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Marketing Strategy 4.0 Using Internet of Things (IoT) Technology in the Cattle Breeding Industry: Case Study of PT. Goopo Innovation Indonesia

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Abstract *This research is a case study that analyses the 4.0 marketing strategy with the use of Internet of Things (IoT) technology in the cattle farming industry, with a focus on PT Goopo Inovasi Indonesia. The background of this research is the rapid development of digital technology and changes in consumer behaviour in the Industry 4.0 era, which encourage cattle farming companies to adopt new marketing strategies. PT Goopo Inovasi Indonesia, as a pioneer in this industry, faces the challenge of integrating IoT technology into its marketing strategy. The theories used in this research include the Marketing 4.0 concept developed by Philip Kotler, as well as theories related to the Internet of Things (IoT) and its application in the livestock industry. This research also refers to models of digital marketing strategies and innovation management. The research method used is a qualitative approach with a case study design. Data were collected through in-depth interviews with the management of PT Goopo Inovasi Indonesia, direct observation, and analysis of company documents. Data analysis was conducted using thematic analysis techniques and data source triangulation. The results showed that the implementation of marketing strategy 4.0 with the use of IoT at PT Goopo Inovasi Indonesia has increased productivity, operational efficiency and company competitiveness. The utilisation of IoT in livestock health monitoring, feed management, and product tracking has increased consumer confidence and opened up new market opportunities. However, the research also identified challenges in terms of technology investment and human resource development. The conclusion of this study confirms that the integration of 4.0 marketing strategies and IoT technology has significant potential to transform the cattle farming industry. PT Goopo Inovasi Indonesia has successfully utilised these technologies to increase the added value of its products and build stronger relationships with consumers. Recommendations for further research include long-term impact analysis and comparative studies with similar companies in different countries.*

Keywords*: Marketing 4.0, Internet of Things (IoT), Cattle Industry*

1. INTRODUCTION

The livestock industry is a vital sector that supports food availability and national economic growth. Demand for beef continues to increase in line with population growth and improving living standards. According to the Central Statistics Agency (BPS), per capita beef consumption in Indonesia in 2023 reached 3.02 kg/year (BPS, 2022), which is still far below the Food and Agriculture Organization (FAO) recommendation of 10 kg/capita/year. Outlook, O. F. A. (2021). OECD-FAO Agricultural Outlook 2021-2030. Outlook, 2030. This shows that efforts are needed to increase domestic beef production to fulfil the needs of the community and support national food security.

Entering the Sustainable Development Goal (SDG) in 2045, Indonesia is expected to become the world's food barn (beef) with a population of cattle and buffalo reaching 41.74 million, domestic production breaking the one million mark of 1,151. 698 tonnes with only 5% contribution from smallholder farms and the remaining 95% from medium and large scale businesses. In 2045, Indonesia's population is projected to reach 309 million while beef consumption increases to 2.79 kg/capita/year (10.3%) in 2025 and 3.04 kg/capita/year (20.4%)

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in 2045. This means that in 2045, Indonesia will need around 939.36 thousand tonnes of beef per year or almost 78.28 thousand tonnes per month or 2.57 thousand tonnes per day. This means that the projected demand in 2045 of 1,151,698 tonnes will be met from 939.36 thousand cattle. (Ardi Novra, 2022)

The Indonesian government has taken various measures to increase domestic beef production, including community livestock development programmes, increasing the intensity of livestock rearing, and improving the quality of feed and breeds. Despite these efforts, local beef production is still insufficient to meet the demand. The government is faced with the challenge of implementing a 4.0 marketing strategy that incorporates Internet of Things (IoT) technology to improve operational efficiency and competitiveness in the market. Therefore, innovations in the marketing and distribution strategies of livestock products are needed to achieve these goals.

In today's digital era, digital marketing 4.0 plays an important role in supporting the cattle sector. Digital technology provides a more efficient and effective solution in reaching a wider market, as well as increasing the availability of information on livestock products for consumers and industry players. The application of digital technology in marketing strategies allows livestock industry players to adapt to changing market dynamics and fulfil consumer needs more optimally.

IoT technology in the cattle industry provides various benefits, such as continuous monitoring of livestock health, feed optimisation, and improved management of the barn environment. With data collected through sensors and IoT devices, farmers can make more accurate decisions and improve operational efficiency. In addition, the integration of IoT in marketing strategies allows companies to better understand consumer behaviour, improve interactions with customers, and design more effective marketing campaigns.

PT Goopo Inovasi Indonesia, as one of the digital breeder companies in the cattle industry with a focus on feedlot, marketing and distribution, has started to adopt IoT technology as part of their 4.0 marketing strategy. The company seeks to improve competitiveness and expand markets through the use of advanced technology in their operations and marketing. This case study aims to analyse how PT Goopo Inovasi Indonesia implements its marketing 4.0 strategy with the use of IoT technology, and evaluate its impact on the company's marketing performance and operational efficiency.

This research is important because it provides insights into best practices in integrating IoT technology with 4.0 marketing strategies in the cattle industry. In addition, the results of this study are expected to serve as a reference for businesses in the livestock sector that want

to apply a similar approach to improve their competitiveness in an increasingly competitive market.

Based on the context of the problem described earlier, the problem formulation in this thesis is as follows:

1. How does PT Goopo Inovasi Indonesia implement marketing strategy 4.0 in the cattle farming sector?
2. How do consumers respond to the use of online applications in marketing cattle farming products by PT Goopo Inovasi Indonesia?
3. How does the availability of livestock affect the implementation of innovative marketing strategies through online applications at PT Goopo Inovasi Indonesia?

The objectives of this research are:

1. Research Objectives for PT Goopo Inovasi Indonesia:
   1) Improve Operational Efficiency:
      a. Implement a 4.0 marketing strategy that incorporates *Internet of Things (IoT)* technology , and *digital platforms* to improve operational efficiency in the cattle farming industry.
      b. Using online applications to accelerate the marketing process and strengthen relationships with consumers.
   2) Improving Competitiveness:
      a. Integrating IoT technology for continuous monitoring of livestock health, feed optimisation, and improved management of the cage environment.
      b. Improve interaction with customers and design more effective marketing campaigns.
   3) Improve Product Information Availability:
      a. Increase the availability of livestock product information for consumers and industry players through digital platforms.
      b. Make more accurate decisions with real-time data collected through sensors and IoT devices.
   4) Optimising Marketing Strategies:
      a. Analyse consumer responses to the use of online applications in marketing cattle products.
      b. Optimise innovative marketing strategies through online applications to increase cattle availability and meet consumer needs more optimally.
2. Research Objectives for the Community
   1) Increasing National Food Security:

a. Increasing domestic beef production to meet community needs and support national food security.
b. Reduce dependence on beef imports by increasing local production.

2) Increase Marketing Efficiency and Effectiveness:
   a. Helping the public with more accurate and faster information about cattle farming products through digital platforms.
   b. Increase public awareness about the importance of digital technology in supporting the cattle farming sector.

3) Developing the Cattle Breeding Industry:
   a. Provides insight into best practices in integrating IoT technology with marketing 4.0 strategies in the cattle farming industry.
   b. Become a reference for business actors in the livestock sector who want to apply a similar approach to increase their competitiveness in an increasingly competitive market.

3. Research Objectives for Academics

1) Contribution to the Development of Knowledge:
   This research can expand knowledge in the field of digital marketing, especially related to the incorporation of IoT technology in marketing strategies.

2) Learning Resources and References:
   The findings from this research can be used as learning materials and references for students and other researchers who want to study the same topic.

2. LITERATURE REVIEW

In this literature, various previous studies that have been carried out regarding the application of IoT in cattle farming are taken. The focus of this research is to provide an in-depth understanding of how this technology can be applied effectively to increase livestock productivity and welfare. In this research provides a general overview of the relevance and benefits of implementing IoT in cattle farming based on existing literature, using the 3C 2S Model, namely Compare, Contrast, Criticize, Synthesize (synthesize), Summarize (summarize) regarding this journal. Previous research conducted previously was:

a. Research conducted by Ni Made Ayu Gemuh Rasa Astiti (2022), with the title: "Digital Market Opportunities for Marketing Beef Cattle", researchers can conclude that this research is relevant to previous research conducted by Mohamad Trio Febriyantoro and Debby Arisandi in 2019 with the title "Utilization of Digital Marketing for Micro, Small

and Medium Enterprises in the Era of the Asean Economic Community". The research concluded that digital marketing makes it easier for MSMEs to provide information, interact with consumers, expand market share, increase awareness and increase sales. However, this research is more specific to marketing beef cattle using digital markets. (Gumuh Rasa Astiti, 2022).

b. Research conducted by Paulina Gressya Kinayang, Lisa Ayu Setyarini, and Prastyo Nugroho (2021), with the title: "Cultivation, Digital Marketing, and Millennial Farmer Networks in Magelang Regency", researchers can conclude that this research is relevant in understanding how the generation Millennials use technology to increase productivity and efficiency in livestock businesses. This shows the change from traditional methods to modern methods that are more profitable and efficient, as well as the importance of social networks in developing businesses. This research can be a model for other breeders in utilizing technology to support their business. (Kinayang et al., 2021)
c. Research conducted by Intan Nia Tata Ayu, Andrie Kisroh Sunyigono, Elys Fauziyah (2022), with the title: "Structure, Behavior and Performance of Beef Cattle Fattening Businesses in Bicorong Village, Pakong District, Pamekasan Regency", the researchers can conclude that this research relevant to studies on market efficiency and the influence of market structure on business performance, providing insight into how oligopoly structures influence prices and market performance in the context of beef cattle fattening businesses in the village Bicorong, Pakong District, Pamekasan Regency. (Ayu et al., 2022)
d. Research conducted by Julita Hasanah, Dian Puspasari Ina Ayati, Dimas Brillian Syaban Pramana (2019) with the title: "Cattle Farming 4.0: Development Of Livestock Sector Through E-Agriovest (Digital Based Investment) To Accelerate Economic Growth In East Java" , (Julita Hasanah et al., 2019) researchers can conclude the results of the research as follows:
    i. Characteristics of people's livestock in East Java include small scale (1-3 animals), sales according to needs, using forage, livestock function as savings, and sales through intermediaries.
    ii. E-agriovest is simulated to be able to increase beef production by up to 20% by integrating sectors from upstream to downstream.
    iii. 20% increase in production is projected to increase livestock population by 8.64%, meat consumption by 1.13%, and reduce meat prices by 0.15%.
    iv. E-agriovest is projected to increase East Java's GRDP by 2.83%.

e. Research conducted by Fastabikhul Khairatih Kardi, Sayekti Handayani (2020) with the title: Strategy for Beef Cattle Farming Business Development in the Bali Indah Farmer Group in Padalembara Village, District. Poso Pesisir Selatan District. Poso researchers can conclude that this research is relevant to understanding how development strategies and the use of technology can increase the productivity and efficiency of beef cattle farming businesses at the farmer group level. Helps identify internal strengths and weaknesses as well as external opportunities and threats that affect the success of livestock businesses. (Khairatih Kardi & Handayani Sayekti, 2020).

f. Research conducted by Sarah Morrone, Corrado Dimauro, Filippo Gambella, Maria Grazia Cappai (2022) Dept of Agriculture, University of Sassari, Italy, with the title: "Industry 4.0 and Precision Livestock Farming (PLF): An up to Date Overview across Animal Productions", researchers can conclude that this research provides a comprehensive review of the application of PLF and Industry 4.0 in animal production. The main goal is to explain how this modern technology can improve efficiency, productivity and animal welfare. By comparing and contrasting the various applications of this technology across different types of farms and regions, this research also critiques existing challenges and provides a synthesis of previous findings. In conclusion, although there are challenges that need to be overcome, PLF and Industry 4.0 have great potential to revolutionize the livestock industry in a sustainable and efficient way. (Morrone & Dimauro, 2022).

3. LIMITATION

In this research, the problem boundaries used based on the research conceptual framework include the following aspects:

a. Implementation of digital marketing strategy 4.0 which involves the use of the Internet of Things (IoT) and digital platforms. The main focus is on the use of technology in the marketing and distribution of cattle farming products by PT. Goopo Inovasi Indonesia.

b. Research is limited to the cattle farming industry sector, with case studies conducted at PT. Goopo Inovasi Indonesia and cattle pens in the Sumedang Regency area. Other livestock sectors or industries outside cattle farming will not be included in this research.

c. Focus more on the integration of IoT technology and its application in PT'. Goopo Inovasi Indonesia marketing and operational strategies. PT. Goopo Inovasi Indonesia, without explaining in detail the technical aspects of IoT such as hardware or special algorithms.

d. The study focuses on the availability of cattle and its impact on the implementation of innovative marketing strategies through online applications. Details regarding aspects of cattle maintenance or breeding will not be discussed in this research.
e. The research method used is descriptive qualitative with data collection techniques through observation, structured interviews and document analysis. This research does not use quantitative methods or statistical analysis.
f. Operational area of PT'. Goopo Inovasi Indonesia includes Head Office in Bandung, branches in Jakarta, and farm locations in Parakan Muncang, Kebon Hui, and Cipelah in Sumedang, West Java. Does not include other regions or locations outside this scope.
g. The main focus of the research is on the marketing of beef products, while by-products from livestock will not be discussed in this research.
h. The research is focused on marketing strategy analysis and will not delve into aspects of operational management or human resource management that are not directly related to digital marketing 4.0.

4. RESEARCH METHODS

In this research, researchers used qualitative research. Qualitative research methods are research approaches that aim to understand phenomena or social realities by exploring the meaning, perceptions and experiences of research subjects in depth. Qualitative research focuses on the interpretation and analysis of non-numerical data such as words, images, and text. According to Sugiyono (Prof. Dr. Sugiyono, 2023) qualitative research is a research approach that focuses more on understanding social phenomena from the participant's perspective. This qualitative research emphasizes aspects of process, meaning and understanding, rather than statistical measurements.

According to John W. Creswell, qualitative research is an approach to exploring and understanding the meaning that individuals or groups give to social or humanities problems. This research process involves methods that focus on collecting data in a natural context, where the researcher is the main instrument. Data analysis is inductive and reflective, with the aim of identifying patterns or themes that emerge from the data. This approach emphasizes the complexity and variety of human experience, as well as understanding phenomena from the perspective of research participants. (John W. Creswell, n.d.)

The research object was carried out at PT Goopo Inovasi Indonesia which is located:

1. Bandung (Head Office)

   Jl. Tulip Raya No. 25, Surapati Core, Cibeunying Kidul, Bandung – West Java.

2. Jakarta (Representative Office)

   Ruko Golden Plaza, Jl. RS. Fatmawati Raya No. 15 D2, South Gandaria, Cilandak - South Jakarta.

3. Livestock Pen:
   a. Parakan Muncang, Sumedang (West Java)
   b. Kebon Hui, Sumedang (West Java)
   c. Cipelah, Sumedang (West Java)

Method of collecting data:

1. Structured Interview

   The interview method provides researchers with the opportunity to obtain focused and specific data in accordance with the research objectives. The data collection process through structured interviews can be implemented with the following steps:

   a. Compile a list of detailed and specific interview questions related to innovative online application-based marketing strategies implemented by PT. Goopo Innovation Indonesia. These questions may include:
      i. Types of online applications used for marketing purposes.
      ii. Marketing strategies and tactics through online applications.
      iii. The process of planning and implementing marketing strategies.
      iv. Challenges and opportunities faced in marketing.
      v. The impact of marketing strategy on market expansion.
   b. Determine relevant key sources such as:
      i. Marketing Manager
      ii. Digital marketing executive
      iii. Online marketing team
      iv. Company customers or partners
   c. Determine relevant key sources, such as:
      i. Marketing Manager.
      ii. Digital marketing executive.
      iii. Online marketing team.
      iv. Company customers or partners.
   d. Arrange an interview schedule with selected sources.
      i. Conduct structured interviews by asking questions according to a list that has been prepared systematically to each source.

ii. Record interviews (with permission from the interviewee) to ensure no important information is missed.
iii. Record answers and important information from sources during the interview process.
iv. Strictly follow the list of questions without improvising or creating new questions outside the prepared list.

2. Document Review

Carrying out document analysis allows researchers to obtain factual and detailed information regarding the marketing strategies that have been implemented, as well as their impact on market expansion. Documents can be used as a source of data in research because they store very valid primary information. For example, in the field of historical studies, these documents can be archives, and archives are a source of data that has significant power.

3. Documentation

Documentation is a writing process that aims to collect information directly from the research site. The documentation method involves searching for data through notes, documents, and books. In data collection techniques with documentation, information is obtained from documents from various written sources or from documents available to informants in the form of photo documentation by researchers involving related parties. This documentation is important to complement the data obtained through observation and interviews. Through documentation, researchers can obtain visual and audio data that provides a more detailed picture of the innovative online application-based marketing strategy that is being implemented.

5. RESULTS

The research method used in this research is a qualitative method with interview techniques. Interview conducted with Mr. Arya Wicaksana as CEO of PT. Goopo Inovasi Indonesia, Mrs. Dwiana Lestariningtyas as Marketing Manager and Mr. Edi as plasma farmer to obtain in-depth and meaningful data about the company's marketing strategy and operational policies.

1. Implementation of marketing strategy 4.0 in the cattle farming sector.

Several applications of innovative marketing strategies in the cattle farming sector, which can be seen as implementations of marketing strategy 4.0. results of an interview with CEO Arya Wicaksana.

a. Create attractive program products

   Objective: Helping plasma farmers in fulfilling livestock or livestock, especially cattle.

   Implementation: PT. Goopo Inovasi Indonesia creates an attractive program for people to participate in the cattle farming business. This program allows the general public to help plasma farmers by purchasing livestock through the Goopo digital platform. This aims to increase capital resources from third parties, so that farmers can expand their business and increase operational efficiency.

b. Create a group of interested people/individuals/companies

   Objective: Build a sustainable livestock business model.

   Implementation: PT. Goopo Inovasi Indonesia creates a collection of people, organizations and companies who are interested in investing in cattle farming businesses. In this way, they can build a sustainable livestock business model and increase their competitiveness in the market.

c. Form a Crop Funding Pattern

   Objective: Make cattle farming more accessible to the general public.

   Implementation: PT. Goopo Inovasi Indonesia implements a crop funding pattern which allows the general public to own a cattle farming business without having to have a large amount of capital. This makes cattle farming more accessible and accessible to more people.

d. Strategy for Establishing Ecosystem Patterns

   Objective: Involve stakeholders in the cattle farming ecosystem.

   Implementation: PT. Goopo Inovasi Indonesia forms an ecosystem pattern that involves stakeholders such as breeders, regulations, buyers, customers/investors, wholesellers, and horeka. In this way, they can ensure that all relevant parties participate in the development of the cattle farming business and increase operational efficiency.

e. Focus Marketing at the Upstream Level

   Objective: Increase the availability of livestock and meet market needs.

   Implementation: PT. Goopo Inovasi Indonesia focuses on the upstream level or upstream sector in marketing. They focus on developing and selling livestock, so they can meet market needs and increase the availability of livestock.

f. Downstream Strategy

   Objective: Integrate cattle farming with the food industry.

   Implementation: PT. Goopo Inovasi Indonesia has entered the downstream stage by entering the frozen and fresh meat retail business through Jawara Meat. They also

collaborate with the Savings and Loans Cooperative through Kodigta (Our Digital Cooperative) to increase the accessibility of cattle farming products to the wider community.

2. Consumer responses to the use of online applications in marketing cattle products.

Several important things related to consumer responses to the use of online applications are the following findings from interviews with Mrs. Dwiana Lestariningtyas as Marketing Manager of PT. Goopo Inovasi Indonesia:

a. Main Marketing Programs implemented:

i. Livestock Business Program Through Partnership Collaboration:

PT. Goopo Inovasi Indonesia implements livestock business programs through effective partnership collaboration. They work together with plasma farmers, livestock product retailers and other stakeholders in the form of a mutually reinforcing ecosystem. This helps increase efficiency and safety in the farming process. (Seen in Figure 4.10 Partnership Scheme).

ii. BUMN, Ministry and Private Company Pension Funds:

This program is not directly implemented by PT. Goopo Inovasi Indonesia. However, they can utilize funds from these sources to improve infrastructure and digital technology in cattle farming.

iii. Retirement Preparation Program from BUMN, Ministries, Banks, Insurance:

This program is also not directly implemented by PT. Goopo Inovasi Indonesia. However, they can utilize this program to improve data quality and efficiency of animal market transactions.

iv. Fund Assistance from Bank BJB:

Financial assistance from Bank BJB can help increase access to wider funds for breeders. This can enable farmers to purchase quality livestock and increase production yields.

b. Consumer responses and responses to cattle breeder applications

Consumers have a positive opinion regarding the use of online applications in marketing cattle farming products by PT. Goopo Inovasi Indonesia for several significant reasons:

i. Ease of access and transactions

ii. No need to provide a cage

iii. Remote monitoring

iv. Financial benefits

v. Transparency and security
vi. Legality of Sale and Purchase Agreement and Ownership Certificate
vii. The team or employees are quick to provide service

c. The availability of livestock influences the implementation of innovative marketing strategies.

Several important things related to livestock availability influence the implementation of innovative marketing strategies, following the findings from an interview with Mr. Edi as a cattle breeder assisted by PT. Goopo Inovasi Indonesia, stated that the main obstacles faced by cattle breeders:

i. Livestock Availability

Farmers often experience difficulties in obtaining quality cattle that suit market needs. The limited number of quality cattle causes suboptimal livestock population growth and hampers the ability of farmers to meet the ever-increasing demand for beef.

ii. Marketing

The marketing process for cattle products is often less attractive and not well organized. Many farmers do not have an effective marketing strategy, so they find it difficult to sell cattle at the right time and at a profitable price. Additionally, reliance on specific seasons for sales is also an issue.

iii. Feed

The availability of quality feed is often a major obstacle for breeders. Many farmers still depend on seasonal forages and agricultural waste, which do not always meet the optimal nutritional needs of cows. This results in slow cow growth and decreased livestock health.

iv. Cage Sanitation

Poor stall sanitation can cause health problems in cows, such as infectious diseases. Lack of sanitation facilities and good pen maintenance contributes to livestock health problems.

6. DISCUSSION

Analysis of Findings:

Based on the findings during observations and interviews, the researcher analyzed the findings carried out during the interview so that the researcher received a summary of the analysis of the answers:

1. Analysis of the first problem formulation regarding the implementation of marketing strategy 4.0 in the cattle farming sector.
   a. Focus on the Upstream Level (Upstream Sector)
      i. Increasing Availability of Capital Resources:

      PT. Goopo Inovasi Indonesia focuses its marketing strategy at the upstream level, namely the upstream sector, with the aim of increasing the availability of capital resources for farmers. They created an attractive program for the general public to invest in and help plasma farmers in developing livestock, especially cattle.

      ii. Digital Livestock Ecosystem Development:

      With this strategy, PT. Goopo Inovasi Indonesia has succeeded in creating an ecosystem that involves various stakeholders, including breeders, regulations, buyers, investors, wholesalers and horticulture. This helps ensure that all parties involved have clear roles and can contribute effectively.

   b. Capital Problems at the Downstream Level

   Even though PT. Goopo Inovasi Indonesia has succeeded in increasing the availability of capital resources for farmers, they have not yet fully reached the downstream level because there are still capital problems. This shows that there are significant challenges in accessing end markets (downstream level) due to unstable capital.

   c. Downstream Strategy
      i. Developing a Meat Retail Business:

      To overcome capital problems and increase added value, PT. Goopo Inovasi Indonesia implements a downstream strategy. They are developing frozen and fresh meat retail businesses through platforms such as Jawara Meat and Our Digital Cooperative (Kodigta). In this way, they can increase the availability of livestock products for the community and ensure that the investments made by the community can be produced in the form of useful products.

      ii. Increased Added Value and Product Availability:

      This downstream strategy also helps increase the added value and availability of livestock products. With platforms such as Jawara Meat and Kodigta, consumers can buy livestock products directly and safely, thereby increasing consumer satisfaction and ensuring the availability of capital resources for farmers.

2. Analysis of the second problem formulation regarding consumer responses to the use of online applications in marketing cattle products.

a. PT. Goopo Inovasi Indonesia has developed a digital platform to market cattle farming products, including beef cattle and sheep. By using Internet of Things (IoT) technology and online applications, this company is trying to increase efficiency and security in the marketing process. However, consumer responses to the use of this online application need to be understood to determine the effectiveness of the 4.0 marketing strategy used.
b. Positive Consumer Response/Response:
    i. Convenience and Efficiency:

    Use of Online Application: Consumers can select, monitor and sell cattle online through the Goopo application. This makes the farming process easier and increases efficiency in managing livestock.
    ii. Transparency and Security:

    Online CCTV Monitoring: All cage locations are equipped with online CCTV for 24 hours, making it easier to monitor animals in the cage. This provides high transparency and security for consumers.
    iii. Animal Condition Monitoring:

    Animal Condition Updates: Consumers can monitor animal conditions through the application, such as feeding schedules, vaccine updates, body temperature and environmental conditions. This helps consumers understand the animal's condition in real-time.
    iv. Availability of Accurate Data:

    Certificate of Ownership and Insurance Policy: Documentation of the sale and purchase agreement, certificate of ownership, and insurance policy are sent online via email. This provides accurate data availability and ensures safe transactions.
    v. Ease of Navigation and Documentation:

    Cage Location Map: Displays a map of cage locations making it easier to navigate towards the animal cages. Sales and purchase agreement documentation and ownership certificates are also sent online.
    vi. Convenience and Efficiency:

    Consumers can take advantage of the convenience and efficiency offered by online applications. They can select and sell cattle more easily and quickly.
    vii. Transparency and Security:

    The use of online CCTV provides high transparency and security for consumers. This ensures that livestock are kept in healthy and safe conditions.
    viii. Animal Condition Monitoring:

Consumers can monitor animal conditions in real-time via the application. This helps them understand the animal's condition and take appropriate preventive measures.

3. Summary of analysis of the third problem formulation regarding the availability of livestock (livestock) influencing the implementation of innovative marketing strategies through online applications at PT. Goopo Inovasi Indonesia.
   a. High Import Dependence:

      One of the main obstacles is the limited availability of lives stock. This is due to its very high dependence on imports, so it cannot meet domestic needs independently. This import dependence also has an impact on the quality and consistency of the products produced because it is difficult to ensure the quality of imported livestock meets domestic standards.
   b. Impact on Product Quality and Consistency:

      Very high import dependence is one of the factors that limits the availability of live stock. This also has an impact on the quality and consistency of the products produced. Imported livestock does not always have the same quality as domestic livestock, so it can affect the quality of the final product.
   c. The Government's Role is Not Optimal Yet in Developing the Livestock Industry:

      The government's role in developing the livestock industry is still not optimal. The government only has a role as the BPIB (Central Information and Statistics Agency) as a breeding center, but it is not being developed optimally. Many livestock died because the staff had minimal knowledge, so they could not maintain continuity in terms of breeding.
   d. Government Focus on Cement Supply:

      The government's role is only to supply cement, while the supply of quality livestock must be handed over to each farm. This shows that the government has not maximized its role in developing the livestock industry. The government must be more active in developing breeding centers that can provide quality livestock to increase the national cattle population.
   e. Inefficient Animal Market Transactions:

      The phenomenon that is occurring now is inefficient animal market transactions. This transaction usually takes the form of fattening cattle, where the cattle are bought to be fattened again, and so on. This is not effective in increasing the quality cattle population because there is no breeding center that can provide quality cattle continuously.

f. Data and Monitoring Limitations:

The government only has 1 website and the Ministry of Agriculture only has data on the number of goat and cattle commodities at a limited level. This has not been done directly to see the real situation, so it cannot provide an accurate picture of the condition of the livestock industry. This limited data makes it difficult to make the right decisions in developing the livestock industry.

g. The importance of the Breeding Center from the Government

With the existence of a breeding center from the government, it is hoped that it can improve education and increase the national livestock population. This breeding center can become a reliable center for developing quality livestock. The government must maximize its role in developing breeding centers that can provide quality livestock to increase the national cattle population

7. CONCLUSION

After conducting in-depth research on the data collected and considering various relevant aspects related to the thesis title: "Marketing Strategy 4.0 Using Internet of Things (IoT) Technology in the Cattle Breeding Industry: Case Study of PT. Goopo Inovasi Indonesia", and based on the researchers' findings the following conclusions can be drawn:

1. PT. Goopo Inovasi Indonesia has implemented an effective marketing strategy 4.0 in the cattle farming industry using Internet of Things (IoT) technology and online applications. The results of this application can increase productivity by monitoring cow health conditions in real-time using IoT sensors, managing feed automatically to ensure proper nutrition, and monitoring the environment to deal with weather changes.
2. In addition, the online application allows digital farmers to select, monitor and sell cattle online, increasing efficiency and security in the marketing process. From the results of this research, researchers can conclude that marketing strategy 4.0 using Internet of Things (iot) technology in the cattle farming industry has the impact of increasing productivity and sales of cattle, as well as improving the welfare of farmers through the use of digital technology.
3. PT. Goopo Inovasi Indonesia has succeeded in increasing the level of public trust and consumers' ability to follow digital marketing developments with an effective marketing 4.0 strategy. By using an online application that allows consumers to select, monitor and sell cattle online, as well as utilizing IoT technology to monitor animal conditions in real-time, the company has increased efficiency and safety in the marketing process. In addition, the development of simpler features and increased education for consumers about how to

use online applications has helped increase the use of online applications and made consumers more comfortable using digital platforms. Thus, PT. Goopo Innovation Indonesia has achieved success in increasing productivity and public trust through implementing sophisticated marketing 4.0 strategies.PT. Goopo Inovasi Indonesia has implemented an effective marketing strategy 4.0 in the cattle farming industry using Internet of Things (IoT) technology and online applications. However, the company still faces several main challenges, including problems with the availability of livestock which still occur today and dependence on livestock imports which is still high. However, the company has tried to increase domestic production through developing partnership programs with breeders and product diversification. Apart from that, the company also increases efficiency and security in the marketing process by using IoT technology to monitor animal health conditions in real-time and increasing transparency and security through the use of online CCTV. Thus, PT. Goopo Inovasi Indonesia must continue to improve its livestock production and development strategy to meet market needs while continuing to increase efficiency and safety in the marketing process.

4. Use of Big Data and Application of Precision Livestock Farming (PLF) in the cattle fattening business at PT. Goopo Inovasi Indonesia cannot currently be implemented due to various obstacles. Here are some of the main reasons:
    a. High Investment Costs: Implementation of Big Data and PLF requires significant investments in advanced IoT technologies, sensors and software. These costs may not be in accordance with the resources available at PT. Goopo Inovasi Indonesia, thus making implementation cost inefficient.
    b. Limited Human Resources: The development and implementation of Big Data and PLF requires a trained and experienced workforce. However, PT. Goopo Inovasi Indonesia currently does not have sufficient human resources to develop and maintain this system effectively.
    c. Time Required: The development and implementation of Big Data and PLF requires a long time, especially in integrating new technology with existing operational systems. PT. Goopo Inovasi Indonesia has not had sufficient time to adapt and maintain the system effectively.
    d. Inaccurate Data Validation: PT. Goopo Inovasi Indonesia faces challenges in ensuring the validity of data produced by Big Data systems. Inaccurate data can make it difficult for actors to make decisions, such as under or over prices.

e. Obstacles in Data Collection: PT. Goopo Inovasi Indonesia faces challenges in collecting accurate and accountable data. Often the data reported is not real according to the actual conditions in the field, thus influencing the decisions taken.

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