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TECHNOLOGY INNOVATION, SUPPLY CHAIN RISK AND DIGITAL MARKETING TOWARDS BUSINESS PERFORMANCE. A CONCEPTUAL STUDY IN LIVESTOCK INDUSTRY IN MALAYSIA

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Abstract:

The livestock industry has become the most dynamic market globally. This is being driven largely by demand due to growth in purchasing power and modern technology. With the constant improvement of the degree of livestock products trade, the market operation and structure of livestock products are also transformed. The survival and development of the livestock industry are dependent on the comprehensive strength of the whole industry chain, therefore, the study of the technology innovation, supply chain risk, and digital marketing towards the business performance of the livestock industry in Malaysia is required. Hence, the ability to conceptualize, observe and give due recognition to the possible relation amongst these variables in question by the livestock industry, perhaps could bring about an insightful engagement for the betterment of the livestock business performance. This paper does not attempt to provide a comprehensive overview of livestock markets and trends in Malaysia or elsewhere in developing countries. On the basis of this, the relationship between technology innovation, supply chain risk, digital marketing, and livestock industry performance is used in this paper, which improves the whole performance of the livestock industry and enhances international competitiveness.

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Keywords:

Technology Innovation, Supply Chain Risk, Digital Marketing, Performance

Introduction

Population growth, globalization, consumer welfare agenda, technology adoption, ICT development, purchasing methods and industrialization have transformed the agricultural industry into an innovative sector (Zainol Abidin, et al., 2018). Under agriculture, the livestock industry is one of the most important industries in Malaysia. This industry supplies the largest source of protein for the Malaysian population as well as to generates income for livestock producers. The livestock industry in Malaysia is powerless compared to neighboring countries such as Indonesia, Thailand, and Vietnam. The livestock industry in Malaysia is unable to improve performance due to lack of technology use, risks in the supply chain and lack of non-commercialized.

The Malaysian Government has created and formulated various policies and strategies to improve the performance of the livestock industry in Malaysia, such as the National AgroFood Policy and the National Agricultural Policy. However, the production of the livestock industry in Malaysia still cannot meet domestic demand. Statistical data also shows that the production of meat in Malaysia supply between 28% and 30% of domestic demand means an increase of between 3-5% per year. Increased demand from domestic customers has become an important issue to meet the demand of buyers. The demand increased due to the growth of population, wedding ceremony, festival, and *Qurban* during Eid al-Adha.

Hence, the livestock industry players and the government created strategies to transform the industry into a competitive in the market. To be successful, industries may have to change their methods of handling, production, packaging, processing, and marketing to satisfy their buyers. According to The International Fund for Agricultural Development, the changes in agricultural production technology and marketing systems provide opportunities for smallholders to increase incomes for breeders and farmers (IFAD, 2006). Industry players should be ready to face all activities in the supply chain.

This paper aims to discuss the current scenario in the livestock industry. Specifically, it discusses several strategies such as technological innovation, supply chain risk, and digital marketing as best factors to improve the performance of the livestock industry. This paper hopes to provide some insights on the livestock industry in Malaysia to at least be able to meet the domestics demand.

Literature Review

Livestock Industry

The Malaysian livestock industry is one of the basic industries in the development of the agricultural industry. The development of this industry can ensure food security in the country and reduce our dependence on imported products. Livestock is an important component of human society, not only as food and clothing but also provides opportunities to work. These job opportunities will be a source of income for the livestock players. In general, livestock is

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divided into two categories, namely ruminants and non-ruminants. Ruminants are cows, sheep, buffaloes, goats, and deer while non-ruminants are chickens, ducks, pigs, and eggs.

Globalization has had an impact and pressure on the global economy as well as livestock activities. The livestock producers in Malaysia had to restructure their businesses and generate a new paradigm in the industry through greater efficiency and technology. For example, based on the Malaysian National Agro-food Policy 2011-2020 (NAP), meat demand and production are expected to increase. Demand is expected to increase for livestock products such as meat, milk and even eggs. The growing demand for livestock products in the market has become an opportunity to encourage livestock producers to focus seriously. However, to what extent are the livestock producers in Malaysia ready to face some challenges in the market. Several issues and challenges in the livestock industry were identified such as: -

1. **Financial -** using a closed house system will contribute to high success in the poultry industry. However, it requires high capital and long-term activities. This will burden small entrepreneurs.

2. **Lack of quality breeds** – Local cattle and goats produce low-quality meat with little productivity. The main cattle breeds in Malaysia are Kedah-Kelantan (KK), Brahman Crosses and European-KK-crossbreeds. KK cattle are the most important native cattle in Malaysia. However, in Malaysia, the average weight is 219 kg to 240 kg for females, and from 300 kg to 312 kg for males compared to Brahman cows from India around (800 kg and 1100 kg).

3. **Higher cost of animal feeds –** The cost of animal feed exceeds 25% of the total cost. The cost of animal feed which contributed to the total cost of production ranged from 22.9% - 31.6% for goats, 5.4% and 19.3% for cattle, and 58.9% - 71.2% for poultry.

4. **Lack of land area -** This will weaken the livestock industry due to the lack of large livestock areas and the farmers also prefer to use the land for more productivity.

Recently, demands to reduce greenhouse gas emissions need to be balanced between production and income. With a focus on the livestock sector, it encourages them to develop technologies farms, which actively adopt modern approaches and operate on a large scale. Many efforts are being made to strengthen vertical and horizontal integration which involves online marketing, agro-bazaars, and networking. Strategic cooperation between the government and private sectors also encourages livestock producers to operate in the large-scale breeding area. The breeding system also was modified to suit using a systematic approach in animal management and breeding systems combined with traceability technology. Based on this statement, the livestock industry should have the ability to operate with a modern approach to improve business performance.

Nowadays, the use of the internet and social media has changed traditional purchasing methods. In line with the circulation of other sectors, retail businesses have been using digital marketing to attract customers. By using the internet to sell agricultural products, it will change marketing channels. Developments in terms of innovation and application of technology can also overcome some of the problems faced by the agricultural sector, such as limited land, low productivity, pest infestation, and labor shortages (Rozhan, 2016). It is supported by Akudugu et al. (2012), where the ability to utilize agricultural production depends on farmer innovation. If farmers wisely use digital channels, it will give them an advantage. Furthermore, An-nisa et

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al. (2015) also suggested that in their research on cattle, it has various risks; one example is productivity risk. Therefore, every cattle farm should maintain activities along the supply chain especially in addressing risks in the supply chain. However, the capacity or number of participating farmers to innovate their production activities depends on the availability of technology. Although technology has been identified as one of the important factors in the development of agriculture, however, the livestock industry in Malaysia lacks changes. In the next discussion, this paper discusses the importance of adopting technological innovation, supply chain risk, and digital marketing to improve the performance of the livestock industry in Malaysia.

Methodology

This study aims to provide conseptual study based on the previous studies related to the relationship between technological innovation, supply chain risk and digital marketing towards business performance. The research methodology that will be used is the questionnaire method. Questionnaires will be distributed to those involved in managing the livestock industry business. The survey will be conducted for 3 months. The results of this questionnaire will be the first source that will be analyzed to obtain the relationship between all factors. These findings will be new decisions for future researchers, businessmen and as one of the materials to produce new policies papers. In addition, the study will provide added value and knowledge to the students who take this field of study.

Discussion

Technology Innovation and Business Performance

Livestock industry systems are undergoing a process of rapid change. Growing demand and preferences from the customer have emerged as key drivers of livestock prices, trade, and technology. These changes by new technology have the potential to change the quantity and quality of livestock worldwide. Livestock technology can improve production capacity, animals' welfare, and improve performance. Modern technology has a positive impact on the growth of agricultural productivity in developing countries (Nin, Arndt, & Preckel, 2003). Innovations should be faster, efficient, and accessible. Innovation technology will be shifting society, identities, economics, possibilities, values, and able to address the problems faced.

Farmers should be able to use technology applications because it produces a sustainable modern livestock industry. In addition, it will be supported by modern infrastructure and central management. By using innovation and technology, it will develop higher value of products, differentiated, unique, and customized. Akudugu, et al. (2012) highlight, the ability to utilize the production depends on their innovation. However, based on a study conducted by Truong (2008), there are many obstacles to running a successful technology such as low education, poor perception, limited knowledge, geographical conditions, low teaching ability, structuring, and insufficient funds and resources.

Technology plays an important role to improve performance and has been adapted in the livestock industry such as using a sensor. By using sensors, it can keep track of daily activity and health-related issues. It can improve the performance such as productivity and welfare of livestock. In the livestock industry, there are several technologies are adoption such as:

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1. **Precision Agriculture –** using RFID, GPS, and biometric sensors to monitoring the animals, controlled-traffic farming (CTF), and monitoring livestock production by using a drone while saving cost and time managing livestock in large land areas.

2. **Big Data** - manage big data by using technology from many sensors and efficient in managing data.

3. **The Internet of Things** - helps in decision-making, predicting, and improve systems such as feeding and caring.

4. **Artificial Intelligence (AI) And Robotics** - using automated milking robots to control and milking many cows within a short time.

5. **Animal Innovations & Innovative Animal Products** - internal capabilities to satisfy consumer demands using livestock technology market.

Technology adoption in the livestock industry a crucial part to increase agricultural performance. According to Department of Veterinary Services (2018), based on level of self-sufficiency, for poultry meat was 103.333% while the pork was 90.25% in 2017. However, only 36% of broiler breeder are using closed house systems in broiler farm. The closed farm systems are using high technology compared to open house system. In contrast, number of breeders in Malaysia are adopted technology innovation compared to Asian country are still low.

The technologies adoption contributes to industrial development, production, and sustainable performance. Producers should use new technology and innovation because it will lead them to gain higher incomes, greater knowledge, and having quality products. Farmers also should look forward to adopting a new technology to achieve the better performance. At the same time, it will improve the performance of the livestock industry in Malaysia.

Supply Chain Risk and Business Performance

Supply chain risks are categories into risk assessment, risk identification, risk treatment and risk analysis (Neiger, et al. 2009). Supply chain risks involve all risks starting from the flow of information, materials, and products or disruptions caused by external parties (Pujawan & Geraldin, 2009). Supply chain risk management is performing routine activities such as planning, conducting, and marketing, containing feed, performance evaluation and corrective, delivery to customers, diversify improve, increase import, coordination, quality, optimize productivity and improve company performance. Yeboah, Feng, Daniel, and Joseph (2014) study, supply chain risk can be emerging either from external or internal supply chain environment.

Every livestock company are the potential to face supply chain risks, such as sick cows and do not reach the weight target. By identifying this supply chain risk, it helps companies to improve performance and manage the problem effectively. All participants could effectively manage the risks to reducing loss and damage (Yeboah, Feng, Daniel, & Joseph, 2014). Hence, the company should manage risk to avoid breakdowns (Geraldin, et al. 2007).

COVID-19 interferes with activities related to livestock well-being. It affects agricultural and veterinary services, and therefore, affects animal health (Gortázar & Fuente, 2020). Such

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conditions limit strict monitoring of animal needs and health status and thus preclude appropriate intervention to address the growing problem. In such a situation, many farmers have taken too much stock of their animals, which increases the stress associated with the crowd and effect the function of the immune system. Thus, the risk of spread of animal diseases is greatly increased, which affects the well -being and productivity of animal stocks (Ghafouri-Fard et al., 2020).

The benefits of an effectively managed risk can solve the supply chain risk and based on the previous research, not much research focus on supply chain risk in livestock. The concepts of supply chain risk also still in infancy (Ju¨ttner, 2005). Every company should manage the supply chain risk by formal risk audits. Hence, the research should be done to increase the number of research related to this relation.

Digital Marketing and Business Performance

Digital marketing refers to techniques that use online platforms to reach customers. Digital Marketing is also known as Internet Marketing, Web Marketing, e-Marketing or Online Marketing. Digital marketing is the process of marketing a product or service using the Internet. It can be defined as the use of the Internet and related digital technologies to achieve marketing objectives and support the modern marketing concept (Eszes, 2010).

Digital marketing encompasses all the activities conducts via the world wide web to attract new business, retaining current business, and developing its brand identity (Quirk eMarketing, 2006). Livestock producers are also trying to develop a digital marketing channel to selling agricultural products via the Internet. Digital marketing is most useful to the farmers since the benefits are high and electronic systems are ready to serve customers all over the world.

Benefits of Digital Marketing to Farmers in the agriculture industry.

- **Wide market:** - Sell their product worldwide and covers many customers.
- **Open for 24 hours:** Can sell their products at any time.
- **The right person and Right price:** Proper price and sell their products to the right person.
- **Less cost:** No middlemen

The development of online media has made it easier for businesses to market their products and expand their marketing territory. Marketing through online media can be done easily as it is carried out through mobile phones / smartphones. In fact, the conventional media communication process for marketing works only one way and is passive, i.e., between producers and consumers, but the presence of online media provides convenience and change where consumers can handle relevant product searches.

According to Lamberton and Stephen, its role has changed for the user from passive to active in choosing the type of information to be received, how, and when (Makrides, Vrontis & Christofi, 2019). The problem is that the villagers who run the business are lacking in knowledge of modern technology. They only use cell phones to make calls and send text messages. Very few of them know about social media, let alone use it to market products.

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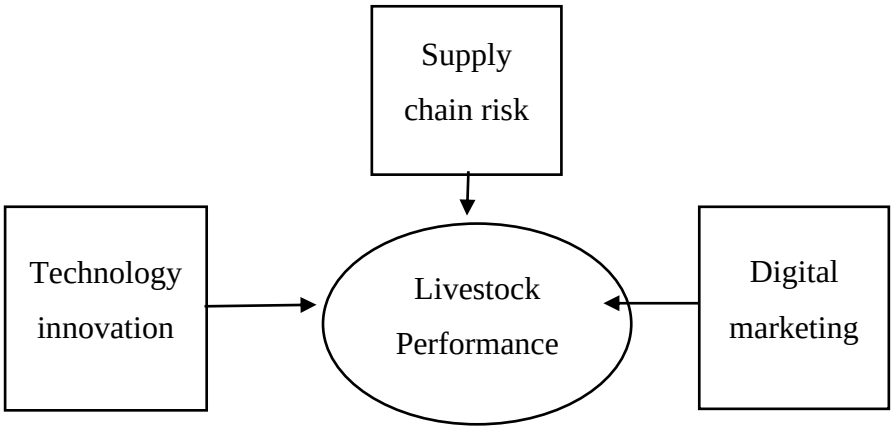
Everyone uses what agriculture has given us. Even so, even now, during the rapid development of information technology and Internet marketing, not all agricultural producers understand the importance of information and active contact with consumers in the network (Borisova, Baranova & Bruzhukov. 2020).

There are few disadvantages such as lack of personal approach, dependability, on technology, security-privacy, maintenance costs, higher pricing, and worldwide competition (Eszes, 2010). In the modern era, online buying became a new norm for customers. Successful firms can meet changing consumer needs through adopting new products, services, and uniqueness by using marketing mixtures (digital/traditional). The growth of local and alternative markets signals an increased search for and use of marketing innovations (Beckie, Kennedy and Wittman 2012).

Research Diagram

Based on the following discussion, the performance of livestock industry in Malaysia needs to be supported in the following diagram.



Conclusion

Based on the discussion, it can be concluded that technology innovation, supply chain risk and digital marketing will improve the performance of the livestock industry in Malaysia. However, planning is required in applying technology into their farming routines (Sork & Caffarella, 1990). In this case, meeting all the conditions will ensure the success of the planned program and breeders are easy to understand when adopting new technology. Livestock producers should acquire a certain level of education and knowledge and a willingness to learn new technologies. In addition, the ability to use digital marketing can play an important role. Livestock producers also should manage supply chain risks to ensure they are survived in the global market.

The development of the livestock industry in Malaysia also depends on the development of the breeders. By giving them online marketing education, it will get the opportunity to market their products. Successful farmers should take care of biosafety, worker / labor safety, welfare standards, access to production inputs and marketing of their products results (Nesrein *et.at.*, 2020). Hence, further research should investigate the relationship between technology innovations, supply chain risk, and digital marketing toward the performance of the livestock industry in Malaysia.

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References

Akudugu, M. A., Guo, E., dan Dadzie, S. K. (2012). Adoption of modern agricultural production technologies by farm households in Ghana: What factors influence their decisions? *Journal of Biology, Agriculture and Healthcare, 2*(3), 1-13.

A. Makrides, D. Vrontis & M. Christofi, (2019). The Gold Rush of Digital Marketing: Assessing Prospects of Building Brand Awareness Overseas," Business Perspectives and Research, 1–17.

An-nisa NS, Rizal S, Gendut S. (2015). Strategi pengembangan asuransi ternak sapi. *Jurnal Manajemen & Agribisnis 12*(1): 27–35.

Beckie, M. A., E. H. Kennedy and H. Wittman. (2012). Scaling up alternative food networks: Farmers' markets and the role of clustering in western Canada. *Agriculture and Human Values 29(*3):333–345.

Borisova L.V.1, Baranova I.V.1*, Bruzhukova O.V. (2020). Digital Marketing: Drivers for the Development of the Russian Agricultural Sector. 2nd International Scientific and Practical Conference "Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Growth" (MTDE 2020). *Advances in Economics, Business and Management Research,* 138, 177-181.

Department of Veterinary Services (2018), Livestock Statistic 2016/2017 http://www.dvs.gov.my/dvs/resources/user_1/DVS%20pdf/perancangan/2018/Perangkaan%202016%202017/3.Muka_Surat_1-15_.pdf

Eszes, I. (2010) An Introduction to Internet Marketing. Retrieves at 20 April 2020 https://pdfs.semanticscholar.org/6e36/bf7151e4e3fbec8b98222c5e1e46a9a98820.pdf

Geraldin LH, Pujawan, IN, Dewi DS. (2007). Manajemen risiko dan aksi mitigasi untuk menciptakan rantai pasok yang robust. *Jurnal Teknologi dan Rekayasa Teknik Sipil (TORSI)* 2007: 53–64.

Gortázar C, de la Fuente J. COVID-19 is likely to impact animal health. Prev Vet Med. (2020) 180:105030. doi: 10.1016/j.prevetmed.2020.105030

Ghafouri-Fard S, Noroozi R, Omrani MD, Branicki W, Pośpiech E, Sayad A, et al. Angiotensin converting enzyme: a review on expression profile and its association with human disorders with special focus on SARS-CoV-2 infection. Vascul Pharmacol. (2020) 130:106680. doi: 10.1016/j.vph.2020.106680

Ju¨ttner, U., (2005). Supply chain risk management Understanding the business requirements from a practitioner perspective. *The International Journal of Logistics Management, 16*(1), 120-141.

Neiger, D., Rotaru, K., & Churilov, L. (2009). Supply chain risk identification with value-focused process engineering. *Journal of Operations Management, 27*(2), 154-168.

Nesrein M. Hashem, Antonio González-Bulnes, and Alfonso J.Rodriguez-Morales (2020). Animal Welfare and Livestock Supply Chain Sustainability Under the COVID-19 Outbreak: An Overview. Front. Vet. Sci.

Nin, A., Arndt, C., Preckel, P.V., (2003). Is agricultural productivity in developing countries really shrinking? New evidence using a modified nonparametric approach. *J. Dev. Econ. 71*, 395–415.

Pujawan IN, Geraldin LH. (2009). House of risk: a model for proactive supply chain risk management. *Business Process Management Journal* 15(6): 953–967.

Quirk eMarketing. (2006) What is E-marketing and How is it Better than Traditional Marketing? Retrieved on http://www.quirk.biz/resources/88/What-iseMarketing-and-how-is-it-better-than-traditional-marketing

Journal of Information System and Technology Management
EISSN: 0128-1666
JISTM
Volume 6 Issue 24 (December 2021) PP. 09-17
DOI: 10.35631/JISTM.624002
Rozhan, A.D. (2016). Merekayasa Pertumbuhan Sektor Pertanian untuk meningkatkan Kemakmuran Negara melalui Inovasi dan Teknologi. Presented in the Prime Lecture VU07 MARDI: Serdang Malaysia.

Sork, T. J., & Caffarella, R. S. (1990). Planning Programs for Adults. In S. B. Merriam, & P. M. Cunningham (Eds.), *Handbook of Adult and Continuing Education*. San Francisco: Josey-Bass. 223-245.

Truong, T. N. C. (2008). Factors Affecting Technology Adoption among Rice Farmers in the Mekong Delta through the Lens of the Local Authorial Managers: An Analysis of Qualitative Data. *Omonrice, 16,* 107-112.

Yeboah, N. E., Feng, Y., Daniel, Oppong-Sekyere., & Joseph N. B., (2014). Agricultural Supply Chain Risk Identification- A Case Finding from Ghana. *Journal of Management and Strategy, 5(*2), 32-48.

Zainol Abidin, A.Z., Rosalli, M.H., Mohammad Nor, M.A.A & Sulaiman, N.H (2018). Adoption of Technology in Malaysia ' s Livestock Industry. Policy article. *Agricultural science policies and technology development.*