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Project Submission Sheet – 2019/2020

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Signature:	Paul ………
Date:	18/08/2020 ………

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A Study on the Factors Influencing the Use of Business Intelligence in Supply Chain Management in Malaysian Small Medium Enterprises

By Saktis Paul Alexander

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Year 2020

Submitted to National College of Ireland August 2020

<u>Abstract</u>

It is undeniable that the existence of disruptive technologies is causing major shifts in organization and society these days (Sousa and Rocha, 2018). This phenomenon has resulted in huge volumes of data being generated, called big data (Sousa and Rocha, 2018), which potentially cause data overload and become a major challenge for firms if not handled using appropriate tools (Debortoli, Miller and Vom Brocke, 2014). This has shifted or focused the firms' attention towards big data. With the rise and dependency on big data, firms are forced to rely on information technology (IT) for collection of various types of structured and unstructured data (Aydiner *et al*., 2018; Verma and Bandi, 2019). The application of IT to analyse highly complex and dynamic data sets, quantitatively and statistically is said business analytic in today's world (Aydiner *et al*., 2018), which drives the firm to make appropriate decisions for greater competitive advantage, through better understanding of the business and market environment (Debortoli *et al*., 2014; Bara and Knezevic, 2013; Sahay and Ranjan, 2008). Studies on the role of business analytics (BA) and business intelligence (BI) have received plenty of attention in developed country while less attention was given to developing countries (Nofal and Yusof, 2013). Business Intelligence tools are vastly used by large established firms (Multi National Corporations) to better understand current business situation and provide solution to improve financial visibility, supply chain operations and human resource processing through its integration into an organization (Nofal and Yusof, 2013), however small medium sized enterprises (SME) remain reluctant to Business Intelligence adoption (Verma and Bandi, 2019). In this research, we wish to explore the effects Business Intelligence has on Supply Chain Management while understanding the reasons for small medium sized enterprises to not implement Business Intelligence into their daily operational processes. This study focuses on the factors that affect the implementation of Business Intelligence in Supply Chain Management (Supply Chain Intelligence) in small medium sized enterprises in Malaysia.

Student Declaration Form

Submission of Thesis and Dissertation

National College of Ireland
Research Students Declaration Form
(Thesis/Author Declaration Form)

Name: SAKTIS PAUL ALEXANDER

Student Number: 19110448

Degree for which thesis is submitted: MSc ENTREPRENEURSHIP

Title of Thesis: A Study on the Factors Influencing the Use of Business Intelligence in Supply Chain Management in Malaysian Small Medium Enterprises

Date: 18/08/2020

Material submitted for award

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1. Sample questionnaire used for the study (Attached at the end of this booklet)

<u>List of Abbreviations</u>

Abbreviations	Full Name
BA	Business Analytics
BI	Business Intelligence
BIT	Business Information Technologies
DQ	Data Quality
H1	Hypothesis 1
H2	Hypothesis 2
H3	Hypothesis 3
IT	Information Technology
KM	Knowledge Management
SC	Supply chain
RQ 1	Research Question 1
RQ 2	Research Question 2
RQ 3	Research Question 3
SCI	Supply Chain Intelligence
SCM	Supply Chain Management
SCMP	Supply Chain Management Performance
SCOR	Supply Chain Operations Reference
SMEs	Small Medium-sized Enterprises

<u>Introduction</u>

Today's digital era is causing the world to shift and adapt, at a fast pace towards technological advancements, hence creating the need for companies to be in the same velocity with these changes to stay ahead. It is an undeniable fact that the existence of internet, mobile technologies, artificial intelligence, big data, robotics, nanotechnology, and other disruptive technologies are causing major shifts in organizations and society (Sousa and Rocha, 2018). This phenomenon has resulted in huge volumes of data being generated, big data (Sousa and Rocha, 2018), which causes data overload and becomes a major challenge for firms, when not handled with appropriate tools (Debortoli, Miller and Vom Brocke, 2014). This has shifted or focused the firms' attention towards big data gathering and processing.

With the rise and dependency on big data, firms are forced to rely on information technology (IT) for collection of various types of structured and unstructured data (Aydiner *et al*., 2018; Verma and Bandi, 2019), and the quality of these data remains questionable (Gyulgyuyan *et al*., 2018). The application of IT to analyse highly complex and dynamic data sets, quantitatively and statistically, is said Business Analytics (BA) in today's world (Aydiner *et al*., 2018), which allows the firm to make appropriate decisions and gain greater competitive advantage, through better understanding of the business environment and market space (Debortoli *et al*., 2014; Bara and Knezevic, 2013; Sahay and Ranjan, 2008). Studies on the role of Business Analytics (BA) and Business Intelligence (BI) to firm's performance have received plenty of attention in developed country while less attention was given to developing countries (Nofal and Yusof, 2013).

BI is a tool that collects, transforms unstructured data into structured data and presents it in a form that allows enhanced decision making in business, corporate behaviour and improves customer relationship (current and targeted customers) by using the valuable knowledge mined from the data and system analysis (Debortoli *et al*., 2014; Bargshady *et al*., 2014; Nofal and Yusof, 2013; Bogdana, Felicia and Delia, 2009). BI helps managers to better understand current business situation and provide solution to improve financial visibility, supply chain operations and human resource processing through its integration

into an organization's daily operations (Nofal and Yusof, 2013). BI tools are vastly used by large established firms (Multi-National Corporations), while small medium-sized enterprises (SME) have less accessibility to these BI tools to overcome business asymmetry (Verma and Bandi, 2019).

Supply Chain Management (SCM) is a tool that uses real time collaboration with internal and external of an organisation for acquisition, conversion and delivery of product or services (Moniruzzaman, 2015; Stefanovic and Stefanovic, 2009). Application of BI into SCM system creates Supply Chain Intelligence (SCI) which allow valuable information for effective decision making in supply chain management to become more visible (Stefanovic and Stefanovic, 2009). Although there are studies exploring the impact of BI in Supply Chain (SC) performance, there lacks research showing how BI aids an organisation in SCM (Ranjan, 2009) and very limited studies on SMEs adaptation of SCI into their organisation.

Through this research, the researcher wishes to identify:

RQ 1: How the use of Business intelligence can influence the Supply Chain Management performance in Small Medium sized Enterprises?

RQ 2: What are the barriers or factors hindering Small Medium sized Enterprises from adapting Business intelligence into their Supply Chain Management?

RQ 3: Why Small Medium Sized Enterprises are reluctant to adopt Business intelligence?

To address these questions, this research was broken down into several sections in the literature review and methodology, for better understanding of the notions mentioned above. In the first section, introduction to the growing impact of Big Data was addressed, and its impact on modern business operations. Secondly would be the BI itself, why is it important for a firm to adapt and utilise BI in all sectors of their operation. Thirdly, the research is narrowed down to BI integration into SCM and its impacts and challenges. This could potentially address the knowledge gap as to why such vital tool is not fully being utilised by most SMEs around the world. The aim of this proposal is to stress on the importance of BI integration into SCM of and organisation and to understand how some of the potential factors that were raise in previous literatures affect the popularity of SCI among SMEs.

2.0 Literature Review

2.1 Big Data

The world today is shifting towards technological advancements and it is an undeniable that the existence of internet, mobile technologies, artificial intelligence, big data, robotics, nanotechnology, and other disruptive technologies (Sousa and Rocha, 2018) has resulted in huge volumes of data being generated and analysed, called big data (Sousa and Rocha, 2018; Dukic Coric and Bara, 2015; Debortoli, Miller and Vom Brocke, 2014). This tilts firm's focus towards big data, and large volumes of data creates a question to the quality of data being collected and forces the companies towards Data Quality (DQ) solutions (Gyulgyuyan *et al.*, 2018). Antunes *et al.* (2019) in his paper further adds that the information within the large volumes of data is more valuable than the data itself, therefore data should be processed in a way that is relevant to the company's growth.

All the steps involve in analysing large data sets which includes data collection, data warehousing, data processing and data analytics are classified as Big Data procedure (**Antunes *et al.,*** 2019). And it is very vital for companies in making strategic business decision based on the relevant data analysed to maintain their competitive edge in the market (Bara and Knezevic, 2013; Sahay and Ranjan, 2008). Thus, further pressing on the need to analyse and deliver relevant and quality data.

Many executives and scholars agree that Big Data is changing the nature of business competition, how effectively and efficiently they use the relevant data from the Big Data to solve challenges creates value for the company (Wamba *et al.*, 2015). These creates digitalized firms (Aydiner *et al.*, 2018). The application of Information Technology (IT) to analyse highly complex and dynamic data sets, quantitatively and statistically is said Business Analytics (BA) in today's world (Aydiner *et al.*, 2018), and through this the firm could make appropriate decisions with greater competitive advantage, with better understanding of the business environment and the market (Debortoli *et al.*, 2014). Studies on the role of BA and BI have received plenty of attention in

developed country while less attention was given to developing countries (Nofal and Yusof, 2013).

2.2 Business Intelligence

In modern business world, the role of IT in information gathering; Business Information Technologies (BIT) is crucial to strategic, tactical, and operational business objectives (Bogdana *et al*., 2009). The integration of IT to business; BIT is called Business Intelligence (BI) which is crucial to effective business performance and understanding the space around an organisation.

The definition of BI as defined by IBM researcher Peter Laun, is the ability to understand relationships between facts and deliver them in a way that it directs an action towards a specific goal (Bara and Knezevic, 2013). Gartner added that BI is a set of IT tools used to collect and analyse data for improved decision making through the discovery of hidden, inherent and decision relevant data set or Big Data (Herschel and Jones, 2005). McKnight and Haimila, both on different papers, classify BI under Knowledge Management (KM), where they argue KM is the "helping hand of BI" since the information are shared internally among employees to make better informed decision faster (Herschel and Jones, 2005). To simplify, BI are a set of tools used to collect data, transform unprocessed data into useful information which will then be used for decision making to improve overall business performance; it consist of technologies such as data warehousing, business analysis tools and knowledge management tools (Bargshady *et al*., 2014; Bogdana *et al*., 2009)

In modern business world, proper implementation of BI help creates the competitive advantage, and this shift the competition from those with the BI tools to those who knows how to use the BI tools (Ramakrishnan, Jones and Sidorova, 2012; Pisello & Strassmann, 2003). Some of the advantage of BI integration into business decision making are listed below (Antunes *et al*. 2019; Bargshady *et al*., 2014; Bara and Knezevic, 2013; Isik Jones and Sidorova, 2012; Bogdana *et al*., 2009):

Advantage	Value Created
Measurement	Creation of performance metrics and benchmarks to show the progression towards a business goal / business performance index
Analytics	Analysis of data to come to an optimal decision making using valuable information; Business Knowledge Discovery
Reporting	Allows strategic reporting of information for ease understanding
Collaboration	Allows different areas both internally and externally to work together to create something new
Knowledge Management	Through efficient human resource management which allow good tacit knowledge management
Cost Reduction	Through efficient supply chain management reducing operational cost
Improves Profit	Through improved efficiency and productivity
Productivity	Improves employee's productivity

Table 2.1 Shows the advantages of BI in SCM.

The success of BI depends on a variety of factors, but most importantly is how a BI is integrated and utilised by the company (Bargshady *et al*., 2014). With so many advantages, it remains a mystery why SMEs are so reluctant to the adaptation of BI into their firm's operation. In order to address this issue, we must weigh in the challenges SMEs face when adopting this BI and why is it not favourable, thus answering RQ 2 and RQ 3 of the proposed notion.

2.3 Supply Chain Management

Supply Chain (SC) is the planning and management of any activity that involves acquisition, conversion and delivery of product or services (Moniruzzaman, 2015; Stefanovic and Stefanovic, 2009). Supply Chain Management (SCM) is a tool that uses real time collaboration with internal and external of an organisation to deliver all aspects of Supply Chain Operations Reference (SCOR) rapidly

(Stefanovic and Stefanovic, 2009). The goal of SCM is creating a more efficient supply chain; increase the ability to satisfy customer requirement profitably; deliver high quality product in the shortest possible time with the lowest cost; reduce manufacturing expenses, transaction costs and inventory costs; increase organisation's responsiveness; create good bonds with key suppliers; increase the planning capacity across supply chain (Stefanovic and Stefanovic, 2009; Ranjan, 2009). SCM is universally classified into five areas; Plan, Source, Make, Deliver and Return, according to the Supply Chain Operations Reference (SCOR)
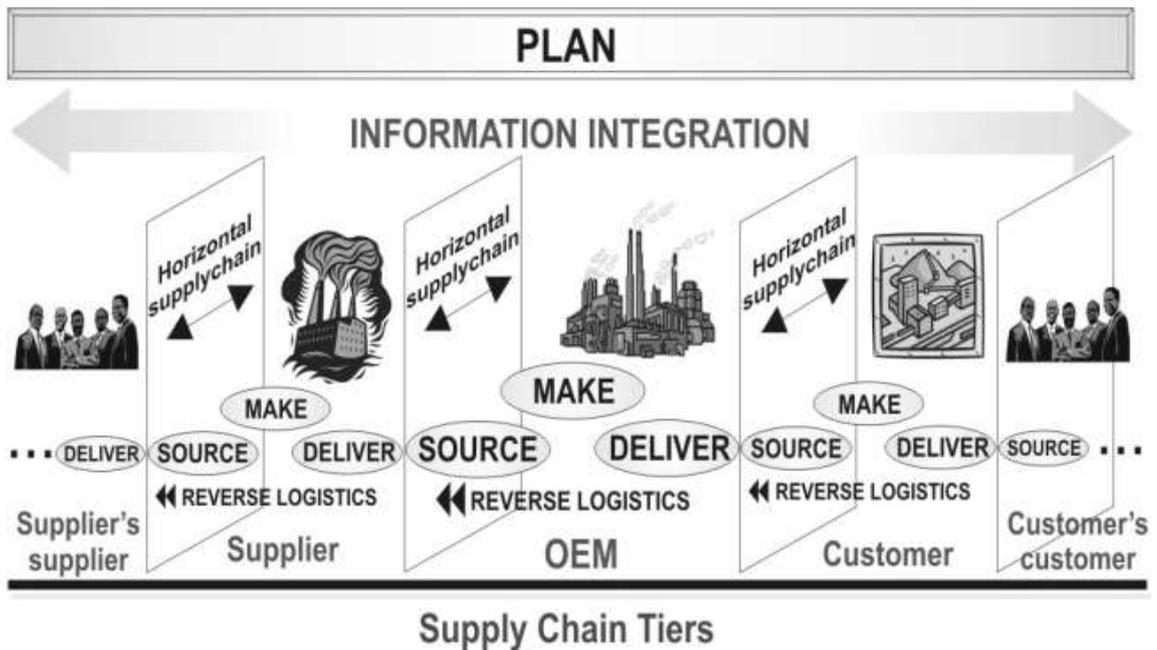
Figure 1.1 Simplified SCOR model (Stefanovic and Stefanovic, 2009).

There are many researchers who studied the effect of IT implementation in SC holistically, however how IT or BI can improve the Supply Chain Management (SCM) remains a question due to the lack of studies in this area (Moniruzzaman, 2015; Swafford *et al.* 2008; Wu *et al.* 2006). Moniruzzaman *et al.* (2015) further adds that a complete study of BI contribution in all aspects of SCM in one study aids in complete understanding its contribution. Although there are studies exploring the impact of BI in SC performance, there lacks research showing what hidden factors affect the implementation of BI into and organisation's SC. This creates a knowledge gap as to how BI can aid to improve Supply Chain Management Performance (SCMP), and the factors influencing its popularity among SMEs.

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2.4 Integration of Business Intelligence

The growing competition in business environment is demanding manufacturers to integrate IT sources to reengineer their business partnership with suppliers, distributors, and retailers (Ranjan, 2009). Successful SCM implementation creates operational and transactional efficiencies across sourcing, manufacturing and distribution of a company, and by applying BI into SCM system, Supply Chain Intelligence (SCI) potentially creates valuable information for decision making in all areas of SCOR (Stefanovic and Stefanovic, 2009).

SCOR Model	Benefits
Plan	Creating balance between resources and requirements
Source	Improve consolidation and optimization
Make	Providing insight into the manufacturing process
Deliver	Improves efficiency of delivery
Return	Improves flow of the returned goods

Table 2.2 Show summary of SCOR benefits

SCI allows cost reduction, increases operational efficacy, improves supply chain cycle time, improves coordination within supply chain players, improves distribution, reduces inventory level while creating data visibility, identifies niche problem areas, analyse logistic performance, allows accurate demand vs supply forecasting, increases customer satisfaction, reducing inventory expenses and increases revenue (Moniruzzaman, 2015; Stefanovic and Stefanovic, 2009; Ranjan, 2009). These could greatly benefit the company to increase their revenue while reducing cost at the same time by understanding their current business performance in aspect to SCOR through the acquisition of valuable information derived from the SCI.

2.5 Factors Hindering SMEs in Investing in Supply Chain Intelligence

Multiple factors are raised by fellow researcher in previous literatures for why SMEs are not keen in adopting SCI into their operation. Some of the factors fall within the organisation's culture which include the management's attitude to

changes in the firms, staff's attitude in receiving these changes, executive supports and employees' attitude as extensive elaborated by Baporikar *et al.* (2015) in their paper on SMEs in Nambia. Wang (2016) on the other hand placed financial strength on any firm is the core and number one reason for SMEs to turn their cheek away from investing in SCI followed by age and experiences of the executives. Another extensive and exploratory research conducted by Kfouri and Skyrius (2016), on factors influencing the implementation of BI in SMEs in Lebanon revealed other minor factors which include management support, employee's acceptance, data quality, quality of expert analysis of the data generated, firm's financial status, understanding of the BI benefits and dependencies on old data.

Through these three very exploratory studies as the foundation, this research will be narrowing down to seven factors that were found predominant among prior literatures and researches (Kfouri and Skyrius, 2016; Wang, 2016; Baporikar *et al.,* 2015).

1. Employee's culture toward the Business Intelligence implementation in Small Medium sized Enterprises in Malaysia.
2. The high set up cost of Business Intelligence implementation that Small Medium Enterprises must bear.
3. Negative impression towards Business Intelligence adaptation by the organisation.
4. Lack of specialist who can analyse and interpret the data generated by the Supply Chain Intelligence.
5. Lack of executive and management support on the idea of Business Intelligence in Supply Chain Management.
6. Lack of understanding on the benefits of Business Intelligence by most Small Medium sized Enterprises in Malaysia.
7. Reliance on old system which is presumed to be doing the daily operations smoothly.

These seven factors were used as core principles (variables) for this study in this research. Exploratory questions were designed to target and address these seven factors.

2.6 Research Objective and Question

Extending further from the literature review, a few research questions arise which becomes the core of this research study.

RQ 1: How the use of Business Intelligence can influence the Supply Chain Management performance in Small Medium sized Enterprise?

H 1: Small Medium sized Enterprises can gain significant competitive edge and performance boost through the adaptation of Business Intelligence in their Supply Chain Management.

RQ 2: What are the barriers or factors hindering Small Medium sized Enterprises from adapting Business Intelligence into their Supply Chain Management?

H 2: There are several barriers and factors for Small Medium sized Enterprises in adapting Business Intelligence into their Supply Chain Management.

RQ 3: Why Small Medium Sized Enterprises are reluctant to adopt Business Intelligence?

H 3: The barriers faced in adapting Business Intelligence into the Supply Chain Management causes the Small Medium sized Enterprises to not favour Business Intelligence.

The goal this research aims to address is to understand the importance of BI integration into Supply Chain Management in Small Medium sized Enterprises, and with the findings from this research, the researcher hopes Small Medium sized Enterprises would know the benefits of SCI and will favour adapting SCI into their firms to increase their competitive advantages. The secondary objective is to understand why Small Medium sized Enterprises are so reluctant in adopting Supply Chain Intelligence system in Supply Chain Management and identify these factors that hinders the implementation of SCI.

3.0 Research Methodology

3.1 Survey Instrument and Data Collection

In this study, the researcher exploited quantitative method. The study was divided into two parts. In the first, the researcher used literature review to narrow down the scope of the study. As mentioned, the listed seven factors will be studied:

1. Employee's culture toward the Business Intelligence implementation in Small Medium sized Enterprises in Malaysia.
2. The high set up cost of Business Intelligence implementation that Small Medium Enterprises must bear.
3. Negative impression towards Business Intelligence adaptation by the organisation.
4. Lack of specialist who can analyse and interpret the data generated by the Supply Chain Intelligence.
5. Lack of executive and management support on the idea of Business Intelligence in Supply Chain Management.
6. Lack of understanding on the benefits of Business Intelligence by most Small Medium sized Enterprises in Malaysia.
7. Reliance on old system which is presumed to be doing the daily operations smoothly.

In the second part of the research, the key information collected and analysed from the literature reviews will be used to formulate the questionnaire to perform a cross sectional survey. This will be a probability sampling technique. This study sampled a range of SMEs located in Malaysia to attain the exact understanding of BI integration into SCM in SMEs. The targeted respondents were senior executives, executives, or managers with sufficient knowledge of the entire firm's supply chain or involved in the supply chain decision making. In this survey and data collection part, the study targeted a population with 500 sample size with an estimated valid response of 100. The reason for such large population was to ensure the outcome is reliable to 0.05% standard error. The valid responses were set at 75 due to the short research

duration and the Covid 19 Pandemic. Thus, the study managed to gather 75 valid responses out of 85 responses received.

The design and structure of questionnaire by Popovic *et al*. (2018) will be used as a guideline for designing the questions. This research relied on other well-established research guidelines. The questionnaire will be distributed to companies via email, with a simple introduction to the research intention and an online survey. The researcher utilised the Google Form as a method of distribution and data collection.

3.2 Measurement of Variables

The data will be measured using six-point Likert scale, ranging from 1 (Strongly disagree) to 6 (strongly agree), which reflects the level of adoption per say. Each question is then analysed further using Cronbach coefficient and two tailed significance test using Pearson's Correlation method to get the probability ratio that reflects the reality, which reflect to estimated real scenario. Pearson's coefficient was used to study the link between popularity of SCI implementation to the factors hindering the implementation of SCI. Quantitative study tools such as SPSS and Microsoft Excel were used to gather, classify, and analyse these data sets.

3.3 Ethical Implication

This study does not have any implication on humans as it does not involve any clinical or medical trial and studies. This wss purely done with the consent of the respondents and they are made aware of the objective of the study. This study was done with the consent of the organisations the questionnaires were distributed to. Furthermore, it does not in any way harm or distress the respondents involve of the organisation being study. If they were any participant, who do not wish to participate, their wishes were respected, and was not used in this study.

4.0 Findings

4.1 Data Analysis

During the data collection period, 85 response was received and only 75 response were filtered and was used in the analysis due to the reliability issues and faulty answers. The 75 responses were from staffs who were directly involved in the SCM team. The table below shows their experience and positions held in the SCM team.

| | N Statistic | Minimum Statistic | Maximum Statistic | Mean Statistic | Std. Deviation Statistic | Variance Statistic | Skewness | | Kurtosis | |
							Statistic	Std. Error	Statistic	Std. Error
Experience of Staff	75	1	4	2.53	0.905	0.820	0.067	0.277	-0.753	0.548
Position held	75	1	5	2.43	0.857	0.734	0.234	0.277	0.136	0.548
Valid N (listwise)	75									

Table 4.1 Shows the background and experience of the respondents

The calculated mean employee's experience in the supply chain department from the survey was 2.53 = '5 to 10 years' working experience. And the position held, 2.43 which indicates that majority of the respondents were Executives' level. These data were analysed using SPSS software. It was also noted that the response was positively skewed for both the experience (0.67) and position (0.234) held by the respondents, which suggests that majority of the respondents were from adequate SCM background. The kurtosis statistics suggests that the employee's experience was distributed normally with light-tailed distribution, while the position was distributed with heavy-tailed. Therefore, both skewness and kurtosis coefficient suggest that the data collected was evenly distributed in a normal distribution.

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Competitive Edge	75	3	3	6	4.87	0.108	0.935	0.874	-0.339	0.277	-0.814	0.548
Information Retrieval	75	5	1	6	4.96	0.108	0.936	0.877	-1.035	0.277	2.719	0.548
Inventory Improvement	75	5	1	6	5.03	0.112	0.972	0.945	-1.233	0.277	2.688	0.548
Overall Performance	75	5	1	6	4.84	0.130	1.128	1.271	-1.187	0.277	1.907	0.548
Increased Productivity	75	3	3	6	4.80	0.100	0.870	0.757	0.152	0.277	-1.201	0.548
Improved Quality	75	3	3	6	4.91	0.093	0.808	0.653	0.016	0.277	-1.111	0.548
Reduced Cost	75	5	1	6	4.63	0.124	1.075	1.156	-1.075	0.277	1.866	0.548
Increased Tracking	75	3	3	6	5.08	0.091	0.784	0.615	-0.488	0.277	-0.272	0.548
Increased Transparency	75	5	1	6	5.09	0.116	1.002	1.005	-1.267	0.277	2.412	0.548
Increased Visibility	75	5	1	6	4.76	0.110	0.956	0.915	-0.639	0.277	1.670	0.548
Valid N (listwise)	75											

Table 4.2 Shows the awareness by the respondents of the advantage of using SCI in SCM in their company.

The above table shows the analysis on the potential benefits BI have on SCM in SMEs and how important the employees think these benefits have in SCM. The overall mean to each aspects of the benefit can be categorised to fit between 4 and 5 from the table 1.2, which reflects to 'agree' and 'partially agree' mind state of the employees. It was also observed that majority of these factors are negatively skewed and have positive kurtosis coefficient, which indicates that majority of the employees are strongly aware of the benefits BI have on SCM.

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Adaptation of SCI	75	1	6	3.97	1.315	1.729	-0.573	0.277	-0.256	0.548
Engagement in SCI	75	1	6	3.93	1.212	1.468	-0.571	0.277	0.643	0.548
Popularity and Adoption level	75	1	6	3.00	1.414	2.000	0.677	0.277	-0.165	0.548
Pursuance towards SCI	75	1	6	4.01	1.310	1.716	-0.766	0.277	0.047	0.548
Suitability for the Firm	75	1	6	3.95	1.365	1.862	-0.426	0.277	-0.289	0.548
Valid N (listwise)	75									

Table 4.3 Show the adaptation, engagement, popularity, pursuance (willingness to adopt) and suitability level of BI software in SCM in SMEs in Malaysia in the year 2020.

The table above is a summary of how well SMEs in Malaysia have adapted the BI use in SCM in their firm. It was observed that the calculated average means for all the above factors fall between 3 to 4, (categorised within 'agree and disagree' mindset), which indicates that the SMEs in

Malaysia are still reluctant to pursue and engage their SCM with BI software. This was further strengthened when we observe the engagement and pursuance level by SMEs from the Table 1.3 was observed to have positive kurtosis which indicates heavily tailed normal distribution among SMEs in Malaysia of not using BI into their SCM (indicating negative involvement in SCI).

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Employee's Culture	75	5	1	6	4.29	1.363	1.859	-0.619	0.277	-0.118	0.548
High Set Up Cost	75	5	1	6	4.84	1.405	1.974	-1.269	0.277	1.068	0.548
Negative Impression of SCI	75	5	1	6	4.24	1.634	2.671	-0.647	0.277	-0.602	0.548
Lack of Specialist	75	4	2	6	4.51	1.057	1.118	-0.229	0.277	-0.627	0.548
Lack of Management Support	75	4	2	6	4.44	1.188	1.412	-0.623	0.277	-0.248	0.548
Lack of Understanding	75	4	2	6	4.72	1.060	1.123	-0.811	0.277	0.447	0.548
Reliance on Old System	75	4	2	6	4.88	0.929	0.864	-0.274	0.277	-0.457	0.548
Valid N (listwise)	75										

Table 4.4 Shows factors that influence the use of BI engagement by SMEs in Malaysia studied in this research.

The table 4.4, shows the seven factors that influences the choice of SMEs to practise SCI in their firms. From this analysis, it was observed that the high set up cost has the greatest influence on the decision making by SMEs in Malaysia. High cost was the only factor that had positive kurtosis coefficient of 1.068 and a very negatively skewed normal distribution, which suggests that cost is the fundamental reason for not engaging in SCI in Malaysian SMEs. The mean statistics for all the above listed factors were calculated to be around 4, which suggests that all the above factor do influence the decision making in Malaysian SMEs.

		N	Marginal Percentage
Popularity and Adoption level	Totally Disagree	10	13.3%
	Partially Disagree	17	22.7%
	Disagree	32	42.7%
	Agree	1	1.3%
	Partially Agree	9	12.0%
	Totally Agree	6	8.0%
High Set Up Cost	Totally Disagree	4	5.3%
	Partially Disagree	2	2.7%
	Disagree	4	5.3%
	Agree	16	21.3%
	Partially Agree	15	20.0%
	Totally Agree	34	45.3%
Lack of Understanding	Partially Disagree	4	5.3%
	Disagree	4	5.3%
	Agree	19	25.3%
	Partially Agree	30	40.0%
	Totally Agree	18	24.0%
Lack of Specialist	Partially Disagree	2	2.7%
	Disagree	11	14.7%
	Agree	24	32.0%
	Partially Agree	23	30.7%
	Totally Agree	15	20.0%
Reliance on Old System	Partially Disagree	1	1.3%
	Disagree	1	1.3%
	Agree	28	37.3%
	Partially Agree	21	28.0%
	Totally Agree	24	32.0%
Employee's Culture	Totally Disagree	3	4.0%
	Partially Disagree	7	9.3%
	Disagree	5	6.7%
	Agree	27	36.0%
	Partially Agree	16	21.3%
	Totally Agree	17	22.7%

Lack of Management Support	Partially Disagree	8	10.7%
	Disagree	5	6.7%
	Agree	22	29.3%
	Partially Agree	26	34.7%
	Totally Agree	14	18.7%
Negative Impression of SCI	Totally Disagree	8	10.7%
	Partially Disagree	4	5.3%
	Disagree	9	12.0%
	Agree	18	24.0%
	Partially Agree	13	17.3%
	Totally Agree	23	30.7%
Valid		75	100.0%
Missing		0	
Total		75	
Subpopulation		54[a]	

Table 4.5 Show the case summary of the individual response used to calculate the statistical data with the corresponding answers.

Individual analysis on the answers submitted was analysed and summarized in Table 4.5. It was also noted that the subpopulation analysed for all the above dependent variables to be 54, and it was indicated that only one value is observed in 50 subpopulations (92.6%). Thus, a significance error of 0.74 for the total response.

	Mean	Std. Deviation	N
High Set Up Cost	4.84	1.405	75
Lack of Understanding	4.72	1.060	75
Lack of Specialist	4.51	1.057	75
Reliance on Old System	4.88	.929	75
Employee's Culture	4.29	1.363	75
Lack of Management Support	4.44	1.188	75
Negative Impression of SCI	4.24	1.634	75
Popularity and Adoption level	3.00	1.414	75

Table 4.6 Shows the average answer of employees to the factors that could influence the decision making of SMEs.

The average answer observed to be in the '4 = Agree' category, which indicates that majority of the employee do agree that these factors do influence the decision making. This individual responds analysis reveal that ' reliance on old system' was rank first, followed closely by 'high cost', ' lack of understanding', 'lack of specialist', 'lack of management support', 'impression' and lastly 'employee culture'.

		High Cost	Lack of Understanding	Lack of Specialist	Reliance on Old System	Employee Culture	Lack of Support	Impression	Popularity
High Set up Cost	Pearson Correlation	1	0.115	0.346**	0.275*	0.321**	0.367**	0.346**	0.054
	Sig. (2-tailed)		0.327	0.002	0.017	0.005	0.001	0.002	0.643
	Sum of Squares and Cross-products	146.080	12.640	38.080	26.560	45.520	45.280	58.880	8.000
	Covariance	1.974	0.171	0.515	0.359	0.615	0.612	0.796	0.108
Lack of Understanding	Pearson Correlation	0.115	1	0.394**	0.446**	0.114	-0.030	-0.132	0.162
	Sig. (2-tailed)	0.327		0.000	0.000	0.331	0.801	0.258	0.164
	Sum of Squares and Cross-products	12.640	83.120	32.640	32.480	12.160	-2.760	-16.960	18.000
	Covariance	0.171	1.123	0.441	0.439	0.164	-0.037	-0.229	0.243
Lack of Specialist	Pearson Correlation	0.346**	0.394**	1	0.434**	0.233*	0.401**	0.288*	0.262*
	Sig. (2-tailed)	0.002	0.000		0.000	0.044	0.000	0.012	0.023
	Sum of Squares and Cross-products	38.080	32.640	82.747	31.560	24.853	37.280	36.880	29.000
	Covariance	0.515	0.441	1.118	0.426	0.336	0.504	0.498	0.392
Reliance on Old	Pearson Correlation	0.275*	0.446**	0.434**	1	0.412**	0.367**	0.117	0.247*

System	Sig. (2-tailed)	0.017	0.000	0.000		0.000	0.001	0.317	0.033
	Sum of Squares and Cross-products	26.560	32.480	31.560	63.920	38.640	29.960	13.160	24.000
	Covariance	0.359	0.439	0.426	0.864	0.522	0.405	0.178	0.324
Employee's Culture	Pearson Correlation	0.321**	0.114	0.233*	0.412**	1	0.620**	0.380**	0.049
	Sig. (2-tailed)	0.005	0.331	0.044	0.000		0.000	0.001	0.676
	Sum of Squares and Cross-products	45.520	12.160	24.853	38.640	137.547	74.320	62.720	7.000
	Covariance	0.615	0.164	0.336	0.522	1.859	1.004	0.848	0.095
Lack of Management Support	Pearson Correlation	0.367**	-0.030	0.401**	0.367**	0.620**	1	0.689**	0.322**
	Sig. (2-tailed)	0.001	0.801	0.000	0.001	0.000		0.000	0.005
	Sum of Squares and Cross-products	45.280	-2.760	37.280	29.960	74.320	104.480	99.080	40.000
	Covariance	0.612	-0.037	0.504	0.405	1.004	1.412	1.339	0.541
Negative Impression towards SCI	Pearson Correlation	0.346**	-0.132	0.288*	0.117	0.380**	0.689**	1	0.064
	Sig. (2-tailed)	0.002	0.258	0.012	0.317	0.001	0.000		0.584
	Sum of Squares and Cross-products	58.880	-16.960	36.880	13.160	62.720	99.080	197.680	11.000
	Covariance	0.796	-0.229	0.498	0.178	0.848	1.339	2.671	0.149

Popularity and Adoption level									
	Pearson Correlation	0.054	0.162	0.262*	0.247*	0.049	0.322**	0.064	1
	Sig. (2-tailed)	0.643	0.164	0.023	0.033	0.676	.005	0.584	
	Sum of Squares and Cross-products	8.000	18.000	29.000	24.000	7.000	40.000	11.000	148.000
	Covariance	0.108	0.243	0.392	0.324	0.095	0.541	0.149	2.000

Table 4.7 Shows the correlation of all seven variables and the popularity of BI usage in SCM in Malaysia

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=75

From the analysis above, it was noted that the strongest correlating factor (variable) with popularity (reasons not to choose SCI) of BI in SCM was with the lack of executive support in SMEs with Pearson's correlation of 0.322 and has a significance of 0.005, which indicates the correlation is significant. This was followed by lack of specialist in the SME with BI knowledge with a Pearson's correlation of 0.262 and a significance of 0.023. Then comes the reliance of SMEs in old system instead of changing the system with a Pearson's score of 0.247 and a significance of 0.033. Next come the lack of understanding factor ranked at fourth strongest relation to the popularity of SCI adaptation with a Pearson's score of 0.162 and a significance if 0.162, which indicates not significant. The last three factors in order of rank are the impression that the firm does not require BI with a Pearson's score of 0.064 (and a significant score of 0.584), high set up cost with a Pearson's score of 0.054 (and a significant score of 0.643) and lastly the employees culture with a score of 0.049 (and a significant score of 0.676). This data suggests that popularity of SCI adaptation in SMEs in Malaysia have a nonsignificant correlation with variables such as 'lack of understanding', 'the impression that the firm does not require BI', 'high set up cost' and 'employees culture'.
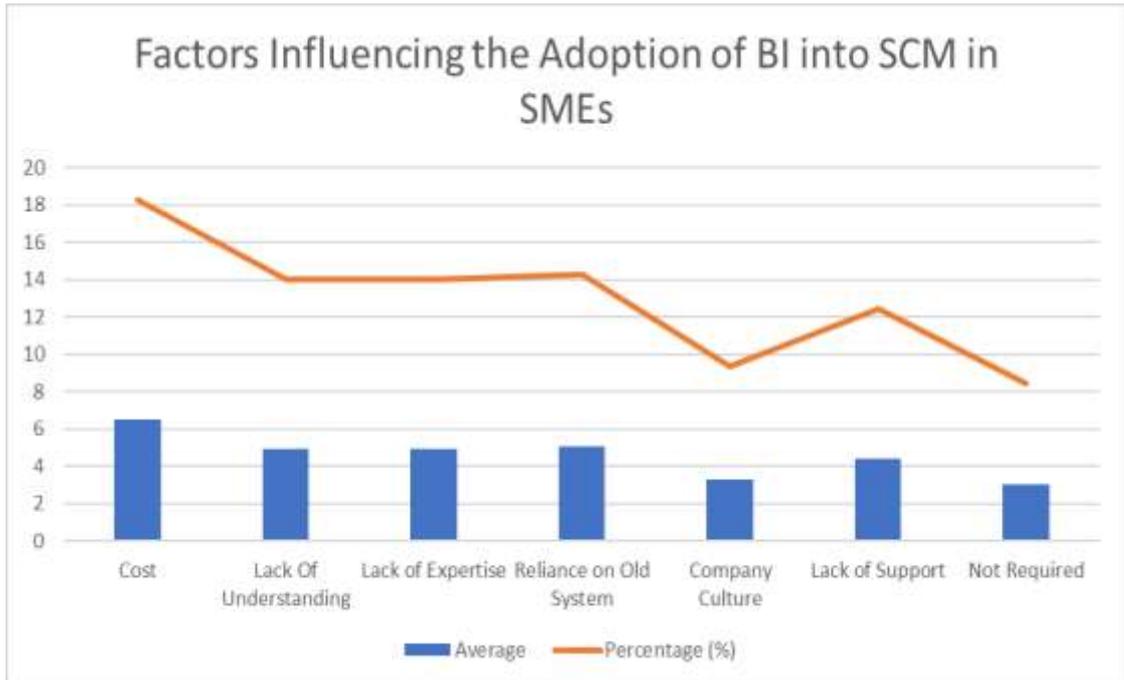
Figure 4.1 Shows the ranking of seven variable as listed by the respondents (employees) working in current SCM department.

From the graph, it was very clear that the high set up cost was clearly the strongest reason not engaging in BI. This result contradicts with the previous Pearson's correlation finding which ranked high cost as the sixth influencing factor for BI engagement, however with a very high significance value, thus confirm the Pearson's analysis that high cost has non-significant correlation with popularity. This followed by reliance on old system by SMEs, which also can explain the high two tailed significant score from Pearson's analysis. As the employees rank in order of highest influencing factor to lowest; cost, reliance on old system, lack of expertise and lack of understanding (tied at third), lack of executive support, company's culture and lastly impression of not requiring BI. These ranking corresponds to Pearson's analysis and significance (two-tailed) score. Therefore, the findings are valid and support the hypothesis. The validity test on the reliability of the study was also carried out using Cronbach's Alpha test.

Case Processing Summary

		N	%
Cases	Valid	75	100.0
	Excludedᵃ	0	.0
	Total	75	100.0

Table 4.8 Shows the case summary values.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.736	.751	8

Table 4.8 Show the Cronbach's Alpha test.

Cronbach Alpha suggests that the data has high reliability if the score was in between 0.7 to 0.9 based on standardized items, and in our questionnaire the score for the variable that influence the popularity or choice to integrate BI into SME's SC has a score of 0.751, which is highly reliable.

ANOVA with Cochran's Test

		Sum of Squares	df	Mean Square	Cochran's Q	Sig
Between People		337.940	74	4.567		
Within People	Between Items	189.492	7	27.070	122.046	.000
	Residual	625.633	518	1.208		
	Total	815.125	525	1.553		
Total		1153.065	599	1.925		

Grand Mean = 4.37

Table 4.9 Show the ANOVA test results.

Another validity test was carried out using Cochran's Q test, where the score was 122.046 with a significance of 0.000. this suggest that the above-mentioned variables have influences on the popularity and engagement level of SMEs in Malaysia in SCI with statistically significant indicators.

Thus, the results obtained from the questionnaire and the analysis indicates that the hypothesis tested is valid and accepted.

5.0 Discussion

This research main findings provide evidences that support the hypothesis proposed. Hypothesis one (H1) was accepted, the SMEs do gain significant competitive advantages through adopting BI into their SCM (SCI). This was observed as majority of the response received indicate awareness and agree to the benefits of SCI implementation has to offer for SMEs. This was in agreement to the findings of Moniruzzaman *et al.* (2015), Bargshady *et al*. (2015), Herschel and Jones (2015), Bara and Knezevic (2013) and Stefanovic and Stefanovic (2009) which indicated several benefits and competitive advantages SCI offers to SMEs.

The second hypothesis was also accepted based on literature review and exploratory previous research works on SMEs in other countries; Asia, Lebanon and Nambia (Kfouri and Skyrius, 2016; Baporikar *et al*., 2015; and Wang, 2015). The third hypothesis was accepted based on the Pearson's correlation test results carried out as mentioned in Table 4.7 above. The results show different factors influence the popularity (willingness to invest in SCI) and all the above listed factors do influence the popularity to a certain extend. Although there were several studies conducted on the factors influencing the implementation and adoption of SCI by SMEs prior to this study, there were no studies tying these factors to the popularity of SCI among SMEs (Moniruzzaman *et al.,* 2015). Through this study we were able to identify how popularity and willingness to adopt and implement SCI into daily operations are linked with the variables that hinder the SCI implementation, and to what extent. From the survey's individual analysis from Table 4.5 and Table 4.6, it was beyond reasonable doubt that high set up cost was the primary contributing factor to the negative involvement of SMEs to SCI implementation, which was in agreement to the findings of Wang (2015). However, this result contradicts with the Pearson's correlation finding which ranked high cost as the sixth influencing factor, yet the Pearson's analysis that high cost showed non-significant correlation with popularity, therefore the finding adds value to Wang (2015). This contradiction was due to the technique used to analyse the variables, in Wang's paper, he used the T-test method to evaluate each variable individual which differs from this study's technique. In this research the analysis was done by comparing the interaction of individual

variables to the popularity of SCI among SMEs and thus resulting in a different values and inference.

The study's findings to a certain extend contradicts to the findings of Kfouri and Skyrius (2016) and Baporikar *et al.* (2015), were they argued corporate culture and management support do influence the adoption of SCI by SMEs. This study indicate that corporate culture and management support do influence the decision to adopt SCI. Therefore, further studies should be carried out to dispute or agree with these findings. However, individual response analysis revealed that majority of the employees do agree corporate culture and management support factors does influence the willingness to adopt SCI into their firms from Table 4.6. This was further supported with some responds that this study received replied 'the management team are unwilling to change or accept a new system', or 'my fellow colleagues are old-school'.

The findings of this study indicate that there may be other underlying factors that affect the involvement into SCI as explained by Kfouri and Skyrius (2016), Wang (2015) and Herschel and Jones (2005), thus further cross-sectional study should be carried out. Although it seemed like the findings of the study raises many questions, the Cronbach Alpha test indicates that these findings were highly reliable. Thus, the hypothesis H2 and H3 were accepted. The difference in result from Table 4.6 and Table 4.7. Pearson's test and individual response analysis was primary due to different techniques used to evaluate. In this study, the researcher used Pearson's test to indicate the correlating factors that affect the implementation of SCI into their SCM operations. This correlation study between factors and popularity was never done before, thus opening the grounds for further research. In order to fully understand the factors influencing the decision and willingness to adopt SCI, additional and more focused studies should be carried out, especially in the interacting variables (dependent and co-dependent variables) identification and how they influence the willingness to accept SCI.

Conclusion

The aim of this study was met by understanding the importance and effect SCI has on SMEs through the literature review that was carried out. The lack of empirical evidence from prior research, and the knowledge gap in that existed in this field was somewhat filled through this study (Moniruzzaman, 2015; Bargshady et al., 2014; Ranjan, 2009; Stefanovic and Stefanovic, 2009). The factors that influence the implementation of SCI was successfully identify through prior research and was used to formulate the questionnaire. These questionnaires were then distributed to SMEs around Malaysia targeting only experience employees with SCM background. The resulting survey data was analysed using SPSS and Microsoft Excel to provide empirical evidence that previously not existing. This study revealed that many SMEs are still reluctant to involve in SCI and the reasons why. The seven factors that influence the implementation of SCI from the literature review was analysed (Kfouri and Skyrius, 2016; Wang, 2016; Baporikar et al., 2015), which indicates that 'High set up cost' was the predominant factor that hinders the implementation of SCI. The findings of the study using the Cronbach Alpha test and Pearson's Correlation test showed that the three hypotheses being tested were accepted with high validity and reliability. Thus, this study was successful

Limitation and Improvement.

There were several limitations when this study was being conducted. Firstly was the effect the Covid 19 Pandemic had on SMEs, which reduced the responds volume to only 75 response received. The Covid 19 had caused many countries to go into lockdown which had heavy impact on SMEs operation. This made some SMEs to not operate during the period when the survey was being carried out. Besides that, the pandemic also limited the interaction quality between the research and the supervisor, the researcher and targeted testing audience. The researcher had to change his mixed method study to a single, quantitative study. Secondly, the duration of the study was too brief, resulting in fewer sample size being studied. However, the results obtained were conclusive.

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Appendices

Sample Questionnaire Used

Kindly refer to the link attached for the Google form link

https://docs.google.com/forms/d/1KLf2RuGy2F1Q-3-
M2IipQFW6UamZ3a4gX6gU-kKmsTs/prefill

Questionairre - Google Forms.pdf (Command Line)

The listed below are the questions used for the study.

Supply Chain Management and Business Intelligence Integration	
This study wishes to understand the benefits of Business Intelligence use in Supply Chain Management, especially in Small Medium Enterprise in Malaysian countries. This research will focus on the barriers that affect the adoption of BI tool into the company. Business intelligence are tools used to analyse data in fast and efficient way to give company advantage. This includes reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, bench marking, text mining, predictive analytics, and prescriptive analytics.	
Position in Company	
	Senior Management
	Senior Executive
	Executive
	Junior Executive
	Others
Q1. How long have you been working in this field?	
	less than a year
	2-5 years
	5-10 years
	more than 10 years
Q2. How frequent does your company evaluates the performance of the Supply Chain Management practices?	
	Weekly
	Fortnightly
	Monthly
	Quarterly
	Annually
	Never
Q3. Is your company successful in dealing with Supply Chain Management	

Practices?	
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'	
	1
	2
	3
	4
	5
	6
Q4. Are your suppliers satisfied with Supply Chain Management Practices that your company offering?	
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'	
	1
	2
	3
	4
	5
	6
Q5. Are your customers satisfied with Supply Chain Management Practices that your company offering?	
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'	
	1
	2
	3
	4
	5
	6
Q6. In your opinion do you think that your company is pursuing best Supply Chain Management Practices?	
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'	
	1
	2
	3
	4
	5
	6
Q7. In your opinion do you think that your company is having suitable Business Intelligent software that help for the better performance of Supply Chain Management?	
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'	
	1
	2

	3
	4
	5
	6

Q8. In your opinion do you think that your company has adopted better management by utilizing Business Intelligent software?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q9. In your opinion do you think that Business Intelligent software can help your company in improving inventory accuracy [inventory accuracy = logical inventory (records) – physical inventory?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q10. In your opinion do you think that Business Intelligent technology can help your company to prevent misplacement of items or to facilitate locating items?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q11. In your opinion do you think that Business Intelligent technology implementation will enhance the transparency of company's supply chain?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q12. In your opinion do you think that using Business Intelligent technology

	benefits speedy and accurate information retrieval?
	Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1	
2	
3	
4	
5	
6	
	Q13. In your opinion do you think that using Business Intelligent technology benefits enhanced visibility along the supply chain and better-quality information?
	Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1	
2	
3	
4	
5	
6	
	Q14. In your opinion do you think that using Business Intelligent technology benefits accurate asset tracking and enhanced process automation?
	Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1	
2	
3	
4	
5	
6	
	Q15. In your opinion do you think that using Business Intelligent technology benefits reduced operating costs?
	Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1	
2	
3	
4	
5	
6	
	Q16. In your opinion do you think that using Business Intelligent technology benefits improved competitive position?
	Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1	
2	

	3
	4
	5
	6

Q17. In your opinion do you think that using Business Intelligent technology benefits improved productivity?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q18. In your opinion do you think that using Business Intelligent technology benefits improved quality and reliability?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q19. In your opinion do you think that using Business Intelligent technology overall benefits the firm's performance?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q20. In your opinion do you think that Business Intelligent technology is popular among Small Medium Enterprise?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1.
	1
	2
	3
	4
	5
	6

Q21.A) In your opinion the company have not engaged in Business Intelligence in Supply Chain Management because (Rank them in the order of importance, with 1 = the lowest and 8 = the highest.)	
	1. Negative attitudes of employee/ Company culture
	2. High Set Up cost
	3. Negative impression towards BI implementation (Not required for Small to Medium Enterprises)
	4. Lack of expertise to analyse the data
	5. Lack of executive support
	6. Lack of understanding of SCI/BI
	7. Reliance on old system
	8. Not Applicable

Q21.B) If for question no.21 your answer is 'others', please specify	
	-

Q22. In your opinion have the company engaged in any Business Intelligence software in Supply Chain Management Practices?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q23. In your opinion the company have not engaged in any Business Intelligence software because of high set up cost?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q24. In your opinion the company have not engaged in any Business Intelligence software because lack of understanding of Business Intelligence software benefits?

Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'

	1
	2
	3
	4
	5
	6

Q25. In your opinion the company have not engaged in any Business Intelligence software because lack of specialist to analyse the data generated?
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1
2
3
4
5
6

Q26. In your opinion the company have not engaged in any Business Intelligence software because of reliance on old technology?
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1
2
3
4
5
6

Q27. In your opinion the company have not engaged in any Business Intelligence software because of negative adoption by employee due to company culture?
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1
2
3
4
5
6

Q28. In your opinion the company have not engaged in any Business Intelligence software because lack of executive support?
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1
2
3
4
5
6

Q29. In your opinion the company have not engaged in any Business Intelligence software because impression of Small Medium Enterprise does not require Business Intelligence?
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'
1

	2
	3
	4
	5
	6
Q30. In your opinion do you think the company can benefit from integration of Business Intelligence into Supply Chain Management Practices?	
Please indicate on the scale of 1 to 6; '1 - totally disagree', '2 - partially disagree', '3 - disagree', '4 - agree', '5 - partially agree' and '6 - totally agree'	
	1
	2
	3
	4
	5
	6