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# The Role of Technological Innovation, Supply Chain Risk and Digital Marketing in Improving the Performance of The Livestock Industry in The Northern Region of Malaysia

Muhammad Aizat Md Sin

Faculty of Business and Science Management, Kolej Universiti Islam, Perlis, Kuala Perlis, Perlis, Malaysia

Ahmad Shabudin Ariffin, Mona Fairuz Ramli

Faculty of Business and Science Management, Kolej Universiti Islam Perlis, Kuala Perlis, Perlis, Malaysia

Hasrul Hashom

Centre of Language & General Studies, Kolej Universiti Islam Perlis, 02000 Kuala Perlis, Perlis, Malaysia

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**Abstract**

The livestock industry has become the most dynamic market worldwide. This is driven largely by demand due to growth in purchasing power and modern technology. The survival and development of the livestock industry is dependent on the overall strength of the entire industry chain. Therefore, a study of technological innovation, supply chain risk, and digital marketing towards the performance of the livestock industry in Malaysia is required. The ability to conceptualize, observe and give due recognition to possible relationships between the variables are questioned by the livestock industry. This paper attempts to provide a comprehensive overview of the current market conditions and scenario of the livestock industry in Malaysia or elsewhere in developing countries. The views of the experts involved are also taken as input in this conceptual study. On this basis, the relationship between technological innovation, supply chain risk, digital marketing and the performance of the livestock industry is conducted. This study is conducted to increase the number of reading materials in the livestock industry as well as to improve the overall performance of the livestock industry and be more competitive at the international level.

**Keywords:** Technological Innovation, Supply Chain Risk, Digital Marketing, Performance

## Introduction

The livestock industry faces several challenges and issues that can affect the sustainability and profitability of farmers. These include disease outbreaks, food quality and availability, environmental impacts, supply chain risks, labour skilled shortages, and access to markets and competition. These problems can lead to reduced productivity, increased costs, and decreased profits for farmers, as well as negative impacts on animal welfare and the environment and cause a lack of youth involvement in the industry.

Population growth, globalization, consumer welfare agenda, technology use, ICT development, purchasing methods and industrialization have transformed the agricultural industry into an innovative sector (Abidin, et al., 2018). Under the agricultural sector, the livestock industry is one of the most important industries in Malaysia. This industry provides the largest source of protein to the Malaysian population as well as generating income for farmers. The livestock industry in Malaysia has not been able to improve performance due to lack of technology adoption, risks in the supply chain and lack of commercial activity.

The Malaysian government has established and formulated various policies and strategies to improve the performance of the livestock industry in Malaysia, such as the National Agro-Food Policy and the National Agricultural Policy. However, the production of the livestock industry in Malaysia is still unable to meet the domestic demand. Statistical data also show that meat production in Malaysia supplies between 28% and 30% of domestic demand. However, pressure is given where the demand for livestock such as cows, buffaloes, poultry, and others continue to increase due to the increase in population, weddings, festivals, and sacrifices during Eid al-Adha celebration.

Thus, livestock industry activists and the government create strategies to ensure that the industry becomes competitive in the market. For example, to achieve success, industries need to change their handling, production, packaging, processing, and marketing methods to satisfy their buyers. According to The International Fund for Agricultural Development, changes in agricultural production technology and marketing systems provide opportunities for smallholders to increase the income of breeders and farmers (IFAD, 2006). Industry players should be prepared to face all activities and risks in the supply chain.

This paper aims to discuss the current scenario in the livestock industry. It discusses several strategies such as technological innovation, supply chain risk, and digital marketing as the best factors to improve the performance of the livestock industry. This paper hopes to provide some insight into the livestock industry in Malaysia to at least be able to meet domestic demand. For a start, the study will focus on the livestock industry in the northern region of Malaysia.

## 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 guarantee food safety 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 as an opportunity for employment. This job opportunity will be a source of income for livestock farmers. In general, livestock is divided into two categories, ruminant and non-ruminant. Ruminants are cattle, sheep, buffalo, goats, and deer while non-ruminants are poultry, ducks, pigs, and eggs.

Globalization has had an impact and pressure on the global economy and animal husbandry activities. Breeders in Malaysia are forced to restructure their business and generate a new paradigm in the industry through better efficiency and technology. For example, based on

Malaysia's National Agro-Food Policy 2011-2020 (NAP), the demand and production of meat is expected to continue 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 pay serious attention. However, to what extent are livestock producers in Malaysia prepared to face some challenges in the market.

Nowadays, the use of internet and social media has changed the traditional method of purchase to digital method. In line with the movement of other sectors, retail businesses have used digital marketing to attract customers. By using the internet to sell livestock products, it will change the marketing channel. Development in terms of innovation and technology application can also overcome some of the problems faced by the agricultural sector, such as limited land, low productivity, insect pest attacks, and lack of labour (Rozhan, 2016). It is supported by Akudugu et al (2012), where the ability to leverage agricultural production depends on the innovation of the farmer himself. If farmers are wise to use digital channels, it will give them an advantage. Furthermore, An-nisa et al (2015) also suggested that in their research on cattle, it has multiple risks. However, the capacity or number of participating farmers to innovate their production activities depends on the availability of technology.

**The role of the Malaysian government in developing the livestock industry**

The Malaysian government has recognized the importance of the livestock industry in contributing to the country's economy and food security. Therefore, the government has implemented various initiatives and policies to support and encourage the development of the livestock industry in Malaysia. One of the main initiatives is the National Livestock Transformation Program (NLTP), which aims to modernize and improve the productivity, competitiveness, and sustainability of the livestock industry. Under the NLTP, the government provides financial support and technical assistance to farmers and livestock producers to adopt modern agricultural practices and technologies.

The government also encourages private investment in the livestock industry through various incentives, such as tax breaks. In addition, the government has established the Department of Veterinary Services to oversee the development and regulation of the livestock industry and ensure the safety and quality of livestock products. Furthermore, the Malaysian government has also implemented policies to support the export of livestock products, including the establishment of trade agreements with other countries and the implementation of food safety and quality standards to meet international requirements. The Malaysian government plays an important role in the development and regulation of the livestock industry to ensure its sustainability and contribution to the country's economy and food security.

**Technological Innovation**

The livestock industry system is undergoing a rapid process of change. Growing demand and preferences from customers have emerged as key drivers of livestock prices, trade and technology. These new technological changes have the potential to change the quantity and quality of livestock worldwide. Livestock technology can increase production capacity, animal welfare and improve performance. Modern technology has a positive effect on the growth of agricultural productivity in developing countries (Nin et al., 2003). Innovation should be faster, efficient, and accessible. Innovation technology will change society, identity, economy, possibilities, values, and be able to deal with the problems.

Farmers should be able to use technology applications as it results in a sustainable modern livestock industry. In addition, it will be supported by modern infrastructure. By using innovation and technology, it will develop higher value, unique and suitable products. Akudugu, et al (2012) emphasized, the ability to use production depends on their innovation. However, based on a study conducted by Truong (2008), there are many obstacles to implementing a successful technology due to low levels of education, poor perception, limited knowledge, geographical conditions, low teaching ability, structuring, and funds or insufficient resources.

Technology plays an important role to improve performance and has been adapted in the livestock industry such as using sensors. Using sensors, it can track daily activities and health-related issues. It can also improve performance such as productivity and livestock welfare.

According to the Department of Veterinary Services (2018), for chicken meat it was 103.333% while for pork meat it was 90.25% in 2017. However, only 36% of broiler farmers use closed house systems in broiler farms. The closed farm system uses high technology compared to the open house system. On the other hand, the number of farmers in Malaysia who adopt technological innovation compared to Asian countries is considered still low.

Adoption of technology contributes to industrial development, production, and sustainable performance. Producers should use new technology and innovation because it will lead them to earn higher income, higher knowledge, and have quality products. Farmers should also look forward to adopting new technologies to achieve better performance. At the same time, it will improve the performance of the livestock industry in Malaysia. But to what extent, cattle farmers use technology as a tool to improve their performance.

**Supply Chain Risk**

Supply chain risk is categorized into risk assessment, risk identification, risk treatment and risk analysis (Neiger, et al., 2009). Supply chain risk involves all risks starting from the flow of information, materials, and products or disruptions caused by external parties (Pujawan & Geraldin, 2009). Supply chain risk management carries out routine activities such as planning, operating, and marketing, containing feed, performance evaluation and correction, delivery to customers, diversifying, improving, improving imports, coordination, quality, optimizing productivity and improving company performance. Yeboah, Feng, Daniel, and Joseph (2014) study, supply chain risk can emerge either from external or internal supply chain environment.

Every livestock company has the potential to face supply chain risks, such as sick cows and not reaching weight targets. By identifying these supply chain risks, it helps companies to improve performance and manage problems effectively. All participants can manage risk to reduce loss and damage effectively (Yeboah et al., 2014). Therefore, companies should manage risk to avoid damage (Geraldin, et al., 2007).

Effectively managed risk benefits can resolve supply chain risks and based on previous research, not much research has focused on supply chain risks in livestock. The concept of supply chain risk is still in its infancy (Ju¨ttner, 2005). Every company should manage supply chain risk through a formal risk audit. Therefore, research needs to be done to further improve the research related to this relationship.

**Digital Marketing**

Digital marketing refers to the technique of using 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 modern marketing concepts (Eszes, 2010).
Digital marketing includes all activities conducted through the world wide web to attract new business, retain current business, and develop its brand identity (Quirk eMarketing, 2006). Farmers are also trying to develop digital marketing channels to sell agricultural products through the internet. Digital marketing is most useful to farmers because the benefits are high and electronic systems are ready to serve customers worldwide.
According to Lamberton and Stephen, the role has changed for users from passive to active in choosing the type of information to be received, how, and when (Makrides et al., 2019). The problem is that the villagers who run the business lack 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 for marketing. This matter was confirmed during an interview session with Mr. Roslan as the Director of MAQIS Padang Besar Perlis, where according to him, most breeders and importers of livestock only use phone calls and WhatsApp applications.
Therefore, it is concluded, during the rapid development of information technology and Internet marketing, not all agricultural producers understand the importance of information and active relationships with users in the network (Borisova, Baranova & Bruzhukov. 2020). Digital marketing has become an increasingly important strategy in the livestock industry to promote products and services, reach new customers and increase engagement with existing customers. However, to what extent do farmers in North Malaysia use digital marketing in their business.

## Methodology

This paper is based on previous research related to technological innovation, supply chain risk and digital marketing towards improving business performance. The methodology of this study aims to facilitate the researcher to obtain the information and data required to complete the study conducted from the search for information from previous studies. Breeders and importer in the livestock industry were chosen as the population of study. The study will be conducted through interview sessions to breeders and importers who run their business around North Malaysia. These interview questions are taken based on previous studies to ensure that these questions do not fall out of the original research topic. This interview session will be conducted for approximately 10-15 minutes for each respondent. Findings from the interviews will be analysed to obtain results from the study.

## Discussion

### Technological innovation and business performance

Livestock technology can increase production capacity, animal welfare and improve performance. Modern technology has a positive effect on the growth of agricultural productivity in developing countries (Nin et al., 2003). Innovation should be faster, more efficient, and more accessible. Innovation technologies will change society, identity, economy, possibilities, and values, and be able to deal with the problems at hand. Farmers should be able to use technology applications as it results in a sustainable modern livestock industry. Technology plays an important role to improve performance and has been adapted in the livestock industry such as using sensors. To what extent the farmers in the northern part of Malaysia use innovation technology as a factor in improving their performance.

**Supply Chain Risk and Business Performance**

COVID-19 has in fact disrupted supply chain activities related to livestock welfare. It affects agricultural and veterinary services, and affects animal health (Gortázar & Fuente, 2020). Such conditions limit close monitoring of animal needs and health status and thus prevent appropriate interventions to address the growing problem. In such a situation, many farmers have taken too much stock of their animals, which increases the stress related to the crowd and affects the function of the immune system. Therefore, the risk of spreading animal diseases is greatly increased, which affects the well-being and productivity of animal stocks (Ghafouri-Fard et al., 2020). In addition, various risks also need to be addressed by them.

However, if they can manage risks well and effectively, they can solve supply chain risks. Based on previous research, not much research has focused on supply chain risks in livestock. The concept of supply chain risk is also still in its infancy (Ju¨ttner, 2005). Every company should manage supply chain risk through a formal risk audit. Therefore, research needs to be done to further improve the research related to this relationship.

**Digital marketing and business performance**

According to Lamberton and Stephen, the user's role has changed from passive to active in choosing the type of information to be received, how, and when (Makrides et al., 2019). The problem is that the villagers who run the business lack 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. This is because, during the rapid development of information technology and Internet marketing, not all agricultural producers understand the importance of information and active contact with users in the network (Borisova et al., 2020).

There are several disadvantages such as lack of personal approach, reliability, technology, security-privacy, maintenance costs, higher prices, and worldwide competition (Eszes, 2010). In the modern era, online shopping has become the new norm for customers. Successful firms can meet the changing needs of consumers using new products, services and uniqueness by using the marketing mix (digital/traditional). The growth of local and alternative markets indicates an increase in the search for and use of marketing innovations (Beckie et al., 2012).

**Conclusion**

Based on the discussion, it can be concluded that technological innovation, supply chain risk, and digital marketing will improve the performance of the livestock industry in Malaysia. In this regard, meeting all the conditions will ensure the success of the planning and the farmers' understanding when adopting the new technology. Breeders should also 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. Breeders and importers must also manage supply chain risks to ensure their survival in the global market. The involvement of the younger generation is necessary in developing the livestock industry in Malaysia to ensure that modern applications are adapted in their businesses.

The development of the livestock industry in Malaysia also depends on the development of breeders. By giving them online marketing education, they will get a chance to market their products. Successful farmers should take care of biosecurity, worker/labour safety, welfare standards, access to production inputs and marketing of their products (Nesrein et.al., 2020). Experts also found that most farmers do not use social media properly. They mostly use phone calls and WhatsApp applications only in interacting between farmers and buyers. Therefore, further research should investigate the relationship between technological innovation, supply

chain risk and digital marketing on the performance of the livestock industry in North Malaysia to obtain real results.

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**Corresponding Author**
Muhammad Aizat Md Sin
Faculty of Business and Science Management, Kolej Universiti Islam Perlis,02000 Kuala Perlis, Perlis Malaysia
Email: aizatmdsin@kuips.edu.my

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