

**THE ACCEPTANCE OF BIG DATA ANALYTICS FACTORS IN THE SMART
SUPPLY CHAIN PERFORMANCE AMONG MALAYSIAN SMALL AND
MEDIUM-SIZED ENTERPRISES (SMEs)**

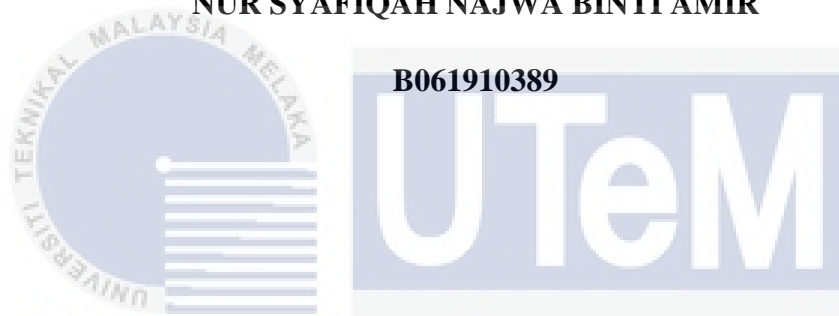


**FACULTY OF TECHNOLOGY MANAGEMENT AND
TECHNOPRENEURSHIP**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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**FACULTY OF TECHNOLOGY MANAGEMENT AND
TECHNOPRENEURSHIP**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DECLARATION OF ORIGINAL WORK

I hereby declare that this thesis with the title

**“THE ACCEPTANCE OF BIG DATA ANALYTICS FACTORS IN THE SMART
SUPPLY CHAIN PERFORMANCE AMONG MALAYSIAN SMALL AND
MEDIUM-SIZED ENTERPRISES (SMEs)”**

is the result with my own research except as the cited in references



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DEDICATION

I would like to express my appreciation to my beloved family and friends, who were always encouraging and supportive as I worked on the research. In addition, my supervisor, Mrs. Nor Ratna Binti Masrom, and panel, Ts. Dr. Nurulizwa Binti Abdul Rashid, supervised my research, and course mates assisted me in completing the research path.



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In the name of Allah, The Most Gracious, The Most Merciful. Praise to Allah S.W.T who blessed me the strength and dedication to complete this thesis. Peace and prayers be upon His Final Prophet and Messenger Muhammad.

First and foremost, I want to express my sincere gratitude to my supervisor, Mrs. Nor Ratna Binti Masrom, and panel, Ts. Dr. Nurulizwa Binti Abdul Rashid, who led and encouraged me during the whole process of completing my final year project. The knowledge, moral support, and guidance has helped me throughout the whole process. I was able to complete the final year's project effectively and thanks to their coaching. Furthermore, I would want to use this opportunity to thank my friends and course mates for their assistance and inspiration when I have a difficulty.

Last but not least, my heartfelt and deepest gratitude would be to the pillars of my strength, which are my family who never fails to support and motivate me in whatever I do in my life. Without their love, guidance, and support, I would have not come this far in my life journey. Finally, I want to thank to respondent, who took the time to fill out the questionnaire.

Thank you.

ABSTRACT

Big Data Analytics (BDA) plays a vital role in achieving the target of the company in Smart Supply Chain performance (SSCP). The acceptance of big data analytics in Malaysian SMEs has become a major barrier. This is because the SMEs in Malaysia are still left behind in how to integrate the big data analytics and have a lack of strong awareness of applying effective big data analytics to smart supply chain performance. Although, some of Malaysian Small and Medium-Sized Enterprises (SMEs) now realize the value of the adoption of big data analytics, but some of the SMEs are not actively using it. Therefore, this research is to study the acceptance of big data analytics on the smart supply chain performance and aim to determine the relationship between the dependent and the independent variables (adoption of BDA acceptance and the impact on smart supply chain performance). This research was conducted by using a quantitative method. This research will focus on the employees who are working in the SME company who is in the work position of executive-level and above as they take more responsibility in decision making. The data was collected from 120 respondents through a questionnaire design using Google Forms and an online platform. Therefore, the result from the Multiple Regression Analysis and Pearson's Correlation Coefficient showed that both variables in this study had a significant and strong relationship together. In conclusion, through this research, it is hoped that it can provide the guideline to the SMEs for them to know the criteria that are needed for employees to apply and use the big data analytics on the smart supply chain in their work which can produce an effective and efficient way of doing business.

Keywords: *Big Data Analytics, Smart Supply Chain Performance, SMEs.*

ABSTRAK

Analisis Data Besar (BDA) memainkan peranan penting dalam mencapai sasaran syarikat dalam prestasi Rangkaian Bekalan Pintar (SSCP). Penerimaan analisis data besar dalam PKS Malaysia telah menjadi penghalang utama. Ini kerana PKS di Malaysia masih ketinggalan dalam cara mengintegrasikan analisis data besar dan kurang kesedaran yang kukuh untuk menggunakan analisis data besar yang berkesan kepada prestasi rangkaian bekalan pintar. Walaupun beberapa Perusahaan Kecil dan Sederhana (PKS) Malaysia kini menyedari nilai penggunaan analisis data besar, tetapi sesetengah PKS tidak menggunakannya secara aktif. Oleh itu, penyelidikan ini adalah untuk mengkaji penerimaan analisis data besar ke atas prestasi rangkaian bekalan pintar dan bertujuan untuk menentukan hubungan antara pembolehubah bersandar dan bebas (penggunaan penerimaan analisis data besar dan kesan ke atas prestasi rangkaian bekalan pintar). Kajian ini dijalankan dengan menggunakan kaedah kuantitatif. Penyelidikan ini akan memberi tumpuan kepada pekerja yang bekerja di syarikat PKS yang berada dalam jawatan di peringkat eksekutif dan ke atas kerana mereka lebih bertanggungjawab dalam membuat keputusan. Data dikumpul daripada 120 responden melalui reka bentuk soal selidik menggunakan Borang Google dan platform dalam talian. Oleh itu, hasil daripada Analisis Regresif Berganda dan Pekali Korelasi Pearson menunjukkan kedua-dua pembolehubah dalam kajian ini mempunyai hubungan yang signifikan dan kuat bersama-sama. Kesimpulannya, melalui penyelidikan ini, diharapkan dapat memberi garis panduan kepada PKS untuk mereka mengetahui kriteria yang diperlukan untuk pekerja mengaplikasi dan menggunakan analisis data besar pada rangkaian bekalan pintar dalam kerja mereka yang boleh menghasilkan cara yang berkesan dan cekap menjalankan perniagaan.

Kata Kunci: *Analitis Data Besar, Prestasi Rangkaian Bekalan Pintar, PKS.*

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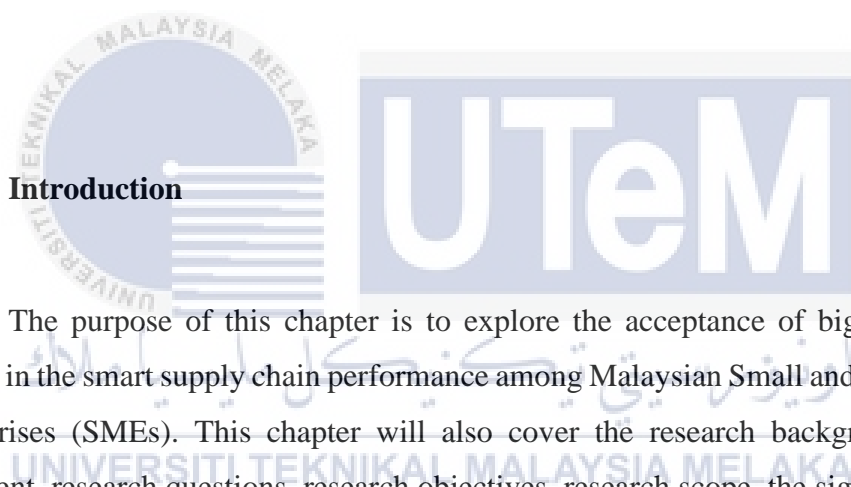
LIST OF ABBREVIATIONS / SYMBOLS

BD	=	Big Data
BDA	=	Big Data Analytics
SC	=	Supply Chain
SSC	=	Smart Supply Chain
SSCP	=	Smart Supply Chain Performance
SMEs	=	Small and Medium Enterprises
RBV	=	Resources-Based View
SPSS	=	Statistical Package for Social Science
IV	=	Independent Variables
DV	=	Dependent Variables
H	=	Hypothesis
P	=	Personalization
IG	=	Information Governance
SCW	=	Supply Chain Warning
IL	=	Innovation and Learning

CHAPTER 1

INTRODUCTION

1.1 Introduction



The purpose of this chapter is to explore the acceptance of big data analytics factors in the smart supply chain performance among Malaysian Small and Medium-Sized Enterprises (SMEs). This chapter will also cover the research background, problem statement, research questions, research objectives, research scope, the significance of the study, limitations of the study, and operational definition.

1.2 Background of Study

Small and Medium Enterprises (SMEs) have played an increasingly important role in Malaysia. If compared to other large companies, SMEs were more resilient during the Asian Financial Crisis 1998-1999. The establishment of the National SME Development Council (NSDC) in 2004 was an important event in recognizing the importance of SMEs to the Malaysian economy. In addition, small and medium enterprises (SMEs) are a common type of business in Malaysia. 97.3 percent of the 662,939 businesses were small

and medium enterprises (SMEs). Then, Micro-enterprises account for more than three-quarters of all SME establishments, followed by 20% of small businesses and 3% of medium-sized businesses (Malaysia, 2014). Thus, Malaysia has a smaller number of medium-sized businesses and leaving a gap in the middle. Thus, the contribution of SMEs to output and employment, as well as productivity and performance in innovative activities, are often used in evaluating the performance.

Moreover, the result of the increase in the use of information technology nowadays which is growing rapidly by customers and the global economy has prompted firms to find innovative ways to produce and deliver value to consumers through supply chain management (SCM) (Seth, et al., 2006). In addition, consumer behavior, the industry environment, and market uncertainties have all influenced the way services in businesses operate. Therefore, companies will be more effective if they collaborate with other companies to improve their capabilities. With this, they can reduce costs and develop higher quality products by leveraging the added value in services for their customers.

Next, to improve the smart supply chain performance, firms have used Big Data Analytics of structured and unstructured data, as well as leveraging firm performance to optimize the business through innovation. As such, Big Data technology has become ingrained in business operations and strategies to anticipate and meet the needs of today's modern customers. In addition, responsiveness flexibility to customer service, and greater reliability of Big Data Analytics have enabled service organizations to improve the performance components of the smart supply chain.

Furthermore, the application of Big Data Analytics in logistics and supply chain operations is critical. This is because effective and fast supply chain decisions are essential to optimize its overall performance. Moreover, the bullwhip effect of supply chains that generate inefficiencies between distribution channels, can be solved by Big Data analysis. According to Gunasekaran, et al., (2017), Big Data's predictive analytics capabilities are not fully defined, which can limit its impact on supply chain performance. By implementing Big Data Analytics (BDA) techniques, many businesses have gained a

competitive advantage in the long run and are able to increase productivity in markets around the world to analyze and manage their data (Wamba, et al., 2017).

Lastly, to always remain competitive in the global market, companies must master their Big Data (BD). These companies should be proficient in managing, processing, and analyzing 5V data-related dimensions using Big Data Analytics (BDA). It is an emerging new technology as a comprehensive approach to generating relevant ideas to create long-term value to track the value of their performance, as well as generate an advantage in competitiveness (Wamba, et al., 2017).



1.3 Problem Statement

Many kinds of research have been done on the acceptance of big data analytics in the smart supply chain performance. Yudi Fernando, et al., (2018) stated that BDA will give an impact on data security practices on service supply chain performance. Big Data Analytics has a strong correlation with a company's and able to manage the data security. Also, it gives positive impact to the service supply chain innovation and performance. Then, big data analytics has a wide range of applications in supply chain demand forecasting including customer behavior analysis and trend analysis applications, and research opportunities (Mahya Seyedan & Fereshteh Mafakheri, 2020). According to L Tamym, et al., (2020), supply chain management in industry 4.0 in big data can improve the data-driven decision-making including the improvement of business efficiency and effectiveness in a new way from the vast amount of data. Rakesh D. Raut (2021) stated that big data analytics gives challenges to Indian manufacturing supply chains. For example, the most significant barriers are the lack of top management support and financial support and the lack of skills and procedures.

It shows that big data analytics has a good impact on smart supply chain performance. L Tamym, et al., (2020) stated that BDA can improve data-driven decision-making in a new way from the large volume of data. It is a reality that big data can enhance end-to-end visibility in smart supply chain processes and develop more flexible and sustainable logistics/supply chain strategies. Therefore, the attempt to strengthen supply chain analytics, skills has become a key priority for all supply chains (Tiwari, Wee & Daryanto, 2018). In addition, organizations create a large amount of data for supply chain operations. Also, these many types of data can be collected in unstructured, structured, and semi structured formats from homogeneous or heterogeneous sources.

However, there is some research that gives the negative impact of big data analytics on the smart supply chain performance. According to N Chbaik, et al., (2022), the fourth industrial revolution led to a new era in the automation industry that transformed it into an autonomous decision-making machine. Thus, Big Data Analytics is also

described as one of the technical foundations of industry 4.0, as it affects all equipment and supply chain operations. With this, it can make activities more accessible and controllable by leveraging complex logistics models to make smart decisions in real-time quickly. So, the availability of data in both unstructured and structured formats has led to security and privacy issues derived from various sources related to large amounts of data. In addition, the existing solutions of the security are often insufficient to handle the complexity and diversity of Big Data. Thus, most businesses do not have a systematic approach to ensuring proper data access mechanisms (Kshetri, 2014). As a result, service organizations lack the data analysis tools and procedures that are needed to gain relevant insights to guide strategy, as well as in improving the business performance (Yiu, 2012, Manyika et al., 2013).

Moreover, Mahya Seyedan & Fereshteh Mafakheri (2020) stated that big data analysis provides demand forecasting, including customer behavior analysis in a smart supply chain performance. Therefore, due to this mixed method, the availability of real-time data and information, and the use of big data analytics may cause some behavioral difficulties for Malaysian SMEs. For example, low estimates and overly high estimates. Any variation from normal operating procedures is referred to as underestimation or overestimation in this context. This can lead to higher inventory costs and higher supply chain risks. Individuals may also worry about losing their jobs as a result of technological advances that are taking place. Thus, these behavioral difficulties may lead to the acceptance of statistically significant but irrelevant relationships in the future. So, due to cultural shift, the implementation of big data analytics causes difficulties in such behaviors (Arunachalam, et al., 2018).

In conclusion, it is important to make the data useable to achieve better operational performance in the value creation process to obtaining a competitive advantage in supply chain performance. Thus, this research is to find out the acceptance of big data analytics in the smart supply chain performance among Malaysian SMEs.