify measures or indicators used by the North Butterworth Container Terminal (NBCT) to measure the performance of operations and the second purpose is to identify the factors influencing the performance of NBCT in determining its operational efficiency. This was a qualitative study with face to face interview and observation with experts' persons related to Operation, Container Yard, and Statistic and Quality & Syariah Department of NBCT. The findings from the interview and observation method, have identified there are four type of Performance Indicators (PI) is being used by NBCT namely are measure of production, a measure of productivity, utilization measurement, and services measurement. The findings of this study have shown that the performance achievement of NBCT for the year 2013 was lower than targeted performance because of the internal and external factors which have influenced the performances such as sets high performance targets especially for targeted total handles TEUs, lack of workforce in the terminal is a main reason to non-achievement of the targets, and less availability of new advanced technology equipment, less supports from the management. As a summary, the internal and external factors have influenced to the drop of the operation's performance in NBCT.

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LIST OF ABBREVIATIONS

USA- United States of America

AAPA- Association of American Ports Authorities

MIDA- Malaysian Investment Development Authority

NBCT- North Butterworth Container Terminal

QCs- Quay Cranes

SCs- Straddle Carriers

AGVs- Automated Guided Vehicles (AGVs)

TTUs- Truck-Trailer Units

XTs- external trucks

UNCTAD- United Nations Conference on Trade and Development

PI- Performance Indicators

ATB- Actual Time Berth

ATUB- Actual Time Unberth

MPH- Movement of Container in Per Hour

PM- Prime Movers

QGC- Quay Gantry Cranes

RTG- Rubber Tyred Gantries

RMG- Rail Mounted Gantries

OBH- Operation Breakdown Hours

MMBF- Mean Moves between Failures

SSC- Ship to Shore Crane

R & D – Research and Development

CHAPTER 1

INTRODUCTION

1.0 Introduction

This is a study discussing more onto the performance measurement of seaport container terminal's operation efficiency: the case of North Butterworth Container Terminal (NBCT). The first section of this part introduces the background of the study. The following section discusses the problem statement and outlines the research questions and followed by the research objectives of this study. The next sections explain the significance of the study and highlight the scope of the study. The last section presents about the definitions of the terms used that make up the conceptual model. The penultimate section outlines the organization of this research.

1.1 Background of the Study

The current booming of the international trade activity has becomes as a primary engine in gearing up the world economics' growth and developments for every countries. An overwhelming majority of these increasing international trade activities are conducted through sea transportation (Tahar & Hussain, 2012 & Lin & Tseng, 2007). Indeed, more than 90% of import and export cargoes are transferring with assist of seaports or seaports container terminal. For instance, in United States of America (USA), based on the reports of Association of American Ports Authorities (AAPA) (2012), nearly $3.2 trillion of total income from the annual economic activity were derived from seaports, and thus, seaports are vital for its country's economic growth and wealthier of the nations (AAPA, 2012).

The contents of the thesis is for internal user only

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Interview Questions

1. Interviewer self-introducing. Next, introducing the research objectives. The research objectives are:
   a) To find out what are the performance measurements used by NBCT in its operation activity to measure their performance and
   b) How effective are the measurementsin measuring the performance of their company.
2. Interviewee self- introducing.

   Before we go further to our main questions, tell me about yourself sir/madam. (i.e. about your name, position, department and the role that you play in the department/organization).
3. Thanking. Well sir/madam, as we know, in accomplishing a company's or organization's missions, objectives of each department in an organization isa vital part. With this in mind, could you explain what are the objectives of your department and in summary, explain what are the activities carried out by your department

   (i.e. what department is in charge of and what are the activities performed by the department).
4. More specifically, could you explainthe overall operations activities of NBCT (etc. from the context of loading and unloading the containers/loads via ships or other hinterland transports, resources used to carry out these activities, delivery/receipt activity).
5. Thanking.Come to the body of interview whereby in terms of measuring NBCT's operation performance, what are the measures/indicators/elements that are being used.
6. Why are these measures chosen? How are they chosen? Who chooses the measures?
7. In terms of "production", what are the measurements used? (or, to put it in another way: "how do you measure NBCT's production?". Could you please explain the measurements of production in detail?

(If the interviewee did not mention any of the indicators for the production measures that have listed before, will ask them gently about those measures (Attachment 1)

8. In terms of production performance, in the scale of 1 to 5, 1 being "not effective at all" and 5 being "very effective", could you tell me the effectiveness of the production measurements that you mentioned just now?
9. Have you encountered any problems when using these production measurements? If yes, which one? How does it cause the problem?

   (Repetition of questions: Question 7, 8 and 9 will ask again but substitute "production" with a) "productivity", b) "utilization" and c) "services"

10. Do you plan to use other types of measurements besides the ones that we have already discussed, to measure NBCT's performance? If so, what are they? Why choose the measurement?
11. In view of the competition with other ports similar to NBCT (whether domestic or international), what changes have you made, in terms of performance measurements, to better measure the port's performance?
12. Would it be possible to provide details i.e. numbers, percentage etc. of the performance elements i.e. production, productivity, utilization and services mentioned just now?
13. Conclusion. Thanking the interviewee and offer to send a copy of the executive summary of the research if they need it.

ATTACHMENT 1

This table will be a guide line to assure the interviewee has answering or mention all the measures (for questions 7, 8, & 9)

Indicators or Measures		*Tick (/), if the interviewee stated*
Production	1. Ship throughput	
	2. Quay transfer throughput	
	3. Container yard throughput	
	4. Receipt/delivery throughput	
Productivity	1. Ship productivity	
	2. Crane productivity	
	3. Quay productivity	
	4. Terminal area productivity	
	5. Equipment productivity	
	6. Labour productivity	
	7. Cost effectiveness	
Utilization	1.Quay utilization	
	2. Storage utilization	
	3. Gate utilization	
	4. Equipment utilization	
Services	1.Ship turnaround time	
	2. Road vehicle turnaround time	
	3. Rail service measures	