Research Proposal: The Use of Technology in Retail to Reduce Stock Losses

The retail industry is a highly competitive field where businesses operate on narrow margins. The issue of stock losses, caused by factors such as theft, damage, and expiration, has significant financial implications for retailers. In recent years, advancements in technology have provided potential solutions to address this problem. This research study seeks to explore the use of technology to reduce stock losses in the retail industry. The research question guiding this study is, "How can technology be used to reduce stock losses in the retail industry?"

Stock losses can significantly impact the financial health of retail businesses, resulting in a decrease in profits and possible closure of the business. According to the National Retail Federation, retail businesses in the United States lost $61.7 billion in 2019 due to inventory shrinkage, with shoplifting accounting for 35.7% of losses (National Retail Federation, 2020). These losses not only impact the retailers but also consumers who may experience higher prices due to the need to recoup losses.

This study aims to identify and evaluate technological solutions that can be employed to reduce stock losses in the retail industry. Specifically, the objectives of the study are:

1. To identify the main causes of stock losses in the retail industry and the impact of these losses on businesses.

2. To examine the different technological solutions available to address stock losses in the retail industry.

3. To explore the effectiveness of different technological solutions in reducing stock losses.

4. To evaluate the potential impact of technology on employees and the ethical considerations involved in the implementation of technological solutions.

The study has the potential to contribute to the existing literature on the use of technology to reduce stock losses in the retail industry. The findings of this study can provide valuable insights to retail businesses in the selection and implementation of technological solutions to reduce stock losses. This study also has implications for the wider retail industry, as it seeks to address a persistent problem that impacts businesses and consumers alike.

The retail industry is an ever-changing landscape, with technology playing an increasingly important role in enhancing operational efficiency and reducing stock losses. This literature review aims to comprehensively examine the current state of technology use in stock management in the retail industry. It will identify the benefits and limitations of current technological solutions to reduce stock losses, explore the potential for new and emerging technologies to address the problem of stock losses, and identify gaps in current knowledge, highlighting the need for further research.

Current Technological Solutions in Stock Management

Radio-frequency identification (RFID) is one of the main technological solutions that retailers use to reduce stock losses. RFID technology is a wireless technology that enables automatic identification of objects using radio waves. Ferreira and Telles (2019) state that RFID technology has been used in the retail industry for over two decades and has been shown to improve stock accuracy and reduce stock losses. RFID works by attaching tags to individual products or pallets, which can be read by RFID readers placed throughout the store or warehouse. This enables retailers to have real-time visibility of their inventory, which can help them to reduce out-of-stock situations, prevent overstocking, and identify and prevent theft.

Electronic article surveillance (EAS) is another technological solution that retailers use to reduce stock losses. EAS is a security system that uses tags and antennas to detect when an item is being taken out of the store without being paid for. Shih and Lin (2017) note that EAS has been shown to be effective in reducing theft and stock losses, but it has limitations. For example, it does not provide real-time visibility of inventory, and it can generate false alarms, which can be a nuisance to customers and store associates.

potential impacts of technology on employees involved in stock management, along with the associated ethical considerations:

Automation of Stock Management: Technology can automate the process of stock management, eliminating the need for manual tracking and counting of inventory. This can save time and reduce errors, but it can also lead to job displacement and create a sense of insecurity among employees who fear losing their jobs.

Ethical considerations: It is essential to consider the potential impact on the employees whose jobs are at risk due to automation. Companies should provide training and development opportunities to help employees acquire new skills and transition to other roles within the company.

Increased Efficiency: Technology can make stock management more efficient by enabling real-time tracking of inventory levels and automating reordering processes. This can reduce stockouts and overstocking, improving customer satisfaction, and reducing waste.

Ethical considerations: Companies should ensure that the use of technology does not lead to the exploitation of workers. For example, employees should not be expected to work longer hours or take on additional responsibilities without proper compensation.

Data Privacy: The use of technology in stock management involves collecting and analysing large amounts of data, such as sales trends, customer preferences, and inventory levels. This raises concerns about data privacy and the potential for misuse of this information.

Ethical considerations: Companies should establish clear policies and procedures for data privacy and security. They should also obtain the necessary consents and permissions from employees and customers before collecting and using their data.

Dependence on Technology: As companies increasingly rely on technology for stock management, employees may become overly dependent on these systems, leading to a loss of critical thinking skills and problem-solving abilities.

Ethical considerations: Companies should ensure that employees receive proper training and support to develop critical thinking skills and problem-solving abilities. They should also establish contingency plans in case of system failures or other disruptions to the technology.

Overall, it is essential to consider the potential impact of technology on employees involved in stock management, and to address any ethical concerns that may arise because of its implementation.

Retailers are also exploring new and emerging technologies to address the problem of stock losses. Computer vision technology is one such technology that has been used to improve stock accuracy and prevent theft. Wang et al. (2018) state that computer vision technology uses cameras and algorithms to detect and track objects. Other technologies such as drones, robots, and blockchain are also being explored for their potential to improve stock management processes and reduce losses. Akhtar, Karami, and Shih (2020) note that these technologies are still in their infancy, and more research is needed to determine their effectiveness and impact on retail operations.

Two main theories will be applied in this literature review to enhance the understanding of the role of technology in stock management in the retail industry. The first theory is the Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) is a widely recognized theory in the field of information systems and technology management that helps to understand the factors that influence users' acceptance of technology. Developed by Fred Davis in 1989, TAM posits that perceived usefulness and ease of use are critical determinants of technology acceptance. In other words, users are more likely to adopt new technologies if they perceive them as useful and easy to use.

In the context of stock management in retail, TAM can be used to examine the factors that influence retailers' acceptance of new and emerging technologies. For example, if a retailer is considering adopting a new inventory management system, TAM can help to identify the factors that will determine whether the system will be accepted by the employees who will be using it.

Perceived usefulness refers to the extent to which a technology is perceived as helpful and valuable to its users. In the case of stock management, retailers may perceive a new technology as useful if it can help them to track inventory levels, reduce stockouts, and optimize replenishment cycles more accurately.

Ease of use, on the other hand, refers to the extent to which a technology is perceived as user-friendly and easy to learn. Retailers may be more likely to adopt a new technology if it is easy to use and does not require extensive training or support.

Other factors that may influence technology acceptance include the perceived compatibility of the new technology with existing systems and processes, the perceived credibility and trustworthiness of the technology provider, and the social norms and expectations surrounding technology adoption in the retail industry. By using TAM to examine these factors, retailers can make more informed decisions about whether to adopt new technologies and how to best facilitate their successful implementation and adoption...

The second theory that will be applied in this literature review is the Resource-Based View (RBV) theory. This theory suggests that a firm's resources and capabilities are the primary drivers of its competitive advantage (Barney, 1991). RBV theory will be used to analyses how the effective utilization of technology resources can contribute to a retailer's competitive advantage in the industry.

Despite the potential of these technologies, there are still gaps in our understanding of how they can be effectively implemented and integrated into existing stock management processes. For example, there is a need for research on the cost-effectiveness of these technologies, their impact on employee productivity, and their effectiveness in different retail settings. Additionally, there is a need for research on the ethical implications of using these technologies, particularly in terms of privacy and data security.

The study will employ a mixed-methods approach, combining both quantitative and qualitative research methods. The first phase of the study will involve the collection of quantitative data through an online survey. This survey will be designed to collect data on retailers' current stock management practices, the use of technological solutions, and the factors that influence the adoption and implementation of technological solutions. The second phase of the study will involve the collection of qualitative data through in-depth interviews with retailers who have adopted and implemented technological solutions in stock management. The rationale for this approach is that it allows for a comprehensive understanding of the impact of technological solutions on stock management practices.

One potential limitation of this approach is that it may be difficult to compare and integrate the quantitative and qualitative data, given the different methods of data collection and analysis. To mitigate this limitation, the study will use a triangulation approach to analyse the data, which involves combining multiple sources of data to verify findings.

For the first phase of the study, a survey will be administered online to retailers in the retail industry. The survey will be designed to collect data on retailers' current stock management practices, the use of technological solutions, and the factors that influence the adoption and implementation of technological solutions. A convenience sampling method will be used to select participants, which involves selecting participants based on their accessibility and willingness to participate. The sample size will be determined based on the number of retailers who are willing to participate in the survey.

To ensure data quality and accuracy, the survey questions will be designed using established scales and will be pretested with a small group of retailers before the main survey is administered. The survey responses will be stored and managed using a secure online survey platform.

For the second phase of the study, in-depth interviews will be conducted with retailers who have adopted and implemented technological solutions in stock management. The sample will be selected using a purposive sampling method, which involves selecting participants based on specific criteria relevant to the research question. The sample size will be determined based on the principle of data saturation, which is the point at which no new themes or insights emerge from the data.

The interviews will be conducted face-to-face or over the phone and will be audio-recorded with the participants' consent. To ensure data quality and accuracy, the interviews will be conducted using a semi-structured interview guide, which will be pretested with a small group of retailers before the main interviews are conducted. The audio recordings will be transcribed verbatim and stored securely.

The quantitative data collected from the survey will be analysed using descriptive statistics, such as frequencies and percentages, to provide an overview of retailers' current stock management practices and the use of technological solutions. Inferential statistics, such as regression analysis, will also be used to identify the factors that influence the adoption and implementation of technological solutions.

The qualitative data collected from the interviews will be analysed using a thematic analysis approach. This involves identifying and analysing patterns, themes, and categories in the data to develop an understanding of the impact of technological solutions on stock management practices. The data will be analysed using a combination of inductive and deductive approaches.

One potential limitation of the data analysis techniques is that the qualitative data may be subject to interpretation bias. To mitigate this limitation, the analysis will be conducted by two or more independent researchers, and intercoder reliability will be calculated to ensure consistency in the coding and interpretation of the data

Data analysis will be conducted using both statistical analysis and thematic analysis. The quantitative data from the survey will be analysed using descriptive statistics, including frequencies, means, and standard deviations, to describe the current state of technology use in stock management in the retail industry. The qualitative data from the interviews will be analysed using thematic analysis, which involves identifying patterns or themes in the data (Braun & Clarke, 2019). Themes will be identified through a process of coding the data and organizing it into categories.

Potential ethical considerations for this study include informed consent, confidentiality, and privacy. Informed consent will be obtained from all participants prior to data collection, and participants will be informed of their right to withdraw from the study at any time. Confidentiality and privacy will be ensured by keeping all data confidential and anonymous. All data will be stored securely and will only be accessible to the research team. Any identifiable information will be removed from the data before analysis to ensure participant anonymity.

The collected data will be analysed using a mixed-methods approach, incorporating both quantitative and qualitative data. The quantitative data collected through the survey will be analysed using statistical analysis methods such as descriptive statistics and inferential statistics (e.g., correlation and regression analysis) using the SPSS software. The qualitative data collected through the interviews will be analysed using thematic analysis using the ATLAS.ti software.

The key findings of the study will be presented in detail, including the results of both the statistical and thematic analyses. The results of the statistical analysis will provide insight into the frequency and distribution of the responses to the survey questions, as well as the relationship between different variables. The results of the thematic analysis will provide a deeper understanding of the participants' perceptions and experiences related to current stock management practices and technological solutions used to reduce stock losses.

The key findings and their implications for the retail industry will be discussed, taking into consideration the research questions and objectives. The findings will be compared with previous research in the field to identify similarities, differences, and areas of agreement or disagreement.

To address potential researcher bias, the data collection process will be designed with a focus on ensuring the validity and reliability of the data. For instance, the survey questions will be designed to be clear, concise, and unambiguous. The interview questions will be open-ended to allow for the collection of detailed and diverse responses from the participants. To address potential ethical considerations, the study will adhere to the ethical guidelines outlined by the Institutional Review Board (IRB). Prior to the commencement of data collection, all participants will be informed about the study's purpose, and informed consent will be obtained. Additionally, all data will be kept confidential and anonymized to ensure the privacy and confidentiality of the participants.

Timeline:

Week 1-2: Review research proposal and obtain ethical approval.

Week 3-4: Collect data through surveys and semi-structured interviews.

Week 5: Analyse data using statistical analysis and thematic analysis.

Week 6: Write up research findings and prepare final report