

Impact of Technological Innovation on Productivity and Competitiveness of the Culinary Industry

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ABSTRACT

This study analyzes the impact of technological innovation on productivity and competitiveness within the bread industry, focusing on a case study of Usaha Roti Gembong Gembul in Makassar. A descriptive qualitative approach was employed, using data collected through in-depth interviews, direct observations, and relevant document analysis. The research provides a comprehensive examination of how new technologies are integrated into various operational aspects, including production processes, inventory management, and marketing strategies. The findings offer practical insights for industry players, highlighting the importance of adopting and utilizing technology to enhance operational efficiency and competitiveness. Respondents generally expressed positive perceptions regarding the availability, accessibility, and efficiency of the technology implemented. Furthermore, high levels of satisfaction were noted concerning product quality and decision-making processes, especially in managing risks and uncertainties. These findings underscore the critical role of technological innovation in boosting both productivity and competitiveness in the bread industry.

Keywords: Technology Innovation, Productivity, Competitiveness, Culinary Industry

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1. INTRODUCTION

The rapid development of information technology and globalization has brought significant impacts on the global economy (Supriandi, 2022; Xu & Liu, 2020). Countries around the world are competing to enhance their economic competitiveness. In this context, innovation is recognized as a key factor that can help countries boost their economic competitiveness (Yurynets et al., 2015). Internationally, studies have shown that countries with high levels of innovation have stronger economic competitiveness. These countries have the ability to produce more advanced and innovative products and services, increasing productivity and creating new job opportunities (Aidhi et al., 2023).

Innovation plays a critical role in fostering long-term economic growth and development. It enables businesses to improve efficiency, reduce costs, and create products that meet the evolving needs of consumers. Companies that invest in research and development (R&D) are more likely to introduce innovative solutions, giving them a competitive edge in both domestic and international markets. This, in turn, contributes to a country's overall economic

competitiveness, as innovative companies tend to be more resilient to economic downturns and are better positioned to capture market share in a rapidly changing global environment.

In addition to boosting economic growth, innovation also leads to the development of new industries and sectors. As technology continues to advance, entire industries, such as digital services, renewable energy, and biotechnology, have emerged, creating new job opportunities and driving economic diversification. Countries that foster innovation by providing favorable conditions—such as a skilled workforce, strong intellectual property protections, and government incentives for R&D—are more likely to experience sustained economic prosperity. Furthermore, innovation can promote inclusivity by offering opportunities for small and medium-sized enterprises (SMEs) to compete on a global scale, enhancing social and economic development.

However, the ability to capitalize on innovation is not uniform across countries. Economies with better infrastructure, access to funding, and high levels of education are more equipped to innovate and drive competitiveness. In contrast, countries that lag in these areas may struggle to keep up, leading to widening economic disparities. As such, fostering an ecosystem that encourages innovation requires a concerted effort from governments, businesses, and educational institutions. By investing in innovation, countries can strengthen their global standing and ensure sustainable economic growth in an increasingly interconnected world.

Technology is not a new concept in modern society. In fact, technology has become an essential part of daily life. The development of technology in various fields has made it easier to perform various tasks and provides numerous benefits. This has led to the exploration and development of technology becoming a focal point of the world. During the period of 2010 to 2020, there will be an extraordinary acceleration in the application of nanotechnology in the industrial world, indicating that the world is now heading towards a nanotechnology revolution. Countries such as the United States, Japan, Australia, Canada, and European countries, as well as some Asian countries like Singapore, China, and Korea, are actively developing a new branch of technology known as nanotechnology (Suwarda & Maarif, 2013).

Indonesia, as a country with a large population and a developing economy, faces various challenges in achieving its vision of becoming a developed country by 2045. To achieve this goal, innovation is recognized as one of the key factors that can drive sustainable economic growth and increase competitiveness (Harto et al., 2023).

However, despite the growing awareness of the importance of innovation, its implementation and development are still hindered by various factors, including a lack of understanding of how to apply innovation in business practice, limited empirical research on the impact of innovation on economic performance, and a lack of research focused on types of innovation and factors influencing them (Aidhi et al., 2023).

On the other hand, the bread industry is a crucial sector in Indonesia's economy. Usaha Roti Gembong Gembul, as one of the players in this industry, faces significant challenges in maintaining its market share and increasing competitiveness (Maruf, 2010).

In the face of intense competition, the implementation of technology innovation is considered a key strategy to enhance production efficiency, product quality, and competitiveness. However, the actual impact of technology innovation on productivity and competitiveness at Usaha Roti Gembong Gembul still requires a comprehensive and in-depth study (Nugroho et al., 2018).

As one of the bread industry players in Indonesia, Usaha Roti Gembong Gembul faces challenges in maintaining and increasing its position in a highly competitive market (Suhaeni, 2018). In the face of tight competition, the implementation of technology innovation is considered a key strategy to enhance production efficiency, product quality, and competitiveness. However, the extent to which technology innovation affects the productivity and competitiveness of this bread industry player still requires a comprehensive study (Aidhi et al., 2023).

This study aims to conduct a comprehensive investigation into the impact of technology innovation on productivity and competitiveness at Usaha Roti Gembong Gembul. By adopting a case study approach, this study will delve into the details of how new technology is applied in various aspects of company operations, including production processes, inventory management, supply chain management, and marketing strategies.

This study will also highlight the factors that influence the implementation of innovation at Usaha Roti Gembong Gembul, such as managerial support, availability of skilled human resources, adequate technological infrastructure, and regulatory climate and government policies. By understanding these factors, this study aims to provide a deeper insight into how companies can successfully adopt and utilize technology innovation to enhance their productivity and competitiveness.

It is hoped that the results of this study will not only benefit Usaha Roti Gembong Gembul in improving its performance but also contribute to the overall development of the bread industry in Indonesia. The recommendations generated from this study are expected to serve as practical guidelines for other companies in the bread industry to adopt technology innovation. Additionally, the findings of this study can also provide valuable insights for the government in designing more effective policies to promote innovation and increase economic competitiveness in various sectors.

2. METHOD

This study employs a qualitative research methodology using a case study approach. Data will be collected through in-depth interviews, observation, and document analysis. The primary informant is the owner, manager, and employees of Usaha Roti Gembong Gembul. In-depth interviews will be conducted to gather information about the implementation of technology innovation, its impact on productivity, and its effects on competitiveness. Direct observation at the workplace will help understand the production processes and management practices in place. Document analysis will include a review of financial reports, production records, and other relevant documents.

a. Time and Location of Research

Research Period: The study was conducted from May 10th to 20th. Location: The research was conducted at Usaha Roti Gembong Gembul, located in Makassar, South Sulawesi.

b. Scope Limitations

Scope of Technology: This study will focus on the innovation in technology applied in the production process, management, and marketing at Usaha Roti Gembong Gembul. The focus of the study is limited to Usaha Roti Gembong Gembul in Makassar and does not include other bread companies outside this area. The impact of technology innovation analyzed is that which occurred over the past five years, providing a relevant and up-to-date picture.

3. RESULTS AND DISCUSSION

a. Result Results

In this study, the respondents are employees of Roti Gembong Gembul. The research was conducted online through a Google Form questionnaire. The summary of the questionnaire distribution to Roti Gembong Gembul employees is shown in the table below:

Table 1. Questionnaire Results

Description	Quantity	Percentage
Questionnaire Distributed	30	100%
Responded Questionnaires	30	100%
Processable Questionnaires	30	100%

Primary Data Processed in 2024

Descriptive Statistical Analysis Results

Descriptive statistical analysis is necessary to examine the overall data, including the mean, maximum, minimum, and standard deviation of each variable, namely Availability and Accessibility of Technology, Technology Efficiency, Product Quality, Innovation Product, and Industrial Competitiveness. The results of the study can be seen in the table below:

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Availability and Accessibility of30 Technology		6.00	10.00	8.4667	1.04166
Technology Efficiency	30	6.00	10.00	8.9333	1.11211
Product Quality	30	7.00	10.00	8.9000	1.06188
Innovation Product	30	6.00	10.00	8.8000	1.03057
Industrial Competitiveness	30	7.00	10.00	9.0333	1.09807
Valid N (listwise)	30				

Source: SPSS 25 output; Secondary data has been processed.

b. Discussion

Based on the descriptive analysis above, we can describe the distribution of the data obtained by the researcher as follows:

1) Variable Availability and Accessibility of Technology

The variable Availability and Accessibility of Technology, based on the data, can be described as having a minimum value of 6 and a maximum value of 10, with a mean value of 8.4667, and a standard deviation of 1.04166. The minimum value of 6 indicates that there are some locations or situations where the efficiency of technology use is relatively low. This means that in those places, technology may not be used optimally or there may be constraints hindering the effective use of technology. The maximum value of 10 indicates that there are some locations or situations where technology use is very high. In those places, technology is used very well and optimally, providing maximum results with available resources. The average value of 8.4667 indicates that, overall, the efficiency of technology use is above the middle scale (which may range from 1 to 10). The relatively small standard deviation indicates that most values of efficiency are not too far from the average value, which means that most locations have similar levels of technology efficiency, close to the average value of 8.4667.

In general, this analysis shows that most locations use technology with sufficient efficiency, with little variation among them. However, there are some places that may require more attention because they are at the minimum value, where technology use efficiency is still

low. This analysis is important for planning and decision-making in efforts to improve technology use efficiency in areas that lag behind, so that all locations can utilize technology more optimally.

2) Variable Technology Efficiency

The variable Technology Efficiency, based on the data, can be described as having a minimum value of 6, a maximum value of 10, and a mean value of 8.4667, with a standard deviation of 1.04166. The minimum value of 6 indicates that there are some locations or situations where the product quality is relatively low, but still within the acceptable range. This means that in those places, the products produced may have some shortcomings or areas that can be improved, but still remain above the average. The maximum value of 10 indicates that there are some locations or situations where the product quality is very high.

The average value of 8.9000 indicates that, overall, the product quality is above the average scale and approaching the maximum value. This suggests that, in general, the products produced have very good quality in most of the surveyed locations. The relatively small standard deviation indicates that most values of product quality are not too far from the average, which means that most locations have similar levels of product quality, close to the average value of 8.9000.

In general, this analysis shows that most locations produce products with very good quality, with little variation among them. However, there are some places that may require more attention because they are at the minimum value, where product quality can still be improved. This analysis is important for planning and decision-making in efforts to improve overall product quality, so that all locations can produce products that meet high standards.

3) Variable Product Quality

The variable Product Quality, based on the data, can be described as having a minimum value of 7, a maximum value of 10, and a mean value of 8.9000, with a standard deviation of 1.06188. The minimum value of 6 indicates that there are some individuals or organizations that face significant difficulties in decision-making under conditions of risk and uncertainty. This means that in those places or situations, the decision-making process may be less effective or suboptimal, with decisions often being less optimal or suboptimal. The maximum value of 10 indicates that there are some individuals or organizations that are highly skilled in decision-making under conditions of risk and uncertainty.

In those places or situations, decisions taken are very effective, optimal, and tend to produce very good results despite high uncertainty. The average value of 8.8000 indicates that, overall, the ability to make decisions under conditions of risk and uncertainty is above average, approaching a very high level. This suggests that, in general, individuals or organizations surveyed have relatively good skills in handling situations filled with risk and uncertainty. The variable Decision-Making in Risk and Uncertainty, based on the data, can be described as having a minimum value of 6, a maximum value of 10, and a mean value of 8.8000, with a standard deviation of 1.03057.

The standard deviation of 1.03057 indicates the level of variation or spread of values of decision-making ability under conditions of risk and uncertainty among different individuals or organizations. The relatively small standard deviation indicates that most values of decision-making ability are not too far from the average, which means that most individuals or organizations have similar levels of decision-making ability, close to the average value of 8.8000.

In general, this analysis shows that most individuals or organizations have relatively good skills in decision-making under conditions of risk and uncertainty, with little variation among them. However, there are some who may require more attention because they are at the minimum value, where decision-making ability can still be improved. This analysis is important for planning and decision-making in efforts to strengthen decision-making ability in situations filled with risk and uncertainty, so that all individuals or organizations can make better decisions in challenging situations.

4) Variable Decision-Making in Uncertainty

The variable Decision-Making in Uncertainty, based on the data, can be described as having a minimum value of 6, a maximum value of 10, and a mean value of 8.8000, with a standard deviation of 1.03057. The minimum value of 7 indicates that there are some individuals or organizations that experience difficulties in decision-making under conditions of uncertainty. Although this value is still relatively high (above the midpoint of the scale 1-10), it suggests that there is room for improvement in decision-making in some locations or situations. The maximum value of 10 indicates that there are some individuals or organizations that are highly skilled in decision-making under conditions of uncertainty. In these places or situations, decisions taken are very optimal and tend to produce very good results despite high uncertainty.

The standard deviation of 1.03057 indicates the level of variation or spread of values of decision-making ability under conditions of risk and uncertainty among different individuals or organizations. The relatively small standard deviation indicates that most values of decision-making ability are not too far from the average, which means that most individuals or organizations have similar levels of decision-making ability, close to the average value of 8.8000. Overall, this analysis suggests that most individuals or organizations have good skills in decision-making under conditions of risk and uncertainty, with little variation among them. However, there are some who may require more attention because they are at the minimum value, where decision-making ability can still be improved. This analysis is important for planning and decision-making in efforts to strengthen decision-making ability in situations filled with uncertainty, so that all individuals or organizations can make better decisions in challenging situations.

5) Variable Decision-Making in Uncertainty

The variable Decision-Making in Uncertainty, based on the data, can be described as having a minimum value of 7, a maximum value of 10, and a mean value of 9.0333, with a standard deviation of 1.09807. The minimum value of 7 indicates that there are some individuals or organizations that experience difficulties in decision-making under conditions of uncertainty. Although this value is still relatively high (above the midpoint of the scale 1-10), it suggests that there is room for improvement in decision-making in some locations or situations. The maximum value of 10 indicates that there are some individuals or organizations that are highly skilled in decision-making under conditions of uncertainty. In these places or situations, decisions taken are very optimal and tend to produce very good results despite high uncertainty.

The average value of 9.0333 indicates that, overall, decision-making ability under conditions of uncertainty is at a very high level. This suggests that, in general, individuals or organizations surveyed have very good skills in handling situations filled with uncertainty, with decisions taken tending to be effective and optimal. The standard deviation of 1.09807 indicates the level of variation or spread of values of decision-making ability under conditions of uncertainty among different individuals or organizations. The relatively small standard

deviation indicates that most values of decision-making ability are not too far from the average, which means that most individuals or organizations have similar levels of decision-making ability, close to the average value of 9.0333.

Overall, this analysis suggests that most individuals or organizations have very good skills in decision-making under conditions of uncertainty, with little variation among them. However, there are some who may require more attention because they are at the minimum value, where decision-making ability can still be improved. This analysis is important for planning and decision-making in efforts to strengthen decision-making ability in situations filled with uncertainty, so that all individuals or organizations can make better decisions in challenging situations

4. CONCLUSIONS AND SUGGESTION

a. Conclusions

Based on the results of the descriptive study, it can be concluded that the respondents' perceptions of the variables under investigation show a very positive trend. For the variable of technology availability and accessibility, the respondents gave an average rating of 8.4667 with a standard deviation of 1.04166, indicating that the available and accessible technology is sufficient. The variable of technology efficiency also showed an average rating of 8.4667 and a standard deviation of 1.04166, suggesting that the technology used is considered efficient by the respondents. The quality of products was evaluated with an average rating of 8.9000 and a standard deviation of 1.06188, indicating a high assessment of product quality. In the context of decision-making in risk and uncertainty, the respondents gave an average rating of 8.8000 with a standard deviation of 1.03057, indicating that they feel confident in making decisions despite facing risk and uncertainty. Finally, the variable of decision-making in uncertainty had an average rating of 9.0333 with a standard deviation of 1.09807, indicating a very high level of confidence in making decisions in situations filled with uncertainty. Overall, these results reflect a high level of trust and satisfaction with the aspects studied in this research.

b. Suggestion

Based on the research results showing positive perceptions from respondents towards technology availability and accessibility, technology efficiency, product quality, and decision-making capabilities under risk and uncertainty, some recommendations can be made. First, it is necessary to maintain and further improve the availability and accessibility of technology to ensure that all users have adequate and easy access to technology. Second, to ensure that technology is kept relevant and effective, companies or organizations must continue to evaluate and innovate technology to ensure that technology used is consistent with current needs. Third, the high-quality products that have been evaluated must be maintained by consistently applying strict quality control measures and being responsive to customer feedback. Fourth, in the context of decision-making under risk and uncertainty, training and simulation related to risk management can be enhanced to increase decision-makers' confidence and effectiveness. In this way, it is hoped that trust and satisfaction can be further increased among users regarding various aspects studied in this research.

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