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Application of Business Intelligence Technology Model to Sustainable Supply Chain

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Abstract: Under the backdrop of globalization, sustainable supply chains are becoming one of the most important directions for commercial development in the future. The efficiency of supply chain management (SCM) will be significantly improved when business intelligence is used in the supply chain. Sustainable supply chain refers to the integration of sustainable development elements on the basis of traditional supply chain management, introducing the assessment and management of social, environmental, economic benefits and other risks. The aim of this paper is to look at how different BI techniques affect different business models. Most of this paper is a summary of previous scholars' work. The most successful and widespread application of BI is the final outcome of the technology acceptance model. These three BI models have different effects on sustainable supply chains, but in general, BI is very helpful for sustainable supply chain development in all aspects. Future results would be much more accurate and effective if three techniques were actually able to monitor and compare the sustainability of supply chains.

Keywords: Business Intelligence, Sustainable supply chain, technology acceptance model, Resource-based view, Unified Theory of Technology Acceptance and Use.

1. Introduction

The tools used in business intelligence and analytics (BI&A) help decision-making by facilitating data gathering, analysis, and information sharing. The relationship between accountancy and administrative accountancy [1] is very close, as management accountancy is an activity that promotes decision-making. Managers consider technology, data and analysis to be a revolution in the business world [1]. Over time, commercial intelligence has become more and more important across a variety of business models. For example, AUS Research on BI is the Technological Acceptance Model and Innovation Diffusion Theory (TFP) [2]. Davis' Technical Acceptance Mode (TAM) is the second-most-used BI mode in the AUS study [2]. The well-known theory of Diffusion of Innovation (DOI) proposed by Rogers Everett [3] is as follows. The Unified Theory for Technology Acceptance and Utilization (UTAUT), RBV (RBV), the Technological Organizational Environment (TOE), and the Incentive Theory (MT) have been relatively low [2]. Some theories, like the Cornet model, expectancy theory, or social exchange theory, have only ever been applied once [2].

However, a lot of enterprises have not been able to make effective use of BI to improve the efficiency of the SCM. However, there is little quantitative research on BI application in SCM. This paper aims to explore how different business models can utilize BI in different ways to improve the

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efficiency of SCM and to adapt them to new developments. The aim of this program is to find out how BI can be used to support SCM.

2. Sustainable Supply Chain Management (SSCM)

Business sustainable means dealing with and managing economic, social and environmental issues in a balanced and integrated way [3]. In an era of rapid globalisation, it is well placed to develop sustainably because of its wide scope. The aim of SCM is to maintain social, economic and ecological stability in the long term [4]. Sustainable supply chains can be categorized into three different arrangements historically. In addition, there are some limitations to this kind of SSCM. To be able to take part in an open SSCM, first-line contractors need to have a sound sustainability record [5]. One is known as "Open Sustainable Supply Chain Management," where the purchaser will collaborate with the top-tier vendors to build the top-tier suppliers. In this case, the leading suppliers will wish to establish long-term subcontractors [6]. In a second arrangement, purchasers seek "third-party" or intermediate platforms to help them find different tiers of providers with a view to creating a sustainable offer [5]. To maximize sustainability, the purchaser has to keep in touch with the first- and second-level suppliers, which is the third approach, "Closed Sustainable Supply Chain Management" (SCM) [5]. Because of their reliance on multiple providers and, therefore, greater administrative burden, a closed-ended SSCM is more suitable for companies with a broadly stable organizational structure [5].

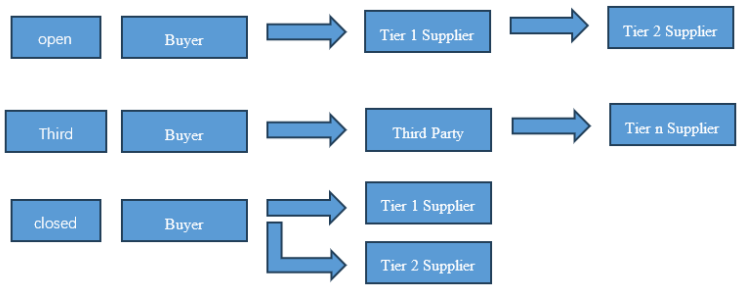

Figure 1: SSCM configurations identification [5]

Figure 1 shows three different supply chain models and the state of business under different supply chains.

In the current commercial environment, however, there are not only three kinds of SCM. Additional complexity needs to be considered. To optimise the benefits of enterprises, sustainable development includes accurate and rapid reflection on the market as well as robust production of products. Consumer preferences are among those that are rapidly evolving due to globalisation. Thus, if a firm is able to determine the most optimal sustainability of the supply chain, it will be able to quickly adjust to changes in customers' preferences and minimise the effect on profits.

3. Business Intelligence

Various industries utilize a variety of BI models. The term "business intelligence", according to Brands, means all of the applications and processes for obtaining, examining, and analysing data for the purpose of making decisions. In Watson's view, Business Intelligence (BI) is a generic term for the software, hardware, and process components that provide data to support decision-making. BI, Jaeger says, is an instrument that companies can use to assess their data and manage their risks. The term "Business Intelligence" (BI) is defined as a platform that combines and integrates data for analysis and assistance in the operation of business decisions.

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3.1. Technology Acceptance Model (TAM)

Various industries utilize a variety of BI models. The term "business intelligence", according to Brands, means all of the applications and processes for obtaining, examining, and analysing data for the purpose of making decisions. In Watson's view, Business Intelligence (BI) is a generic term for the software, hardware, and process components that provide data to support decision making. BI, Jaeger says, is an instrument that companies can use to assess their data and manage their risks. The term "Business Intelligence" (BI) is defined as a platform that combines and integrates data for analysis and assistance in the operation of business decisions. Various industries utilize a variety of BI models. The term "business intelligence", according to Brands, means all of the applications and processes for obtaining, examining, and analysing data for the purpose of making decisions. In Watson's view, Business Intelligence (BI) is a generic term for the software, hardware, and process components that provide data to support decision making. BI, Jaeger says, is an instrument that companies can use to assess their data and manage their risks. The term "Business Intelligence" (BI) is defined as a platform that combines and integrates data for analysis and assistance in the operation of business decisions. In all, 375 English peer-reviewed publications were identified for applications, such as "TAM" or "Technology Acceptance Model" and "Education" or "Study" in the heading. TAM has been widely used in most assessment and analysis studies to assess the acceptability and prognosis of all learning strategies. According to studies, perceived usefulness and usability among learners boost learning satisfaction, and usefulness and learning satisfaction result in a favorable willingness to use. Perceived utility and perceived ease of use, the model's main variables, have consistently been demonstrated to be necessary conditions for technology learner acceptance. In the overwhelming majority of analyses, undergraduates were the most frequently selected sample (83%), suggesting that most of the empirical data was collected within the institutions. Only 17% of the total population contained other participants (high-school graduates, faculty/faculty members, and employees), which may have been considered to be a deficiency in the study and will be discussed in more detail in the Limitations section. In addition to improving the prediction effectiveness of the initial model, more than half of the identified studies (in particular, 49%) contained new exogenous variables while continuing to apply the baseline TAM. In the second part, the author's explanation of the TAM model was used to take into consideration the factors influencing students' acceptability (38 percent and 13 percent, respectively) [5]. Nowadays, m-learning is becoming an attractive tendency, and many researchers are keen to explore its characteristics and measure their acceptance by both students and teachers [6]. Ell-Gayar and Moran took TAM as a theory model to test their acceptance of the "tablet" as a tool for anticipation, interpretation, and creation of usage patterns. Abatan and Maharaj utilized TAM to investigate the way in which South African IT students make use of their mobile communications services. Soleimani, Ismael and Mustaffa conducted a TAM study on "Mobile Assisted Language Learning (MALL)" for ESL postgraduates in Malaysia. Gelderblom, Van Dyk and Van Biljon, in their research on cell telephone usage in South Africa, identified appropriate adoption models for this demographic. Scholtz and Kapek assessed the adoption of openSAP and SAP Learn Now, with the first being an eLearning system and the second being a mobile learning system in South Africa. Using TAM, Sun, Chang, and Chan conducted a survey on the attitudes of Taiwanese university students towards GSM-ENABLED Context Awareness Learning (GPMT) [6].

3.2. Resource-Based View (RBV)

The Resource Based Corporate Outlook (RBV), initiated by Jay Barney, takes center stage in this debate. It says, "Only when an enterprise creates value in a manner which is rarely seen or replicated by its rivals will it be able to build sustainable competitiveness." Indeed, RBV stresses that complementary benefits are beneficial by emphasising their importance in both value-capture and

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value-creation. This is due to the fact that it is more difficult to duplicate supplementary procedures than good practice, even when they are in line with the general commercial strategy [7]. The RBV model argues that HRM can achieve a competitive advantage by creating a workplace environment that encourages the accumulation and contribution of workers' CSR and HR, promotes greater innovation, customer service and operating performance, and strengthens the competitiveness of different business strategies [8]. What is important is that efficient HRM practices and the appearance of potentially invaluable and unusual staff resources are not sufficient to adequately account for the contribution of HR to competitiveness. Rather, there is a need for further studies to look at organisational capacities that may account for the greater likelihood of effective exploitation of employee based resources through OHCHR strategies for competitiveness purposes [8]. Strategic Human Resource Scholars can begin to explore more deeply how leadership and other organization features and resources influence human resource efficiency through the RB-based Strategic Human Resources Model [7].

3.3. Unified Theory of Technology Acceptance and Use (UTAUT)

The United Technique Acceptance and Usage Theory (UTAUT) was developed by Venkatesh and his colleagues in order to clarify the acceptability and application of IS/IT. The theory is founded on a comprehensive review and synthesis of many theoretical frameworks. While the initial UTAUT model accounted for a large number of changes in behaviour and use behaviour, it overlooked potentially meaningful relations and eliminated those that might be critical for understanding IS/IT acceptance and application. Based on the research of Mr. Ko and his colleagues, the perception of value has an intermediary role in affecting the behavior of purchasing fashion goods. Demographic data, such as the age of the customer, the attitude, the previous experience, and the relation to the usage of the cell phone, were found to be important predictive factors for the choice of mobile business in the other Spanish study. A survey of U. S. consumers found that the intent to use mobile shopping is largely driven by performance expectations, societal impact, and convenience. Wang et al verified the influence of Perceived Utility (PU), Perceived Usability (PEOU) and Subjective Criterion (SN) to Mobile Shopping Intent [9].

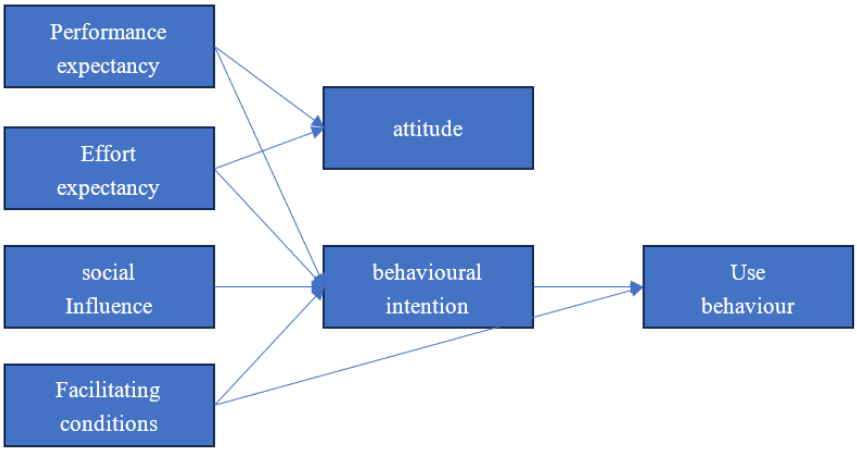

Figure 2: Proposed theoretical model [9]

Figure 2 shows the application of one kind of BI in the business model and the specific process.

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4. Conclusion

The sustainability of the supply chain is highly dependent on commercial intelligence. These three patterns are important parts of a lot of business models. The TAM model is often used to test the popularity and acceptance of a particular technology. mHealth is also exploiting a number of TAM-related models simultaneously. The RBA model is often used to research various HR problems. The main focus of this paper is on how to improve the performance of mobile shopping applications with UTAUT. Little research has been done on the application of BI in the SCM. Even the hottest models are almost never used by supply chains. The correct use of BI is essential to the increasingly complex supply chain models. It's the fastest and easiest way to improve the efficiency of SCM. In my view, the key to further research is the integration of different types of BI techniques into the SCM with different types of business patterns so that they can be considered as compatible as possible. This research, if successful, would be a major step forward in making SCM more effective. In addition, enterprises have more scope for development and growth.

References

[1] *Ain, N., Vaia, G., DeLone, W. H., & Waheed, M. (2019). Two decades of research on business intelligence system adoption, utilization and success–A systematic literature review. Decision Support Systems, 125, 113113.*

[2] *Reefke, H., & Sundaram, D. (2017). Key themes and research opportunities in sustainable supply chain management–identification and evaluation. Omega, 66, 195-211.*

[3] *D Dubey, R., Gunasekaran, A., Papadopoulos, T., Childe, S. J., Shibin, K. T., & Wamba, S. F. (2017). Sustainable supply chain management: framework and further research directions. Journal of cleaner production, 142, 1119-1130.*

[4] *Koberg, E., & Longoni, A. (2019). A systematic review of sustainable supply chain management in global supply chains. Journal of cleaner production, 207, 1084-1098.*

[5] *Granić, A., & Marangunić, N. (2019). Technology acceptance model in educational context: A systematic literature review. British Journal of Educational Technology, 50(5), 2572-2593.*

[6] *Collins, C. J. (2021). Expanding the resource based view model of strategic human resource management. The International Journal of Human Resource Management, 32(2), 331-358.*

[7] *Chopdar, P. K., Korfiatis, N., Sivakumar, V. J., & Lytras, M. D. (2018). Mobile shopping apps adoption and perceived risks: A cross-country perspective utilizing the Unified Theory of Acceptance and Use of Technology. Computers in Human Behavior, 86, 109-128.*

[8] *Gerhart, B., & Feng, J. (2021). The resource-based view of the firm, human resources, and human capital: Progress and prospects. Journal of Management, 47(7), 1796-1819.*

[9] *Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. Information Systems Frontiers, 21, 719-734.*