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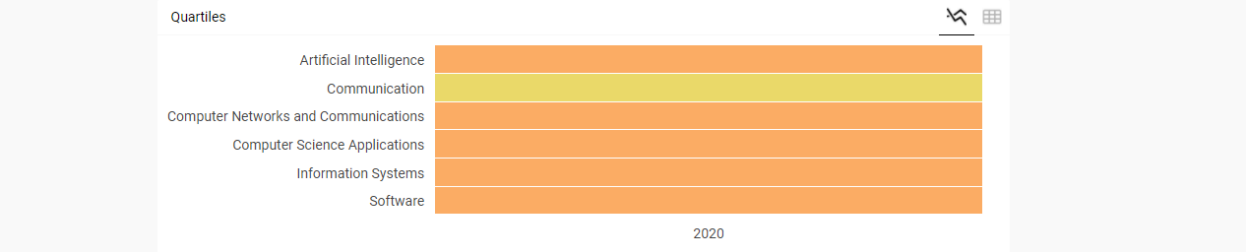

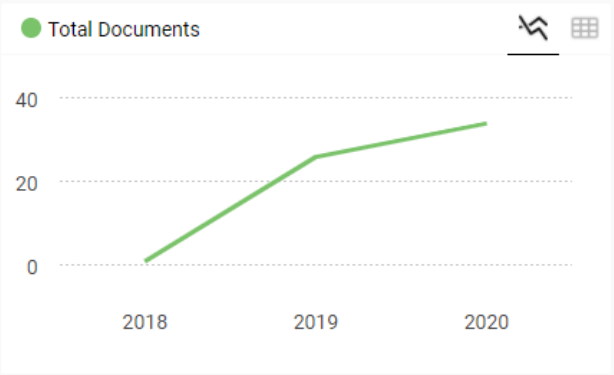

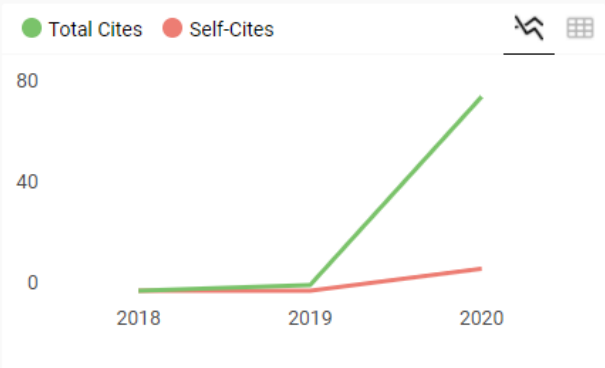

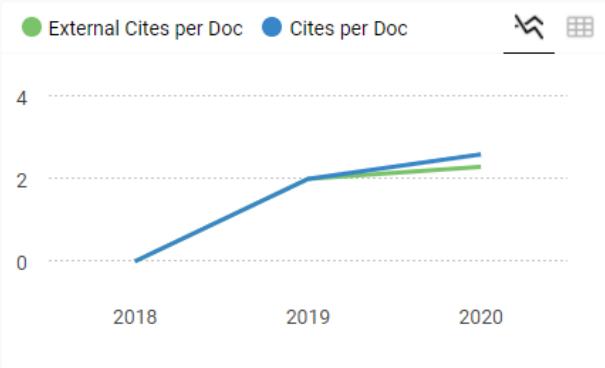

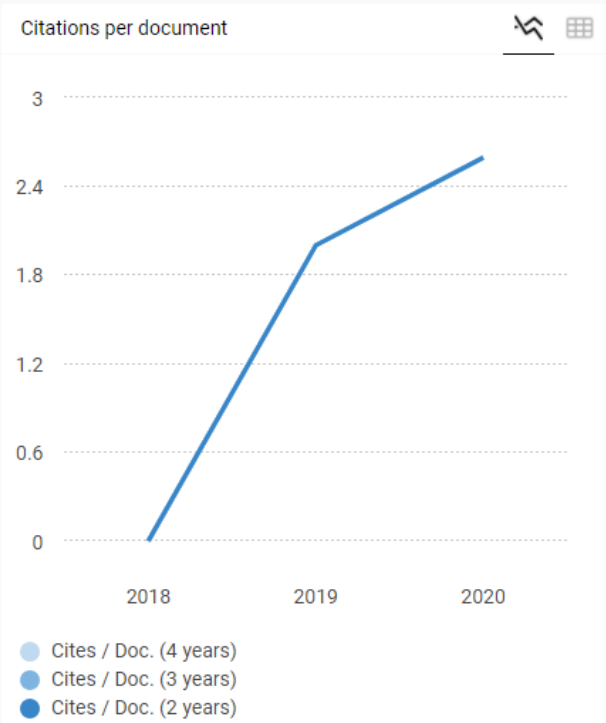

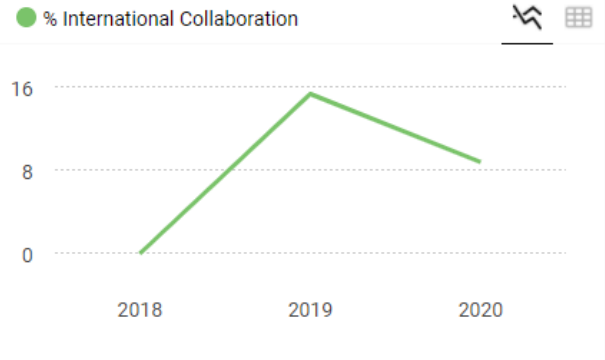

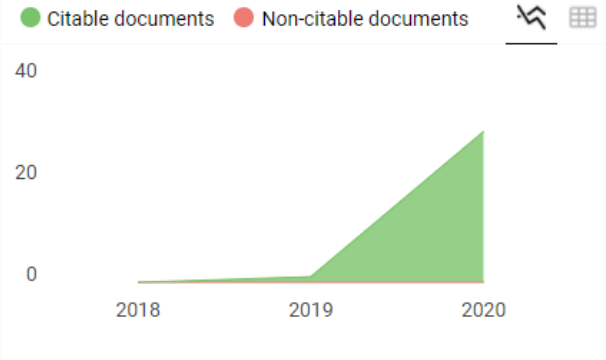

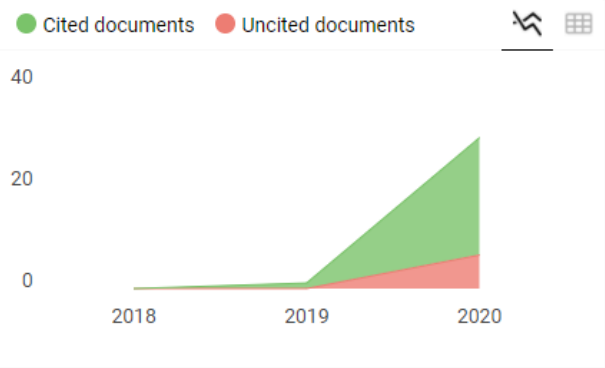

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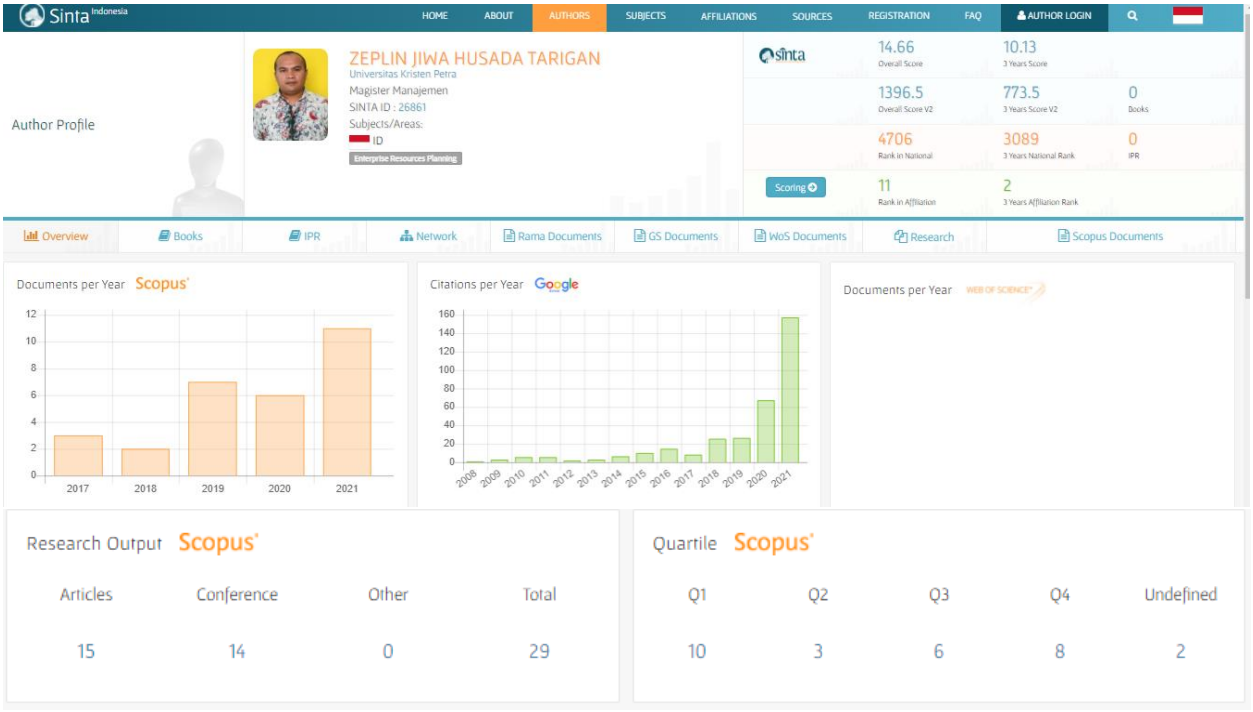
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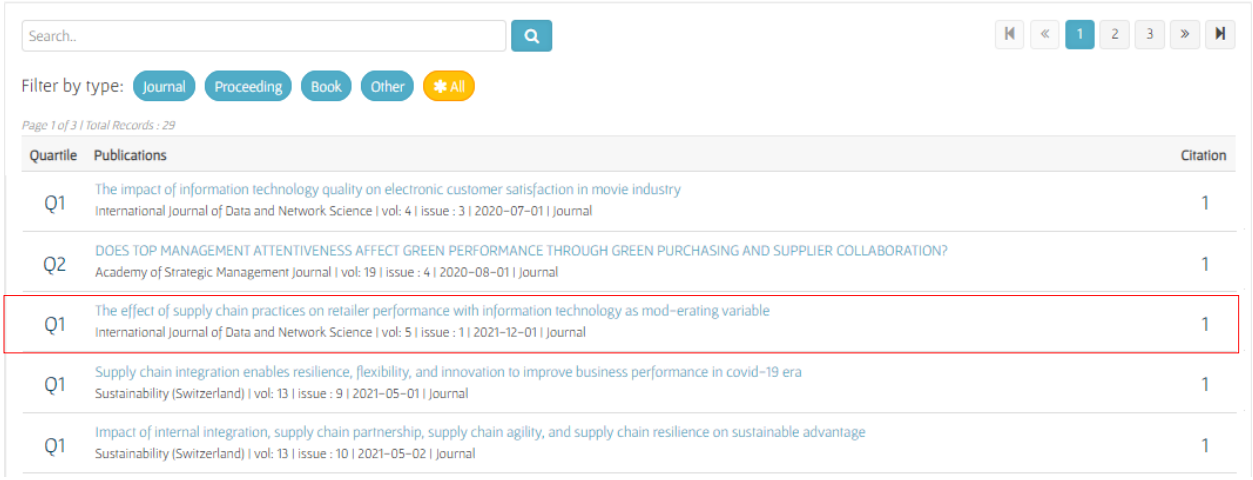
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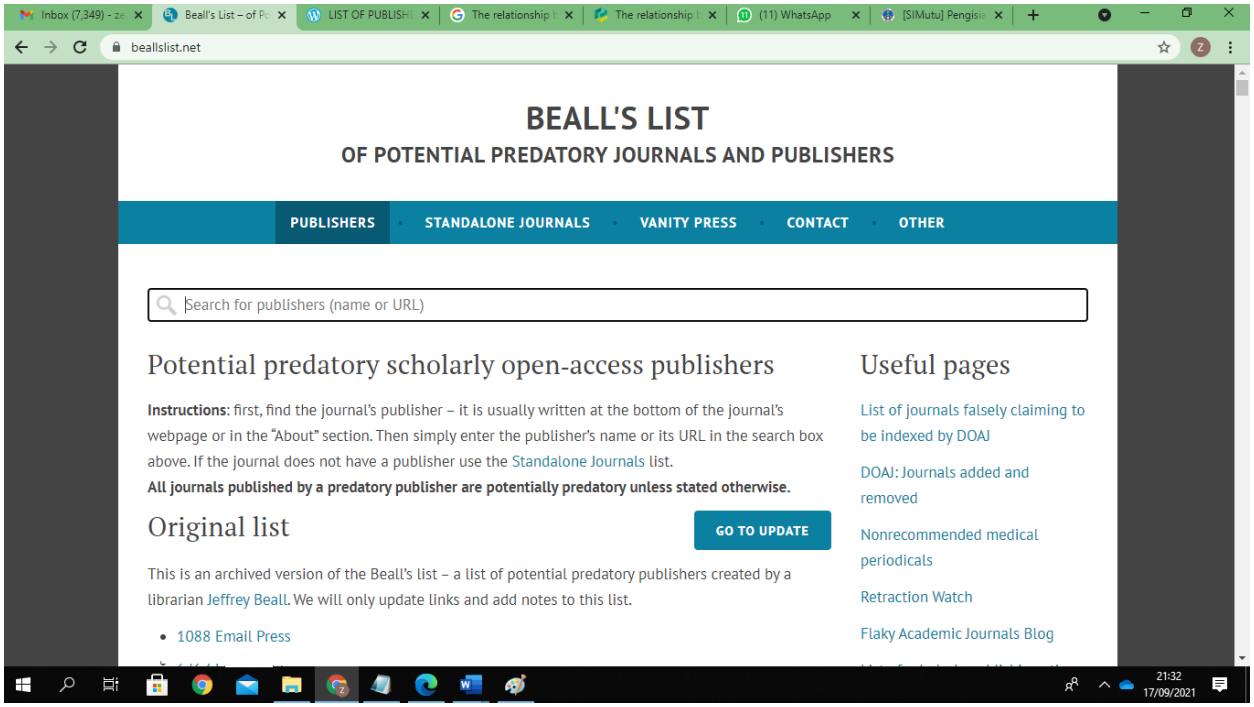

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- Apex Journal
- Applied Science Innovations (**note:** their journal "Carbon: Science and Technology" is indexed by DOAJ)
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We hope that tenure and promotion committees can also decide for themselves how importantly or not to rate articles published in these journals in the context of their own institutional standards and/or geocultural locus. We emphasize that journal publishers and journals change in their business and editorial practices over time. This list is kept up-to-date to the best extent possible but may not reflect sudden, unreported, or unknown enhancements.

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- Global Business Research Journals
- Global Institute for Research and Education
- Global International Scientific Analytical Project (GISAP), see International Academy of Science and Higher Education
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Volume 5 No. 1 Pages: 1-74 (Winter 2021)

Open Access Article

1. **Energy efficient target set selection and buffer management for D2D mobile data offloading** *Pages: 1-10*

Prince Sharma PDF (650K)

Abstract: Data offloading offers a significant solution to the problem of explosive rise in mobile data traffic. A naive approach would be to utilize the infrastructure (cellular tower, WiFi, femtocell) or other mobile devices to offload data. However, increasing the number of a cellular towers, WiFi, or femtocells is costlier deal for data delivery. Recently, device-to-device (D2D) paradigm of data communication has emerged out as one of the most promising solutions to deal with cost effective cellular traffic offloading. D2D communication provides a direct communication link between closely located mobile users. Another significant feature of D2D is its content centric nature, which makes it useful in data offloading. In this paper, we have addressed the issue of data offloading in mobile devices and proposed a hybrid model of D2D communication with ad-hoc nature. The paper also considers the issues like memory constraints of the devices, pruning of replicated messages and energy efficiency to increase the lifetime of the battery. Considering all the constraints and trade off, we have modeled our problem into optimal target selection problem and distributed community detection problem, both of which are NP-hard. We propose a clustering algorithm to optimize the cooperative mobile nodes. The proposed algorithm uses the betweenness centrality and k-means for optimizing target set section. Our proposed algorithm requires less time in terms of computational complexity with limited space. We compare it with the community-based approach in terms of load transferred for varying target set sizes for validation. The simulation results of the suggested algorithm may reduce the energy requirements up to 16.7% and is able to accommodate 80% more traffic as compared to the community-based algorithm.

DOI: 10.5267/j.ijdns.2020.12.002
Keywords: Target set selection, Data offloading, D2D, Summary vector, Betweenness

2. **Human resources practices and job satisfaction on customer satisfaction: The mediating role of quality of customer interaction in online call center** *Pages: 11-18*

Bilal Eneizan, Mohammad Taamneh, Odai Enaizan, Mohammad Fathi Almaaitah, Abdul Hafaz Ngah and Asaad Alsakarneh PDF (650K)

Abstract: The frequently discussed topic of job satisfaction is not new in the field of organizational behavior research. Job satisfaction is related to customer satisfaction; however, there is a scarcity of empirical evidence regarding this link. The current piece of research examines the said relationship in the context of the online call center. In addition, this study investigates the effect of human resources (HR) practices on job satisfaction within the online call center context. The sample of the study consists of 275 employees who were working as an online call center. SMARTPLS 3 was used to analyze the data. The findings of the study indicated a positive relationship between HR practices with job satisfaction. Furthermore, a positive impact of job satisfaction on customer satisfaction is observed. The mediation of customer interaction quality is also found to be significant in the relationship between job satisfaction and customer satisfaction.

DOI: 10.5267/j.ijdns.2020.12.001
Keywords: HR practices, Job satisfaction, Customer satisfaction, Quality of customer interaction, Online call center

3. **Factors affecting e-procurement division employee performance** *Pages: 19-24*

Luis Marnisah, Fakhry Zamzam, Susi Handayani, Tien Yustini, Hendry Wijaya, Hakima Maris and David Irwanto PDF (650K)

Abstract: In facing business competition in the cement industry, PT Semen Baturaja (Persero) Tbk is making creative and innovative breakthroughs. Poor procurement planning, competence in the procurement of goods and services, hard skills and soft skills, ineffective coordination between divisions, low culture and work discipline, as well as ineffective education and training are the main causes of the ineffective implementation of the e-Procurement system in the company. Employee performance in the e-procurement division is a concern in this study. This study aims to determine the influence of competence, education, training, and employee placement partially and simultaneously on employee performance at PT. Semen Baturaja (Persero) Tbk. This study uses a quantitative approach with a confirmative survey method that is descriptive and uses verification. The population and sample of this study is all employees in e-procurement division, as it uses a census sampling technique, amounting to 105 respondents. The data is gathered using questionnaire, documentation, and observation method. Furthermore, the data is then processed using SPSS 24 application. The results of this study show that employee competence, education, training, and employee placement had positive effects on employee performance. The strategy to improve employee performance will be effective by first providing technical training to improve competence in the e-Procurement division, then rearranging the placement by paying more attention to the suitability of individual competencies, expertise, and abilities in carrying out the e-Procurement Standard Operating Procedure.

DOI: 10.5267/j.ijdns.2020.11.007
Keywords: Employee Competence, Employee Education, Employee Training, Employee Placement, Employee Performance

4. **The effect of digital technology development on economic growth** *Pages: 25-36*

Inna Irtyshcheva, Marianna Stehnei, Nazariy Popadynets, Konstantin Bogatyrev, Yevheniia Boiko, Iryna Kramarenko, Oleksandr Senkevich, Nataliya Hryshyna, Ivanna Kozak and Olena Ishchenko PDF (650K)

Abstract: The article simulates the impact of the digital technologies' development on economic growth, which makes it possible to find ways to improve the quality of various spheres of life and identify areas of the economy, the accelerated digitalization of which will ensure an increase in gross domestic product (GDP). The research used groupings of economic activities that directly influence the development of the digital economy. Using the data of regression models, the coefficients of GDP elasticity from the development of the studied sectors were calculated and used to forecast GDP under the development influence of the studied sectors while maintaining the existing trends. The dynamics of the e-commerce market development in Ukraine, the dynamics of production volumes of products (services) of the main types of economic activities in the field of digital transformation of the economy in Ukraine, the dynamics of financial results of enterprises in the information and telecommunications sector in Ukraine, the dynamics of capital investments in the field of information and communications of Ukraine, the dynamics of foreign investment in the development of the type of economic activity "information and telecommunications" in Ukraine, the dynamics of the development of the main areas of digitalization of the Ukrainian economy in 2010-2018 and the dynamics of GDP in actual prices were revealed. A correlation and regression analysis of the impact of the main indicators of the digital technologies sectors development on Ukraine's GDP is also carried out. The forecast extrapolation trend of production growth volumes of products and services in the information sector of Ukraine was built. A forecast of GDP growth in Ukraine has been constructed, taking into account the processes of digitalization of the economy in accordance with certain trends. The forecast dynamics of changes in GDP under the influence of the IT sector development until 2023 was also illustrated. It was found that Ukraine lags significantly behind most developed countries in terms of the level of industrial production development of information and communication technologies and equipment, Ukraine is completely import-dependent in this area. It has been proved that stimulating the development of information and communication technologies has significant prospects for activating digitalization processes in all spheres of the economy and society and increasing GDP.

DOI: 10.5267/j.ijdns.2020.11.006
Keywords: Digital Technologies, Digitalization, Economic Growth, Modelling, Trends

5. **The effect of PESTLE factors on development of e-commerce** *Pages: 37-42*

Sy Thanh Phan PDF (650K)

Abstract: Over the past time, the dramatic growth of e-commerce has made Vietnam as one of the most potential markets in ASEAN. Vietnamese businesses as well as consumers are facing great opportunities from the industrial revolution 4.0. However, in addition to those significant developments, e-commerce in Vietnam also faces many challenges and barriers. Therefore, this research gives an overview of the current situation of e-commerce development and recommendations based on the findings of significant effect generating from PESTLE issues to further development of the online trading platforms in Vietnam.

DOI: 10.5267/j.ijdns.2020.11.005
Keywords: PESTLE factors, Development, E-commerce, Viet Nam

6. **The effect of e-learning in developing high thinking skills** *Pages: 43-46*

Ni'mat Rababa PDF (650K)

Abstract: This research aims to investigate the impact of adopting e-learning in an attempt to enhance higher thinking skills among students at the University of Jordan. In addition, we examine the relationship between e-learning and higher thinking skills and identify the effect of e-learning on higher thinking skills at the University of Jordan. The study examines the effect of using e-learning effectiveness and its effect on developing higher students' thinking skills at the university level. The study also focuses on intellectual education for high-level thinking and the impact of the e-learning environment on a group of students at the University of Jordan. The target community for this study is undergraduate students at the University of Jordan, in Amman, Jordan. The resulted sample consists of 45 students. During the experiment, two research tools were used to analyze the relationship between the independent and dependent variables. The quantitative data are collected from the students' perception analyzed using some statistical tests. The results of the research indicate that students could be helped to enhance higher-order thinking skills and maybe enriched by integrating an e-learning model into teaching and learning. There is also a positive relationship between e-learning and higher thinking skills at the University of Jordan. The experimental results of this study indicate several results, as the adoption of the e-learning model led to a significant improvement in the higher thinking skills of students. The e-learning model can remove many social and cultural barriers.

DOI: 10.5267/j.ijdns.2020.11.004
Keywords: E-learning, High thinking skills, Educational Objectives

7. **The effect of supply chain practices on retailer performance with information technology as moderating variable** *Pages: 47-54*

Zeplin Jiwa Husada Tarigan, Juan Alexander Jiputra and Hotlan Siagian PDF (650K)

Abstract: Today, the retail industry has been overgrowing in offering various products to its customers. The retailer needs excellent support from the supplier to replenish the requirement based on the demand. This support can be achieved by using a secure and fast information system. Retailers, suppliers, and customers should be integrated using information technology and also practicing supply chain management for the benefit of all parties. This study examined the influence of supply chain practices on retailer performance and moderated by information technology. The study has surveyed eighty-six (86) retailer, using a questionnaire, domiciled in the city of Surabaya, Indonesia. Data analysis used SPSS software version 25 to examine the hypothesis. The results showed that supply chain practices had a direct impact on retailer performance; secondly, information technology moderated the effect of supply chain management practices on retailer performance with an increase of 14.70%. Finally, information technology had an impact on increasing retailer performance. This research has an impact on modern retailers to keep adjusting their business with the use of information technology. This finding also contributes to the current research in supply chain management.

DOI: 10.5267/j.ijdns.2020.11.003
Keywords: Supply chain practices, Information technology, Retailer performance

8. **The effect of business regulation on social progress** *Pages: 55-62*

Kenza Ghazaouni and Okechukwu Lawrence Emeagwali PDF (650K)

Abstract: This study sought to determine the effect of business regulation on social progress. The dependent variable, social progress, was measured in terms of social progress index of the sampled countries. On the other hand, the independent variable, business regulation, was measured in terms of business regulation score. Consequently, the study used secondary data from a sample of 248 countries over a period of five years (2014-2018). In order to determine the appropriate model for analysis, the study conducted the Hausman test where it was established that the random effect model was more appropriate as compared to the fixed effect model. Using the Stata computer program to run multiple regression analysis of the random effect model, the study findings indicated that business regulation has a positive and significant effect on social progress as given across all the six models that were estimated in this study. However, the overall effect of regulation, as given by the estimated regression coefficients under the respective models, kept varying with the introduction of an additional control variable. These findings were in accordance with the study expectations that business regulation significantly affects social progress. Further, the findings implied that, governments should devote additional resources towards addressing the social indicators of progress to meaningfully improve the living standards of residents, instead of solely focusing on economic and environmental factors. On the other hand, considering that the current study did not categorize countries according to their levels of development, it recommends for further research to determine the effect of business regulation on social progress in low-income, middle-income, and high-income countries to allow for comparison of findings from countries that are at different levels of development.

DOI: 10.5267/j.ijdns.2020.11.002
Keywords: Business regulation, Social progress, Ease of doing business, Social progress index (SPI), Foundations of wellbeing, Personal freedom and choice, Inclusiveness

9. **Investigating the impact of electronic health record on healthcare professionals** *Pages: 63-74*

Amira Mohammed, Ahmed Mehrez and Lamia Aladel PDF (650K)

Abstract: Although there is a significant influence of implementing the electronic health records (EHR) system in Qatar, there are very limited studies reviewed and analyzed the influence of implementing the EHR system on healthcare professionals in Qatar. This research aims to assess, summarize, and analyze the influence of the EHR system in healthcare settings in Qatar. The outcome of assessing the implementation of the EHR system may have advantages and disadvantages, which can impact healthcare professionals in healthcare settings in Qatar. The main objective is to evaluate EHR on healthcare professionals in healthcare. A total number of 210 participants were selected randomly from three private hospitals in Qatar. A validated survey distributed to physicians, pharmacists, nurses, and dietitians who work in these healthcare hospitals in Qatar. The purpose is to identify whether the outcome of using the EHR system improved healthcare professionals' work after it has shifted from using files and hand-writing paperwork to the EHR system. By applying online survey, results indicate that most healthcare professionals positively perceive the use of the EHR system as a valuable system.

DOI: 10.5267/j.ijdns.2020.11.001
Keywords: Electronic health record (EHR), Healthcare professionals, Private hospitals, Qatar

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The effect of supply chain practices on retailer performance with information technology as moderating variable

Zeplin Jiwa Husada Tarigan[a*], Juan Alexander Jiputra[a] and Hotlan Siagian[a]

[a]*Faculty of Business and Economics, Petra Christian University, Jl. Siwalankerto 121–131, Surabaya 60236, Indonesia*

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A B S T R A C T

Today, the retail industry has been overgrowing in offering various products to its customers. The retailer needs excellent support from the supplier to replenish the requirement based on the demand. This support can be achieved by using a secure and fast information system. Retailers, suppliers, and customers should be integrated using information technology and also practicing supply chain management for the benefit of all parties. This study examined the influence of supply chain practices on retailer performance and moderated by information technology. The study has surveyed eighty-six (86) retailer, using a questionnaire, domiciled in the city of Surabaya, Indonesia. Data analysis used SPSS software version 25 to examine the hypothesis. The results showed that supply chain practices had a direct impact on retailer performance; secondly, information technology moderated the effect of supply chain management practices on retailer performance with an increase of 14.70%. Finally, information technology had an impact on increasing retailer performance. This research has an impact on modern retailers to keep adjusting their business with the use of information technology. This finding also contributes to the current research in supply chain management.

1. Introduction

In recent years, the retailer industry, both traditional and modern retailers, in Indonesia has indicated a high growth. During the first quarter of 2019, the growth has reached up to 10%, and it is convincing that the growth will continue in the coming months. The retailer sector still has enormous potential demand in Indonesians. East Java Province is in the top 3 ranks with the number of modern retailers in Indonesia. This position indicates that modern retailers have enormous potential and can accommodate the presence of small shops such as grocery stores and warungs (a traditional Indonesian retailer). This phenomenon is interesting to research since East Java has many big cities that have a very high purchasing power of people. The dynamic changes in business models have also made it easy for many competitors to enter this retailer business by a different business model. Indomaret retailer had the highest growth rate of 14.2 thousand outlets from January 2017 to March 2017 and was followed by Alfamart, who was in second place with 12.7 thousand outlets. Meanwhile, a modern retailer such as Hypermart, Giant, and Ramayana compete for each other in a similar market segment. There are 115 Hypermart outlets, 112 Giant outlets, and 97 Ramayana outlets, which are experiencing a downward trend due to the presence of Indomaret, Alfamart, and Alfamidi retailers which have strategic locations and are present in many locations which makes it easier for consumers to find the goods they need quickly and efficiently (Herlinda, 2019). East Java province shows a retailer industry growth rate of 3.8% and can contribute around 14.9% to public demand. However, the industry of modern retailers in Indonesia, especially in Surabaya, is considered to experience potential loss of sales up to IDR. 1.9 trillion. This loss is due to the current unfavorable

* Corresponding author. Tel.: +62312983145
E-mail address: zeplin@petra.ac.id (Z. J. H. Tarigan)

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environmental conditions, the pandemic which has caused restrictions on visitors to enter, and social restrictions imposed in the city of Surabaya (Wijayanto, 2019). This condition, of course, will become a challenge for retailers on how to survive and to minimize the losses. Besides, intense competition has forced retailers to be more creative in providing attractive promotions. The locations used by these retailers have also been adjusted based on market demand. Also, the presence of modern retailers provides distinctive advantages for consumers because consumers favor shopping at retailers that are closer to their homes even though the price is higher than wholesalers. Even so, this business competition can be said to be quite tight and often leads to unfair competition. Retailers in society can determine changes in existing consumption, especially the number of retailers that have adopted information technology (Lehner, 2015). One retailer company will always compete in achieving performance and competitiveness, generally measured by-product prices, product quality, services provided to customers, and strategic retailer locations for customers (Petljak et al., 2017). The question raised is how to survive and improve the retailer performance amid the current pandemic. Researches have argued that the retailer should be creative and innovative to find the best solution to overcome the on-going situation.

Information technology in an organization aims to help improve the performance of its employees, information technology is also often contained in the company's mission and vision, business objectives, operating procedures, in increasing the company's competitiveness (Tarigan et al., 2019). The implementation of the information technology application helps support the activities of supply chain management and becomes important in the context of increasing economic competition both locally and globally (Li et al., 2009, Mavengere, 2013). Information technology enables retailers and suppliers to collaborate in supply chain management, such as sharing data and information to identify changes in the market and assisting in taking appropriate actions such as moving facilities, changing suppliers, and outsourcing (Ketchen & Hult, 2007). The influence of information technology on the relationship between buyers and suppliers (Kim, 2008). The information technology investment in supply chain management has varied the results and have dynamic interactions between the three feedback loops that represent information technology (Chae et al., 2018). IT success depends on relationships between vendor and client (Okundaye et al., 2019). An outsourcing relationship is a long-term relationship between the vendor and the client (Chakrabarty and Whitten, 2011). The relationship has a long-term orientation and mutual recognition and understanding that the benefits obtained by each company depending on the other company. Supply chain management is also one of the tools used by organizations to improve their business performance as well as to maintain their competitive advantage because the competition is between supply chains and not between individual organizations. (Attia, 2016).

Vu et al. (2020) stated that supply chain activity as a form of supply chain practices for retailer business found that collaboration, information technology, inventory, manufacturing, location, and transportation determine the direction of the supply chain strategy. Supply chain activities that are carried out in practice can result in increased competitiveness; especially in-retailer performance compared to its competitors. Supply chain practice can provide an increase in supply chain performance efficiency at food retailer companies in Australia (Jie & Gengatharen, 2019). Supply chain practices related to company suppliers in strategic supplier partnerships, information sharing with suppliers, information quality with suppliers, and integration intensity with suppliers can increase the retailer performance (Hamister, 2012). Supply chain management practices in manufacturing companies can have an impact on firm performance manufacture (Al-Shboul et al., 2018, Tarigan et al., 2020). Supply chain practices related to downstream customer focus and upper stream supplier focus are determined mainly by the use of information technology so that there is supply chain integration in the company's supply chain flow (Tarigan et al., 2020). Research conducted by Gandhi et al. (2017) states that supply chain practices determined from the dimensions of customer relationship management, supplier relationship management, goal congruence, and information sharing provide improvements in company performance and supply chain performance. Firm performance can be improved by adopting supply chain practices in companies (Sundram et al., 2011). SCM practice can have an impact on firm performance and competitive advantage (Ince et al., 2013, Truong et al., 2017).

The manufacturing companies used information technology to integrate the external and internal parties (Baheshti et al., 2014). The information technology is adopted to provide increased performance for companies engaged in retailer business. Based on the above discussion, this research has set research objectives. Firstly, supply chain management practices can have an impact on company performance. Secondly, the implementation of information technology can increase company performance and, thirdly, that the implementation of information technology can moderate the influence of supply chain management practices on the increase in firm performance.

2. Supply chain management

Supply chain management is an activity to plan and regulate all activities related to the procurement of raw materials, changing forms, and all logistics management activities (Tarigan et al., 2019). SCM also includes coordination and collaboration with related partners, which can be suppliers, intermediaries, third parties as service providers, and customers, or consumers. SCM integrates supply and demand arrangements within or between companies (Siagian et al., 2020). Every relationship in a supply chain signifies a relationship between a particular customer and a particular supplier; this association aims to provide direct customer delivery requirements and then replicate practices throughout the supply chain for the benefit of the end consumer (Gorane & Kant, 2016).

SCM has the aim of regulating production needs starting from raw materials and various other components to be converted into semi-finished goods or finished goods, then stored as inventory and ready to be distributed to consumers. The supply chain starts from the point of production to the point of consumption, on the other hand. The supply chain consists of several different companies and organizations that work together to produce value in the form of goods or services (Vural, 2015, Ketchen & Hult, 2007). SCM works to bring suppliers, distributors, and consumers into a cohesive process (Gandhi et al., 2017). Manufacturers, suppliers, transporters, warehousing, retailers, and consumers are involved in a constant but always dynamic flow of information, products, and money (Sundram et al., 2018). SCM has also become a supply network or supply web because it can show how a unit in a supply chain interacts with one another. Suppliers and distributors who were once opposites are now partners for the good of both parties. SCM manages all processes in a complex chain and always improves product quality and customer satisfaction effectively; this is called SCM (Truong et al., 2017).

2.1. Supply Chain Practices

Supply chain practices is a practical activity carried out by companies in the supply chain flow in order to improve company performance and competitiveness of companies along with the supply chain flow (Tarigan et al., 2019). Supply chain practices that can improve supply chain performance with practical activities include building strategic alliances, building customer relationship management, conducting an information sharing with company partners, quality of information sharing internal and external companies, and implementing lean thinking (Jie and Gengatharen). Supply chain practices determine retailer performance by carrying out supply chain practice activities, including strategic supplier partnerships, information sharing, information quality, and integration intensity (Gorane and Kant, 2016, Hamister 2012). Supply chain management practices consist of two streams, namely downstream, which focuses on customers and upstream, which focuses on suppliers (Tarigan et al., 2020). Supply chain practices proposed by Al Al-Shboul et al. (2018) are collaborations built with suppliers, the flexibility built into suppliers, the use of internet technology, customer focus, lean production on manufacture, integrated internal integration, and quality management. Customer relationship management, supplier relationship management, goal congruence, and information sharing are dimensions of supply chain management practice (Gandhi et al., 2017). Supply chain practices consist of eight dimensions, namely strong strategic supplier partnerships, excellent customer relationships, information sharing with company partners, information quality, postponement, agreed and vision, and risk and reward sharing (Sundram et al., 2011). Supply chain practices also consist of upstream, focal company, and downstream. Supply chain practice has four dimensions in a company, namely lean practice (waste elimination, total quality management, just in time and cleaner production), resilient practice (flexible sourcing, supply chain risk management, and flexible transportation) and green practice, including ISO 14001 certification. Research conducted by Ince et al. (2013) states that strategic partnerships measure supply chain practice with suppliers, customer relationships, and levels of information quality and sharing. Supply chain practices that focus on the environment are called green supply chain management practices, which consist of supplier selection and evaluation, supplier manages inventory, investment recovery, eco-design and packaging, reverse logistics and corporation with customers (Sundram et al., 2018).

2.2. Information Technology

Companies use technology in order to be able to integrate company activities in practice can be known quickly in information technology systems (Lehner, 2015). The activities along the supply chain can be identified by the company in detail when starting from receiving orders, planning production, entering and leaving of materials and supporting materials from the warehouse, material procurement, company inventory positions and product delivery using information technology implemented by the company (Okundaye et al., 2019). The information technology used by the company can sustainably accelerate supply chain practice and is useful in improving company performance (Mavengere, 2013, Chae et al., 2018)). SCM practice in companies driven by an ERP system can have a significant impact on firm performance and competitive advantage (Ince et al., 2013). The ERP system used is measured by systems and information quality, system use, individual impact, and organizational impact (Tarigan et al., 2020). The effectiveness of supply chain practices can have an impact on the company's success in improving company performance, which is accelerated by the existence of system integration in the company (Siagian et al., 2020). An organization must be able to plan and integrates all functions within the company and also integrate effectively with external parties as to the company's business partners (Baheshti et al., 2014; Govindan et al., 2014). Supply chain practices have an impact on manufacturing firm performance by using information technology in the form of supply chain integration as an intervening variable. The use of information technology enables companies to integrate within the company, integration with suppliers, and integration with customers (Sundram et al., 2018).

2.3. Retailer Performance

Retailer performance is the achievement of targets or goals in a certain period. Retailer performance can determine the increase in retailer competitiveness compared to other retailers. Retailer performance used the indicators suggested by Ltifi and Gharbi (2015), namely the availability of inventory, there is no stock out, product information, ease of shopping or purchases, and ease of returning goods to retailers. The retailer performance measures the competitiveness, which is traditionally determined by the price of the product, the quality of the product produced, the services provided, and the strategic location owned by the retailer (Petljak et al., 2017). Manufacturing companies should provide service to the retailer to improve retailer performance. The services provided consists of the following terms: efficient order process, mismatched orders rectification, promised lead

time, particular order lead time, consistency of deliveries as promised, speed of delivery before the due date, consistency with the quantity promised, order accuracy, and the company's ability to deliver undamaged products (Davis-Sramek et al., 2008). Measurement items used to assess supply chain performance at a retailer in Australia are low inventory costs, high labor costs, low transportation costs, minimal waste costs, and increased profits (Jie and Gengatharen, 2019). Hamister (2012) suggested the measurement items of retailer performance, namely volume flexibility, schedule flexibility, on-time delivery, and delivery reliability/consistency. Meanwhile, Gandhi et al., (2017) suggested eight indicators to measure supply chain performance at manufacturing companies: forecasting and planning material requirements with high accuracy; the company has a timely delivery of products; reliable supplier with proper delivery, reliability, and consistency; the company can control costs and supply chain knowledge; companies have a fast response time, and the company has the right level of inventory.

3. Research methods

This study focused on the population of retailers that have used information technology in providing service to customers and has been well-coordinated through information technology in ordering goods to manufacturing companies as suppliers. A modern retailer is a retailer whose system has been integrated with its partners in performing the procurement of goods and inventory at the retailer storage. One of the objectives of this study is to obtain a moderation effect of information technology on retailer performance from the implementation of supply chain practices (Fig. 1). The data used were as many as 86 modern retailers.

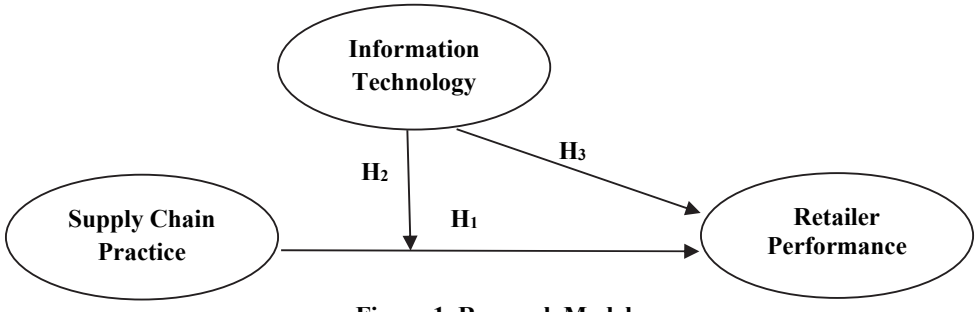

Figure 1. Research Model

Fig. 1 demonstrates the research model, and the three hypotheses developed as follows:

H_1: Supply chain practice affects retailer performance.
H_2: Information technology moderates the relationship between supply chain practice and retailer performance.
H_3: Information technology improves retailer performance.

The measurement used for supply chain management practices is strategic supplier partnership (SCP1), information communicated (SCP2), sharing of quality of information (SCP3), and demand management interaction (SCP4). For information technology, six indicators are used to assess the extent to which the retailer and supplier have implemented information technology, which is reliability (TI1), objectivity (TI2), timeliness (TI3), value-added (TI4), richness (TI5), and provided in a proper format (TI6). The measurements used for retailer performance are ordering procedure (RP1), order discrepancy handling (RP2), order lead time variation (RP3), timeliness (RP4), product availability (RP5), order condition (RP6). Data analysis used SPSS version 25 with multiple linear analyses to examine the three research hypotheses (Sekaran & Bougie, 2016). The acceptance of the hypothesis is based on the t-statistic value obtained from the multi regression technique.

4. Analysis and discussion

The object in this research is the *modern retailer,* which engaged in the sale of *Fast-Moving Consumer Goods* (FMCG) products in the city of Surabaya. Researchers distributed as many as 86 questionnaires, in the form of *hardcopy, to the retailer* that met the criteria for the research sample, namely *modern retailers* engaged in FMCG. Characteristics of respondents in terms of gender consists of the male 56 respondents (65.11%), and female respondents are 30 respondents (34.89%). Majority of the respondent is male because the retailer views that men are more capable of maintaining shops than women. Males are more suitable in the point of view of security if something happens, such as robbery. Most *of modern retailers* are open 24 hours so that men are seen as more secure and able to take care of themselves. However, females are considered to be more careful in checking the retailer inventory.

Based on the working experience, the *modern retailer* in the city of Surabaya, the retailer manager has worked for 4 to 6 years amounted to 37 (43.02%), 7 to 9 years amounted to 23 (26.74%), 1 to 3 years 15 respondents (17.44%), and less than one year seven respondents (8.13%), more than ten years amounted to 4 (4.67%). This finding shows that the majority has worked for 4 to 6 years. The result indicated that the owner needs more time to see and assess the performance of each employee before they deserve to be the head of the *retailer*.

The detailed analysis result related to the score of respondents' responses to the items is illustrated in Table 1.

Table 1
Descriptive analysis result

Items	Statement	Std. Deviation	Average	Items	Statement	Std. Deviation	Average
SCP1	Strategic supplier partnership	0.595	4.37	RP1	Ordering procedure	0.586	4.44
SCP2	Level of information sharing	0.564	4.43	RP2	handling of order discrepancies	0.636	4.38
SCP3	Quality information sharing	0.561	4.41	RP3	Order lead time variation	0.528	4.29
SCP4	Customer relationship management	0.600	4.40	RP4	Timelines	0.526	4.49
TI1	Reliability	0.500	4.66	RP5	Product availability	0.588	4.47
TI2	Objectivity	0.548	4.49	RP6	Order condition	0.608	4.47
TI3	Value Added	0.547	4.52				
TI4	Timeliness	0.612	4.36				
TI5	richness	0.523	4.44				
TI6	format	0.546	4.23				

Table 1 demonstrates that indicators of supply chain management practices have the lowest average of 4.37, the strategic supplier partnerships. This indicator indicated the extent to which the supplier and retailer have established a long-term relationship that focused on joint planning and problem-solving efforts. The indicator of supply chain management practices with the highest score of 4.43 is the level of information sharing (the extent to which information communicated with partners in the supply chain). This result shows that in practice, retailers have a good relationship with their suppliers, in this case, retailers always inform suppliers before changes in needs occur, so that suppliers have time to prepare their needs from the retailer.
Besides, Table 1 also shows that the indicator information technology has the lowest average format value of 4.23 (the information technology used can provide data according to the needs of the company in proper format), and the indicator with the most significant score of 4.66 is reliability, the information technology adopted by the company is highly reliable. This result shows that in practice, suppliers always provide factual and reliable information to the retailers to help increase retailer sales. Furthermore, Table 1 indicated the indicator of retailer performance with the lowest score average of 4.29 that order lead time variation is high. The indicator of retailer performance with the biggest score of 4.49 is that the supplier ship products correctly. This finding shows that in practice, the supplier always sends the product correctly without error to the retailer, and it will increase the performance of the retailer. Further analysis is the examination of the three hypotheses. The analysis used the linear regression model between supply chain performance and retailer performance, and the results are shown in Table 2, Table 3, and Table 4.

Table 2
R-Square Value of Supply Chain Management Practice

Model	R	R Square	Adjusted R Square	Std. An error of the Estimate
1	.637[a]	.405	.398	.3804

a. Predictors: (Constant), Supply Chain Management Practice

Table 3
F-test results of supply chain management practice

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.284	1	8.284	57.245	.000[b]
	Residual	12.155	84	.145		
	Total	20 439	85			

a. Dependent Variable: Retailer Performance
b. Predictors: (Constant), Supply Chain Management Practice

Based on the results of Table 2, the variances of retailer performance can be explained by the Supply Chain Management Practice variance up to 40.50%, while the other variances are explained by variables that have not been determined in this study. The F test in Table 3 illustrates that the Supply Chain Management Practice variable affects retailer performance significantly with a significant level <0.05. This finding empirically supports that the model of that the research model can be used the predict the retailer performance.

Table 4
T-test results of supply chain management practice

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.006	.453		2.220	.029
	Supply Chain Management Practice	.767	.101	.637	7.566	.000

a. Dependent Variable: Retailer Performance

Based on Table 4, the supply chain practices had a significant impact on the retailer performance with a coefficient of 0.767 and sig. level of 0.000. This result proved that the first hypothesis could be accepted, the improvement in Supply Chain Management Practice increase in retailer performance.

Table 5
R-square of information technology

Model	R	R Square	Adjusted R Square	Std. of error of the Estimate
1	.740[a]	.547	.530	.3360

a. Predictors: (Constant), Moderator, Supply Chain Management Practice, Information Technology

Table 5 shows that the role of information technology as a moderating variable exists. The variance of retailer performance explained by the Supply Chain Management Practice on retailer performance is greater than that of without the presence of the moderating variable. The R-square value is 0.547 > 0.405 (without moderating variable). This finding shows that the moderating effect of information technology exists between supply chain management practices and retailer performance. In Table 2, the R-square between Supply Chain practices and retailer performance is 40.50%. There is an increase in R-square by 14.70% so that information technology can moderate the effect of supply chain practice on retailer performance. This finding supports the second hypothesis that information technology moderates the relationship between supply chain management practices and retailer performance.

Table 6
F test results of information technology

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.181	3	3.727	33.010	.000[b]
	Residual	9.258	82	.113		
	Total	20.439	85			

a. Dependent Variable: Retailer Performance
b. Predictors: (Constant), Moderator, Supply Chain Management Practice, Information Technology

Table 6 illustrated the result of the F test for linear regression between information technology, supply chain management practices, and retailer performance as the F value is 33.010 and the significant level is 0.000 < 0.05. It means that the model involving all the variables is acceptable. Table 6 also illustrates that supply chain management practices, information technology, and the role of information technology as a moderator can simultaneously impact retailer performance.

Table 7
T-test results for information technology as moderating variable

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.276	4.076		1.049	.297
	Supply Chain Management Practice	.416	.939	.345	2.443	.039
	Information Technology	.502	.925	.488	2.543	.028
	Moderator	.214	.211	.454	2.013	.043

a. Dependent Variable: Retailer Performance

Besides, Table 7 illustrates that supply chain management practices can influence retailer performance, as indicated by the sig value. 0.039 <0.05, and information technology is also able to significantly influence the increase in retailer performance by 0.028< 0.05, and the moderating effect of information technology with the sig. level of 0.43 < 0.05. These results suggest that the third hypothesis, namely information technology, has an acceptable impact on retailer performance. Information technology can build internal and external company integration, both supplier integration and customer integration so that it can have a strong influence on supply chain management practices on retailer performance.

5. Conclusion

The main objective of this study was to examine the effect of supply chain practices on retailer performance with the moderating role of information technology. The result revealed that supply chain practices enable the retailer to improve the performance by connecting the retailer and the supplier and the customer. Information technology is a very useful tool to enhance the effect of supply chain practices on retailer performance. Beside moderating, information technology also directly improves retailer performance. The adoption of information technology provides a double impact in enhancing retailer performance as a direct and moderating impact. The use of information technology can increase the company's integration with its suppliers and customers. Information technology assists the retailer's achieve excellent effectiveness and efficiency in the pursuit of better retailer performance. This study could provide a new insight for the retailer manager on how to enhance retailer performance through supply chain practices and the adoption of information technology. This research also contributes to enriching the on-going research in the field of supply chain management.

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