Technological advancements in NZ Supermarkets: The digitalization of Food Safe Pro implementation (A Qualitative Study).

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Abstract

The development of technology today has contributed to an increase in implementation within many industries. For example, the retail industry has continued implementing modern technologies, machines and systems to provide a more efficient and productive working environment. One of the technologies implemented in New Zealand supermarkets, such as Pak' n Save and New World, was a digital food safety program application (FSP). The primary purpose of this research was to investigate the factors contributing to implementing the Food Safe Program despite its recognised benefits. This research explored the employee's perception and acceptance of the technology Food Safe Program (FSP).

This study adopted a qualitative phenomenological method, completed by interviewing frontline supermarket employees, managers, and supervisors. A sample size of ten respondents was selected, interviewed, and analysed from the interview transcripts through the aid of the qualitative program NVivo. Specifically, utilising two theoretical frameworks, the technology acceptance model (TAM) and Lewin's change theory, has aided in understanding the employees' experience during the FSP implementation.

The research's benefits or results have provided insight into supermarket employees' perceptions during the implementation of food safety technology. This understanding can help determine whether employee perspectives contribute to the limited integration of food safety technology in other food businesses. By highlighting these critical insights, the study advances the comprehension of technology adoption and informs future strategies for more effective implementation in other food businesses.

Keywords: *supermarket retail, implementation, food safety, digitalization, supermarket workers, Food Safe Program app (FSP).*

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced, along with the purpose of use), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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Ethical Approval

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Chapter 1: Introduction

1.0 Introduction

Food safety is vital in the fresh food industry, especially for supermarkets that sell various fresh and non-perishable products. For many years, maintaining food safety was documented using pen and paper. However, the 21st century has ushered in a modernised digital era where technology is developed and implemented in various business operations. With the increasing complexities of food supply chains and product traceability, supermarkets are looking towards innovative food safety technology to enhance food safety standards and regulations. This dissertation delves into implementation of food safety technologies, with a focus on employees as the primary users. By further exploring the perceptions and experiences of the employees, will help the retail food sector gain a better understanding on the adoption process impact and address the challenges to maximize the benefits of the food safe technology.

Compared to the past decade, there has been an increase in the adoption of food safety technologies in the retail food sector. With the possibility of a foodborne illness, food industries recognize the need for strict and technology-enabled management. Three research articles revealed three technologies: First, a temperature monitoring system, ensuring that products are managed and stored at the required temperature to maintain quality (Abass et al., 2024). The second is automated cleaning and sanitation equipment that minimizes cross-contamination risk (Wang et al., 2020). The third technology is the traceability systems, which ensure access to and trace the product from its origins, from the farm to the store shelves, ensuring any problems with the product can be acknowledged and addressed immediately (Olsen & Borit, 2018). Although the food industry has implemented these food safety technologies, there are areas for improvement due to user acceptance and utilization.

Technological advancements have become more noticeable over the years, such as self-checkout machines used in retail stores. Ultimately, retail industries are embracing modern technologies to increase efficiency and productivity in operational performance (Meuter et al., 2003). For instance, there is a shift from being served by a checkout operator at the supermarket counter to using self-checkouts to prevent long lines more effectively (Araújo et al., 2018). Additionally, Sharma et al. (2021) explored whether customers still care about checkout staff due to advanced self-checkout machines. Meuter et al. (2003) studied customers' feelings about self-service machines, such as anxiety about technology. All three researchers focused on various concepts around using and adopting technology, finding that some customers experience tech anxiety and prefer the traditional methods, such as going through the checkout counter. Overall, it highlights the need to understand

employee attitudes towards modern technologies and how these views impact adoption within the food industry.

Hence, it is essential to understand supermarket employees' perspectives towards new technology implementation and whether it is a contributing factor towards limited adoption in many food industries despite its benefits of record traceability, cleaning, inwards traceability, temperature checks, and supporting evidence for the traceability of food quality, handling, and condition of food production environments (Grau-Noguer et al., 2023). By gaining insights into employees' attitudes and challenges, organisations can create various methods to increase technology acceptance and usage. Thus, this helps set the step for future research to discover solutions that address the possible barriers, eventually resulting in improved food safety standards and operational efficiencies across the food industry sector.

1.1 Significance of Research:

The significance of this study lies in its focus on the users of food safety technology within supermarkets. While considerable attention has been given to the implementation and benefits of food safety technology—with 65 per cent of food industries adopting these technologies to enhance supply chain safety (Araújo et al., 2018)—there remains a notable gap in understanding how supermarket employees perceive and utilise these technologies. According to Cobanoglu and Karaman (2013), adopting food safety technology met with resistance primarily due to insufficient resources and a lack of awareness. Thus, this dissertation sets out to fill these gaps and examine the following:

- Employees’ initial response to food safety technology.
- The level of employee training and support.
- The challenges and changes encountered in the working environment.

The first gap in the research pertains to how employees initially perceive food safety technology. The second gap concerns the training and support provided to employees by the headquarters responsible for food safety technology. The last gap looks at challenges and changes employees met during technology adoption in their work environment. This includes identifying the challenges employees face when adopting the technology and the impact on the department. Other research has examined technologies implemented in supermarkets, including self-checkout machines, digitalised

price tags, and online shopping (Sharma et al., 2021 & Garaus et al., 2016). These studies demonstrated various modernised technologies implemented in retail.

This research focuses on understanding supermarket employees' experiences and challenges using food safety technology. The objective is to strengthen training programs and user support for an easier transition for future technology adoptions. Leveraging the findings of this research can assist in advising supermarket management, the FSP technology head office, and food safety regulatory specialists on suitable practices for employee training and technology adoption. This will enable users to use the technology confidently, ensuring consistent and effective food safety practices and contributing to the broader academic literature on technology adoption.

1.2 Research Questions:

By expanding on these studies, this research seeks to address two key questions:

1. How do supermarket employees perceive using the digitized Food Safe Program (FSP app) in daily tasks?
2. How has adopting Food Safe Pro (FSP app) reshaped department operations, such as role changes and challenges the employee faces?

1.3 Overview:

This dissertation contains five chapters. The introduction, which includes the research background and questions, was discussed in the first chapter. Chapter 2 encompasses the literature review, exploring the research gap, previous literature on food safety technology, and the two theoretical frameworks—the Technology Acceptance Model and Lewin's Change Theory—and how they are integrated into this research. Chapter 3 outlines the research methods, detailing the qualitative approach, the sampling method (10 participants), data collection methods (i.e., interviews), analysis using NVivo software, and the ethical considerations involved in conducting this research, such as consent, confidentiality, and privacy. Chapter 4 presents an in-depth explanation of the findings and discussion. Lastly, Chapter 5 discusses the contributions of this research, the limitations encountered, and potential future research areas.

Chapter 2: Literature Review & Theoretical Framework

2.0 Overview

This literature review, three sections explain their relevance to this study's objectives. The first section discusses the background of technology adoption in retail and the Food Safe Pro (FSP) app. Section two identifies and describes the critical factors involved in the Technology Acceptance Model (TAM). Lastly, section three refers to Lewin's Theory of Change, clarifying its essential aspects.

2.1 Background

2.1.1. Importance of Food Safe Systems:

Food safety is crucial for many food businesses, especially when customers purchase food products, whether fresh or pre-packaged. With food safety systems such as the well-known Hazard Analysis and Critical Control Points (HACCP), Panghal et al. (2018) acknowledge that these systems can help recognise, assess, and closely monitor food safety risks. Maintaining safe food standards is fundamental. Bendekovic et al. (2015) suggested adopting robust food safety policies in the retail sector through technological systems to ensure high-quality food safety in supply chain management. Developing and applying these food safety technology systems assists supply chain management and helps supermarket stores maintain and uphold practical food safety standards.

According to McMahon (2013), improvement is still needed as a practical regulatory framework is vital to efficiently overseeing the quality of food safety risks. Although food safety is crucial in various food retail sectors, one area that previous studies need to consider is the implementation of digital technologies in retail food industries. Therefore, in response to this gap in research, this study will explore the integration of digital food safety technology applied and utilised in a supermarket retail setting.

2.1.2. Efficiency in managing food safety in small food businesses:

As technology advances, different business sectors slowly depend on technology to improve productivity and efficiency. This expansion entails the role of digital in food safety, whereby its emergence has dramatically enhanced how fast and easy food safety activities are created for small-scale food industries. As Sgroi (2022) notes, the role of blockchain technology is in building traceability and transparency across agri-food chains to improve food safety control effectiveness and sustainability. Sgroi's (2022) findings align with this study, as it was found that technology

involved in improving food safety management or supply chain management can contribute to increased reliability and productivity when recording food safety tasks.

Jmal (2023) similarly stated that the advantages of digital tools and technologies implemented in small and medium-sized businesses contribute to real-time monitoring and management. Furthermore, Lee et al. (2023) discovered that small and medium-sized food businesses could enhance food safety practices by using digital technologies, including more effective food safety regulations and information sharing between various individuals in the food industry.

Past studies have addressed efficiency in food safety systems. Nevertheless, this research explores the efficiency of food safety systems operating through supermarket outlets, focusing on employees' perceptions of the FSP app. With this integration, one can get advanced functionalities such as real-time monitoring when working on performance and accuracy. Unlike traditional systems, the FSP app enables continuous data and quick corrective action to mitigate risks of foodborne illnesses.

2.1.3. Improving food safety standards using technology

Maintaining and managing food safety is one of the most essential factors in a food business. There have been instances where technology can decrease human error when completing food safety forms. Enhancing food safety through technology is becoming increasingly popular. Advanced technology systems such as blockchain and many other advanced analytics can be useful tools to manage food safety from the supplier to the retail store, such as a supermarket.

According to Eruaga (2024), adopting blockchain technology helps trace the origin of products, enabling effective responses to food safety incidents. This benefits any food business, as blockchain technology can efficiently trace and track products while enhancing food safety standards through its productive process. Similarly, Valdramidis and Koutsoumanis (2016) argue that time-temperature integrators can be utilised during deliveries and at retail locations to monitor the temperature of food products in storage and transit, thereby improving food safety management by providing accurate temperature checks.

As King et al. (2017) highlighted, another advantage of implementing technology is accurately identifying harmful substances in food. Collectively, Eruaga (2024), King et al. (2017), and Valdramidis and Koutsoumanis (2016) portray three food safety technologies that assist in maintaining food safety standards. Previous literature focused on the benefits of the technologies but did not discuss the implementation process, the interaction, and the users' perception of the process.

2.1.4. Food safety digital vs. Paper base in Retail

The transition from paperwork to digital has also shifted with the world's constant technological development and advancements being marketed globally. This is especially true in the food sector, where online purchases have risen since the COVID-19 pandemic. As Grau-Noguer et al. (2023) state, digital technology can improve the accuracy of food safety assessments and enable real-time data sharing among management. While Grau-Noguer et al. (2023) present a recent study on digital food safety technology, food safety paperwork is still frequently utilised despite the rise of technology, as it can be prone to errors and time-consuming. Thaivalappil et al. (2018) argue that despite the accessibility of digital solutions, various small and large retail businesses depend on paper-based systems due to expenses and resistance to change. More recently, and with technological advances, Grau-Noguer et al. (2023) present a literature article emphasising the development of technology in improving food safety.

While both authors provide essential perspectives, this research study aims to extend Grau-Noguer et al.'s (2023) work. This will be done through the lens of food safety technology implementation and will focus explicitly on retail supermarket workers. It will also shed light upon digital technology, highlighting how it promotes an increase in accuracy and efficiency in the retail industry.

2.1.5 Food Safety Pro App (FSP app)

Advanced technology has grown significantly in various industries, improving operational efficiency and productivity and reducing task loads. There are many advantages to implementing technology, and it is clear that food safety technology significantly improves safety standards and practices in the food industry. This area has the potential to be studied extensively, mainly focusing on the experiences and perspectives of employees interacting with food safety technology in a supermarket setting. Ultimately, the FSP app is one of the recent food safety technologies developed to manage and maintain safe food practices in food-related industries such as supermarkets, food manufacturers, or any food industry in general (SafeFoodPro, 2023).

Recently, some supermarkets have adopted this newly developed technology to assist in managing food safety protocols and traceability, according to an article by Pieniak et al. (2019). Furthermore, Shanker et al. (2021) emphasise that significant technological advancements in the supermarket industry have risen and are utilised more effectively to save time and money. Grau-Noguer et al. (2023) provide further insight into supermarket food safety methods, highlighting the transition

from pen and paper to digital software as a simple and easy way to document food traceability and handling standards.

DiPrete et al. (2023) expressed that technology can be successfully incorporated into food businesses, with participants acknowledging its role in maintaining food safety records. While there are many studies on food safety, prior studies concerning the digitalisation of food safety are very few, especially those focusing on the impact on supermarket staff adapting to food safety technology. For example, DiPrete et al. (2023) concentrated on the broader aspect of food safety culture, while Grau-Noguer et al. (2023) investigated the influence of technology on food safety auditors within the supermarket setting.

2.1.6 Technology adoption in Retail

The supermarket adoption of technology in New Zealand is exhibited positively or negatively. According to Aly (2020), the introduction reveals an array of latent beliefs represented by different cultural orientations, which provide distinct barriers and triggers for cooperative retailers in New Zealand, who have little choice but to adopt some form of digital technology. Existing infrastructure challenges here only exacerbate this issue, as small supermarkets might need deep pockets to absorb low margins and the heavy capital expenditures involved in transforming into omnichannel stores. The COVID-19 pandemic accelerated the pivot to online shopping, requiring supermarkets to re-evaluate their approach.

Another reason food safety technology remains limited in its adoption is the cost of implementation, for example, as Feng (2009), highlighted the costs to stage new technology can be quite a determinant of the installation of appropriate technologies. This can include costs for training, materials, and support. Similarly, Mirzaei et al. (2019) highlight that while small retail businesses in New Zealand recognize the benefits and drawbacks of new systems, employee engagement with these systems varies significantly, impacting successful adoption.

There also was a highlight that local retail business in New Zealand experienced obstacles from low technical skills, as well as new system-entry faults when using an outlined small self-service business analytic system and application systems, creating high barriers to adopt such practices for smaller businesses (Esbjerg et al., 2016). However, it is necessary to comprehend such barriers in order to facilitate smooth transitions to new systems.

Understanding these barriers is significant for forming strategies that promote an easier transition for future technology adoptions. This paper examines staff perspectives on modern technology

within a supermarket retail sector and utilises two theoretical frameworks: the Technology Acceptance Model (TAM) and Lewin's Change Theory.

2.2 Theoretical Framework

2.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is commonly adopted by businesses and in numerous past studies to analyse how individuals accept and adapt to new technology (Shankar et al., 2021). Originating in 1989 by Davis, TAM presents two primary elements: perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989). These core factors signify an individual's approach and purpose towards implementing new technology. Utilising TAM has proven effective in various contexts, such as business, education, and medicine. In food safety, technology integration presents technologies such as documentation, traceability, and productivity across food manufacturers, supermarkets, and the broader food industry.

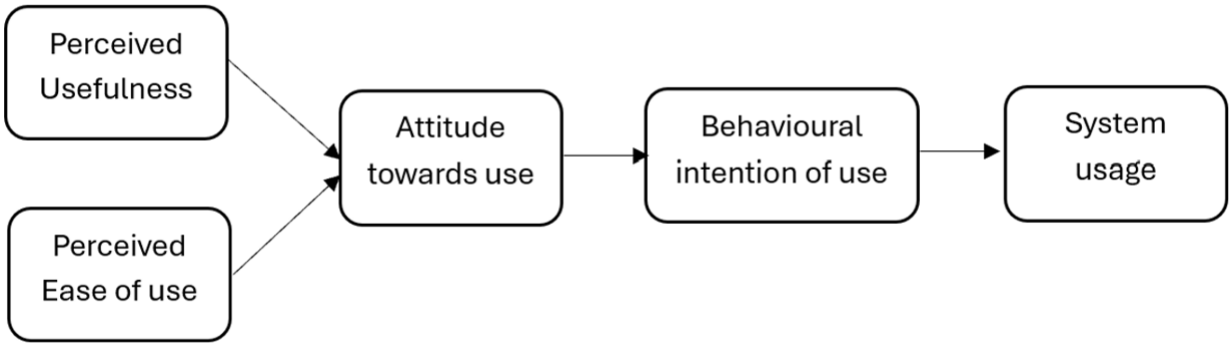
Numerous past studies have adopted TAM to investigate factors that affect individual acceptance of technology in the food industry. For example, An et al. (2023) focused on understanding users' acceptance of mobile food delivery applications and found that innovativeness and trust positively affected TAM's perceived usefulness (PU) and ease of use (PEOU), influencing users' intention (BIOU) to use the food application. Similarly, Sun et al. (2021) and Wen et al. (2021) provided valuable insights into TAM's core elements—perceived usefulness and ease of use—in determining food app users' attitudes towards food technology development and implementation. Thus, the need for technology to be user-friendly and operate effectively is crucial.

From previous literature, TAM has been used to recognise the acceptance of digital solutions, especially among specialists and researchers in the food business. Kumar et al. (2022) provided insight into factors such as trust, security, and privacy concerns to identify whether these factors impact users' decisions towards blockchain technology. It was revealed that security, trust, and privacy significantly impact perceived usefulness and ease of use, demonstrating that these core factors contribute to users' intention to use or accept the technology. Similarly, Bauerová and Klepek (2018) reflected on TAM in the context of online shopping. Their study showed that the perception of usefulness and attitude of online shoppers positively influenced their intention to purchase.

Davis's Technology Acceptance Model has been utilised in many studies and adopted by businesses in various fields, as evidenced by numerous literature articles. TAM is not limited to understanding users' perspectives towards technology; it is also helpful in exploring how business owners decide

and implement technology. However, little literature has explored the context of the supermarket industry, particularly how food safety technology impacts supermarket staff. Gaps in the literature provide an excellent opportunity to gain insight into supermarket workers' perspectives and attitudes towards accepting the food-safe system. By adopting TAM and investigating the link between perceived usefulness, perceived ease of use, and workers' attitudes, this study will contribute to previous research by clarifying the factors influencing the integration of food-safe technology in a supermarket retail context.

Figure 1.



Technology Acceptance Model (Davis, 1989)

2.2.2 Lewin's Change Theory

Lewin's Change Theory is a simple framework for understanding and managing changes. The theory consists of three phases: unfreezing, changing, and refreezing (Cummings et al., 2015). According to Burnes (2019), Lewin's Change Theory is described as a simple model that has proven most influential. Corresponding to Burnes's (2019) study, Hussain et al. (2018) describe the unfreezing phase as a planning stage for businesses to prepare for change. This could include organising the mandatory requirements for change by reducing the traditional existing processes and attitudes. Transitioning from a paper-based system to digital through the unfreezing phase will help identify weak food traceability practices while also contributing to improving and re-evaluating future food documentation. For instance, Charlebois et al. (2024) emphasised the importance of digital food systems as they can assist in tracing and maintaining operational efficiency. This also included tracking products that paper-based documentation could not provide, thus encouraging other food industries to review their food traceability plans.

The changing phase focuses on a series of change stages that commence due to implementing food safety technology (Burnes, 2019). This stage of adopting the FSP app will provide insight into employees' opinions and experiences using the FSP app to understand whether the app can enhance and maintain effective operations. However, it is also essential to assess other factors linked to

implementing new food safety technology, such as additional training in monitoring, procedure documentation, etc. (Ng & Salin, 2012).

Lastly, the refreezing stage, or as Lewin identifies it, the freezing process, entails the new change being effectively integrated and adapted by individuals affected by the change (Burnes, 2019). Jin et al. (2020) state that digitised food safety apps are more secure and effective since they require daily monitoring, which is particularly relevant for managing meat or cold products. The refreezing phase is where the new changes in the business will remain in place as part of a long-term upgraded procedure under the food safety section (Burnes, 2019).

Lewin's Change Theory provides significant insight into implementing food safety technology. It presents a framework for gaining insight into the transition and highlights the crucial significance of stakeholder engagement and the impact of organisational culture on technology uptake. This theory provides an excellent opportunity to contribute to prior research by providing insight into the learning and training received during FSP implementation.

Figure 2.

Lewin's Three Stage Change Model (Lewin, 1940)

Chapter 3: Methodology

3.0 Overview

The methodology section is divided into five sub-sections to explain this research's selected research design process. This section presents the research design, outlining the research method, philosophy and approach designated for this research study. The following section will explain the selected sampling method used in this research. This leads to the data collection, explaining the interview method that will be conducted and constructed. The data analysis procedure involves the critical factor that will be utilised in this study to analyse the data collected. Lastly, to conclude, this methodology section discusses the ethical considerations for this research.

3.1 Research Philosophy:

The research philosophy incorporated interpretivism as a philosophical foundation guiding this research. Interpretivism is a paradigm that highlights the comprehension of social experiences from the individuals' perspectives (Petty et al., 2012, p.270). This paradigm approach is aligned with the purpose of this study. Due to its definition, interpretivism can be applied to understand the employees' experience when the FSP app was implemented and by analysing the employees' experiences and perspectives on adopting the FSP app. This allows the researcher to understand better the impact, challenges, and adjustments that impacted them. In support of this, Petty et al. (2012) argue that this paradigm is appropriate for qualitative research methods like case study methods, phenomenology and ethnography. All of these hold the purpose of further investigating an individual's experiences. Expressly, Kelin and Myers (1999) referred to interpretivism as an excellent method for information systems researchers as it provides a way to obtain the intricacy of human and organisational behaviour. This has proven that the interpretivism paradigm is an appropriate approach used in this research.

3.2 Qualitative Research Design

This research uses the case study approach to gain insight into the impact of supermarket chains adopting a recent food-safe technology called the FSP app. A case study is utilised to provide an in-depth background analysis of a specific occurrence in a real-life situation (Kekeya, 2021). The emphasis of the case study is on two supermarket branches that had been introduced to the FSP app. This study explores how supermarket employees perceive using the FSP app in daily tasks. Also, the challenges and operational changes occurred during the adoption of the FSP app. The data collected was composed of various methods, including semi-structured interviews with supermarket managers and employees and observations when they used the FSP app. Ultimately, data collection through interviews, observations, and written materials helps case studies gain a detailed

understanding of each participant's experience (Baxter & Jack, 2008). A qualitative method approach allowed for a comprehensive insight into the impact the employees experienced when implementing the FSP app. The results will be analysed to clarify the themes and patterns connected to technology's usefulness and identify possible challenges the employees faced during the implementation. Concentrating on this case study allowed the researcher to understand the practical implications of the FSP app in a supermarket setting.

3.2.1 Qualitative Research Method:

A qualitative research design is adopted in this study to understand and explore the perspectives of individuals who have experienced the implementation of a new FSP app in supermarket stores. Applying the qualitative research method is appropriate for this study since it allows for a deeper understanding of the intricate experiences being portrayed through narrative. Qualitative research is used to "understand human experiences" data gathering rather than statistical data (Petty et al., 2012, p.269). This method allows for the exploration of participants' perspectives, attitudes and motivations in ways that the quantitative method cannot capture. By utilizing qualitative techniques through semi-structured interviews and a deductive thematic analysis, this research aims to gain detailed insights into the barriers and ways of adopting the new food safe app. The qualitative method is particularly suited to the research objective of understanding the underlying reasons behind the resistance or acceptance of the food safety app thereby offering a comprehensive view that can inform more effective strategies for future technological implementations.

3.3 Research Design

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implementation. Concentrating on this case study allowed the researcher to understand the practical implications of the FSP app in a supermarket setting.

3.4 Data Collection Methods & Sampling Strategy:

This study conducted ten semi-structured interviews with two major supermarkets in New Zealand stores, New World and Pak n Save. This was to gather a detailed understanding of the participant's perspectives on implementing the FSP app. The interviews involved frontline employees of all levels, from department managers and supervisors to working employees. However, when conducting the interviews for both stores, gaining an interview opportunity with the department employees during working hours was difficult. Especially when Pak n Save and New World stores are hectic during operating hours. Therefore, the best option was to interview the department managers as the primary source of data collection, as referred to in Table 1.

Table 1.

Participants Interviewed

Table of Participants		
Code	Position	Interview Duration
Participant 1	NW Bakery Manager	9 mins
Participant 2	NW Compliance Manager	17 mins
Participant 3	NW Service Deli Manager	26 mins
Participant 4	NW Produce Manager	8 mins
Participant 5	NW Seafood Manager	8 mins
Participant 6	PNS Butchery Supervisor	11 mins
Participant 7	PNS Compliance Manager	13 mins
Participant 8	PNS Service Deli Manager	35 mins
Participant 9	PNS Compliance Manager	7 mins
Participant 10	PNS Seafood Manager	6 mins

Note: Data created by author on 26 of July 2024

The semi-structured interviews with the participants permitted flexibility when gaining more information and allowed for the participant to feel more comfortable speaking when answering questions. According to Kallio et al. (2016), semi-structured interviews give the researcher flexibility when communicating with the "Participants", which can lead to exploring predefined subjects and permitting an in-depth conversation that can further delve into developing themes. This proves beneficial as it facilitates a detailed insight into the "participants" perspective and experience on adopting the FSP app. Also, before and during the interview, the participants were provided with

a copy of the research information sheet and interview questions. This allowed the participants to review the information sheet, interview questions again, and ask any questions regarding the research. The interview questions were focused on understanding their feelings, perspectives, attitudes, challenges, and the changes they faced when the supermarket store implemented the FSP app. As a researcher, consent a was necessary when conducting interviews on store premises. Therefore, after gaining approval from the senior store management, I was given an enclosed room to conduct the interviews. All nine interviews were conducted face-to-face on store premises. The tenth participant was only available to be interviewed on a phone call. The interviews lasted between 6 and 30 minutes according to the audio recorded with the participant's consent and transcribed into a Word document for further analysis. However, Participant 8 preferred not to be recorded, and as a researcher, a note-taking approach was used. According to Weller et al. (2018), note-taking still allowed detailed responses to open-ended interview questions. For instance, what were your thoughts when the FSP app was introduced to the store? This provided an opportunity to recognise the new meaning of participants' perspectives and in-depth comprehension of the main topic (Kabir, 2016). Note-taking and conducting open-ended questions proved valuable for further exploring the impact of the FSP app on participants. Especially when the detailed responses allowed themes and patterns to emerge. The sampling strategy in this research was only targeted towards supermarket employees who interact or use the FSP app daily and often as an essential part of their responsibilities—for instance, department managers, supervisors, department employees and compliance managers. The primary purpose of this sampling was that it not only links to the research scope but also ensures various responses were collected from different departments and stores regarding implementing the FSP app. However, the interviews were roughly nearing the 10-minute, if not 30-minute mark; the open-ended questions allowed for a more flexible, in-depth conversation to occur when gathering information.

3.5 Data Analysis:

Data was collected and analysed from the interviews with supermarket employees by adopting a thematic analysis method. This method is commonly used in qualitative research to analyse collected data. It assisted in solving the research questions and highlighting the primary responses related to developing themes under the theoretical frameworks. The thematic analysis focuses on distinguishing, describing, explaining, and linking themes (Kampir, 2021). Specifically, implementing a deductive analysis approach where the data was analysed through the lens of existing frameworks (Braun & Clarke,2006). This was demonstrated throughout the data analysis as the codes were developed from the theoretical structures of TAM and Lewin's Change Theory. For instance, the deductive approach has allowed various responses to be grouped under one main

theme which is identified at the end of the TAM framework. Thus, demonstrating the theme's importance to various participants. Figure 1 organises participant responses by theme, allowing comparisons of perspectives to be easily made.

Figure 1.

NVivo Matrix Chart: Theme System Usage

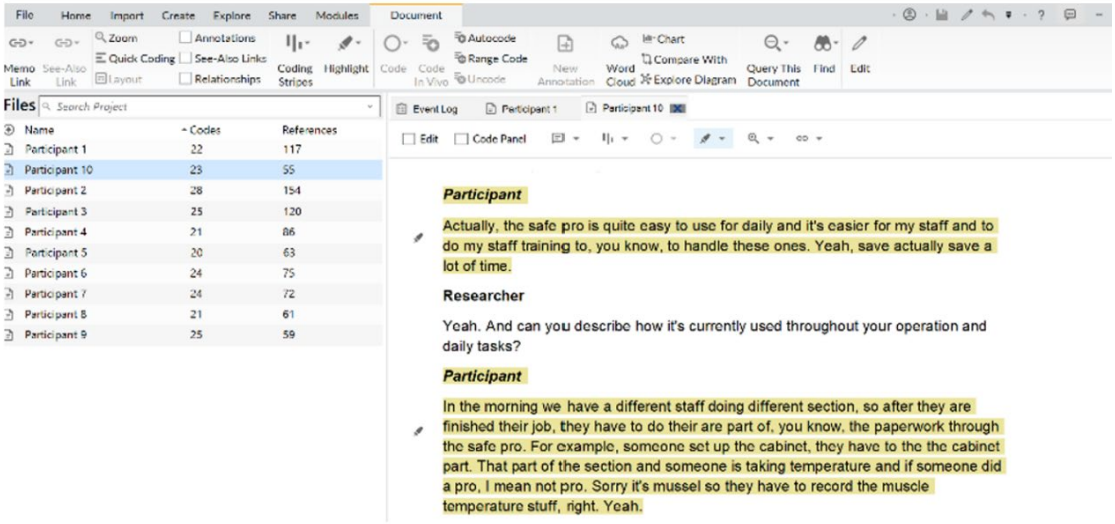
	A : System Usage	B : Corrective Actions	C : Daily Use	D : Suggestion on Improve...
1 : Participant 1	3	0	1	0
2 : Participant 10	6	1	2	0
3 : Participant 2	17	2	3	9
4 : Participant 3	11	0	4	2
5 : Participant 4	7	0	3	0
6 : Participant 5	4	0	3	0
7 : Participant 6	6	1	3	1
8 : Participant 7	3	0	0	3
9 : Participant 8	7	0	2	0
10 : Participant 9	3	0	1	1

Note: Data Collected by author on 07 of July 2024

According to Braun and Clarke (2012), thematic analysis starts with analysing the transcripts multiple times to understand the context and identify emerging patterns. Utilising the analysis tool, NVivo helped analyse the transcripts and organise the codes into various themes. Displayed in Figure 2 is an example of the codes being highlighted and sorted under the themes. The coding, described by Edwards-Jones (2014) as a way to "manage" and concentrate on the distinctive patterns in the data, can be seen in Figure 2. One participant commented on the daily tasks using the FSP app. Categorising the second quotation under the "Daily Use" theme is recognised under TAM's system use (SU). Moreover, thematic analysis demonstrates a "flexible interpretation" and helps researchers in coding by utilising software tools such as NVivo or Excel, especially with big data sets (Castleberry & Nolen, 2011, p. 809).

Figure 2.

NVivo Coding and Organising



Note. Data collected by author on 07 of July 2024.

In this study, generating themes took 12 iterations. Figure 3 represents the original themes developed after multiple analyses and reiterations of reviewing participants' responses.

Figure 3.

Original Themes: After a few Iterations

Technology Acceptance Model	
Perceived Usefulness (PU)	1. **Environmental Impact: (Theme)** **Example Quotes** "It also saves a lot of paper, so overall I can say it increases productivity, and accountability and is environmentally friendly." (P8) "We're going to save quite a lot of trees now because there was a lot of paperwork," (P7) "overall, the environment, it's. I mean, there are a lot of things. I think we save a whole lot of paper when it comes to traceability" (P2) 2. **Improved record keeping: (Theme)** 3. **Increased Efficiency: (Theme)**
Perceived Ease of Use (PEOU)	1. **Learning Curve (Theme)** 2. **Support and Training (Theme)**
Attitude Towards Use (ATU)	1. **Positive Attitude (Theme)** 2. **Improvements (Theme)**
Behavioural Intention to Use (BIU)	1. **Future Plans (Theme)** 2. **Interest for Implementation (Theme)**
System Use (SU)	1. **Daily Use (Theme)** 2. **Corrective Actions (Theme)** 3. **Adaption (Theme)**
Lewin's Change Theory	
Unfreeze	1. **Identifying need for Change: (Theme)** 2. **Motivation for Change (Theme)**
Change	1. **Implementation of FSP app (Theme)** 2. **Learning & Adapting (Theme)** 3. **Overcoming Challenges (Theme**
Refreeze	1. **Establishing new norms (Theme)** 2. **Acceptance (Theme)** 3. **Support & Improvement (Theme)**

Note: Data collected by author on 07 of July 2024.

Transcripts were continually examined and "refined" until they represented the data (Guest et al., 2012). For instance, after further investigation and analysis, supermarket employees highlighted the theme of improved record-keeping as an advantage. This was demonstrated through various reiterations in Figure 4 over a few days, with constant changes and comparisons to the analysed responses.

Figure 4.

Day One: NVivo History Log

28/06/2024 4:14 PM	Technology Acceptance Model\Perceived Usefulness\At	Codes	Modified	Coded
28/06/2024 4:13 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:10 PM	Lewin's Change Theory\Unfreeze\Change\Refreeze	Codes	Modified	Coded
28/06/2024 4:10 PM	Technology Acceptance Model\Perceived Usefulness\At	Codes	Modified	Coded
28/06/2024 4:09 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:08 PM	Lewin's Change Theory\Unfreeze\Change\Refreeze	Codes	Modified	Coded
28/06/2024 4:08 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:06 PM	Lewin's Change Theory\Unfreeze\Change	Codes	Modified	Coded
28/06/2024 4:05 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:03 PM	Technology Acceptance Model\Perceived Usefulness\At	Codes	Modified	Coded
28/06/2024 4:03 PM	Lewin's Change Theory\Unfreeze\Change\Refreeze	Codes	Modified	Coded
28/06/2024 4:02 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:02 PM	Technology Acceptance Model\Perceived Usefulness\At	Codes	Modified	Coded
28/06/2024 4:01 PM	Lewin's Change Theory\Unfreeze\Change	Codes	Modified	Coded
28/06/2024 4:01 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:01 PM	NW Bakery interview	Files	Modified	
28/06/2024 4:00 PM	Technology Acceptance Model\Perceived Usefulness\At	Codes	Modified	Coded

Note. Data collected by author on 28 of July 2024.

Figure 5 signifies returning and modifying the themes after further analysis of participant responses. Modification continued and ended in early August based on the dates from late June.

Figure 5.

Latest NVivo History Log

Logged	Name	Location	Event	Detail
4/08/2024 11:26 PM	Technology Acceptance Model\System Usage\Suggestion	Codes	Modified	Renamed from Suggestion on Improvements (Theme
4/08/2024 11:26 PM	Technology Acceptance Model\System Usage\Corrective /	Codes	Modified	Renamed from Corrective Actions (Theme)
4/08/2024 11:26 PM	Technology Acceptance Model\System Usage\Daily Use	Codes	Modified	Renamed from Daily Use (Theme)
4/08/2024 11:21 PM	TA		Created	
4/08/2024 9:22 PM	Lewin's Change Theory\Refreeze\none	Codes	Modified	Renamed from Positive Acceptance
4/08/2024 9:22 PM	Lewin's Change Theory\Refreeze\Daily operations	Codes	Modified	Renamed from Daily Operations Established
4/08/2024 9:21 PM	Lewin's Change Theory\Change\Stages to adopting FSP a	Codes	Modified	Renamed from Implementation of Food Safe Pro
4/08/2024 9:21 PM	Lewin's Change Theory\Change\Adaption	Codes	Modified	Renamed from Training & Adapting
4/08/2024 9:21 PM	Lewin's Change Theory\Change\Initial Complexity	Codes	Modified	Renamed from Solving Challenges
4/08/2024 9:21 PM	Lewin's Change Theory\Unfreeze\Incentives for adopting F	Codes	Modified	Renamed from Motivation for change
4/08/2024 9:20 PM	Lewin's Change Theory\Unfreeze\Identifying discrepancies	Codes	Modified	Renamed from Identifying need for change
4/08/2024 9:19 PM	Technology Acceptance Model\System Usage\none	Codes	Modified	Renamed from Adaption to Food safe Pro (Theme)
4/08/2024 9:05 PM	Technology Acceptance Model\Behavioural Intention of U	Codes	Modified	Renamed from Interest in implementation (Theme)
4/08/2024 9:05 PM	Technology Acceptance Model\Behavioural Intention of U	Codes	Modified	Renamed from Future plans (Theme)
4/08/2024 9:05 PM	Technology Acceptance Model\Attitude towards Use\Posi	Codes	Modified	Renamed from Positive attitude (Theme)
4/08/2024 9:04 PM	Technology Acceptance Model\Attitude towards Use\non-	Codes	Modified	Renamed from Uncertainty (Theme)
4/08/2024 9:04 PM	Technology Acceptance Model\Perceived Ease of Use\Trai	Codes	Modified	Renamed from Training and Support (Theme)

Note. Data was collected by author on 28 of July 2024.

The last step was reporting the findings in writing, viewed in Chapter 4 of this dissertation. Initially, twenty-one themes were identified under TAM and Lewin's Change Theory. However, after further reiterating the participants' responses, the themes decreased to seventeen, with some themes being modified in identification. For example, "positive attitude" was modified to "positive impact" since

the responses were analysed based on the practical impact of using the FSP app. The data analysis demonstrated the FSP app's overall impact based on participants' responses. It efficiently addressed and developed suitable themes that effectively addressed the research questions.

3.6 Reliability:

Ultimately, research must be accurately validated through continuous comparisons and reiterations with other data and contexts (Leung, 2015). This was demonstrated through NVivo historical logs displayed in Figure 4. An organized approach to data maintenance leads to appropriate outcomes that address the research purpose. Ensuring the reliability of the findings was crucial, as well as incorporating effective and efficient procedures to maintain consistency. One significant approach was managing data more securely. All data collected for this research was recorded, maintained, and secured in an electronic database during the research stage. The database contained audio-recorded files from interviews, Word document transcripts from recordings, interview notes, and multiple analysed documents in Excel. The interview recordings, in particular, allowed the researcher to refer to them repeatedly for thorough analysis and accuracy (Noble & Smith, 2015). Additionally, NVivo was a software tool utilized during the data analysis process to assist in organizing and enhancing the trustworthiness of the data through multiple reiteration processes. This included modifying, changing, reorganizing codes and retitling themes to reflect the data accurately.

Furthermore, a project file was created to ensure all recorded documents were explicitly labelled and saved in the database for retrieval during research. This practice ensured that the data was documented and easily retrievable, decreasing the chance of inaccuracies. Triangulation was utilized to ensure the reliability and credibility of the research. For example, various data sources involved participants in different roles and working in different stores. According to Patton (2002), triangulation is applied by examining various data sources and procedures to cross-confirm the results, thereby increasing the integrity of the research.

3.7 Validity

Validity in qualitative research is critically important to demonstrate throughout the research process. It ensures that the results are accurately represented for the intended purpose of the research. According to Morse et al. (2002), the collected data must accurately reflect the research topic, be dependable, and be free from biases to attain validity. This is evidenced by demonstrating validity within the context of data collection. Interviews were conducted on supermarket premises to gather the necessary quotations for this research. Researching the premises made participants feel comfortable, as it was conducted in a familiar environment. Furthermore, this research utilized participant quotations to reflect the study's purpose and accuracy.

3.8 Ethical Considerations

Ethics plays a crucial role in this research study and all research projects. Without ethics applied in research studies, it would be uncertain how the research would be conducted appropriately. Ethics or ethical considerations are referred to as safeguards for the rights and security of the participants. For example, before the interview, all participants were given informed consent, including information sheets, interview questions, and consent forms. It is mandatory to abide by the ethical procedures, as informed consent is vital to ensure all participants know the research's "purpose, process, risk, and withdrawal rights" (Orb et al., 2001, p.22). An oral consent form was provided for participants who preferred to participate via phone call or FaceTime, and the researcher read out the oral consent while audio recording as proof of the participant's consent. Therefore, with audio-recording and written materials, confidentiality is one of the most essential ethical standards to maintain in every research study. For example, anonymizing research participants while ensuring data collected is securely stored on the AUT OneDrive. Furthermore, the data is stored on a password-protected computer, with only the researcher and primary supervisor having authorized access.

Before the interviews began, the institution's AUT ethical committee conducted an ethical review assessment to minimize potential risks in this study, and approval was obtained. Participation in this study is strictly voluntary. Additionally, the researcher's self-reflection ensures that "potential biases" between the researcher and participants can be mitigated (Berger, 2015, p5). By adopting these crucial ethical considerations and standards and, most importantly, following the AUT ethical policies and standard procedures, this study will produce valid, reliable, and ethical research results to contribute to the research field.

Chapter 4: Findings & Discussions

4.0 Overview

Chapter 4 will be going over the findings based on the data that was analysed in this research. The first section of findings will be discussing the themes generated under the Technology Acceptance Model. Followed by the second section of themes developed under Lewin's Change Theory. The last section will be the discussions regarding the findings developed to address the research questions.

4.1 Technology Acceptance Model:

The themes identified in Table 1 were generated based on the supermarket employees' perceptions of the FSP app. The theme codes represented the patterns developed and identified during the analysis process.

Table 1.

TAM Framework Example Quotes and Themes

Technology Acceptance Model	**Theme Codes**		**Example Quotes**
Perceived Usefulness (PU)	**1.**	**Environmentally sustainable:**	*"We're going to save quite a lot of trees now because there was a lot of paperwork…"* (Participant 1).
	2.	**Improved record keeping:**	*"Definitely make keeping track of everything way easier …in bakery you're busy all the time, sometimes like when you're busy doing something and it'll give you a ping. Reminder to do something …"* (Participant 1) *" …. Having access into old records…. can just click…which day it is and if forms are completed……"* (Participant 2).
	3.	**Increase time efficiency:**	*"It's good, yeah efficient, a lot of time save and yeah because initially we had a lot of paperwork to be completed. It seems pretty easy, convenient and efficient"* (Participant 5). *"…. I can even give an example…butchery department on the paper base form for many years and we always struggle to get that completed because in every single thing they have to sit and write and make time to complete the form."* (Participant 9)
Perceived Ease of Use (PEOU)	**4.**	**User-friendly:**	*"I mean at the start it definitely can be rough because it's something new, but people realised its much easier to do than with paper..."* (Participant 1).
Attitude Towards Use (ATU)	**5.**	**Positive impact:**	*"...I think we are going in the right direction going with food safety ...with this we can do and look at the next day. So, it's quite easy to maintain…"* (Participant 7) *"For us, yeah, I mean we're just so glad that we went for this app rather than the paperwork stuff…. I recommend they're the best"* (Participant 3)

Behaviour Intention of Use (BIOU)	**6.**	**Future actions for continue usage:**	*"…just connect straight away and getting it set up on my phone and everything…I've never had any issues with it. Very good…it made things a lot easier so yeah, every store should be on it…"* (Participant 4)
System Usage (SU)	**7.**	**Daily Use:**	*"In the morning, we have different staff doing different section, so after they have finished their job, they have to do their part… through the food safe pro. For example, someone set up the cabinet, they have to do the cabinet part of the section, or someone is taking temperature for mussels. So they have to record the mussel temperature…"* (Participant 10) *"Managers/supervisors check that all machines and tools we use in the department are intact with no missing pieces, gloves etc, take the temperatures of the display, take temperatures of the product displayed and cooked, check stock, ensure cleaning tasks before cooking etc……"* (Participant 8). "*I use it in all rounds for department checks and whether departments have been completing their daily, weekly, monthly tasks regularly on time. I am able to…. also escalate many notes and I look for customer complaints.."* (Participant 9)
	8.	**Corrective Actions:**	*"……. I mean obviously our records not perfect, but it's actually how we follow it up… like if they miss the temperature…you need to retrain your team to make sure it's actually not going to happen again..."* (Participant 2). *"The blue note, you know that took a long time, but we got there…... I mean it's not a problem. We just don't like having to fill out why…you've got to have a reason why particular areas haven't been completed..."* (Participant 6).
	9.	**Suggestion on improvements:**	*"…if making a CAR, I would need 2000 characters… because I have to cover everything…perhaps give a little bit more characters to write…"* (Participant 2). *"…through the logistics side of it, like when we receive the stock, there should be like a checklist on it."* (Participant 7) *"Mainly to navigate the summary of it…. It will be easier to summarize how many customer complaints you got, how many escalations you got and stuff to summarise it. But in safe food pro you have to kind of like deep dive into it to navigate that section."* (Participant 9).

Note. Quotes (Data) collected by author on 5th of June 2024.

4.1.1 Theme 1: Environmentally sustainable

Environmentally, sustainability has been recognized as an essential theme due to its impact on decreasing paper waste and usage. It was found during interviews that most participants initially perceived adopting the FSP app as a great way to reduce paper usage and save trees. This finding aligned with the perceived usefulness of the TAM framework, which suggests that the perceived advantages of the FSP app influence acceptance and usage. The following quote exemplifies one participant's view on the environmental benefits of the FSP app: *"We are going to save quite a lot*

of trees now because there was much paperwork…" (Participant 1). This resonates with Jmal (2023), who stated that adopting new technology reduces paper usage and lowers printing costs. Therefore, less handling of food-safe paperwork is required to maintain and keep track of the traceability of fresh goods produced in the departments.

Additionally, the influence of the FSP app being environmentally sustainable was supported by Grau-Noguer et al. (2023), who stated that food safety inspections also require checking through food-safe paperwork and that using paper during the inspection was time-consuming. The findings provide insight into the vital role of perceived usefulness in accepting the FSP app due to its environmental benefits. This allowed supermarkets to become more environmentally responsible by decreasing paper waste by adopting the FSP app, further enhancing the value of food safety practices in supermarket retail.

4.1.2 Theme 2: Improved Record Keeping

Record keeping for food safety is and continues to be a requirement in supermarket retail to maintain and ensure consistency when managing food safety protocols. The main advantage of improved record-keeping resulted from adopting the FSP app. Improved record keeping was identified under perceived usefulness (PU) from TAM's framework. Participants reflected that improving record keeping by integrating the FSP app in supermarkets would bring additional value to the working environment. As one participant shared, *"Definitely makes keeping track of everything way easier …in bakery, you're busy all the time, sometimes like when you're busy doing something, and it will give you a ping. Reminder to do something …"* (Participant 1).

As stated by Participant 1, employees at supermarkets such as Pak'n Save, New World, and many others tend to be busy, which can lead to missed tasks. Therefore, it would be beneficial to use the FSP app to notify staff and remind them to complete the FSP app food safety records. Moreover, adopting the FSP app can assist employees with a more "comprehensive monitoring and data collection system" that can increase food safety effectiveness, decrease food safety risks, and practice food safety compliance protocols (Eltabey, 2023, p. 48). Another response expressed that improved record keeping was perceived as applicable since most participants compared the manual process of documenting food safety on paper to using the FSP app. Further analysis revealed that the FSP app allows viewing previous records while ensuring accuracy during daily recording. Another participant echoed this view and commented, *"…. Having access into old records…. can just click…which day it is and if forms are completed……"* (Participant 2).

Furthermore, the perceived usefulness of the FSP app was apparent in its capability to enhance the food safety management system, which is crucial for maintaining food safety practices in supermarkets. As highlighted by Duan et al. (2024), technology expansion is fundamental in improving business operations, and all food safety technology should aim to replace manual practices with new ones so that food safety requirements are accurately recorded daily. The following supporting statements and studies further present that implementing the FSP app for supermarkets can be incredibly beneficial for maintaining accurate records without delay and errors.

4.1.3 Theme 3: Increase Time Efficiency

Recognized under perceived usefulness, implementing the FSP app in supermarkets has shown increased time efficiency. The 'Increased Time Efficiency' theme targets how the participants perceived using the FSP app. Participants observed that the introduction of automated record-keeping and real-time monitoring tools has made managing food-safe practices more time-efficient. This was one of the most commonly expressed views by the participants: *"It is good, yeah efficient, a lot of time save and yeah because initially, we had a lot of paperwork to be completed. It seems pretty easy, convenient and efficient"* (Participant 5). Participant 5, among many participants, shared similar thoughts during the interview. With the constant mention of record-keeping changes, the views focused on transitioning from paper to the FSP app. The participants discussed the comparison between both as having a significant and beneficial impact on increasing efficiency for many employees. Another participant provided an example of how efficiency increased in daily department tasks after adopting the FSP app*: "...I can even give an example…butchery department on the paper-based form for many years, and we always struggle to get that completed because, in every single thing, they have to sit and write and make time to complete the form."* (Participant 9)

Based on the evidence presented by Participant 9, the inefficiency of completing food-safe forms on paper, which required sitting and writing, demonstrates an inefficient food-safe procedure. This further proves that the app's practicality gives insight into increasing effectiveness and efficiency when practising daily food safety regulations and procedures. As Lei and Wang (2023) clarified, most businesses adopting the technology will benefit employees in-store by increasing 'speed, accuracy, and efficiency' when completing daily tasks. With further analysis, the FSP app being implemented in supermarkets can also contribute to a faster response to possible food-safe issues and increase department operations. This could occur if an issue with a product or equipment needs to be solved urgently. In support, Grau-Noguer et al. (2023) pointed out that transitioning from paper to digital allowed food records to be stored and notifications sent in real-time without the paperwork. The real-time feature of the FSP app has contributed significantly to increasing time

efficiency based on the majority of participant comments, as seen in Figure 1. Together, these results have provided insight into employees' perceived outlook when using the FSP app daily. Additionally, highlighting the impact of the FSP app on employees and the primary influence of efficiency increase was acknowledged under perceived usefulness.

Figure 1.

NVivo Matrix: Perceived Usefulness

	A : Perceived Usefulness	B : Environmental Sustain...	C : Improved Record Keep...	D : Increase time efficienc...
1 : Participant 1	8	0	2	7
2 : Participant 10	3	0	2	2
3 : Participant 2	6	1	3	1
4 : Participant 3	2	0	2	0
5 : Participant 4	5	0	2	2
6 : Participant 5	4	0	3	2
7 : Participant 6	2	0	1	1
8 : Participant 7	3	1	2	2
9 : Participant 8	2	1	1	2
10 : Participant 9	1	0	0	1

Coding Matrix Chart

Note: Data collected by the author on 28 of July 2024.

4.1.4 Theme 4: User Friendly

There has been a notable increase in trust in using the FSP app among the employees. This increase in trust has made the app user-friendly and aligns with the perceived ease of use aspect of the TAM framework. The theme's primary reason, user-friendliness, was based on the participants' certainty in utilizing the FSP app. Consistent learning and familiarization with the FSP app have helped employees progress and adjust well. One participant commented, *"I mean, at the start, it definitely can be rough because it's something new, but people realized it's much easier to do than with paper..."* (Participant 1). All participants agreed with the quote made by Participant 1. It was clear that the FSP app provides an easy and reliable process for monitoring food safety, which has increased their trust in using the app in daily operations. Particularly when Yang and Jong (2021) emphasized that trust in technology adoption plays a significant role. In this theme of trust, the participants briefly mentioned that there were some difficulties, in the beginning, in adjusting to the sudden transition from paper to the digital FSP app. According to Liberity et al. (2023), machine learning can assist in gaining 'hands-on experience,' thereby overcoming the challenges faced and following the new food-safe practices more effectively. There were challenges initially before realizing the ease of use, and the growth of trust in using the app settled in later. As time progressed and with further understanding, the employees began to recognize the benefits of the FSP app

implementation during daily tasks. Additionally, through perceived ease of use, trust was a significant factor that contributed to the employees' acceptance of the FSP app, deeming the app user-friendly while ensuring the app was used to complete daily tasks needing to be completed.

4.1.5 Theme 5: Positive Impact

The positive impact was an important recurring theme recognized during the analysis. The purpose of the positive impact theme was that most of the participants interviewed reflected a positive reaction or attitude towards adopting and using the FSP app. Therefore, a positive impact was created and highlighted under TAM's attitude towards use (ATU) phase.

Increasing food safety practices and their importance to the supermarket as a business and to the customers shopping in-store were also emphasized: *"…I think we are going in the right direction with food safety …with this, we can do and look at the next day. So, it's quite easy to maintain…*" (Participant 7). Participant 7's answers were similar to those of other participants, who emphasized the overall analysis of using the FSP app. Commenting on the FSP app's implementation, Participant 7 highlighted that retail is heading in the right direction, with two positive advantages: viewing the food-safe forms ahead of time and ease in maintaining records. In addition, Participant 3 further exclaimed, "For us, yeah, I mean we're just so glad that we went for this app rather than the paperwork stuff.… I recommend they're the best" (Participant 3).

This highlights the main point that the FSP app is a better technology than food-safe paperwork, along with a recommendation that it is an excellent app for supermarkets to implement further. After further analysis, the data revealed that the theme of positive impact under attitude towards use (ATU) surfaced essentially about using the FSP app. It was clear that based on the findings, nearly most of the participants had similar responses to using the FSP app. This was viewed on the chart where eight out of ten participants felt the FSP app was great to adopt in supermarkets, resulting in a positive attitude towards using the app.

According to Kwon and Ahn's (2023) study, once users of the FSP app experienced the enjoyment of using the technology, employees were more likely to hold a positive attitude towards technology. Additionally, Grau-Noguer et al. (2024) agreed with Kwon and Ahn's findings since Grau-Noguer et al. (2024) also stated that there would likely be a positive rise in effectiveness after using technology. By adapting and using the FSP app, the positive impact can decrease the influence of food-safe mistakes during daily operations and showcase the importance of positive impact from the employees to utilize the benefits.

4.1.6 Theme 6: Future Actions for Continued Usage

Through the implementation and usage of the FSP app, further analysis presents future actions for continued usage, another theme recognized in the findings. This theme was identified under the TAM structure, specifically under the behavioural intention of use (BIOU). Future actions for continued usage were developed to represent the participants' response when using the FSP app, which was depicted as long-term through their actions. The following response from Participant 4 was similar to the responses of most participants involved in the interview: *"…just connect straight away and getting it set up on my phone and everything… I've never had any issues with it. Very good…it made things a lot easier, so yeah, every store should be on it…*" (Participant 4). Participant 4's satisfied response aligns with Foroughi and Yadegaridehkordi (2024), who found that satisfaction was crucial for employees when implementing technology. Especially when there were no problems with using the FSP app, it made completing tasks more efficient and manageable, contributing to Participant 4's willingness to continue usage in the future. According to Abideen et al. (2021), embracing digital technology can improve food safety by increasing performance in completing forms and increasing efficiency and reliability. Additionally, it was reasonable when Participant 4 recommended other supermarkets implement the FSP app since it can enhance food safety procedures in supermarkets in the future.

4.1.7 Theme 7: Daily Use

Daily use was a theme developed to identify how the participants used the FSP app after the implementation phases. Under the TAM framework, daily use was recognized under system use (SU) since it was based on the participants' responses involving their day-to-day tasks using the FSP app. One participant answered, "*In the morning, we have different staff doing different sections, so after finishing their job, they have to do their part… through the safe pro. For example, someone sets up the cabinet, does the cabinet part of the section, or takes the temperature for mussels. So, they have to record the mussel temperature*…" (Participant 10).

The response from Participant 10 was similar to that of most participants involved in the interview. All had standard food safety practices in the morning, where the department employees had various tasks to complete by having different staff members assigned tasks to be completed each day using the FSP app. Whether it involved tasks such as cleaning, traceability of products, or temperature checking, all roles and tasks were required to be completed daily.

Further analysis of the data collected involved the department managers' daily tasks, which were explained by Participant 8, "*Managers/supervisors check that all machines and tools we use in the department are intact with no missing pieces, gloves, etc., take the temperatures of the display, take*

temperatures of the product displayed and cooked, check stock, ensure cleaning tasks before cooking, etc….." (Participant 8). The manager's role is to ensure that all department equipment, tools, and protection gear, such as gloves, are specified since these tasks are crucial to food safety protocols. Along with ensuring all standards of food safety are practised by maintaining checks on stock, temperature records, and cleaning, among other tasks, are completed using the FSP app.

Specifically there were three participants whose daily tasks using the FSP app were slightly different compared to the managers and department staff. As stated by Participant 9, "*I use it in all rounds for department checks and whether departments have been completing their daily, weekly, monthly tasks regularly on time. I can…. also escalate many notes, and I look for customer complaints*." (Participant 9). After further analysis, another two participants and Participant 9 undertook the same role and tasks. As reflected in Participant 9's statement, there was a clear indication that the role and tasks were significantly crucial since the daily tasks listed demonstrated the overall managing of the FSP app when it was mentioned "*using it in all rounds for department checks*" and ensuring food-safe practices were completed promptly. According to Jmal (2023), food safety systems help give an overview of daily tasks that have been completed. They allow department management to manage food-safe practices efficiently and productively. In addition, other daily tasks, such as checking customer complaints and escalating notes, were also not explicitly stated by other participants. In fact, through "escalating notes," the FSP app's real-time feature has allowed for potential issues to be escalated, which contributed to improved responsiveness and proactive management of food safety in supermarket operations.

However, different roles and tasks were assigned according to all participants' responses using the FSP app. The FSP app has revealed daily tasks, such as monitoring food temperatures, tracking stock, and documenting other food safety records, to be simplified and provide easy access to records. Also, a previous study discovered that food-safe systems are beneficial since they can reduce manual errors and save time, allowing employees to be more productive and complete other tasks (Grau-Noguer et al., 2023). The findings of theme 8 indicate that daily tasks using the FSP app have increased productivity, ease in managing food-safe records, and increased employee efficiency in completing tasks, contributing to a safer and more effective supermarket workplace.

4.1.8 Theme 8: (SU) Corrective Actions

Corrective actions were created and classified under system usage (SU) of TAM's framework. This was based on responses from participants who clarified that new food-safe procedures were implemented if food-safe forms were incorrectly filled or incomplete in the FSP app. The central theme of corrective actions was the participants' approach to addressing the problem and ensuring it

did not occur again. According to one of the participants, "*……. I mean, obviously, our records are not perfect, but it's actually how we follow it up… like if they miss the temperature…you need to retrain your team to make sure it's not going to happen again..."* (Participant 2). Participant 2 mentioned that although their records are not perfect, there was always retraining involved with the department team as a reminder to ensure temperatures were recorded on the FSP app. Several participants gave similar responses to Participant 2. The managers had to retrain the department staff, especially when food-safe forms were incomplete or missed.

Additionally, Participant 6 commented on the new corrective measures that needed to be actioned when the FSP app displayed incomplete, missed, or incorrectly completed forms. Participant 6 stated, "*The blue note, you know that took a long time, but we got there…... I mean, it's not a problem. We just don't like having to fill out why… you've got to have a reason why particular areas haven't been completed..."* (Participant 6). Participant 6's response described the blue note as a representation of a corrective action that was needed to apply to any missed, incorrect, or incomplete food-safe forms on the FSP app. The blue note was utilized to report a specific reason why the form was incomplete or why it was incorrectly filled in. According to Singh et al. (2022), if food traceability is incomplete, creating or writing a note seems to be the corrective action to rectify the problem.

Further analysis also points out that creating blue notes could allow management to address food safety compliance standards immediately, preventing delays in retraining and ensuring food-safe records are completed on time. This aligns with Eruage (2024), who mentioned that constantly monitoring food-safe practices can help identify any issues and adjust the food safety control measures while using corrective actions to solve food safety problems. This proactive approach increases effectiveness and confidence in the employees' ability to ensure the FSP app has been completed.

As a result, in theme 9, corrective actions using the FSP app demonstrated an effective response to immediately addressing any incompetent practices regarding incomplete FSP app daily forms. Retraining was implemented to correct employees' actions and prevent future problems from reoccurring. Overall, this improved food safety and standard protocols in supermarket operations.

4.1.9 Theme 9: (SU) Suggestion on Improvements

Since implementing the FSP app, recognized under TAM's system usage (SU), a theme, Suggestions on Improvements, was generated. This last theme under the TAM framework referred to suggestions by participants about additional features that can further improve the effectiveness of the FSP app. These suggestions include vital points that are more efficient and effective when

navigating or using the FSP app. Additionally, they would assist in reducing the time spent learning and using the system. One participant commented on the limitations of characters used to explain a corrective action report (CAR). Participant 2 responded, "…*if making a CAR, I would need 2000 characters… because I have to cover everything…perhaps give a little bit more characters to write..."* (Participant 2). The suggestion of increasing characters in the FSP app indicates the high significance of the report, especially when there was a warning regarding the requirements of ensuring all problems are documented in the CAR. Therefore, there is an expectation of increasing the number of characters in the CAR instead of limiting it to fewer than 2000 characters.
Participant 7 commented on the logistics side of when supermarket stores receive deliveries. It was suggested that a checklist should be featured on the FSP app to ensure stocks have been received after delivery. Participant 7 stated, "…*through the logistics side of it, like when we receive the stock, there should be like a checklist on it*." (Participant 7). This checklist would also manage the stock counts of the products after delivery, which will be productive and efficient when featured on the FSP app. This will ensure the effective handling and management of stock being received at the supermarket.

Participant 9 did not suggest any additional features to be added to the FSP app. However, it was recommended that the navigation outline of the FSP app be improved to provide easy access to summaries of customer complaints and note escalation or corrective action reports. As expressed in the response, "Mainly to navigate the summary of it…. It will be easier to summarise how many customer complaints you have, how many escalations you have, and stuff to summarise it. But in Safe Food Pro, you have to kind of like deep dive into it to navigate that section." (Participant 9).

According to Jmal (2023), the findings highlighted that featured digital tools could improve in real time and ensure accurate traceability. Based on the three participants, suggestions of additional features can address the few improvements needed to help department operations use the FSP app effectively and efficiently. Applying the features suggested would aid in reducing mistakes in filling out the FSP forms and assist in accurate practices of food safety standards. In addition, Lei et al. (2023) emphasized that food industries or supermarkets should use technology in food safety practices, from supply chain to traceability documentation, to maintain high food safety standards and protocols. Overall, suggestions for improvement from participants on using the FSP app will contribute to increasing development in the app's effectiveness for employees using the app for daily tasks.

4.2 Lewin's Change Theory:

In this section, the themes are recognized and categorized under Lewin's change theory, which consists of the unfreezing, changing, and refreezing stages. This is reflected in the participants' responses from the initial stages of implementation to the transition and, lastly, adapting and solidifying the new changes (Cummings et al., 2016). Each theme under Lewin's change phases represents the different stages of implementing the Food Safe app. For instance, unfreezing refers to the time before the change occurs, also known as the introduction to the Food Safe app (Hussin et al., 2018). The change stage is the shift from the old process of paper-based recording to the new digital recording process. The refreezing stage involves firmly sticking to the new process of using the Food Safe app. Overall, the themes discussed are meaningful and essential in this section. They will assist in further understanding the impact of the FSP app in department operations and clarify more details of the transition from a different theoretical framework than TAM.

Table 2.

Lewin's Change Theory Theme Codes and Example Quotes

Lewin's Change Theory	Theme Codes		Example Quotes
Unfreeze (UF)	**1.**	**Identifying discrepancies:**	*"Initially we had a lot of paperwork ..... there's a lot of chances to lose your data and paperwork at the end of the week...so paper are inefficient"* (Participant 5) *"... before there were incidents where people would discard the paper they were writing, and then there's a gap in the paperwork ... the next day corrective action would be taken..."* (Participant 7)
	2.	**Incentive for adopting FSP app:**	*"... easier to handle once under the app...all I can say it increases productivity...."* (Participant 8) *".... compared to the manual filling there were chances of manual paper being missed but regarding to food safe pro its time stamped and it's easy to complete"* (Participant 9)
Change (CH)	**3.**	**Stages to adopting the FSP app**	*"...the compliance manager.... was the one to introduce safe food pro...I was told in seafood it will be on app and whatever paperwork that I was doing before they have been transferred to the food safe pro."* (Participant 5). *"At the very start we had to request tasks to be added according to the department requirements."* (Participant 8). *"have a 4-digit number .... like a staff number"* (Participant 3). *".... two full day training from the head office, and they basically went through line by line and then gave their proper instructions and guideline and kit. And we also had some demo sessions prior to going live for the usage..."* (Participant 9).
	4.	**Initial Complexity**	*".... the only thing is, the tablet was a bit hard. Like with gloves ....cause obviously we're wearing gloves... and gloves aren't really touch safety with it.."* (Participant 1).

			"…we were used to paperwork…you know pen and paper. We've been doing it for years and years and then when this new programme came. It took a little while for everyone to get used to it. But it's better because on a day-to-day basis." (Participant 6).
	5	**Training and Support**	*"Actually, it was quite hard when you are working through paperwork for 11 years to get it within the system. But once you get the hang of it, we're still learning new stuff you can do…. we only had support for one day."* (Participant 7). *"….we were just given like less than five days. Only one trainer, and it was quite hard for her because of some of the people from the department. They didn't have exposure to the tablet, and they didn't know how to use it…." (Participant 7)* *"Yeah, I just don't like electronic stuff…"* (Participant 6,).
	6.	**Adaption:** .	*"It just took three full weeks; I would say to get in the rhythm correctly. Now they do it very naturally, it comes to their mind very quickly to do it..."* (Participant 9) *"…because we vary in English comprehension so it probably would have taken a good I would say few weeks for us to feel confident."* (Participant 6).
Refreeze (RF)	**7.**	**Daily operations:**	*"….we have a little list …people should be completing…. if they're like a bread packer. They should definitely be shown all the stuff that a break packer should see..."* (Participant 1). *"…wearing the correct PPE gear, to make sure there are no foreign matters in our product, make sure everyone uses the correct equipment…every day there is always forms we need to complete…we always have to record all dates and suppliers and where it come from."* (Participant 6).
	8.	**Support and improvements:**	*"…..I need to look at everything by myself …it's hard to just go into things and check it by yourself due to a little bit of coaching was given..."* (Participant 7). *"…if the food safe pro want to save the environment without all these papers. They need to be better at improving their app….if they had done exactly what is on the paper but just put like when you enter something and it's incorrect it tells you that it's wrong. If they had done that, we don't even need training…. you will not get confused…"* (Participant 2).

Note. Quotes (Data) collected by author on 5th of June 2024.

4.2.1 Theme 1: Identifying Discrepancies

Identifying discrepancies was a theme used to acknowledge the old traditional system where pen and paper were found to be inefficient compared to the FSP app. It was classified under the unfreezing stage of Lewin's change framework due to the discrepancies being identified as a prior problem involving manual documentation. Some participants admitted to struggling since it was stated that the paperwork for food safety was more likely to be misplaced. As one participant stated, "*Initially we had a lot of paperwork ….. there's a lot of chances to lose your data and paperwork at the end of the week…so paper is inefficient*" (Participant 5). Participant 5 reveals that prior to the adoption of the FSP app, a lot of paper was being used in the departments for food safety practices. In addition, with handling large amounts of paperwork, there was more probability of food safety

paperwork being lost by the end of the week, explicitly indicating that the paper base was inefficient compared to the technology. After all, it has been said that the technology being used is essential in improving operations in business, and with technology, there should be a change from old practices to new ones to ensure accurate records (Duan et al.).

Participant 7's response further expressed it as an example of one reason that led to missing food safety paperwork: *"... before there were incidents where people would discard the paper they were writing, and then there's a gap in the paperwork ... the next day corrective action would be taken…*" (Participant 7). From Participant 7 and Participant 5's comments, it can be recognised that there are two reasons for the gap in the food safety paperwork. Therefore, it would be understandable for a corrective action report to be given to ensure that it would not occur again. Oriekhoe et al. (2024) found that manual record-keeping procedures can be completed incorrectly, falsified, and missed, thus increasing the chances of "data inaccuracies" (Oriekhoe et al., 2024, p.814). By identifying these discrepancies, the supermarket rectifies the issue by introducing a technological solution, such as the FSP app. In particular, one previous study by Foroughi et al. (2024) found that implementing food safety technology contributes to an increase in maintaining high food safety protocols and reducing the weaknesses in the manual process. Overall, this theme can help identify and address the areas of concern in the manual food safety process through the unfreezing stage of Lewin's change framework, further emphasising the importance and need to adopt the FSP app to improve accurate and efficient food safety practices in supermarket operations.

4.2.2 Theme 2: Incentives for adopting the FSP app

Incentives for adopting the FSP app were a theme that was recognised when participants wanted to change and listed the reasons for the FSP app to be implemented. Therefore, under the unfreezing phase of Lewin's Change Model, theme two was identified as the participants' initial response before the FSP app was implemented the supermarkets. According to one participant, when there was an introduction to the FSP app, the participant viewed it as "*... easier to handle once under the app…all I can say is it increases productivity…."* (Participant 8). Participant 8's response can be regarded as an agreement towards adopting the FSP app, and other participants' responses were portrayed as similar during the interviews.

Furthermore, another participant compared the manual documentation and the FSP app, stating, "*…. compared to the manual filling, there were chances of manual paper being missed but regarding food safe pro it's time stamped and it's easy to complete*" (Participant 9). The response from Participant 9 reflected the other participants' comments on the food safety manual process. To

most of the participants, it was commonly viewed that the manual process was a lot to maintain, and it led to potentially missing records, which was not efficient nor productive when maintaining food safety standards. However, adopting the FSP app would be more reliable and effective when it involves quickly filling out food safety forms for supermarket employees and when it is time-stamped. In addition, the FSP app's time stamp will document the time the food-safe forms have been completed. Specifically, the beneficial features technology offers will encourage fresh food businesses to adopt such technology to increase the management of food safety standards and protocols (Macheka et al., 2013). This would be a more proactive and efficient approach to managing food safety in the fresh food industry.

Moreover, the shift to using the FSP app would involve changing "attitudes, roles, and responsibilities" regarding the department operations in supermarkets (Abideen et al., 2021, p. 28). This change would impact in-store operations and enhance accountability so that they can practice food safety standards more efficiently and productively. At the same time, it increased the skills and experience level when using advanced technology like the FSP app.

4.2.3 Theme 3: Stages to adopting the FSP app

The stages of adopting the FSP app were established to address the participant's responses to the process of the FSP app being introduced to the supermarket departments. The theme was recognisable under the changing phase of Lewin's change framework structure due to the initial changes that were being implemented. This included the training and learning required before using the FSP app. One participant's statement expressed the first stage of adoption: "…*the compliance manager…. was the one to introduce safe food pro…I was told in seafood, it will be on the app, and*

Table 3.

Outline of stages adopting the FSP app

Stages to FSP App Adoption
Stage 1: Employees are informed by the Compliance Manager about what the FSP app does and what will happen.
Stage 2 Manual paperwork will be transferred into the FSP app.
Stage 3 Employees being assigned with a 4-digit pin
Stage 4 FSP app training

Note. The table was created by the author on 30 July 2024.

whatever paperwork that I was doing before they have been transferred to the food safe pro." (Participant 5). Participant 5 revealed that the compliance manager was the first to initiate and introduce the FSP app to the employees, ensuring all department employees were prepared to transition from paper to the FSP app.

The next stage was the initial transition, during which the paperwork would be transferred into the FSP app. This was when one participant commented on the actioned task: "*At the very start, we had to request tasks to be added according to the department requirements*." (Participant 8). According to Participant 8, after transferring the food-safe paper version to a digital version in the FSP app, there seemed to be a slight problem that needed to be fixed during the transfer since Participant 8 mentioned "tasks needed to be added," resulting in the transfer from paper to the FSP app not being transferred accurately. This indicates why employees must "request tasks according to department requirements" before training to use the FSP app commences.

After further analysis, Participant 3 commented on the training and introduction, which was the next stage when adopting the FSP app. It was explained that all employees would "*have a 4-digit number …. like a staff number*" (Participant 3). There were a few participants who briefly mentioned that the 4-digit number was provided for each employee in the department to sign off. It was designated to prevent employees from signing off using another employee's number. This approach ensured that the employees completing food safety on the FSP app took responsibility and accountability when signing off completed tasks.

Participant 9's response contains the overall process during the training period. This included instructions and demonstrations applied prior to the usage of the FSP app. Participant 9 stated, *"…. two full days of training from the head office, and they went through line by line and then gave their proper instructions, guidelines, and kit. And we also had some demo sessions before going live for the usage*…" (Participant 9). According to Participant 9's response, the training timeframe appeared appropriate for employees to learn when using the FSP app. The training conducted seemed to be based on demonstration practices and reading through instructions to apply what was being taught by the FSP trainer. A previous study found that food safety training was a fundamental practice. Precisely using technology can assist in staff gaining knowledge and skills (Friedlander & Zoellner, 2020).

Additionally, demonstration learning was necessary during the training stage since it assisted participants in developing confidence and skills. This aligned with Mensah and Julien (2011), revealing that adopting good learning strategies can also increase the knowledge and skills of

employees. This highlighted that a suitable and appropriate strategy and training method could address participants' initial complexities during the training and adaptation period.

4.2.4 Theme 4: Initial Complexity

Initial complexity was created as a theme to identify how the participants overcame the challenges from the implementation or transition from paper to the FSP app. Therefore, this theme was classified under the change phase from Lewin's change theory framework. According to Participant 1, using gloves while completing the forms on the FSP app was seen as complicated, especially for departments requiring gloves when cooking or baking. As stated by the participant, "…. *the only thing is the tablet was hard. Like with gloves …. cause obviously we're wearing gloves… and gloves aren't really touch safety with* it." (Participant 1). Participant 1's challenge in wearing gloves while using the FSP app can be highlighted as inefficient. Especially when it requires the employees to take gloves off and use the tablet, this can be seen as less productive than planned when considering the FSP app's benefits.

Although there were some difficulties initially, most participants agreed with Participant 6's statement: "…*we were used to paperwork…you know, pen and paper. We've been doing it for years and years, and then when this new programme came. It took a little while for everyone to get used to it*" (Participant 6). This is reflected by Participant 6's response to the initial complexities in the beginning due to adapting to manually completing the food safety for many years. It was reasonable that with adopting a new technology, there would be challenges during training and adjustment to the FSP app. According to Mensah and Julien (2011), increasing communication and enhancing internal training are appropriate for overcoming challenges. In support, Eruaga (2024) also mentioned that "working together, sharing knowledge, resources, and practices" can also address any challenges and aid in enhancing a smooth transition from paper to technology app (Eruaga, 2024, p. 28). By solving challenges, adopting the FSP app eases the transition and develops learning skills to increase food safety practices and effectiveness in a retail environment.

4.2.5 Theme 5: Training and Support

The significance of practical training and support aligns with the changing phase in Lewin's change theory. The central theme of training and support was influenced by the participants' approach to understanding the usage of the FSP app. Some participants felt there was not enough time for training, as they were given a less comprehensive training program when only one trainer was involved to teach the employees in the store. One participant highlighted the initial training conducted: "…. *we were just given like less than five days. Only one trainer, and it was quite hard for her because some of the people from the department didn't have exposure to the tablet, and they*

didn't know how to use it…." (Participant 7). This further instigated the main point that the training was not organised properly and effectively for those who first struggled with the change. According to findings by Eruage (2024), conducting proper training programs can be crucial in increasing food safety standards and compliance protocols. It was also vital that proper training programs and continuous support were in place to address the issue of the training period, which could have been extended.

Additionally, Participant 7 continued to comment, "*Actually, it was quite hard when you are working through paperwork for 11 years to get it within the system. But once you get the hang of it, we're still learning new stuff you can do…. we only had support for one day*." (Participant 7). These statements indicate that it took much work to adjust, but consistent usage of the FSP app increased employee confidence in daily use. However, the ongoing support needed to be addressed from the viewpoint of participants who emphasised the lack of support during the FSP app training. After all, dissatisfaction with "new initiatives will possibly result in a bad effect" (Wardman & Bouder, 2022, p. 12). Significantly when one participant responded, "*Yeah, I just don't like electronic stuff…*" (Participant 6). There could be many feasible reasons for Participant 6's dislike towards technology. Although it was not communicated in further detail, one contributing factor could be the lack of knowledge and understanding towards learning (Duan et al.).

To summarise, the responses from the participants revealed the low level of how the training and support were conducted. The transition from paper to the FSP app could have been planned more effectively. Although training and support were unsatisfactory, the participants continued using the FSP app. Reviewing the training and support program would allow a smooth transition when integrating the FSP app in future supermarkets.

4.2.6 Theme 6: Adaption

Adopting an effective training program to assist supermarket staff in implementing the FSP app was essential in the changing phase. The adaption theme was created to represent the participants' period of adapting to using the FSP app. One participant's response reflected this, "*It just took three full weeks, I would say, to get in the rhythm correctly. Now they do it very naturally; it comes to their mind very quickly to do it..."* (Participant 9). According to Participant 9's statement, it took three weeks for all departments to adapt to using the FSP app. The participants involved in the interview would agree with this statement since it would take around one month for employees to adjust to using the FSP app instead of documenting on paper. This was evident from another participant who stated, "…*because we vary in English comprehension, so it probably would have taken a good, I would say, few weeks for us to feel confident*." (Participant 6). Most participants

mentioned that the FSP app is challenging to adjust to. This could be due to the "lack of training and experience" (Pantano et al., 2022, p. 2). Especially when low-level training sessions conducted during the adoption can result in difficulty in comprehension (Mensah & Julien, 2011). Even with challenges, most participants have expressed how they adjusted to implementing the FSP app. This adaption theme not only identified the participants who adapted to using the FSP app but also recognised and understood the reason for difficulty found when the duration of the training was unexpectedly restricted. Overall, the findings analysed under adaptation can be reflected under the changing phase as the theme signifies the changes from overcoming challenges in training to using the FSP app confidently. Therefore, this increases employees' capabilities and responsibilities in managing tasks using the FSP app.

4.2.7 Theme 7: Daily Operations

Theme six, named Daily Operations, was created based on participants' comments regarding their daily use of the FSP app. Daily Operations was classified under the refreezing phase of Lewin's Change Framework, as it demonstrated the daily process of utilising the FSP app. According to one participant, "*...We have a little list...people should be completing...if they're like a bread packer. They should be shown all the stuff that a bread packer should see...*" (Participant 1). Participant 1's response exemplified an excellent food safety process by ensuring that each employee was responsible for completing their assigned tasks on the FSP app. This approach ensures that each employee holds responsibility for their tasks on the FSP app, highlighting the advantages of technology adoption, which can improve productivity, efficiency, and effectiveness in food management systems (Abideen et al., 2021).

Another participant responded differently to Participant 1, emphasising the importance of employees "*...wearing the correct PPE gear, to make sure there are no foreign matters in our product, make sure everyone uses the correct equipment...every day there are always forms we need to complete...we always have to record all dates and suppliers and where it comes from*." (Participant 6). Participant 6 (2024) directly referenced a list of daily tasks that employees in fresh food departments must check and complete in the FSP app. According to Participant 6, the first task was to ensure the correct PPE gear was worn, followed by checking the product for any foreign matter while using the correct equipment. Lastly, they completed the FSP app forms and documented the dates of the products and suppliers' names. The steadiness established in this theme ensured that the technological changes were solidified and accepted as the new standard. It was reported that the app enhanced efficiency and decreased the chances of errors in food safety monitoring and records. This aligns with Eltabey et al. (2023), which states that integrating a sound food-safe system can assist fresh food businesses with proactive food safety, fewer risks, and an

accurate standard of food-safe management. In this stage, all participants appreciated the benefits of the FSP app when completing daily tasks.

4.2.8 Theme 8: Support & Improvements

Support and improvements are classified under the refreezing phase since the FSP app has been integrated into employees' daily routines. The need for improvements and increased support was expressed after participants had established confidence and an appropriate food safety management process when using the FSP app. Some participants felt there was a need for improved training. One participant responded, "*...I need to look at everything by myself... it's hard to just go into things and check it by yourself due to the little bit of coaching that was given...*" (Participant 7). Participant 7 was one of three participants who mentioned that the training program needed improvement. The main point highlighted was the need for better navigation of the FSP app with more guidance from the instructor. Based on Participant 7's response, there also seems to be a lack of support during the training period. According to Jacxsens et al. (2011), an "intervention is needed to improve" the management of food-safe systems and tasks (Jacxsens et al., 2011, p. 85). Providing feedback on using the FSP app could help organise a better training program and support future store adoptions.

Another participant expressed disappointment in the FSP app's efficacy: "*...if the food-safe pro wants to save the environment without all these papers, they need to be better at improving their app...if they had done exactly what is on the paper but just put, like, when you enter something, and it is incorrect, it tells you that it's wrong. If they had done that, we wouldn't even need training... you would not get confused...*" (Participant 2, 2024). Participant 2 was vocal about the improvements needed for the FSP app, especially since using the FSP app was part of their responsibility for food safety. Participant 2's response focused on the environmental impact, where the paper was still used alongside the FSP app.

Further analysis revealed that Participant 2 had to write on paper and scan it into the FSP app, ensuring the attachment was uploaded in portable document format (PDF). This was due to the FSP app's inability to accept any other document format. The analysis of Participant 2's statement indicates that the FSP app still needs improvement. Although technology can be effective, one disadvantage is its "inability to improve automatically" (Qian et al., 2023, p. 18). This is evident in this theme, but employee and user feedback would be the best approach to improving the FSP app. Support and improvement in the FSP app would allow developers to enhance food safety practices and reliability, increase productivity, and boost employees' confidence and support in food safety management. Furthermore, addressing participants' feedback and implementing improvements to

the FSP app will help ensure the quality of food safety management is highly regarded in terms of application, consistent maintenance, and operational effectiveness in supermarkets.

4.3 Discussion

This section will emphasise the significance of the results derived from the findings. It will further contribute to addressing the research questions and provide valuable insights into the impact of the FSP app adoption process on supermarket employees.

4.3.1 RQ1: How do supermarket employees perceive using the digitalised Food Safe Program in daily tasks?

The employees' perceptions are examined through the lens of critical components from both theoretical frameworks. Namely the TAM components, perceived usefulness, ease of use, attitude towards usage, behavioural intentions, and system use, each critically illustrate how the FSP app impacts their daily operational efficiency and satisfaction.

4.3.1.1 Perceived Usefulness:

Based on the findings of this study, it was revealed that supermarket employees perceived the FSP app as a tool to enhance efficiency. This perception aligns with the Technology Acceptance Model's perceived usefulness (PU) concept, suggesting that employees believe the FSP app can improve time efficiency during daily tasks. Perceived usefulness significantly impacts adopting modern technology (Dehghani et al., 2022). In this case, the employees' responses indicated the FSP app's efficiency.

The second factor was the improvement of record-keeping, as several issues were identified during the manual documentation of food safety records. The employees perceived that the FSP app significantly enhanced the convenience and accuracy of record-keeping. Notably, a few employees highlighted the benefits of receiving notifications or reminders, as the departments tend to get busy during store operating hours.

Thirdly, the most notable factor was environmental sustainability. Employees no longer had to document food safety on paper. Most employees believed using the FSP app would reduce paper usage, thus contributing to environmental sustainability. Specifically, their responses emphasised a preference for using the app over the paper to save the environment. The three themes identified under perceived usefulness addressed the first research question.

4.3.1.2 Perceived Ease of Use:

Under TAM's perceived ease of use (PEOU), user-friendliness was recognised. Participants believed the FSP app would be easy to understand and use, especially with daily utilisation. This ensured that employees became familiar with using the FSP app. Additionally, one participant noted that the app would improve the department's food safety training requirements. Perceived ease of use is when an individual considers technology uncomplicated (Kim & Woo, 2016). Participants summarised responses indicated that they perceived the app as user-friendly.

4.3.1.3 Attitude Towards Use:

It was found that all employees enjoyed using the app, as they considered it convenient and practical for navigating its features. The positive impact of the FSP app was evident from the employees' reactions to the findings. According to Cobanoglu & Karaman (2013), the study found that the employee's attitudes towards food-safe technology were positive in adopting the food-safe technologies and practices. Xun et al. (2021) also found that users with increased knowledge towards technology development were likely to portray a positive attitude towards adopted food-safe technology. These studies and the positive attitudes the participants demonstrated through their statements. It clarifies that the employees perceived the adoption of the FSP app as positive due to the apparent results of increasing efficiency and accuracy in completing their daily tasks.

4.3.1.4 Behavioural Intention of Use:

Behavioural intention of use (BIOU) revealed one finding involving the employees' future actions for continuing to use the FSP app. This finding reflects the long-term advantages the employees considered when using the FSP app. The employees' willingness to continue using the app was demonstrated through their actions in downloading the app onto their phones and, most importantly, encouraging other supermarket branches to adopt the FSP app. This clarifies that the employees who agreed with Participant 4's response would perceive the FSP app as beneficial and recommend that other supermarket chains or food industries implement the app to manage food safety compliance and daily tasks effectively.

4.3.1.5 System Use:

System use (SU) identified four key findings during the FSP app system use: adaption to FSP, corrective actions, daily use, and improvement suggestions.

Adaption to FSP focused on employees' responses to using the FSP app after training. According to the findings section, the supermarket employees found that using the FSP app made food safety compliance more convenient and easier to use. This also included the ease of teaching new

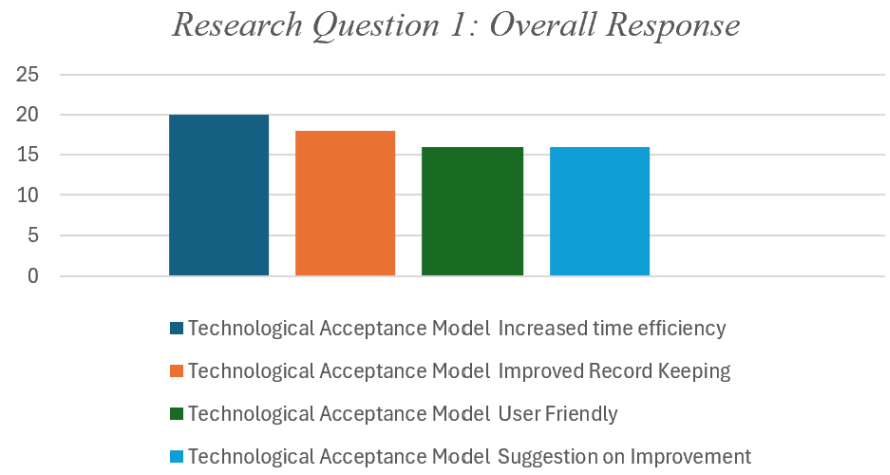
employees compared to the old process of managing food safety using paper. The responses reflected various benefits such as ease of keeping up with daily tasks, being user-friendly, assisting in auditing, and reducing the time for managers. These benefits were reflected after adapting to using the FSP app. It would have been a different reaction and experience compared to the beginning. Nevertheless, based on the example, quotes reflect the participant's confidence in using the app.

Corrective actions reflect the steps taken to resolve food safety issues. For instance, if staff forget to sign off, leaving the form incomplete, the manager must create a blue note on the FSP form as a corrective action the following day. According to the employees who participated in this study, after adjusting to using the FSP app, there were rarely any corrective actions needed for incomplete food safety forms. This indicates that implementing the FSP app was a good decision for supermarket stores to manage food safety. Each employee was assigned tasks to ensure the app was up to date, decreasing the possibility of incomplete forms. Most employees interviewed expressed similar routines practised daily in completing tasks on the FSP app.

Suggestions for improvement highlighted the technical features in the FSP app that needed improvements. This is understandable since technology can only effectively complete some tasks correctly. Especially when there are phases when the FSP app needed to be updated to increase employee effectiveness and accuracy. The findings displayed a brief list of the technical features that need to be improved, such as increasing the word limit in the app. Another point would be to simplify the navigation of the summary. This allows employees to access specific forms easily and to view the FSP forms simultaneously. Overall, the three findings demonstrated that although a few features need improvement, the employees perceive the FSP app as an excellent tool for making

daily tasks more efficient, productive, practical, environmentally friendly, easy to use, and reliable. These familiar words were frequently expressed throughout the employees' interview statements.

Figure 2.



Note: Data collected by author on 28th of July 2024

In summary, the overall data response from Figure 2 identified the key themes consistent with TAM, thus showing the practical advantages acknowledged by the participants about research question one. The first response found to be crucial from participants was the improvement in time efficiency, facilitating a smoother workflow for employees. The FSP's ability to improve record-keeping was frequently stated, highlighting its role in improving data accuracy and accessibility. Participants also recognised the user-friendly theme, which they stated more often after overcoming challenges initially. It later became more straightforward to incorporate into daily department routines. However, participants provided constructive feedback for potential improvements, indicating areas where the system's utility could be optimised. Collectively, these findings emphasised the favourable response and functional benefits of the Food Safe Program while also providing a foundation for future iterations to better address the needs of supermarket employees during the adoption of food-safe technology.

4.4.1 RQ2. How has adopting the Food Safe Program (FSP app) reshaped department operations, such as role changes and challenges the employee faces?

The adoption of the FSP app allowed the employees to experience various management changes. The changes from implementing the FSP app involved employees adjusting to department operational changes, shifts in responsibilities and roles, and challenges encountered during the process. Lewin's change theory is utilised to utilise employees' experiences through the phases of change. These phases include unfreezing, changing, and refreezing. Each phase will demonstrate

how adopting the FSP app has reshaped department operations, role changes and the challenges they faced.

4.4.1.1 Unfreeze Phase

This qualitative research found that adopting Lewin's change theory helped develop seven findings that addressed the second research question. Regarding Lewin's three phases, the first phase, unfreezing, generated two findings.

The first finding was identifying discrepancies. Employees found the original food safety procedures could have been more efficient and needed change. They expressed that there were gaps in the food safety paper documentation, records were often misplaced, and there needed to be an excessive amount of paper to manage in the department. Therefore, employees emphasised change to address the weaknesses in the food safety practices.

The second finding was incentives for adopting the FSP app. It was apparent that employees were influenced by the benefits that adopting the FSP app could bring to all departments. They expressed interest in the FSP app during the initial stages when the store's upper management introduced it to the department managers and employees.

4.4.1.2 Change phase

Under the change phase, four significant findings were identified:

Stages of Adopting the FSP App: This finding included the introduction of the FSP app. Employees' responses revealed the phases involved in adopting the FSP app. The first phase involved the compliance manager's introduction of the FSP app. This was followed by transferring food safety paperwork into the FSP app format. All staff were then issued personalised 4-digit PINs, allowing them to sign off on their assigned tasks. The final phase was the training conducted to teach each department about the features of the FSP app and how to navigate it. These initial phases represented the changes occurring while adopting the FSP app.

Furthermore, this allowed department managers to assign responsibilities and tasks to the department employees. It enabled all employees to take responsibility and gain new knowledge and skills in navigating the FSP app.

Initial Complexities: This finding represented employees' challenges during the initial FSP app use. One example mentioned was the difficulty of using the tablet with gloves, as all employees who cook or bake must wear gloves for health and safety reasons. Although removing gloves to use

the FSP app was initially challenging, it eventually became a part of the operation process to ensure food safety.

Training and Support: The second finding was related to training and support based on the initial adoption of the FSP app. This aimed to understand the difficulties encountered during training. Some employees, whose responsibilities included managing the FSP app, expressed concerns about the unfairness of the training. This included reduced training time for all department employees, particularly those overseeing the FSP app daily. Additionally, some employees perceived the way the training was conducted as brief and difficult to understand, indicating their dissatisfaction with the process. Therefore, it is recommended that the head office of the FSP app review the "users' satisfaction levels" during the training sessions to "identify the users' dissatisfaction" (Bhattacherjee & Premkumar, 2004, p. 250). This process would enable the head office to address issues effectively before training future supermarket chains.

Adaption: This finding focused on how employees adapted to using the app. The duration of adaption varied, with some employees experiencing difficulty due to uncertainty in using the electronic tablet. It was reasonable that the adaption period took a few weeks during the change phase. The shift from documenting food safety on paper to using the FSP app represented a significant adjustment for some employees. However, the FSP app allowed more employees to be trained and take on new responsibilities.

Overall, these three findings—implementation, solving challenges, and adjusting to training—helped employees adopt the changes introduced by the FSP app. Employees highlighted that, although it was initially challenging, the initial complexities reduced over time with daily use of the app. This transition also created opportunities for other employees to take on new tasks and acquire added skills.

4.4.1.3 Refreeze Phase

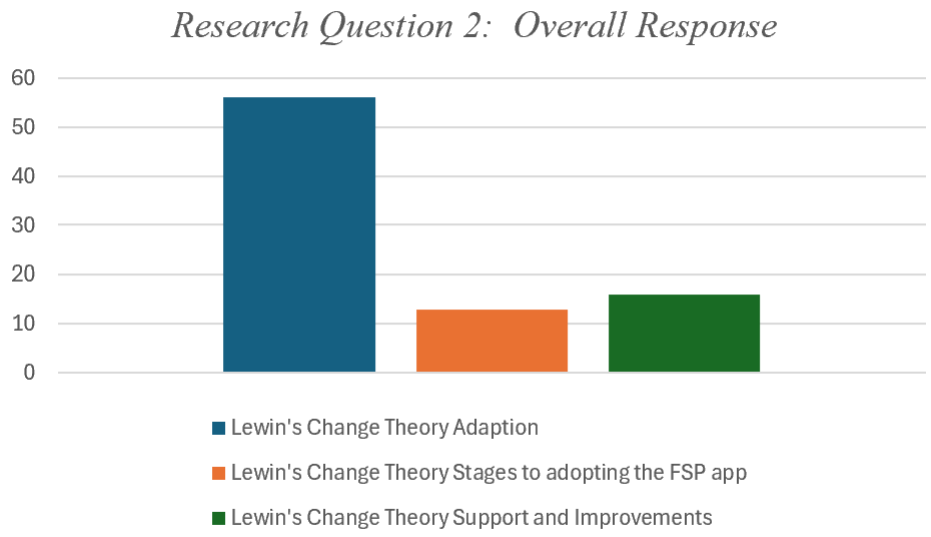
The refreeze phase of Lewin's change framework included two findings: daily operations and positive acceptance and support.

Daily Operations: This finding focused on the consistent practices of using the FSP app daily. It was found that tasks were assigned to staff each day, and they were required to ensure that tasks on the FSP app were completed. If not, managers would remind the staff to complete the forms. Positive acceptance came after a few months of using the FSP app. For example, using the FSP app alleviated pressure from the managers.

Another example was that people were in charge of different forms. While manual documentation on paper limited the number of staff who could complete the food safety paperwork, now all staff can complete the food safety forms on the FSP app since no writing is involved. This is particularly efficient when completing tasks in a busy department.

Support and Improvements: This finding refers to the employees' suggestions for improving the FSP app to allow the department to operate more efficiently. For example, one employee suggested merging two forms—one for customer complaints and the other for food poisoning. This would reduce confusion for staff, as it would be more efficient to categorise food poisoning complaints under customer complaints instead of having two separate FSP forms. Although other employees made a few more improvement recommendations, the two findings under the refreezing phase indicate that adopting the FSP app allowed departments to operate more efficiently and effectively. These findings demonstrate that the FSP app has positively impacted daily operations and has been positively accepted and supported by the staff, leading to more efficient and effective departmental operations.

Figure 3.



Note: Data collected by author on 28th of July 2024

Overall, implementing the Food Safe Program has visibly altered department procedures, as supported by the data illustrated in Figure 3. Lewin's Change Theory highlighted the adaption process through distinct stages and gathered more responses during the changing phase, especially when the adaption theme demonstrates various adjustments to the employees' roles and

responsibilities. According to Figure 2, the response to the support and improvements was revealed to be the second most important to participants. This accentuates the importance of effective change management strategies to assist unified changeover and increase employee experiences. The third theme identified was the stages of adopting the FSP app. Through the third theme, the participants responded to those who were more technologically savvy and adaptive people to step up, which included the young employees to step up to the role. These findings indicate the significance of strategic change, guaranteeing effective technological implementation, minimizing resistance, and enhancing employee experience within the evolving food industry.

Chapter 5: Conclusion

5.0 Overview

In this study, the following aspects will be explored and explained. First, the contributions section will highlight and assess the empirical insights gained and the theoretical implications identified, as well as emphasise the practical implications generated from this study. Third, the conclusion will summarise the research process and address the research questions. Fourth, the limitations identified during the research will be addressed in this chapter. Lastly, research recommendations will be provided, further acknowledging the gaps in this study to enhance knowledge and advancement in this potential study area.

5.1 Contribution

This qualitative study explored the adoption of the FSP app in New Zealand supermarkets, focusing on the operational impact, challenges, and departmental changes experienced by supermarket employees who also use the FSP app. Employing the Technology Acceptance Model (TAM) and Lewin's Change Theory, this research comprehensively investigates the impact of adopting the FSP app. Specifically, it analysed the initial perceived viewpoints of the employees involved in the study. This research contributes to theoretical and practical areas by interpreting the components influencing the implementation of the FSP app and the stages of organisational change. Furthermore, it highlights the significance of improvements needed for effective training programs, increased accuracy of food safety practices, and departmental efficiency.

5.1.1 Theoretical Implication:

The two theoretical frameworks adopted to conduct and analyse the research findings in this study were the Technology Acceptance Model (TAM) and Lewin's Change Theory. TAM reveals how perceived ease of use and perceived usefulness impact supermarket employees' acceptance and implementation of the FSP app into their daily responsibilities. This research presents that most participants expressed positive experiences utilising the FSP app, resulting in increased FSP implementation in other Pak'n Save and New World supermarket stores in New Zealand.

Lewin's change theory refers to the unfreezing, changing, and refreezing stages. These three stages are significant as they provide insight into the change process, the management of adopting the FSP app, and the identification of improvements in FSP app training or the support provided by FSP developers during the implementation process. Overall, both theoretical frameworks provided a solid foundation for future research on technology implementation in similar working environments.

5.1.2 Practical Implications

The practical implications of this research offer significant insights into technology implementation in retail supermarkets. First, the findings from the participants suggested that adopting food safety technology can enhance department operations and food safety compliance practices. For example, implementing appropriate food safety technology training programs and demonstration sessions for a few weeks allows employees to educate themselves on the correct practices and protocols for food safety. Additionally, food safety technology helps reduce paper usage, ensuring that the supermarket industry practices environmental sustainability. When modern technologies are introduced, integrating a suitable training method, such as demonstration sessions, along with proper support, is essential.

5.2 Conclusion

This research was conducted to explore implementing the FSP app in New Zealand supermarkets. By examining how supermarket employees perceive using the FSP app in daily tasks and the operational changes and challenges encountered during its adoption, this study contributes to increasing knowledge in food safety technology implementation. The findings indicated that before the FSP app, paper-based methods were used to record all food safety practices. This was a standard procedure that all employees were accustomed to practising. However, implementing the FSP app has significantly improved daily tasks, productivity, efficiency, and precision in food safety practices. Although some employees initially faced challenges adapting to the FSP app, the overall response and acceptance were positive. Implementing food safety technology has prompted changes within department operations by promoting increased responsibilities and introducing new tasks for employees. Despite the challenges faced, the overall response and acceptance of the FSP app were positive, emphasizing the app's ability to effectively improve food safety practices and protocols in New Zealand supermarkets.

5.3 Limitations and Future Research

Conducting this research study on implementing the FSP app in New Zealand supermarkets encountered several limitations. The first limitation acknowledged was the small sample size, with only ten participants involved. Specifically, five participants were selected from one New World store and one Pak'n Save store in Auckland, New Zealand. Although both supermarket chains are recognized and operated locally throughout New Zealand, making them suitable for this research, the data represents only some of the supermarket stores in the country.

Another limitation was that both stores operate daily and are busy with customers, making it challenging for participants to take time during working hours to participate in the research.

Consequently, some interviews were condensed into 10–15-minute sessions with each participant, limiting the depth of data that could be gathered. Ultimately, some interviews even took slightly less than 10 minutes.

Thirdly, the study's location was confined to Auckland, which limits the geographical representation and understanding of the findings across all supermarket chains in New Zealand. This study targeted supermarket employees who use the FSP app, aiming to involve all levels of the fresh food department, from department managers and supervisors to frontline staff. However, due to staff shortages and the stores being busy, the participants involved were only department managers and supervisors. The potential bias of managers in this research was an important aspect to consider, as it could affect the findings. Especially managers when this study was conveyed from a manager or supervisors' lens and preference. Meaning that it could influence how the information was collected, interpreted or presented. This dependence can lend itself to confirmation bias — the tendency to highlight data that supports a manager's existing beliefs and underplay or ignore evidence to the contrary. Therefore, this study does not represent all levels within the retail store, which may affect the study's findings and interpretation. This allows future research to focus on more roles in the supermarket store.

5.3.1 Future Research

The implementation of modern technology in retail is a progressing field. This research presented important insights into existing practices and challenges of adopting the FSP app. However, future studies could further explore the few gaps in this study.

A crucial area for future research is increasing the sample size. Small sample sizes have restricted some studies; in this case, only ten participants participated in this research. Expanding the number of participants would allow future research to produce more effective study results. For instance, a larger sample size would assist in gaining diverse experiences across various demographic groups and working positions in supermarket chains (Sandelowski, 1995).

Increasing interview time beyond 10–15 minutes, or as DiCicco-Bloom & Crabtree (2006) mentioned, half an hour or more, would have allowed for a better understanding of employees' encounters and attitudes regarding modern technologies. More extended interviews lead to thorough data collection and a more unambiguous indication of employees' perspectives.

Future studies should also examine different supermarket chains to compare the implementation of modern technologies and the results of employee reactions. The comparative method can help

identify trends and organizational strategies influencing technology implementation (Al-Sunairy & Tang, 2000).

Establishing a new theoretical framework is another potential future research aspect for researchers to explore—for example, the Self-Efficacy Based Value Adoption Model (SVAM). According to Zhu et al. (2010), SVAM is a technology adoption framework that focuses on self-efficacy in user acknowledgement and could be significantly valuable in recognizing employee interaction with technology (Zhu et al., 2010).

Addressing these gaps allows potential researchers to comprehensively understand how adopting modern technology affects supermarket employees and offers actionable insights for improved adoption strategies.

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Appendices

Appendix 1: Interview Questions

Introduction questions:

- Can you describe your role and the tasks you undertake within the department?
- How long have you been working in the department?

So, I understand that this store has recently adopted as new digital food safe program:

- What are your thoughts on the introduction of new technology, (like the food safe app), in the store?
- Can you describe how would this food safe program is currently used in your daily work tasks?

Experience:

- Can you describe your experience with learning to use the new food safe app?
- Has the food safe app improved the efficiency of your work tasks? If so, how?

Training and support:

- What kind of training or support was provided when learning to use the food safe app?
- Have you encountered any difficulties using the app? If so, how were they addressed?

Impact on work:

- How do you think the food safety app has impacted the overall work environment?
- Were there any common problems, if any, have you experienced with the app?
- Do you find the food safety app easier to use compared to the previous paper-based method? (What are the key differences?)

Suggestions for improvement/ Future expectations:

- Do you have any suggestions for improving the implementation or use of technology in your department?
- Is there anything else you would like to add regarding the adoption and usage of the food safe app?

Appendix 2: Oral Consent Form

For use when interviews are being conducted by videoconference.

Project title: **Technological advancements in NZ supermarkets; The digitalization of food safe pro implementation (A qualitative study)**

Project Supervisor: Dr Maryam Mirzaei

Researcher: Rebecca Asa

The participant joins the video conference

- ○ Do you agree to my recording your consent to participate?

If they agree, then the record function will be activated and they will be asked the following:

- ○ Have you read and understood the information provided about this research project in the Information Sheet dated 18 March 2024?
- ○ Do you have any questions about the research?
- ○ Do you understand that notes will be taken during the interviews and that the interview will also be audio-recorded and transcribed?
- ○ Do you understand that taking part in this study is voluntary (your choice) and that you may withdraw from the study at any time without being disadvantaged in any way.?
- ○ Do you understand that if you withdraw from the study then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used? However, once the findings have been produced, removal of your data may not be possible.
- ○ Do you agree to take part in this research?
- ○ Do you wish to receive a summary of the research findings? (please tick one): Yes○ No○
- ○ Do you want me to send you a copy of the audio recording for this consent? Yes○ No○
- ○ Please confirm you name and contact details

Participant's name:

.....……

Participant's Contact Details (if appropriate):

……..

……..

I will now turn off the recording of the Consent and then will start a separate recording for the interview.

Approved by the Auckland University of Technology Ethics Committee on type the date on which the final approval was granted AUTEC Reference number type the AUTEC reference number

Note: The Participant should retain a copy of this form.

Appendix 3: Participant Information Sheet

Date Information Sheet

Produced:

18 March 2024

Project Title:
Technological advancements in NZ Supermarkets: The digitalization of food safe implementation (A Qualitative Study)

My name is Rebecca Asa, and I am a student at Auckland University of Technology. I am currently conducting research as a part of my master's degree on the topic of technological advancements in NZ Supermarkets: The digitalization of food safe implementation.

What is the purpose of this research?
The goal of this research is to explore the impact of digitized food safety technology on supermarket employees and department operations, specifically focusing on how employees experience this technology in their daily tasks and how its adoption has reshaped their roles.

How was I identified and why am I being invited to participate in this research?
You are identified as a potential participant for this research due to your direct involvement and experience with food safety technology in your workplace. Your insights are valuable for understanding its impact on supermarket operations and employee roles.

How do I agree to participate in this research?
Your participation in this research is voluntary (it is your choice), and whether or not you choose to participate will neither benefit nor disadvantage you. You can withdraw from the study at any time. Suppose you choose to withdraw from the study. In that case, you will be offered the choice between having any data identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?
If you agree to be part of this project, the Senior Manager has given permission for you to receive a study invitation and the interviews will take place during work time. You will receive a consent form from the researcher before the interview and then you will be interviewed. Interviews will take approximately 10-15 minutes. The interview can be in-person and in a quiet and comfortable setting like enclosed room such as training room or meeting room. Alternatively, you can choose to be interviewed online or by phone, in which case we can use oral consent. Once the interview is transcribed, you will receive a copy of the transcription for approval. The questions will be focused on your experiences with the food safe app.

What are the benefits?
This research provides participants with reflective opportunities and insights into the effectiveness of food-safe apps. It also enriches existing literature, benefiting future researchers and helps organizations improve technology implementation.

How will my privacy be protected?
In writing the project report, we do not require names. I would like to record our conversation so I can analyse and review the material we will be discussing. However, if you prefer not to be tape-

recorded, I am happy to take notes instead. The record and aggregated data will be accessible to my supervisor. The tape and data will be securely stored and will be destroyed after a fixed time frame after the completion of the research. Final report can be emailed to you when the project is completed.

What opportunity do I have to consider this invitation?
One week will be given to consider this invitation before contacting participants for an answer (only for participants who need clarification on being interviewed).

What do I do if I have concerns about this research?
Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Professor Maryam Mirzaei, Email: maryam.mirzaei@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, *ethics@aut.ac.nz* , (+649) 921 9999 ext. 6038.

Whom do I contact for further information about this research?
Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Rebecca Asa

Email: txz4448@autuni.ac.nz

Project Supervisor Contact Details:

Dr Maryam Mirzaei

Email: maryam.mirzaei@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, AUTEC Reference number *type the reference number*.

Appendix 4: Consent Form

Project title: **Technological advancements in NZ Supermarkets: The digitalization of food safe implementation (A Qualitative Study)**

Project Supervisor: **Dr. Maryam Mirzaei**

Researcher: **Rebecca Asa**

- ○ I have read and understood the information provided about this research project in the Information Sheet dated (/ /2024).
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ○ I agree to take part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature:

.....

Participant's name:

.....

Participant's Contact Details (if appropriate):

……..

……..

Date:

Approved by the Auckland University of Technology Ethics Committee on type the date on which the final approval was granted AUTEC Reference number type the AUTEC reference number

Note: The Participant should retain a copy of this form.

Appendix 5: Permission to Access Form for Interview Purposes

Dear Sir/Madam

Introduction:

I am a master's degree student at Auckland University of Technology conducting research on the topic of technological advancements in NZ Supermarkets, specifically focusing on the digitalization of food safety implementation. I seek permission to conduct interviews within your store to explore the impact of digitized food safety technology on your employees and department operations.

Purpose of the Interview:

The research aims to understand how supermarket employees experience digital food safety technology in their daily tasks and how its adoption has reshaped their roles.

Consent:

I request permission for staff members to receive an interview invitation. Interviews will be conducted either in-person in a quiet setting within the store, online, or by phone, based on the preference of the participants. Each interview will take approximately 10-15 minutes and will be recorded and transcribed for participant approval.

Confidentiality and Data Use:

Strict confidentiality and data protection measures will be maintained throughout the research process. All information will be used solely for the purposes of this academic research.

Note: Your approval of this research will greatly contribute to its success and is highly appreciated. Please contact me if you have any questions or require further information.

Signature of Store Manager/HR Manager: _____

Date: _____

Signature of Researcher:

Rebecca Asa (AUT Student)

Date:

Appendix 6: AUTEC Ethics Approval Letter

27 May 2024

Maryam Mirzaei
Faculty of Business Economics and Law

Dear Maryam

Re Ethics Application: **24/80 Technological advancements in NZ supermarkets; The digitization of food safe pro implementation (A qualitative study)**

Thank you for your responses to AUTEC's conditions.

Your ethics application has been approved for three years until 26 May 2027.

Non-Standard Conditions of Approval

1. In the manager's sheet, revise "First a Senior Manager has given permission", since this is the first time the Manager has read the study information, and fill in the missing word 'not' in "we do mention names of individuals or organizations".

Non-standard conditions do not need to be submitted to or reviewed by AUTEC unless requested but must be completed before commencing your study.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC.
2. All public facing documents must have the AUTEC approval number and be of a high standard of spelling and grammar. Dates on the Information Sheet(s) and Consent Form(s) must be consistent.
3. Any amendments to the project must be approved by AUTEC prior to being implemented.
4. A progress report is due annually on the anniversary of the approval date.
5. A final report is due at the expiration of the approval period, or, upon completion of project.
6. Any serious or adverse events must be reported to AUTEC, this includes unforeseen issues that might affect continued ethical acceptability of the project.
7. AUTEC grants ethical approval only. You are responsible for obtaining management permission for access from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

The application number and title need to be referenced on all correspondence related to this project.

All forms are available online http://www.aut.ac.nz/research/researchethics

For any enquiries, please contact ethics@aut.ac.nz
(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: txz4448@autuni.ac.nz