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Objective

As mentioned above the aim of this journal is to provide a platform and a means for disseminating and exchanging of knowledge and experience pertaining to academic advancement and research findings which may be beneficial for academy and society as a whole.

Deadline - Period of Publication

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Message from the President

Season's Greetings!

Dear Our Valued Readers:

Welcome to Vol. 4 No.1 of the UBRU International Journal, presented by Ubon Ratchathani Rajabhat University. We are proud to offer this edition in both digital and print formats, serving as a vital resource for scholars and researchers worldwide. Our commitment is to foster the exchange of scholarly work, promoting academic growth and global collaboration.

We extend our deepest thanks to all contributors for their role in the success of this journal. As an educational institution, we dedicate ourselves to advancing academic knowledge across diverse fields, benefiting faculty, researchers, and academia at large.

This journal stands as an open call to respected lecturers, professors, and researchers globally to submit their research papers and academic insights. We eagerly await contributions from various institutions, aiming to enrich our community's intellectual landscape.

Thank you to everyone involved in this endeavor. We hope the UBRU International Journal serves as a beneficial and enlightening platform for your academic pursuits and professional growth.

Assoc. Prof. Thamarak La-ongnual
Acting President, UbonRatchathni Rajabhat University

EDITORIAL

Dear Valued Readers:

As we welcome the year 2024, I am thrilled to extend my warmest wishes to everyone. May this new year bring you a wealth of blessings, interwoven with hope, safety, success, vibrant health, strength, prosperity, and empowerment. Time, as universally acknowledged, indeed flies. Despite seeming lengthy, a year passes swiftly, often unnoticed. Throughout 2023, we have committed ourselves to serving our readers and contributors by soliciting papers and articles to enhance our online journals. Our goal has been to elevate our academic platforms, providing enriching and insightful reading and research opportunities. We hope that our academic articles and studies have ignited your intellectual curiosity and have positively impacted your perceptions, experiences, attitudes, interests, vision, and worldview.

Once again, we cordially invite our readers and contributors to submit their scholarly articles and studies for publication in our journal. For submissions and further information, please visit us at ThaiJo system at https://so04.tci-thaijo.org/index.php/ubruij

We sincerely hope you find our online journal not only meaningful and engaging but also relevant and applicable in your academic and professional pursuits. Your continued cooperation and contributions are highly anticipated and deeply appreciated.

Pimook

Asst. Prof. Dr. Pimook Somchob

Editor

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Abstract

This research aims to 1. study the marketing mix and service quality affecting the loyalty of users of food delivery services in the Muang district of Ubon Ratchathani province, and 2. compare the marketing mix and service quality impacting the loyalty of food delivery service users in the Muang district, categorized by gender, age, occupation, and average monthly income. The sample group consisted of 400 general citizens in the Muang district, Ubon Ratchathani province, using a cluster sampling method. The research tool was a questionnaire. Statistical values used included frequency, percentage, average, standard deviation, multiple regression analysis, t-test, and F-test.

The research findings are as follows:

1. The overall marketing mix was rated highly. When considered in detail, every aspect of the marketing mix was important, ranked from highest to lowest average score: product, distribution channels, price, physical characteristics, processes, promotion, and personnel. The overall service quality was also rated highly. In detail, every aspect of service quality was important, ranked from highest to lowest average score: reliability, responsiveness, assurance, empathy, and tangibles. Overall loyalty of the service users was high. When considered in detail, the aspects of loyalty, ranked from highest to lowest average score, were: repeat usage, decision-making process, attitude, customer satisfaction, and perception.

2. The variables of the marketing mix, including product, price, and distribution channels, significantly affected the loyalty of the service users at the 0.05 level. Similarly, the service quality variables, including reliability, assurance, empathy, and tangibles, also significantly affected the loyalty of food delivery service users in the Muang district of Ubon Ratchathani province at the 0.05 level. These seven variables could predict service user loyalty by 63.2%.

3. In comparing the decision-making of consumers who chose food delivery services, categorized by gender, age, occupation, and average monthly income, it was found that service users of different genders and ages had different opinions on empathy. Users with different occupations had varying opinions on reliability, assurance, empathy, and tangibles. Similarly, users with different average monthly incomes had differing opinions on assurance, empathy, reliability, and tangibles.

Keywords: Loyalty of Consumers, Food Delivery Service

Introduction

Towards the end of 2019 (B.E. 2562), the world faced the outbreak of a new disease, the spread of the SARS-CoV2 virus, which caused a global pandemic, including in Thailand. This outbreak, besides directly affecting public health, also devastated the economy. The transmission of this virus occurred in a manner similar to influenza, primarily through respiratory droplets from coughing. Consequently, campaigns were initiated to encourage everyone to wear masks, practice social distancing, avoid touching shared objects, and frequently wash their hands to prevent further spread (The spread of COVID-19 in Thailand, 2022).

Thailand was one of the countries impacted by this global situation. The population nationwide experienced panic about their well-being and lifestyle amidst the spread of this virus. Social gatherings and close social interactions were avoided. As the situation evolved, the government implemented legal measures to control and prevent the spread of the virus, including travel restrictions and prohibitions on dining in at restaurants. Consequently, businesses had to adapt for survival by utilizing online food delivery services to maintain continuous operations. Online food ordering applications thus played a significant role in supporting various businesses. This situation provided an opportunity for companies to act as intermediaries between restaurants and consumers, leading to an increased emphasis on marketing online food delivery services. The advent of food delivery services through smartphone applications emerged as a crucial development during this period (Pinsamran, Suwakulsiri, and Juntarathanee, 2022).

Due to the aforementioned reasons, there has been an interest in studying the "Loyalty of Food Delivery Service Consumers in Mueang District, Ubon Ratchathani Province." This research is anticipated to benefit delivery business operators or those interested in distribution channels. The findings could be used to inform decision-making processes and assist in strategizing future marketing plans.

Objective

1. To study the marketing mix and service quality that affect the loyalty of food delivery service users in the Mueang District of Ubon Ratchathani Province.
2. To compare the marketing mix and service quality that influence the loyalty of food delivery service users in the Mueang District of Ubon Ratchathani Province, categorized by demographic characteristics such as gender, age, occupation, average monthly income, and level of education.

Literature Review

The 7Ps of Marketing Mix, as outlined by Kotler and Keller (2016), comprise of seven components:

1.Product: Refers to goods and services, including core and supplementary products, representing the benefits customers seek for competitive advantage, fulfilling customer satisfaction and user needs.

2.Price: The cost incurred, whether in terms of money or time, including the effort in purchasing and using the service.

3.Place: Decisions regarding the delivery of services to customers, including the time and location of delivery, and distribution channels, both physical and electronic.

4.Promotion: Activities designed to create incentives and marketing communications to generate customer satisfaction.

5.People: All personnel involved in delivering services, impacting customer perceptions of service quality.

6.Physical Evidence: The environment where the service is provided, tangible components like décor, ambiance, equipment, service personnel, which help communicate service quality.

7.Process: Necessary operations and procedures in serving customers, involving design and implementation for effective outcomes.

Service Quality, as defined by Gronroos (1990), occurs during interactions between consumers and service employees, products, or systems of the service provider. Quality services should be flawless, understanding and responding to consumer needs (Kitapci, Akdogan, & Dortyol, 2014). Service quality measures include:

1. Tangibles: Physical aspects of the service environment perceivable through the five senses, such as decor, atmosphere, equipment, and service personnel.
2. Reliability: The quality of delivering services as promised, correctly meeting objectives. Failure to do so diminishes consumer trust and loyalty.
3. Responsiveness: The ability to respond to consumer needs promptly and willingly, showing problem-solving and assistance.
4. Assurance: Involving knowledge and skills to instill consumer confidence.
5. Empathy: Personalized care and attention to consumers before, during, and after the service, catering to their unique needs.

Loyalty, according to Skogland & Siguaw (2004), is the commitment between the service provider and the consumer, characterized by regular and happy patronage, leading to a positive relationship and intent to return. Brand Loyalty, as conceptualized by Oliver (1999), has four stages:

1.Cognitive Loyalty: Awareness and understanding of the brand's attributes and benefits.

2. Affective Loyalty: Emotional preference or aversion towards the brand.
3. Conative Loyalty: The intent to purchase or trial buying behavior.
4. Action Loyalty: The final stage where consumers repeatedly purchase the product.

Conceptual Framework

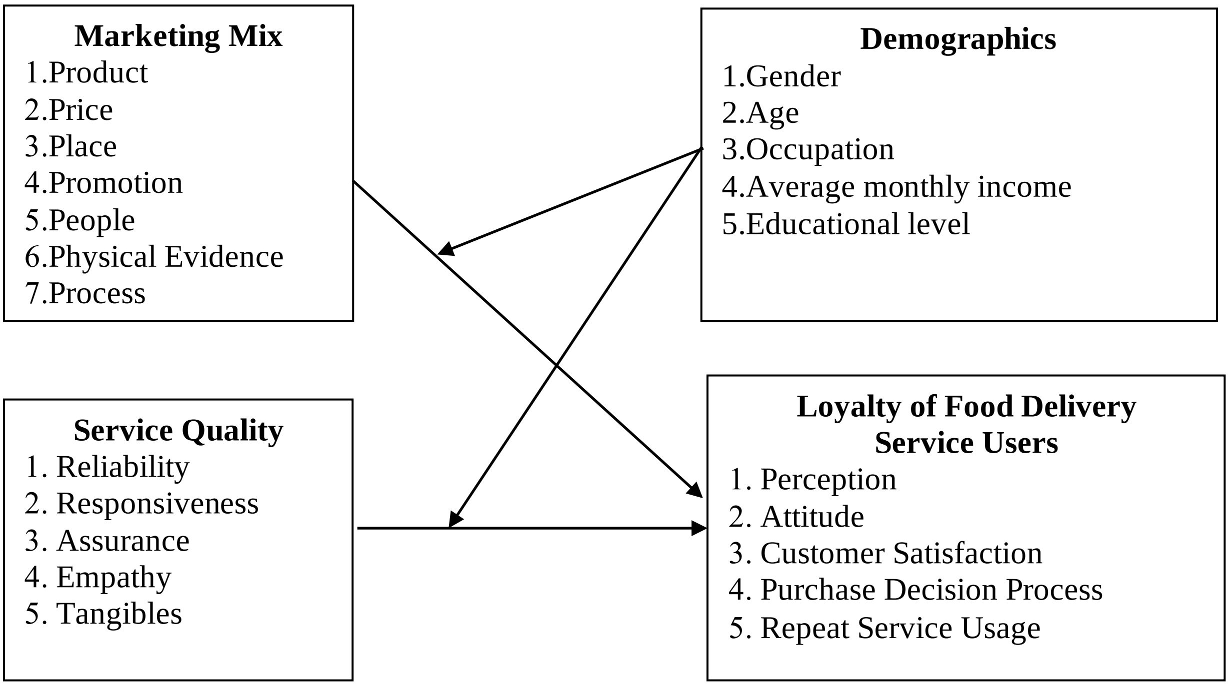

Figure 1: Conceptual Framework

Research Methodology

Population and Sample

The population for this study consisted of the general public in Mueang District, Ubon Ratchathani Province. A sample size of 400 people was determined using Cochran's formula (1977), employing a cluster sampling method. The respondents were individuals who had previously used a food delivery application, surveyed during March-April 2023 (B.E. 2566).

Research Tools

The research tool was a questionnaire, validated for content accuracy by three experts and analyzed for Item Objective Congruence index (IOC) (Tirakanant, 2007). The IOC values ranged from .60 to 1.00. The instrument's reliability was tested on a population of 30 individuals similar to but not part of the sample group, resulting in a reliability coefficient of .963.

Data Collection

Data for this study was collected using quantitative research methods. The researcher personally gathered data from residents in the Mueang District, Ubon Ratchathani Province, using the questionnaire.

Data Analysis and Statistical Methods

Data were analyzed using computer software for frequency distribution and percentage of general information about the sample group, categorized into five levels.

The differences in mean values were tested using the t-test for two-sample groups and One-Way ANOVA, with F-test for groups of three or more. If statistically significant, pairwise comparisons were made using Fisher's Least Significant Difference (LSD) method. The statistics used in data analysis included percentage, mean score, standard deviation (S.D.), and F-test.

Research Findings

1. General Analysis Results of Food Delivery Service Users

The study and analysis of data from a survey on food delivery services in Mueang District, Ubon Ratchathani Province, found that out of the total 400 respondents, the majority were female, constituting 227 individuals or 56.75%. The predominant age group was 20-30 years, making up 62.25%. The majority were students, accounting for 63.75%. Most had an average monthly income of no more than 10,000 Baht, representing 56.25%. The highest level of education for most respondents was a bachelor's degree, comprising 64.75%.

2. Analysis Results on the Opinion Levels Regarding the 7P's Marketing Mix Factors:

Table 1 Mean and Standard Deviation Values Summarizing the Aspects of the 7P's Marketing Mix, Service Quality, and Loyalty of Users.

7P's Marketing Mix	$\overline{X}$	S.D.	Important level
1.Product	4.28	.439	Much
2.Price	4.12	.517	Much
3.Place	4.19	.479	Much
4.Promotion	3.98	.558	Much
5.People	3.93	.618	Much
6.Physical Evidence	4.07	.481	Much
7.Process	4.05	.520	Much
Total	**4.09**	**.369**	Much
Service Quality			
1. Reliability	3.97	.528	Much
2. Responsiveness	3.96	.559	Much
3. Assurance	3.93	.561	Much
4. Empathy	3.92	.583	Much
5. Tangibles	3.92	.546	Much
Total	**3.94**	**.461**	Much
Loyalty of Service Users			
1. Perception	3.92	.586	Much
2. Attitude	3.96	.588	Much
3. Customer Satisfaction	3.95	.538	Much
4. Purchase Decision Process	4.04	.546	Much
5. Repeat Service Usage	4.12	.538	Much
Total	**4.00**	**.459**	Much

From Table 1, the 7P's Marketing Mix overall is at a high level. Upon detailed consideration, it is found that every aspect of the 7P's Marketing Mix is very important, ranked in descending order of average value: Product, Distribution Channel, Price, Physical Evidence, Process, Promotion, and People.

Service Quality, overall, is also at a high level. Each aspect of service quality is very important, ranked in descending order of average value: Reliability, Responsiveness, Assurance, Empathy, and Tangibles.

The Loyalty of Service Users overall is at a high level. When considering individual aspects, the loyalty of food delivery service users in the Mueang District of Ubon Ratchathani Province is ranked in descending order of average value: Repeat Service Usag e, Purchase Decision Process, Attitude, Customer Satisfaction, and Perception.

3. Analysis of the Impact of Marketing Mix and Service Quality on the Loyalty of Food Delivery Service Users in Mueang District, Ubon Ratchathani Province

Based on the first objective, to study the marketing mix and service quality affecting the loyalty of food delivery service users in the Mueang District of Ubon Ratchathani Province, the findings are as presented in Table 2.

Table 2 Multiple Regression Analysis of the Marketing Mix and Service Quality Impacting the Loyalty of Food Delivery Service Users in Mueang District, Ubon Ratchathani Province.

Predictor		Unstandardized		Standardized	t	p
		B	Std. Error	Beta		
1	Product	.098	.037	.093	2.606	.010**
2	Price	-.093	.033	-.104	-2.767	.006**
3	Place	.093	.041	.097	2.251	.025*
4	Promotion	.067	.038	.081	1.771	.077
5	People	-.038	.035	-.052	-1.084	.279
6	Physical Evidence	.072	.045	.076	1.607	.109
7	Process	-.046	.041	-.053	-1.131	.259
8	Reliability	.148	.045	.017	3.279	.001**
9	Responsiveness	.082	.042	.100	1.935	.054
10	Assurance	.120	.040	.147	3.044	.002**
11	Empathy	.153	.037	.193	4.138	.000**
12	Tangibles	.233	.040	.277	5.804	.000**
n = 400, Constant = .458, R = .802, R^2 = .643, R^2_{adj} = .632, F = 58.058, Sig = 0.00						

From Table 2, the marketing mix variables of the 7P's, including Product, Price, and Distribution Channels, significantly impact the loyalty of food delivery service users in the Mueang District of Ubon Ratchathani Province at the 0.05 level. Similarly, service quality variables such as Reliability, Assurance, Empathy, and Tangibles also affect the loyalty of food delivery service users in the Mueang District at the 0.05 significance level. These variables have a predictive power of 63.2% and can be used to formulate a predictive equation as follows:

Raw Equation Regression:

Y = 0.458 + .098 (Product) - .093 (Price) + .093 (Distribution Channel) + .148 (Reliability) + .120 (Assurance) + .153 (Empathy) + .233 (Tangibles)

Standard Score Regression Equation:

Z = + .093 (Product) - .104 (Price) + .097 (Distribution Channel) + .017 (Reliability) + .147 (Assurance) + .193 (Empathy) + .277 (Tangibles)

From the second objective, to compare the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province, categorized by demographic characteristics including gender, age, occupation, average monthly income, and education level, it was found that:

1. Food delivery service users in Mueang District, Ubon Ratchathani Province, of different genders have significantly different opinions at the 0.05 level regarding the aspect of empathy.

2. Users of different ages have significantly different opinions at the 0.05 level regarding empathy.

3.Users of different occupations have significantly different opinions at the 0.05 level regarding reliability, assurance, empathy, and tangibles.

4. Users with different average monthly incomes have significantly different opinions at the 0.01 level regarding assurance and empathy. Additionally, there are significant differences at the 0.05 level in opinions on reliability and tangibles.

Discussion

From the research on the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province, there are interesting points for discussion as follows:

1. The Product Aspect significantly affects the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province. An interesting point is that the application features reputable and trustworthy restaurants. The research indicates that users consider products from applications featuring well-known, reliable restaurants with a variety of appealing options. The exact match of ordered products to the app's descriptions also impacts loyalty, aligning with Hongyont's (2019) study on factors influencing online purchase decisions and Pinijchop's (2017) research on factors affecting e-commerce entrepreneurs' satisfaction with transportation services in Bangkok.

2. The Price Aspect impacts the loyalty of food delivery users in Mueang District, Ubon Ratchathani Province. Key points include reasonable delivery fees and various discounts offered by the application. Research shows that users consider the appropriateness of delivery fees and discounts, leading to perceived value and loyalty. This is consistent with Mekarun's (2017) findings on the influence of price factors on consumer behavior for ready-to-wear fashion and Sathienchok's (2017) study on factors affecting consumer satisfaction with Lazada online purchases in Thailand.

3. The Distribution Channel Aspect affects the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province. Noteworthy points include the application's layout, imagery, pricing, speed, and accuracy of delivery, and a wide variety of restaurant choices. The research indicates that user-friendly applications with clear, appealing images and detailed information enhance customer convenience and loyalty, in line with Panyana & Sapsanguanboon's (2019) study on factors affecting decision-making in Thai food delivery and Tularak's (2020) research on factors influencing consumers’ choice towards food delivery applications in Bangkok.

4. The Reliability Aspect influences the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province. The highest average scores were given for confidence in the application and knowledgeable service staff providing advice. This finding suggests that service reliability, including the reputation and variety of restaurants and the accuracy of order fulfillment, enhances loyalty. It aligns with Sombultawaee's (2018) study on service quality factors affecting repurchasing decisions in food products via the Food

Panda application and Buakaew's (2018) research on service usage behavior, quality, and efficiency affecting repeat usage between Kerry Express and Thailand Post.

5. The Assurance Aspect plays a role in the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province. The top-rated factors include polite and respectful service staff, accurate billing, and well-packaged food delivery. This finding suggests that assurance in service quality, including courteous behavior and accurate service delivery, fosters customer loyalty. This is consistent with Sombultawaee's (2018) research on service quality factors influencing repurchasing decisions in food products via the Food Panda application and Aroonlert & Kosakarika's (2022) study on service quality factors affecting customer satisfaction and repurchase in the Food Panda application.

6. The Empathy Aspect influences the loyalty of food delivery service users in Mueang District, Ubon Ratchathani Province. High scores were given for attentive and willing service, enthusiasm in service delivery, and thorough response to customer queries. The research indicates that empathetic service, including attentive and caring behavior, impacts customer satisfaction and loyalty, aligning with Jantaraprawat & Napompech's (2019) study on service quality satisfaction in parcel transportation service of Thailand Post affecting loyalty behavior of online selling business in the central region.

Suggestion

Suggestions for Utilizing the Research Results:

1. Product Aspect: Users value the reputation and credibility of restaurants. Hence, entrepreneurs should communicate through online media about the quality and reliability of their food and involve celebrities in promoting their restaurants.

2. Price Aspect: Although users prefer food delivery services, they consider reasonable delivery fees. Entrepreneurs should negotiate with application administrators to reduce fees to encourage more food purchases.

3. Distribution Channel Aspect: Users prioritize delivery time and the accuracy of delivery coordinates. Entrepreneurs should ensure clear terms and information in the application for efficient delivery.

4. Reliability Aspect: Users trust the reliability of applications. Entrepreneurs should choose trustworthy applications with a large customer base.

5. Assurance Aspect: Users value polite service staff who avoid using coarse language. Entrepreneurs should select employees who are willing to provide service, polite, and able to solve problems intelligently without using force or emotion. Training in service aspects is also essential, and the courteousness of the staff should be publicized online.

6. Empathy Aspect: Users appreciate attentive and willing service. Entrepreneurs should choose employees who are naturally caring and willing to serve customers. Performance evaluations focusing on customer care should be conducted, with results disseminated online to highlight their attentive service.

7. Tangibles Aspect: Users pay attention to clear and distinct signage and symbols in the application. Entrepreneurs should focus on designing distinctive and memorable logos and symbols for their business.

Suggestions for Future Research:

1. Study the characteristics of logos that influence purchasing decisions in the applications of users in Ubon Ratchathani Province.
2. Research the personality of employees that influence purchasing decisions in the applications of users in Ubon Ratchathani Province.
3. Investigate online marketing factors that influence the decision to purchase products in the applications of users in Ubon Ratchathani Province.

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Examining The Influential Factors of Turnover Intentions Among Early Childcare Teachers in Jinan City, China: A Structural Modeling Approach

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Abstract

This research explores the influential pathways to the turnover intention of early childcare teachers from the perspective of leadership in Jinan City, China. Employing a quantitative approach rooted in structural equation modeling, we aim to construct a strategic framework that can effectively mitigate the turnover intention among early childcare teachers. The conceptual framework was proposed based on the leadership theory and it examined how emotional leadership is associated with turnover intention. And it conducted empirical research through a questionnaire survey. The empirical data for this study encompassed 375 early childcare teachers operating in Jinan City, China. The findings reveal several key insights: Firstly, both leadership factors (particularly emotional leadership) and organizational elements (such as LMX and organizational commitment) exhibit a negative correlation with turnover intention. Secondly, organizational commitment and LMX emerge as significant mediators in this relationship, while leadership legitimacy does not mediate the process. The SEM model from the results for reducing turnover intentions of early childcare teachers in Jinan, China provide customized theories and strategies for human resource management and leadership development in kindergartens. This is crucial for promoting the healthy and sustainable growth of kindergarten education, laying a firm foundation for early childhood education and development. Our findings hold significant implications for retaining qualified teachers, ensuring the continuity and quality of early childhood education in Jinan and beyond.

Keywords: Emotional leadership, Leader-member exchange, Leadership legitimacy, Organizational commitment, Turnover intention, Early childcare teacher

Introduction

To achieve high-quality early childhood education (ECE), a skilled, professional, and stable teaching force is indispensable. Regrettably, despite the apparent importance of these teachers, their high turnover rate has become a global concern. According to multiple research reports, teacher attrition rates are relatively high in different regions. For instance, in the United States, the turnover rate of preschool teachers ranges from 15% to 30%, while in some Australian childcare centers, this ratio soars to 60% (Jovanovic, 2013). As a leading developing country globally, China is also confronted with the same dilemma. Relevant studies indicate that among early childcare teachers in six provinces in China, over one-third expressed a desire to leave kindergarten for other professions if given the opportunity (Hong et al., 2021).Scholars based on comprehensive survey data of 1,249 participants, similarly concluded that as high as 27.3% of early childcare teachers plan to choose to quit their positions in the following year (Shang et al., 2020). Scholars generally agree that teacher turnover can undermine the stability of schools, disrupt the continuity of curriculum, and result in the loss of experienced and effective teachers, thus dealing a significant blow to teaching quality (Holme & Rangel, 2012; Parkay et al., 1999). Given the profound impact of high turnover rates on early childhood education, as well as the significant challenges posed to the development of kindergarten teaching staff, it is vital to undertake an in-depth investigation into the factors influencing early childcare teachers' turnover (Cassidy et al., 2011).

In previous studies, numerous scholars have delved into the reasons for early childcare teachers' turnover, revealing that various personal and environmental factors affect their turnover intention (He & Wei, 2022; Heilala et al., 2022; Schaack et al., 2020). Among these, leadership style is a critical environmental variable significantly impacting kindergarten teachers' turnover intention. For instance, destructive leadership can lead to adverse outcomes such as reduced organizational commitment and increased turnover intention (Mackey et al., 2021). Conversely, emotional leadership, which emphasizes establishing emotional connections with employees and attending to their emotional needs, may reduce turnover intention (Saeed et al., 2014). In China, early childcare teachers tend to avoid directly pointing out issues with management when leaving their positions. Therefore, emotional leadership in the kindergarten setting is easily overlooked. Given China's unique cultural backdrop and collectivist values, the importance of emotional leadership in this context may be even more prominent. It's worth noting that teacher turnover is not solely an individual choice; it also reflects challenges and deficiencies in leadership within kindergarten management (Qu, 2023). Thus, an in-depth exploration of emotional leadership's specific applications and impacts in the Chinese kindergarten environment holds significant importance for stabilizing the teaching staff and enhancing the quality of early childhood education.

Leadership factors undeniably play a pivotal role in early childcare teachers' turnover decision-making. Simultaneously, interpersonal networks play a crucial role in organizational dynamics (Salip & Quines, 2023). The relationship between leaders and subordinates manifests work-related connections and incorporates profound social relationship elements (Yasin et al., 2023). The quality of leadership, the interaction between principals and early childcare teachers, all significantly impact the career development of early childcare teachers (Berkovich & Eyal, 2020; Schaack et al., 2020). This study investigates factors influencing early childcare teachers’ turnover from both leadership and organizational perspectives.

As the key leader of a kindergarten, the principal's leadership ability is closely linked to the quality of education. Specifically, emotional leadership not only impacts teachers' work attitudes (Price, 2012; Tai & Kareem, 2018)and educational effectiveness (Zembylas, 2011), but also correlates with teachers' intentions to remain in their jobs (Schaack et al., 2020). Recent research has demonstrated a negative association between the principal's emotional leadership and early childcare teachers' turnover intentions (Kim et al., 2020). In other organizational contexts, scholars have discovered that LMX (Gara Bach Ouerdian, 2021), leader legitimacy (Seonmi & Sa-Jean, 2020), and organizational commitment (Jin et al., 2020; Kim & Jung, 2010) mediate the relationship between these factors. However, these variables are rarely addressed in educational contexts. We hypothesize that LMX, leader legitimacy, and organizational commitment also assume crucial roles within kindergartens.

This study is research from an educational institution. As scholarly research has seldom focused on the turnover intentions of early childcare teachers in China from a leadership perspective, this study aims to explore the factors influencing the turnover intentions of early childcare teachers, and how leadership factors influence early childcare teachers ' turnover intention. Through questionnaire surveys, data will be collected from multiple kindergartens in Jinan, focusing on early childcare teachers' emotional leadership, organizational commitment, and leader-member exchange (LMX) relationships, among other vital elements. The objective is to comprehensively understand the mechanism of leadership's role in early childcare teachers' turnover intention. This research aspires to provide practical guidance and suggestions for kindergarten management by uncovering the specific relationship between leadership and preschool teachers' turnover intention. It will assist management in adjusting leadership strategies, thereby enhancing teachers' job satisfaction, and effectively reducing turnover rates. Furthermore, this study also enriches academic understanding of the relationship between leadership and teachers' turnover intention, contributing new knowledge and insights to theoretical research in related fields.

Objective

To explored the influencing factors and mechanism of early childcare teachers' turnover intention from the perspective of emotional leadership in Jinan, China.

Research Methodology

This study is a quantitative research methodology and the research process is described below.

Participants and Procedure

The population of this study was 14,402 early childhood teachers in the main urban area of Jinan City (data from the Jinan Education Bureau website). The number of early childhood teachers in the main urban area of Jinan City were 2,789 in Lixia District, 3,546 in Licheng District, 2,679 in Huaiyin District, 3,119 in Shizhong District, and 2,278 in Tianqiao District. According to Morgan's table, the effective sample size of this study is 375.

To ensure adequate sampling and sample representativeness, the study initially calculated sampling weights based on the ratio of full-time teachers in each district to the total teacher population. Considering an effective sample size N of 375 and a 10% sample loss, the sample size is 412.5, and applying the rule of rounding off, the final sample size is determined to be

415. Researcher proportionally sampled ECTs from each district to reflect the actual teacher distribution. The sampling number of each district is 80 in Lixia District, 102 in Licheng District, 77 in Huaiyin District, 90 in Shizhong District, and 66 in Tianqiao District. A total of 415 responses were received. After clearing the unqualified questionnaires through the SPSS software, 375 valid ones were obtained, recovery rate was 90.36%. And the sample number was sufficient to align with the regularly accepted sample size standards (Krejcie & Morgan, 1970).

The research method adopted was the questionnaire method. The questionnaire is divided into two parts. The first part involves collecting demographic information from the participants, while the second part entails detailed measurements of variables in our predefined model. It's a seven-point Likert scale, with scores ranging from 1 (strongly disagree) to 7 (strongly agree). An online questionnaire survey was utilized to collect data, offering several advantages over other methods. The online survey method not only aids in data collection but also streamlines the data input and processing procedures. By utilizing online data collection, the integrity of the data was ensured throughout the entire research process. Survey links through the Survey Star platform was distributed, clearly describing the study's purpose.

The statistics used in the study consisted of descriptive statistical procedures, consisting of Percentage, Mean, and Standard Deviation. PLS-SEM was also employed as our primary analytical technique and validated the model using the Smart PLS V.3.0 software. Contrasting with the traditional maximum likelihood estimation of CB-SEM, PLS-SEM does not strictly necessitate data to fulfill typical distribution assumptions, and it also possesses the capability to estimate intricate models in smaller sample sizes (Hair et al., 2017; Khan et al., 2019; Shiau & Luo, 2012). PLS-SEM aims to maximize the explained variance in the dependent variable, showcasing its superior adaptability in empirical quantitative research. Consequently, when probing the relationship between emotional leadership and their turnover intentions, PLS-SEM undoubtedly emerges as an apt analytical choice.

Measures

Details of the scales adopted in this research are as follows.

Emotional leadership scale. It was used to measure emotional leadership in this study from an other-rated perspective, integrating related researchers' scales (Boyatzis, 2001; Jin, 2010; Jordan et al., 2002; Jordan & Lawrence, 2009; Wong & Law, 2002) in three dimensions: emotion recognition, empathy, and emotion management. The Cronbach's alpha in present study was 0.932.

Leadership legitimacy scale. Leadership legitimacy was measured by 4 items on a seven-point scale (Choi & Mai-Dalton, 1998; Vugt & Cremer, 1999). The Cronbach's alpha in present study was 0.882.

Organizational commitment scale. The study utilized Meyer & Allen's Organizational Commitment Scale (1991), initially comprising 15 items. However, due to the significant association between the continued commitment scale and the dependent variable, the focus was primarily on affective and normative commitment. These sections included a total of 9 items. The affective and normative commitment subscales showed satisfactory internal consistency reliability, with respective Cronbach's α values of 0.954.

LMX scale. In this study, we employed the LMX scale developed by Graen and Uhl-Bien (1995). The scale consists of 8 items to reflect the subordinate's self-perception of the exchange relationship between leaders and members. The Cronbach's alpha coefficient for the scale reached 0.871.

Turnover intention scale. This study utilized Mobley's (1978) turnover intention scale. The scale consists of 4 items. The Cronbach's alpha coefficient for this scale in this study was found to be 0.901.

Research Findings

Descriptive Analysis

Descriptive analysis of the participants' demographics. This study conducted a questionnaire survey of early childcare teachers in Jinan, Shandong Province, China. A total of 425 questionnaires were collected. After excluding invalid questionnaires, 375 valid responses were retained in this survey. The basic information of the study participants is shown in Table 1.

Table 1: Demographic information

	Items	Frequency	Percentage (%)
Gender	Male	35	9.3
	Female	340	90.7
Age	<24 years old	175	46.7
	25-29 years old	95	25.3
	30-34 years old	42	11.2
	35-39 years old	26	6.9
	>40 years old	37	9.9
Major	Pre-school education majors	256	68.3
	Non-Preschool Teacher Training Programs	61	16.3
	Non-teacher-training majors	58	15.5
Education	High middle school, vocational high middle school and below	34	9.1
	College	119	31.7
	Undergraduate	209	55.7
	Graduate and above	13	3.5
Marriage	Unmarried	213	56.8
	Married	162	43.2

Descriptive analysis of the surveyed constructs. As a seven-point Likert scale was adopted to measure the items, with the values of each item ranging from "1 = Strongly disagree" to "7 = Strongly agree", so correspondingly, the Criteria of Scale in evaluating the mean of the constructs in this study range from "1- 1.5=Very Low" to "6.51-7= Very High", with "3.51-4.5=Moderate", with "1.51-2.5=Low, 2.51-3.5= Somewhat low" and "4.51-5.5= Somewhat high, 5.51-6.5= High".

There are 5 constructs in this survey. Emotional leadership (M=5.52, SD=1.15), Leadership Legitimacy (M=5.47, SD=1.25) and LMX (M=5.42, SD=1.18) have the 'Somewhat high' results, with the means in 4.51-5.5; and organizational commitment (M=5.66, SD=1.21), has the 'High' result, with the means from 5.51-6.5. Turnover intention (M=2.29, SD=1.20), has the 'Low' result, with the means from 1.51-2.5.

The research was conducted by employing a partial least squares structural equation modeling (PLS-SEM) approach. The outer model in this research was assessed through the following aspects: the internal consistency and the reliability of each item, convergent validity and discriminant validity of the constructs.

An analysis of the data from Table 2 reveals that the range for Cronbach's α coefficient is between 0.871 and 0.949, consistently exceeded the recommended threshold of 0.7. Similarly, the values for composite reliability fall between 0.921 and 0.957, surpassing the suggested threshold of 0.7. The AVE values range from 0.795 to 0.872, exceeding the standard value of 0.5. Notably, all factor loadings for the constructs are more significant than 0.7, indicating their reliability. In conclusion, based on the evaluation criteria(Hair et al., 2017), our findings affirm the reliability and convergent validity of the model.

Table 2: Reliability results.

Conduct	Items	Factor Loading	Cronbach's Alpha	CR	AVE
AC	AC1	0.917	0.944	0.957	0.816
	AC2	0.908			
	AC3	0.935			
	AC4	0.870			
	AC5	0.887			
EM	EM1	0.902	0.945	0.961	0.859
	EM2	0.949			
	EM3	0.944			
	EM4	0.911			
EMM	EMM1	0.920	0.949	0.963	0.867
	EMM2	0.950			
	EMM3	0.942			
	EMM4	0.912			
EMR	EMR1	0.932	0.926	0.953	0.872
	EMR3	0.937			
	EMR4	0.932			
LA	LA1	0.889	0.882	0.927	0.809
	LA2	0.887			
	LA3	0.922			
LMX	LMX1	0.888	0.871	0.921	0.795
	LMX3	0.863			
	LMX4	0.923			
NC	NC1	0.910	0.939	0.956	0.844
	NC2	0.931			
	NC3	0.924			
	NC4	0.910			
TI	TI1	0.910	0.901	0.938	0.835
	TI2	0.935			
	TI3	0.896			

EM, Empathy; EM, Emotional management; EMR, Emotional recognition; LA, Leader acceptance; LMX, Leader-membership exchange; AC, Affective commitment; NC, Normative commitment; TI，Turnover intention.

Discriminant validity is utilized to assess the differentiation between items. Based on the Fornell-Larcker criterion (Fornell & Larcker, 1981), discriminant validity is evaluated by comparing the square root of each construct's Average Variance Extracted (AVE) with the correlation coefficients of other constructs. If the AVE of a construct surpasses its correlation with other constructs, it indicates satisfactory discriminant validity. Data from Table 3 suggests that the square root of each construct's AVE exceeds its correlation with other constructs.

Table 3: Discriminate validity（Fornell–Larcker criterion）

	EL	LL	LMX	OC	TI
EL	0.868				
LL	0.861	0.899			
LMX	0.781	0.764	0.892		
OC	0.774	0.833	0.744	0.855	
TI	-0.775	-0.753	-0.725	-0.781	0.914

Note: EL, Emotional leadership; LL, Leadership legitimacy; LMX, leader-membership exchange; OC, Organizational commitment; TI, Turnover intention.

Therefore, the internal consistency, item reliability, convergence validity, and discriminant validity of this study have all been confirmed.

Discussion

The results of this study indicate that emotional leadership is negatively correlated with turnover intention, with Leader-Member Exchange (LMX) and organizational commitment mediating this process, while leadership legitimacy does not mediate this process. The research findings confirm the validity of hypotheses H1-H4, H6, and H7, while H5 is not supported. Specifically, the principal's emotional leadership contributes to establishing a positive organizational climate. They may create an open, inclusive, supportive, and respectful work environment (Salip & Quines, 2023). When kindergarten principals exhibit high levels of emotional leadership, they can significantly influence teachers' emotions and attitudes. As a result of this positive emotional interaction, teachers often feel respected and understood, thereby enhancing their satisfaction and commitment to the kindergarten. Furthermore, in challenging team situations, the principal's demonstration of positive emotions and provision of emotional support during difficult times can significantly improve the quality of LMX.

A good LMX has a positive impact on employees' perceptions of the organization (Baranik et al., 2010; Lapointe & Vandenberghe, 2017). Studies have shown that when employees communicate well with their leaders, their views on the organization change positively (Ahmed, 2013). The importance of organizational commitment in reducing employee turnover has been mentioned many times. Organizational commitment can help organizations reduce employees' turnover intention, thereby significantly improving the organization's human resource management level (Dawley, 2008; Pratama, 2022).

The results of this study indicate that there is no significant correlation between leadership legitimacy and job turnover, failing to validate Hypothesis H5, which contradicts previous research (Hassan et al., 2011). This outcome suggests that employee recognition of leadership is one of many factors that affect their turnover intention. Turnover intention is typically influenced by multiple factors, including but not limited to salary levels, work environment, job satisfaction (Feyerabend et al., 2018; Heilala et al., 2022), personal growth opportunities, and interpersonal relationships with colleagues and superiors (Harris et al., 2014; Ouerdian, 2021). Although leadership legitimacy may affect job satisfaction and relationships with superiors, it is only one aspect of the complex decision-making process. Even if leaders have a high degree of legitimacy and are respected and supported by employees, if other aspects of the organization fail to meet their needs and expectations, they may still choose to leave.

Based on the above research and findings, this study demonstrates the relationship between emotional leadership and preschool teachers' turnover intention. Meanwhile, it contributes new theoretical insights into emotional leadership to the academic community. In order to reduce teacher turnover rates, increase teachers' intention to stay, and optimize kindergarten management, the following countermeasures and suggestions are proposed. They aim to strengthen the positive impact of leadership further and optimize kindergarten management, thereby stabilizing the teaching staff and improving the quality of education.

To stabilize the teaching staff and promote the development of kindergartens, the following key measures need to be taken based on the results of this study. Firstly, it is necessary to strengthen emotional leadership training for kindergarten principals, establish deep emotional connections with teachers, and create a positive working environment to enhance teachers' job satisfaction. Secondly, optimizing the relationship between principals and teachers is crucial. This can be achieved through effective communication and emotional support to enhance mutual trust and cooperation, thereby reducing teachers' turnover intention. Furthermore, kindergartens should provide competitive compensation and benefits and good career development opportunities to strengthen teachers' organizational commitment and sense of belonging. Meanwhile, it is important to comprehensively consider various turnover factors, such as salary, working environment, and interpersonal relationships, and take steps to improve them to reduce the turnover rate. Finally, establishing an effective feedback mechanism is essential. This encourages teachers to provide suggestions and promptly addresses any issues they may face, thereby retaining excellent teachers and laying a solid foundation for the sustainable development of the kindergarten.

Conclusions

A model was constructed based on leadership theory, and the Partial Least Squares Structural Equation Modeling (PLS-SEM) method was employed for empirical analysis. The research findings convincingly validated the direct and mediating effects of perceived emotional leadership on early childhood teachers' intentions to leave their positions. More specifically, the study elucidated that perceived emotional leadership significantly and positively influences early childhood teachers' turnover intentions, either through the mediating pathways of LMX and organizational commitment or by directly impacting the intention to leave. However, it is salient to note that perceived emotional leadership does not mediate the effect on turnover intentions through the leadership legitimacy. This investigation furnishes valuable insights and contributes to the extant theories concerning emotional leadership and employee turnover. Educators, managerial decision-makers, and researchers are encouraged to contemplate these research findings earnestly, as they provide a more profound comprehension of emotional leadership's role in retaining employees.

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Service Quality, Privacy, and Reliability Influencing Loyalty Through Satisfaction in The Use of BAAC Mobile Application in Si Sa Ket Province

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Abstract

This research aims to 1. investigate the impact of service quality, privacy, and reliability on user satisfaction with the BAAC Mobile application, 2. examine the influence of service quality, privacy, reliability, and satisfaction on loyalty towards the BAAC Mobile application, and 3. explore how service quality, privacy, and reliability affect loyalty through satisfaction with the BAAC Mobile application. The sample consisted of 500 users of the BAAC Mobile application from 20 branches of the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Si Sa Ket Province, using a stratified random sampling method. The instrument used was a questionnaire, and the statistics employed included mean, percentage, standard deviation, and analysis of direct and indirect effects. The findings revealed that 1. service quality, privacy, and reliability directly influence satisfaction with the BAAC Mobile application, 2. privacy, reliability, and satisfaction directly affect loyalty towards the BAAC Mobile application, and 3. service quality, privacy, and reliability influence loyalty through satisfaction with the BAAC Mobile application.

Keywords: Service Quality, Privacy, Reliability, Satisfaction, Loyalty, BAAC Mobile Application Users

Introduction

Currently, banks in Thailand, whether commercial or state banks, have adapted and developed using electronic banking systems (E-banking), which is a form of electronic banking. This system offers customers access to various banking services such as bill payments, investments, money transfers, utility payments, payment for goods and services, loan applications, card blocking, checking account balances, and requesting account statements, among others. The use of E-banking provides convenience for those who find it difficult to visit a bank physically, as transactions can be performed over the internet network anytime, anywhere. The advancement of technology has significantly changed people's lifestyles; where previously one had to travel to a bank for financial transactions, now money transfers, payments for goods, or other financial transactions can be done from anywhere via the internet. However, this convenience, if not used cautiously, could lead to potential issues, including scams such as being tricked into installing malware, creation of fake emails and websites to phish for victims' information. Furthermore, fraud schemes have evolved over time, including random phone calls or SMS messages by impersonating government officials or organizations to appear credible, then concocting stories to deceive victims, with the ultimate goal of extracting money from their accounts by any means possible. Common pretexts used by scammers include claims of account seizure/debt on credit cards, involvement in drug trafficking or money laundering, tax refunds, winning a large prize, phishing for personal information, and erroneous transfers (Bank of Thailand, 2023).

The Bank for Agriculture and Agricultural Cooperatives (BAAC) is a state enterprise under the supervision of the Ministry of Finance, Thailand. It has developed information systems to meet the service needs of its customers in various aspects, steadfastly and continuously improving financial services in response to ever-changing situations. Prioritizing convenience and security for customers in financial transactions is paramount. BAAC has offered Mobile Banking services through the BAAC A-Mobile application since 2018. In 2022, BAAC A-Mobile was upgraded to BAAC A-Mobile Plus, and most recently, in 2023, it was further developed into BAAC Mobile. Specifically, in the lower northeastern region, there are currently 498,556 users of BAAC Mobile, with 61,290 of those in Si Sa Ket Province, accounting for 57.75% of the original customers. Si Sa Ket Province has the highest percentage of users who have migrated to BAAC Mobile in the lower northeastern branch, followed by Amnat Charoen Province at 56.56% and Ubon Ratchathani Province at 55.80% (Bank for Agriculture and Agricultural Cooperatives, 2023).

It is evident that despite the various risks associated with electronic financial transactions in today's cashless society, customers still prefer to conduct their financial transactions through Mobile Banking for daily convenience. However, as the banking business market and financial institutions offering various financial services adopt digital innovations, creating new phenomena such as FinTech and new financial services provided by non-banking entities challenging traditional banking continuously, the Bank for Agriculture and Agricultural Cooperatives (BAAC) must develop modern systems that cover a wide range of services to always meet user demands. This development aims to create satisfaction and loyalty among users of BAAC Mobile services. Therefore, the researcher intends to conduct a study on the influence of service quality, privacy, and reliability on loyalty through satisfaction with using the BAAC Mobile application in Si Sa Ket Province.

Objective

1. To investigate the influence of service quality, privacy, and reliability on customer satisfaction with the use of the BAAC Mobile application in Si Sa Ket Province.

2. To examine the impact of service quality, privacy, reliability, and satisfaction on loyalty towards the BAAC Mobile application in Si Sa Ket Province.

3. To explore how service quality, privacy, and reliability affect loyalty through satisfaction with the BAAC Mobile application in Si Sa Ket Province.

Literature Review

The concept of Service Quality comprises three main ideas: Customer Satisfaction, Service Quality, and Customer Value (Cronin and Taylor, 1992; Oliver, 1993; Zeithaml, Parasuraman, and Berry, 1988). Based on these foundational ideas, customer satisfaction towards a service is a psychological behavior that an individual has towards the received or perceived service (Oliver, 1993). Cronin and Taylor's perspective is that satisfaction or dissatisfaction involves comparing the service experience with the expectations held at the time of the service, which aids in measuring service quality. Literature review shows that service quality positively influences customer satisfaction and loyalty (Monchantha, 2019, p. 2981-2996; Laohasiripanya, 2017, p. 53-55), leading to the following hypotheses:

H1: Service Quality influences satisfaction.

H2: Service Quality influences loyalty.

The concept of Privacy and Cyber Security are inseparably related. Nowadays, data stored digitally or traditionally is highly valuable, potentially leading to personal data breaches or leaks affecting privacy, security, reputation, and organizational trust. Thus, data privacy and security protection have become increasingly critical (Personal Data Protection Act, 2019). If online banking providers guarantee secure transactions and protect personal data privacy, consumers are more likely to trust them (Thaichon et al., 2014; Shankar and Kumari, 2016). Literature review finds that data privacy protection, financial data protection, and secure transactions positively influence customer satisfaction in Pakistan (Haq & Awan, 2020) and privacy in responsiveness and contact correlates with Netflix streaming service users' loyalty (Pinyopanitchakarn, 2020), leading to the following hypotheses:

H3: Privacy influences satisfaction.

H4: Privacy influences loyalty.

The concept of Reliability refers to the service provider's ability to deliver services accurately and consistently as promised (Parasuraman et al.,2005, p. 23). In the context of electronic services, consistent quality service delivery (Pakdil, 2012), error-free service availability, and accurate service delivery as promised encourage customer retention. Reliability is also a key feature in EBSQ, influencing positive customer responses to various E-banking services (Blut et al., 2015). Literature review indicates that service providers' reliability in delivering accurate, consistent, and efficient services influences customer satisfaction factors in Malaysia (Koay, 2022) and trust in K–Mobile Banking's straightforwardness and consistency positively affects loyalty (Boonma, 2019), leading to the following hypotheses:

H5: Reliability influences satisfaction.

H6: Reliability influences loyalty.

The concept of Satisfaction is when a product or service meets customer expectations, leading to increased and frequent purchases and referrals (Pearson and Johnson, 1978). "The difference between prior expectations and post-consumption perception" results in satisfaction if the perception is positively different from expectations, but dissatisfaction if it's negatively different, also being an emotional response to the overall product or service experience (Oliver, 1980). Literature review finds that customer satisfaction with product or service features that meet needs satisfactorily, both below and above expectations, significantly positively impacts customer loyalty in the case of Sharia Banking in Indonesia (Saraswati, 2022) and consistent service satisfaction in Grab Food application correlates directly with user loyalty (Weeraphong, 2022), leading to the following hypothesis:

H7: Satisfaction influences loyalty.

The concept of Loyalty is the desire to repeatedly use a product or service and have a positive attitude towards the brand, which increases with positive attitudes and satisfaction, leading to referrals and enhanced loyalty. Loyalty can be divided into two types: 1) Emotional Loyalty and 2) Rational Loyalty (Gamble, Stone, and Woodcock, 1989), with loyalty being the service provider's ability to make users feel pleased to choose their products and services as their first choice (Caruana, 2002), leading to continuous and consistent use due to satisfaction.

The concept of a Mediator is a variable that mediates the causal relationship between independent and dependent variables, acting as a third variable that changes the relationship between them by explaining the relationship (Baron & Kenny, 1986). Literature review shows that service quality delivered by businesses, including reliability, responsiveness, assurance, empathy, and tangibles, indirectly affects loyalty through mediators such as perceived value and satisfaction (Durongdumrongchai, 2018), and privacy and security mechanisms, data transaction security, financial guarantees, and payment system security lead to customer loyalty through satisfaction in using M-Banking in Sri Lanka (Navarathne, 2021), and reliability in immediate problem or complaint resolution, consistent banking transactions, and sufficient application security influence loyalty through user satisfaction in Livin' by Mandiri in Indonesia (Hariyanto, 2022), leading to the following hypotheses:

H8: Service Quality influences loyalty through satisfaction.

H9: Privacy influences loyalty through satisfaction.

H10: Reliability influences loyalty through satisfaction.

Research Methodology

The population used in this study comprises users of the BAAC Mobile application from 20 branches of the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Si Sa Ket Province, totaling 61,290 individuals (Bank for Agriculture and Agricultural Cooperatives, 2023).

The sample group used for analysis was calculated based on the ratio of sample units to the number of parameters or variables according to the formula by Hair et al. (2010). The suitable sample size for multivariate statistical analysis should be at least 10 to 20 times the number of indicators. In this study, with 50 observed variables from the questionnaire, the minimum sample size should be approximately 500 samples.

Sampling units from the population, knowing the total population number, with an equal chance of being selected for the sample group, was done using the Proportional Stratified Random Sampling method.

The tool used in this study was a questionnaire, serving as the instrument for data collection. The questions were divided into six sections: personal information, service quality, privacy, reliability, satisfaction, and loyalty.

The research instrument creation process began with the researcher studying concepts, theories, and related research to establish a basis for selecting variables that encompass the objectives. This foundation informed the construction of a questionnaire aligned with the research framework and defined its scope. The draft questionnaire was presented to an advisor for verification and adjustment based on their recommendations to ensure accuracy and appropriateness. Following this, five experts were consulted to review the questionnaire's correctness and content validity, and their feedback was analyzed to determine the Index of Item Objective Congruence (IOC). The review yielded an IOC value of 1, indicating that the questionnaire items were congruent and capable of measurement. A trial run of the questionnaire was conducted with a non-sample population of 50 individuals in Ubon Ratchathani Province to determine the reliability of each item using Cronbach's Alpha Coefficient, which resulted in an overall reliability score of 0.96.

For data collection, the researcher issued external letters to obtain permission for research data collection from 20 branches of the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Si Sa Ket Province. The aim was to cooperate in gathering data from users of the BAAC Mobile application in the area. The questionnaire was prepared in both paper and online formats (Google Form), complete with a QR Code, and data was collected from a sample of 500. The researcher distributed the questionnaires to the sample group at predetermined locations, providing explanations about the objectives and clarifying any questions before distribution.

Data analysis was conducted after the questionnaires were collected and verified for accuracy and completeness. The data were coded and entered into a computer for processing with statistical software IBM SPSS Statistics 26 and jamovi-2.3.28.0. Descriptive analysis was used to calculate means and standard deviations, factor analysis was performed to examine the grouping of measurement scales, and correlation coefficients were calculated for discriminant validity. Direct, indirect, and total effects were analyzed using GLM Mediation Analysis. The results of the hypothesis testing were then summarized.

Research Findings

The results of the factor analysis to examine the grouping of measurement scales for service quality, privacy, and reliability influencing loyalty through satisfaction in using the BAAC Mobile application in Si Sa Ket Province are explained in Table 1.

Table 1: Results of Factor Analysis

Latent Variable	Observed Variable	Factor Loading	Eigenvalue/ Cumulative	KMO/ (P-Value)
Service Quality : SQ	SQ1 - SQ10	0.44 - 0.70	2.96/29.70	0.82/(0.00)
Privacy : PC	PC1 - PC10	0.49 - 0.64	3.37/33.70	0.81/(0.00)
Reliability : RL	RL1 - RL10	0.52 - 0.66	3.65/36.50	0.83/(0.00)
Satisfaction : SF	SF1 - SF10	0.52 - 0.67	3.71/37.10	0.82/(0.00)
Loyalty : LO	LO1 - LO10	0.49 - 0.64	3.41/34.20	0.85/(0.00)

From Table 1, the factor analysis of the indicators in the questionnaire tested on a sample of 500 samples, the researcher analyzed using the Varimax rotation method and set the eigenvalues greater than 1.0 (Revelle, W., 2019). It was found that all indicators could be grouped together, and every indicator of each measurement scale had a weight in the same single component as follows: Service Quality (SQ) had Factor Loadings ranging from 0.44 to 0.70, an Eigenvalue of 2.96, and a KMO value of 0.82. Privacy (PC) had Factor Loadings ranging from 0.49 to 0.64, an Eigenvalue of 3.37, and a KMO value of 0.81. Reliability (RL) had Factor Loadings ranging from 0.52 to 0.66, an Eigenvalue of 3.65, and a KMO value of 0.83. Satisfaction (SF) had Factor Loadings ranging from 0.52 to 0.67, an Eigenvalue of 3.71, and a KMO value of 0.82. Lastly, Loyalty (LO) had Factor Loadings ranging from 0.49 to 0.64, an Eigenvalue of 3.41, and a KMO value of 0.85.

The results of the correlation coefficient analysis for examining the discriminant validity between variables can be explained as follows in Table 2.

Table 2: Results of the Multicollinearity Analysis

Collinearity Statistics		
	VIF	**Tolerance**
SQ	4.82	0.20
PC	5.76	0.17
RL	6.48	0.15
SF	6.82	0.14

From Table 2, the results of the analysis for high commonality linearity check for independent variables, namely service quality, privacy, reliability, and satisfaction, it was found that the minimum tolerance value was 0.14 and the maximum was 0.20, both of which are above the minimum threshold of Tolerance greater than 0.10. The Variance Inflation Factor (VIF) values ranged from a minimum of 4.82 to a maximum of 6.82, all below the threshold of 10, indicating that each variable is not redundant with others. Therefore, there is no issue of high multicollinearity

The results of the analysis for direct effect, indirect effect, and total effect of service quality, privacy, and reliability on loyalty through satisfaction in using the BAAC Mobile application in Si Sa Ket Province, using the GLM Mediation Model, can be explained as follows in Table 3:

Table 3: Results of the Analysis for Direct Effect, Indirect Effect, and Total Effect

Type Effect	Path	Estimate	SE	β	z	p
Direct	SQ ⇒ LO	-5.69	0.04	-5.36	-0.01	0.99
	PC ⇒ LO	0.21	0.04	0.20	4.63**	0.00
	RL ⇒ LO	0.34	0.04	0.35	7.47**	0.00
	SF ⇒ LO	0.37	0.04	0.38	7.77**	0.00
Component	SQ ⇒ SF	0.32	0.03	0.29	8.48**	0.00
	PC ⇒ SF	0.21	0.04	0.21	5.25**	0.00
	RL ⇒ SF	0.45	0.04	0.46	11.98**	0.00
Indirect	SQ ⇒ SF ⇒ LO	0.12	0.02	0.11	5.73**	0.00
	PC ⇒ SF ⇒ LO	0.08	0.01	0.08	4.35**	0.00
	RL ⇒ SF ⇒ LO	0.17	0.02	0.17	6.52**	0.00
Total	SQ ⇒ LO	0.11	0.04	0.11	2.77**	0.00
	PC ⇒ LO	0.29	0.04	0.28	6.22**	0.00
	RL ⇒ LO	0.51	0.04	0.53	11.93**	0.00
F = 582 Sig. = .00 R = 0.90 R^2 = 0.82 $R^2_{adj.}$ = 0.82						

**Level of Significance 0.01

From Table 3, it was found that the analysis of the multiple correlation coefficient R is equal to 0.90 (R = 0.90), indicating that service quality (SQ), privacy (PC), reliability (RL), and satisfaction (SF) together predict loyalty (LO) in using the BAAC Mobile application in Si Sa Ket Province by 82.00 percent (Adjusted R^2 = 0.82).

The analysis of direct effect found that service quality (SQ), privacy (PC), and reliability (RL) have a statistically significant direct effect on satisfaction (SF) at the 0.01 significance level.

The analysis of direct effect found that privacy (PC), reliability (RL), and satisfaction (SF) have a statistically significant direct effect on loyalty (LO) at the 0.01 significance level. Service quality (SQ) does not have a Direct Effect on loyalty (LO).

The analysis of indirect effect found that service quality (SQ), privacy (PC), and reliability (RL) have a statistically significant indirect effect on loyalty (LO) through satisfaction (SF) at the 0.01 significance level.

To summarize, all hypotheses, except for H2, have been confirmed.

The path relationship of service quality, privacy, and reliability influencing loyalty through satisfaction in using the BAAC Mobile application in Si Sa Ket Province is depicted in Figure 1.

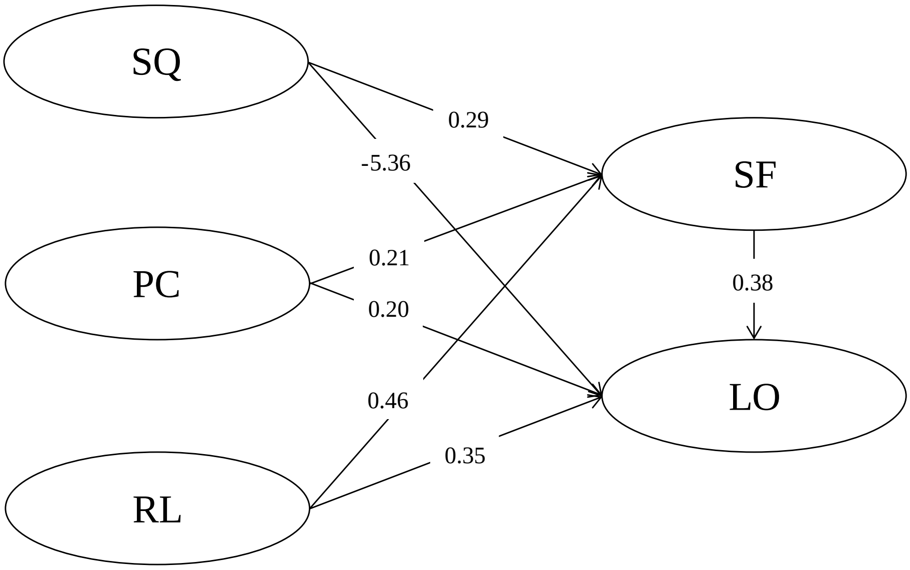

Figure 1: The path relationship of service quality, privacy, and reliability influencing loyalty through satisfaction

Discussion

Service quality analysis revealed that service quality (SQ) directly influences satisfaction (SF), demonstrating that the application's capability to efficiently respond to customer service needs, with speed, a wide range of services, stable and continuous operation without failure, and availability anytime and anywhere, leads to satisfaction with the BAAC Mobile application. This is consistent with Weeraphong's (2022) research, which found that overall electronic service quality influences satisfaction, where users with positive purchasing experiences or overall feelings towards the Grab Food application are satisfied with its service. Saraswati (2022) discovered that guaranteed service quality, tangibility, reality, and responsiveness positively affect customer satisfaction in Sharia Banking in Indonesia. Sulaiman (2021) found that service quality with reliability, responsiveness, tangibility, guarantee, and empathy significantly influences the satisfaction of customers in interest-free banks in Nigeria. Furthermore, the analysis found that service quality (SQ) does not directly influence loyalty (LO) in using the BAAC Mobile application, aligning with Fatikah's (2022) research, which showed that service quality does not impact customer loyalty, while service quality affects loyalty through satisfaction in banking transactions via mobile for Islamic customers in Indonesia. This shows that besides the service response capability of the app being efficient, quick, and failproof, user satisfaction is also essential for generating loyalty.

The analysis found that service quality (SQ) has an indirect effect on loyalty (LO) with satisfaction (SF) serving as the mediating variable. This shows that the app's ability to efficiently respond to customer service needs, easy and convenient transaction processing, well-organized menu categories, and modern display screens, along with knowledgeable and friendly staff providing service advice, leads to satisfaction. Once satisfaction is achieved, app users develop a positive attitude towards using the app or the service provider, resulting in a decision to regularly use the app, thereby creating loyalty to the BAAC Mobile application. This is in line with the research of Durongdumrongchai (2018), which found that service quality delivered by fitness centers to customers, including reliability, responsiveness, assurance, empathy, and tangibility, indirectly affects loyalty through the mediating variables of perceived value and satisfaction. Fatikah (2022) found that service quality with personalized service, well-organized site, user-friendliness, and efficiency influences loyalty through satisfaction as the mediator in the relationship of customers conducting banking transactions via mobile for Islamic customers in Indonesia.

Privacy analysis revealed that privacy (PC) directly influences satisfaction (SF), indicating that the privacy and security of personal data in using the app are critical. Service providers must ensure the protection of personal data, including safeguarding users' transaction behavior data, not sharing data with others without permission, and not misusing the data, leading to satisfaction with the BAAC Mobile application. This is in line with the research by Haq & Awan (2020), which found that the protection of personal data, financial information, and secure transactions positively influence customers' electronic satisfaction in Pakistan. Additionally, the analysis found that privacy (PC) directly influences loyalty (LO) in using the BAAC Mobile application, aligning with Charusiri's (2022) research. This study found that the app's ability to protect user privacy and secure payment channels influences loyalty in using a music streaming application in Bangkok. Pinyopanitchakarn (2020) found that privacy, responsiveness, and contact have a relationship with the loyalty of Netflix streaming service users.

The analysis found that privacy (PC) has an indirect effect on loyalty (LO) with satisfaction (SF) acting as the mediating variable. This indicates that the privacy and security of personal data in using the app, which includes not using data without permission and securing the transmission of data between the app and the users to prevent access by third parties, leads to satisfaction. Once satisfaction is achieved, app users develop a positive attitude towards using the app or the service provider, making it their primary choice for financial transactions, thereby creating loyalty to the BAAC Mobile application. This is consistent with research by Hariyanto (2022), which found that satisfaction mediates the relationship between personalization and the loyalty of Livin' by Mandiri users in Indonesia. Furthermore, Navarathne (2021) discovered that privacy and security mechanisms, data security in transactions, financial transaction guarantees, and secure payment systems result in customer loyalty through satisfaction with using M-BANKING during the COVID-19 pandemic in Sri Lanka.

Reliability analysis revealed that reliability (RL) directly influences satisfaction (SF), demonstrating that trust in the app's service standards, efficiency in service delivery that is fast, accurate, and meets expectations, and comprehensive service offerings result in satisfaction with the BAAC Mobile application. This aligns with research by Koay (2022), which found that service reliability, including the ability to deliver services as promised accurately, consistently, and efficiently, influences customer satisfaction factors in Malaysia. Damrongthakoengkiat (2019) discovered that reliability, which creates trust among users through maintaining honesty and adherence to promises, affects the loyalty of mobile phone users in Bangkok. Furthermore, the analysis revealed that reliability (RL) directly influences loyalty (LO), consistent with research by Indrasari (2021), which showed that reliability in terms of quality service, error-free operations, and consistency in fulfilling service promises is expected from service providers and affects the loyalty of electronic banking users during the COVID-19 pandemic in Indonesia. Boonma (2019) found that trustworthiness and the straightforwardness and clarity of services offered by K–Mobile Banking, always adhering to contracts, positively influence user loyalty in Bangkok.

Reliability analysis revealed that reliability (RL) indirectly influences loyalty (LO) with satisfaction (SF) serving as the mediating variable. This shows that trust in the app's service, which operates as promised, allows for the retrospective verification of transaction details, exceeding customer expectations, and offers a reliable protection and rights system. In case of any loss due to app usage, the service provider compensates adequately, leading to satisfaction. Once satisfaction is achieved, app users develop a positive attitude towards using the app or service provider, deciding to use the app regularly. This likelihood increases the chance of recommending the app to close acquaintances, fostering loyalty towards the BAAC Mobile application. This aligns with research by Navarathne (2021), which found that reliability in delivering services as promised reliably and accurately, offering services within the agreed timeframe, and providing necessary information for problem-solving and customer inquiries indirectly impacts loyalty. It suggests that customer satisfaction mediates the relationship between reliability and customer loyalty in M-BANKING during the COVID-19 pandemic in Sri Lanka. Hariyanto (2022) discovered that reliability in immediately addressing customer complaints or inquiries, consistent accuracy in banking transactions, and the sufficient security of the Livin' app by Mandiri are factors affecting loyalty through customer satisfaction in Indonesia.

Satisfaction analysis revealed that satisfaction (SF) directly influences loyalty (LO), indicating that positive feelings and impressions received from using the app, which meets expected needs, offers a comprehensive range of services, sets reasonable fees, has user-friendly and fast procedures, and provides excellent service recommendations from staff, lead to a positive attitude and the belief that choosing the service was the right decision. This results in loyalty towards using the BAAC Mobile application. This is consistent with the research findings of Haq & Awan (2020), which showed that customer satisfaction has a positive influence on customer loyalty, where service providers can understand and prioritize customer perceptions and needs, especially for electronic banking platforms during lockdown situations in Pakistan. Milenia (2020) found that customer satisfaction, creating a positive experience and meeting expectations, influences the loyalty of users of JakOne Mobile Banking in Indonesia. Durongdumrongchai (2018) found that overall customer satisfaction, providing services as expected with positive feelings and experiences, impacts loyalty in the context of fitness centers.

Conclusion

The study on loyalty (LO) highlights the significant role of the mediator of satisfaction (SF), as mediator help to understand the process by which independent variables influence dependent variables. From the direct effect analysis, it was found that 1) service quality (SQ), privacy (PC), and reliability (RL) influence satisfaction (SF); 2) privacy (PC), reliability (RL), and satisfaction (SF) influence loyalty (LO). Furthermore, the direct effect analysis revealed that the independent variable of service quality (SQ) does not have a direct effect on the dependent variable, loyalty (LO). However, when examining the indirect effect, it was found that 3) service quality (SQ), privacy (PC), and reliability (RL) have an influence on loyalty (LO) through satisfaction (SF). This demonstrates that satisfaction (SF) explains the relationship between independent variables and the dependent variable, showing that satisfaction (SF) acts as a third variable that intervenes between the originating variables to transmit influence to the outcome variable (Perfect Mediation Effect).

Suggestions

Creating loyalty is a critical aspect that should not be overlooked in business operations. Beyond seeking new customers to expand the customer base, maintaining existing customers for continuous service use is crucial in business. In the highly competitive financial business environment of today, service providers should prioritize and create awareness in every aspect to enable consumers to utilize information when deciding to use the BAAC Mobile service. This includes the aspect of service quality, where providers should develop the application to facilitate speedy transactions, ensure employees provide professional and friendly service; the aspect of privacy, where providers must assure users that their personal data will be securely protected, not used for other purposes or shared without permission; and the aspect of reliability, where providers should develop an application's transaction system to have standards, allowing transaction details to be checked anytime and offer adequate compensation in case of problems or losses. This will create satisfaction among users, leading to loyalty, where they will return to use the service regularly and engage in word-of-mouth behavior, recommending the application to others. This loyalty from users will reflect positively on the organization's image, yielding sustainable business benefits.

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Development of a Model for Empowering Teacher Job Performance in Private Primary Schools of Henan Province, China

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Abstract

The job performance of primary school teachers significantly impacts the quality of primary education. However, private primary school teachers in China often exhibit subpar job performance. Therefore, it is crucial to investigate ways to enhance private primary school teachers' workplace environment and behavioral factors in China to improve their job performance. This research explored the relationship, path, and mechanism between five variables: workplace spirituality, workplace allies, workplace well-being, organizational citizenship behavior (OCB), and job performance. The research employed a questionnaire survey method targeting private primary school teachers in Henan Province, China. In total, 457 questionnaires were distributed using a random stratified sampling method, with 416 considered valid.

The findings showed that workplace spirituality, allies, well-being, and organizational citizenship behavior positively influenced job performance by constructing a structural equation model and data analysis using Smart-PLS3.0 and SPSS27.0. Furthermore, workplace spirituality and workplace allies mediated the relationship between job performance through workplace well-being and OCB.

In conclusion, the research revealed the significant impact of workplace spirituality, workplace allies, workplace well-being, and Organizational Citizenship Behavior on the job performance of primary school teachers, offering theoretical and practical guidance for enhancing their work efficiency. However, there were limitations, including restrictions in sample selection and reliance on a single data source. Therefore, future research could further expand the sample size, adopt diverse data collection methods, and consider the effects of other potential variables to obtain more comprehensive and accurate findings.

Keywords : Workplace Spirituality, Workplace Allies, Workplace well-being, Organizational Citizenship Behavior, Job Performance

Introduction

As globalization accelerated and the knowledge economy era emerged, foundational education has seen rapid global development, with increased investments and intensified reforms by nations in this sector (Dong et al., 2022). In this environment, teachers, central to the educational landscape, have significantly influenced student growth and national futures through their professional competencies and performance (Zhao et al., 2023). Consequently, teachers face new and greater demands to adapt to the evolving educational landscape.

In China, implementing the 'Double Reduction' policy and a sustained economic downturn in the post-pandemic era has presented unprecedented challenges for private primary school teachers. The Double Reduction policy, designed to reduce academic and extracurricular burdens on students, has required teachers to reevaluate and adapt their pedagogical philosophies, methodologies, and effectiveness (Zheng, 2023). Simultaneously, the economic downturn has increased operational pressures on private schools, affecting teachers' working conditions, compensation, motivation, and performance.

In Henan, a populous province with moderate economic development, there is an exceptionally high parental emphasis on education (Chen, 2023; Wang et al., 2024). As a result, private primary school teachers in Henan face increased work pressures and expectations. Against this backdrop, enhancing teachers' work performance has become critical.

However, research on the impact of workplace spirituality, allies, well-being, and organizational citizenship behavior on job performance requires further exploration. These under-researched factors are crucial in influencing teachers' work performance, and our limited understanding restricts the development of strategies to enhance teacher performance, ultimately impacting the overall quality of teaching in private primary schools. Therefore, this study aimed to bridge this research gap by investigating how these factors affect the job performance of private primary school teachers to create an effective model to empower their performance. The endeavor seeks to improve the teaching quality and job satisfaction of teachers in Henan and provide school administrations with targeted motivational strategies, fostering the healthy development of private primary school education in Henan Province and throughout China.

Literature Review

The sector will first review relevant literature to lay the theoretical foundation for the research. Based on Self-Determination Theory, Social Exchange Theory, and SOR Theory, the article will analyze the influencing factors and mechanisms of teachers' job performance in existing studies. Subsequently, combining the actual situation of private primary education in Henan Province, the article will propose a series of research hypotheses to construct a model that can effectively enhance teachers' job performance.

1. Self-determination Theory

Self-Determination Theory (SDT) is a macro theory concerning human motivation and personality, proposed by American psychologists Deci Edward L. and Ryan Richard M. in the 1980s (Deci & Ryan, 2013). This theory primarily delves into the intrinsic motivations of human behavior and how external environments influence these motivations. It posits that human behavior is primarily driven by intrinsic motivation, which stems from three fundamental psychological needs: autonomy (the control of one's actions and freedom of choice), competence (confidence in one's skills and abilities), and relatedness (the need to establish closeness and caring with others) (Deci & Ryan, 2017). Individuals exhibit higher motivation, enthusiasm, and creativity levels when these needs are met. Self-determination theory can serve as a theoretical framework to explain and design strategies for empowering teachers' job performance, promoting their active engagement and innovation in the workplace, and ultimately improving overall teaching quality and organizational performance.

Considering the effected of workplace spirituality, workplace allies, Workplace well-being, and organizational citizenship behaviors in unison, it became possible to delve into the job performance of private primary school teachers in Henan Province. This inquiry aimed to deepen understanding regarding teachers' self-determination and behavioral performance within complex environments. Furthermore, it provided valuable insights and recommendations for educational management and teacher development.

2. Social Exchange Theory

Homans (1958), human social behavior could be viewed as an exchange process in which people interact with others to obtain rewards and rewards (Homans, 1958). Blau (1964) proposed that social exchange was the economic exchange and social exchange and distinguished between the two (Blau, 2017), both of which are based on the principle that "giving will be rewarded." Social exchange was an essential form of exchange in people's social interactions in which individuals displayed voluntary behaviors and expected positive future behaviors. This expectation of future benefits drives the process of social exchange. According to the theory, various interactive behaviors in human society can be viewed as exchange behaviors, whereby individuals obtain desired resources, emotions, or status through exchanges (Meira & Hancer, 2021). Such exchanges are not limited to the material level but include non-material aspects such as emotions, information, and services. In the exchange process, individuals assess the costs they incur and the benefits they receive, seeking to maximize the latter. Social Exchange Theory emphasizes the principle of reciprocity, whereby individuals tend to maintain relationships that provide them with satisfactory returns and avoid those where the costs outweigh the benefits (Xu et al., 2022).

Social Exchange Theory can be utilized to analyze and improve the interactions and relationships between teachers and school management, colleagues, students, and parents. Specifically, research can explore how optimizing these social exchange relationships can enhance teachers' job performance. The theory provides a perspective for profoundly understanding the exchange relationships between teachers and leaders, colleagues, and the school, guiding researchers to consider how to effectively improve teachers' job performance by optimizing exchange relationships, balancing costs, and benefits, and ensuring fairness in model development.

3. SOR Theory

The SOR (Stimulus-Organism-Response) model is a theoretical framework in psychology that explains how individuals process external stimuli (S), undergo internal processing (Organism, O), and generate behavioral responses (R) (Mehrabian & Russell, 1974). Originating from environmental psychology, this model has found widespread applications in consumer and organizational behavior. In the model, "Stimulus" refers to external environmental factors, such as social or physical environments; "Organism" represents the individual's internal psychological processes, including emotions, attitudes, and cognition; and "Response" denotes the individual's behavioral or emotional reaction to the stimulus (Jacoby, 2002).

The SOR model can aid in elucidating how a teacher's job performance is influenced by the school environment (stimulus), which undergoes internal psychological processing by the teacher (organism), ultimately affecting their teaching behavior and work outcomes (response) (Kim et al., 2020). The SOR theory provides a practical analytical framework for this study, facilitating a deeper exploration of how to enhance the job performance of private primary school teachers by optimizing external stimuli and stimulating their intrinsic motivation. Based on the S-O-R theoretical framework, external stimuli such as teachers' work environment, leadership, school leaders' strategies, and leadership tactics influenced teachers' OCB. As a result, they perceived well-being as affecting job performance. Improving teacher job performance, which brings higher material and spiritual rewards and social status, would empower teachers' capacity for well-being and OCB. Similarly, increased Workplace Allies and Workplace Spirituality positively affected teachers' perceived well-being.

4. Workplace Spirituality (WS)

Ashmos & Duchon (2000) proposed that spirituality in the workplace was about employees which was defined as the inner life as spiritual identity, which could be experienced as a sense of meaningfulness, unity, and connection (Ashmos & Duchon, 2000). It also included meaning, and purpose in work, a sense of connection and community. Sheep (2006) concluded that Workplace Spirituality was defined through four elements: integration of self with the workplace, meaning of work, transcendence of self, and personal growth within the workplace inner life at work (Sheep, 2006). The concept of workplace spirituality Pandey workplace spirituality could be described as three different dimensions: Harmony with self, Harmony in the work environment, and Transcendence (Pandey et al., 2009). According to UTAMI et al. (2021), three dimensions could be found about Workplace Spirituality. Work that is meaningful, felt like a community, and aligned with the goals (UTAMI et al., 2021).

In the professional environment of private primary school teachers in Henan Province, workplace spirituality referred to the ability of teachers to prioritize their inner growth and development needs despite facing pressures such as epidemics and the double-decrease policy. It involved actively seeking meaning in their work that aligned with their goals and educational mission, experiencing a sense of value and psychological well-being beyond material possessions. Additionally, it involved forming emotional connections, cooperating with others, and providing mutual assistance, all of which help enhance job satisfaction, improve job performance, and contribute to overall educational development. Furthermore, workplace spirituality was viewed as an ability to help teachers maintain psychological balance in stressful environments, prioritize intrinsic value pursuits, and integrated them with work goals. It had a positive impact on individuals, organizations, and society. Therefore, this study proposes the following hypothesis:

H1. Workplace Spirituality positively effect on Workplace Well-being.
H2. Workplace Spirituality positively effect on OCB.
H3. Workplace Spirituality positively effect on Job Performance.

5. Workplace Allies (WA)

Workplace Allies included supervisor support and college support. Eisenberger (1986) defined supervisor support as an individual's perceived supervisor's evaluation of his or her contribution to the organization and the supervisor's concern for his or her well-being, which developed a comprehensive and integrated perception of organizational support by employees (Eisenberger et al., 1986). Wang et al. (2023) perceived that organizational support was enhanced by providing employees with communication of the ready availability of help and support to increase job satisfaction. Workplace Allies (colleague or supervisor support) constitute an effective form of social support (Wang et al., 2023). Support from colleagues was more prevalent than buffering influences from supervisory leadership versus support received in non-work settings (Collins et al., 2021).

For any team member, the attention and understanding of colleagues or peers became necessary for inner and work needs, and anyone needed support from colleagues or peers at any time. It had also been argued that peer support was the ability to "seek help from colleagues" at a similar level and that good work behavior would result when individuals receive simultaneous support. Peer support was crucial because it satisfies the need for autonomy, competence, and relatedness (Wut et al., 2022). Therefore, this study proposes the following hypothesis:

H4. Workplace Allies positively effect on Workplace Well-being.
H5. Workplace Allies positively on OCB.
H6. Workplace Allies positively effect on Job Performance.

6. Workplace Well-being (WWB)

Workplace Well-being refers to the overall sense of well-being and satisfaction experienced by teachers in their work environment. It encompassed multiple aspects, including physical health, mental health, and social well-being (Diener et al., 1999). Horn et al. (2004) proposed that workplace well-being directly impacts individual job performance. Workplace Well-being referred to the summation of satisfaction, joy, and a sense of accomplishment experienced by teachers in their work. It encompassed teachers' subjective well-being, physical and mental health well-being, and social well-being (Horn et al., 2004). In short, workplace well-being was the pleasure and fulfillment teachers felt in their work, and it served as a crucial indicator for evaluating the quality of teachers' work life and job status.

For private primary school teachers, workplace well-being was one of the driving forces that motivated them to invest in their educational work continuously. Liang (2021) studied four dimensions of workplace well-being for employees in Chinese companies(Liang et al., 2022). The research proposed that high workplace well-being can gain organizational, leadership, and colleague job recognition. In addition, teachers' workplace well-being positively correlates with students' interactive well-being. Singh et al. (2019) concluded that there was a strong relationship between self-efficacy and workplace well-being(Liang et al., 2022). Finally, Penttinen et al. (2020) concluded that teachers' workplace well-being of affects teachers' work engagement and classroom effectiveness (Penttinen et al., 2020). Therefore, this study proposed the following hypothesis:

H7. Workplace Well-being positively effect on OCB.
H8. Workplace Well-being positively effect on Job Performance.

7. Organizational Citizenship Behavior (OCB)

Organizational citizenship Behavior was a voluntary behavior exhibited by teachers in the workplace that goes beyond their formal job descriptions and aims to promote the school organization's effective functioning and overall well-being (Organ, 1988; Podsakoff et al., 2000). These behaviors included but are not limited to assisting colleagues, participating in team collaboration, caring about school development, actively offering constructive suggestions, maintaining the school's image, and conserving organizational resources.

Organizational Citizenship Behavior reflects teachers' positive attitudes and high sense of responsibility. It not only helps to improve teachers' job performance but also positively impacts the overall performance of the team and the school (Xin et al., 2021).

Organizational citizenship behavior referred to a series of beneficial actions that teachers voluntarily and proactively demonstrate within the school organization beyond the scope of their formal job duties. These actions might include but were not limited to assisting colleagues, caring about the school's development, actively participating in school activities, and offering constructive suggestions (Bogler & Somech, 2023). Organizational citizenship behavior was manifested at the individual, team, organizational, and societal levels, and it was particularly crucial for promoting school development, enhancing teaching quality, and strengthening school cohesion (Wang et al., 2024). Therefore, this study proposed the following hypothesis:

H9. Organizational Citizenship Behaviors positively effect on Job Performance.

8. Job Performance (JP)

Job performance referred to the tasks completed, and achievements made by teachers, which served as a criterion for evaluating their performance in the workplace. It reflected teachers' work capabilities, professional qualities, and dedication to their jobs (Borman & Motowidlo, 1997). The private primary school teachers mainly encompassed four aspects: tasks, relationships, learning, and innovation. Improving teachers' job performance in private primary schools plays a crucial role in enhancing the overall educational quality of the school and promoting its development (Motowidlo, 2003). Borman (2004) referred person who had done his job well concerning the results and success of the organization (Borman, 2004). Job performance referred to the tasks completed, and achievements made by teachers, which served as a criterion for evaluating their performance in the workplace. It reflected teachers' work capabilities, professional qualities, and dedication to their jobs. The private primary school teachers mainly encompassed four aspects: tasks, relationships, learning, and innovation. Improving teachers' job performance in private primary schools plays a crucial role in enhancing the overall educational quality of the school and promoting its development.

Cheng & Li (2006) defined performance as efficiency and quality over a certain period(Cheng et al., 2021). An employee with greater well-being would be more committed to their job and organization, which enhances job performance. The higher the job performance, the greater its impact on Organizational Citizenship Behavior (OCB) (Jain & Sullivan, 2019). Hewett et al. (2018) argued that high job performance leads to higher Workplace Well-being and self-happiness, and these factors have a mutually reinforcing relationship. Katebi et al. (2022) proposed that job insecurity significantly reduced employee performance. Conversely, high job performance enhanced job security for employees(Katebi et al., 2022).

Based on the comprehensive review of the literature, this study proposed the following hypotheses:

H10. Workplace spirituality positively effect on job performance through organizational citizenship behaviors.

H11. Workplace spirituality positively effect on job performance through workplace well-being.

H12. Workplace spirituality positively effect on organizational citizenship behavior through workplace well-being.

H13. Workplace Allies positively effect on Job Performance behavior through Workplace well-being.

H14. Workplace Allies positively effect on Job Performance through OCB.

H15. Workplace well-being positively effect on Job Performance through OCB.

Among the fifteen hypotheses, nine were direct assumptions between independent and dependent variables, while six involved mediating variables. Furthermore, the research took it into account contextual factors like the epidemic and the double-decrease policy which contributed to a comprehensive exploration and analysis of the factors that influenced teachers' job performance. Specific information was shown in Figure 1.

Research Methodology

1. Sample and Data Collection

This study employed an online questionnaire survey to gather data due to its advantages compared to alternative methods. Specifically, online surveys facilitate the acquisition of substantial datasets, eliminating the need for manual data entry and processing. Moreover, they guarantee data integrity throughout the entire survey period, as Shiau et al. (2019) reported(Shiau et al., 2019).

There are a total number of 25274 private primary teachers in Henan province, according to the Education Department of Henan Province(EDHP, 2022). According to Krejcie and Morgan (1970), the sample with a total number of 25,274 people is 384 (Krejcie & Morgan, 1970). After obtaining approval from the local psychology ethics committee, participants were recruited online. The questionnaire of this research was distributed from June to July in the selected seven private primary school teachers. The inclusion criteria were that a university student with sufficient proficiency in Chinese or comprehension skills would complete all related questionnaires and online data collection. Participants were asked to provide basic demographic details in the questionnaire, which took approximately 30 minutes to complete. The number of people surveyed was 457, and the number of valid questionnaires returned was 416, with a validity rate of 91.02%. Following the exclusion of ineligible questionnaires using SPSS27.0 and Smart-PLS3.0, 416 valid responses were obtained.

Among the 416 respondents,87.3% were female, and 23.7%were female. People aged 31-40 accounted for 47.6%, which was the most significant proportion. The age groups of 21-30 and 41-45 had a similar proportion, with 22.4% and 21.4%, respectively, placing them in the middle. of the 416 surveyed individuals, 71.3% held a bachelor’s degree, 23.2% Collage Degree, and 5.5% Junior College.

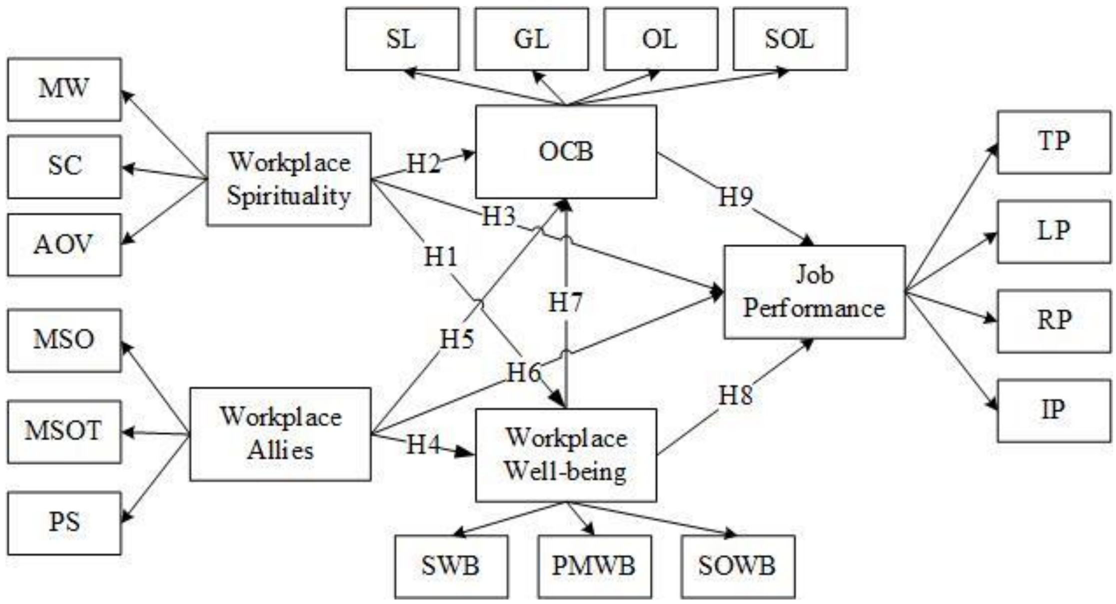

Figure1: Research Hypotheses

Note: WS= Workplace Spirituality; WA= Workplace Allies; WWB=Workplace Well-being; OCB= Organizational Citizenship Behaviors; JP= Job Performance.

3.2 Measurements

Building upon prior research and adhering to the structural equation modeling guideline of a minimum of three items per construct (Shiau et al., 2019), this study incorporated four or more measurement items for each construct. Additionally, a 7-point Likert scale was employed for all scales, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The main research method of this research was a questionnaire. The Questionnaire consisted of background variables and five measurement instruments (scales). Workplace Spirituality, Workplace Allies, Workplace Well-being, OCB, and Job Performance Scale. There were 61 items. All five scales had been extensively validated and their reliability and validity are relatively stable and mature.

3.3 Ethical Considerations

This study project was approved by Stamford International University-Human Research Ethics on 6th November 2023 (Approval Code: STIU-HREC 023/2023).

Research Finding

1. Common Method Bias

Addressing common method bias is a primary concern in this cross-sectional study, particularly with collecting questionnaire data solely from expatriates. Harman's one-factor approach was implemented to prioritize and tackle this potential issue (Podsakoff et al., 2003). The findings indicated that the initial factor accounted for 27.59 percent of the variance, below the 50 percent threshold, suggesting that common method bias did not pose a significant concern in this research.

2. Analytical Method

This study used Smart-PLS software to perform partial least squares structural equation modeling (PLS-SEM). PLS-SEM, a variance-based method within the SEM framework, is notably effective for evaluating models with limited theoretical backing (Arnett et al., 2013). This approach is also particularly apt for analyzing complex models with numerous moderators (Shiau et al., 2019). Given that the study's hypotheses involved moderators related to an emerging phenomenon, PLS-SEM was deemed an appropriate technique for the data analysis. This study, Smart-PLS 3.0 software was used to analyze the data and test the research hypotheses presented above. The reasons for using this software are path and regression analysis through structural equation modeling and, secondly, to explore the causal relationships between structural variables, deal with model structure and item measurement. In addition to this, the software analysis is not very restrictive on the amount of data and can address issues such as multicollinearity and measuring external models in addition to analyzing complex predictive models. Maximum number for path analysis should be 5–10 times the sample size. This study will test the measured model regarding reliability, convergent, and discriminant validity(Shiau et al., 2019).

3. Outer model and scale validation

The analysis and estimation in this study's Partial Least Squares (PLS) approach were segmented into two discriminant validity phases. Initially, the first phase focused on assessing the reliability and validity of the constructs. Subsequently, the second phase involved estimating and validating the structural model's path coefficients and explanatory capacity. These phases aimed to establish the reliability and validity of the constructs, thereby confirming the interrelations among them(Hulland, 1999). Smart-PLS3.0, developed by Sarstedt and Cheah (2019), was the tool of choice for this purpose. Evaluation of the study's external model involved several metrics: internal consistency, reliability of individual items, and the convergent and discriminant validity of each construct, along with assessing standard method variance (CMV) severity. Table 2 outlines the values for Cronbach's alpha, composite reliability, and average variance extracted (AVE). Following Hair et al. (2021), the reliability of constructs was appraised using Cronbach's alpha and composite reliability. As Hair et al. (2021) define, convergent validity reflects the correlation extent between measurements of theoretically related constructs. As detailed in Table 1, Cronbach's alpha values ranged from 0.936 to 0.981, surpassing the recommended 0.7 threshold and confirming their acceptability (Chin, 1998).

Table1: Reliability and AVE of the outer model

Questionnaire	**Cronbach'α**	**Rho-A**	**R**	**AVE**
Workplace Spirituality	0.969	0.969	0.977	0.916
Workplace Allies	0.981	0.981	0.986	0.946
Workplace Well-being	0.936	0.936	0.958	0.871
OCB	0.949	0.95	0.966	0.891
Job Performance	0.968	0.969	0.979	0.934

Table2: Results of discriminant validity by HTMT

Questionnaire	WS	WA	WW	OCB	JP
WS	0.896				
WA	0.848	0.91			
WWB	0.842	0.826	0.846		
OCB	0.805	0.838	0.796	0.915	
JP	0.797	0.976	0.793	0.92	0.94

Note1: WS= Workplace Spirituality; WA= Workplace Allies; WWB=Workplace Well-being; OCB= Organizational Citizenship Behaviors; JP= Job Performance.
Note2: The bold values on the diagonal represent the square root of the Average Variance Extracted (AVE) for each construct, while the other values represent the correlation coefficients between different constructs.

Discriminant validity detects the degree of discrimination between tested variables and different constructs criterion. Henseler et al. (2015) indicated a testing method technique which is the heterotrait-monotraitratio (HTMT) of correlations based on the multitrait-multimethod matrix. Therefore, this study evaluated discriminant validity through HTMT. While the discriminant validity did not have a serious problem when the values of HTMT are lower than HTMT value of 0.90 (Shiau et al., 2019), values as Table 2 shows the HTMT values between the constructs are almost below the 0.90 threshold pointing that discriminant validity has been acceptable. However, there were values of 0.910 and 0.915, which are slightly higher than the commonly expected norms, suggesting that the distinction between certain constructs may need to be clarified. However, considering the specific context of this study, the diversity of the sample, and other validity indicators of the measurement instrument used, this researcher considers these two HTMT values to be within an acceptable range.

Besides, as shown in Table 3, the comparison of cross-loadings and factor loadings for each indicator indicated reasonable discriminant validity, when the factor loading of each scale item for its assigned latent construct is higher than its loading on any other constructs(Hair Jr et al., 2021). Therefore, the constructs in this research had good discriminant validity.

Preventive measures were taken to avoid common method variance (CMV) that may result from the collection of single respondent's cognitive information by a self-reported scale and reduce the impact of CMV. In addition to anonymous surveys, this study strived to hide the meaning of each question and separate questions for different variables as much as possible. However, the variable results in Table 2 and 3 had a considerable degree of construct validity, which also shows that the results were not largely affected by CMV. In addition, this study used Harman's One-Factor Test to test the severity of CMV(Podsakoff et al., 2003). Exploratory factor analysis for the 49 questions in this study found that the explanatory variance for the first factor was 37.69% and was a non-integrated factor. It can be seen that the impact of CMV was not serious in this study.

The study computed the Goodness of Fit (GOF) following to Tenenhaus et al. (2005) to understand the overall quality of the proposed model(Tenenhaus, 2005). The GOF is calculated as: GOF= $\sqrt{\overline{AVE} \times \overline{R^2}}$=$\sqrt{0.912 \times 0.937}$=0.924

According to above result, GOF is 0.924 which exceeds the cut-off criterion of 0.36 for a large effect size(Wetzels, 2009).

Table 3: Standardized factor loadings and cross loadings of the outer model.

	JP	OCB	WA	WS	WW
IP1	0.964	0.861	0.743	0.755	0.735
IP2	0.927	0.850	0.762	0.757	0.756
IP3	0.859	0.816	0.759	0.748	0.744
LP1	0.947	0.874	0.757	0.751	0.753
LP2	0.957	0.858	0.732	0.741	0.746
LP3	0.966	0.863	0.739	0.749	0.743
RP1	0.933	0.865	0.734	0.738	0.718
RP2	0.945	0.873	0.748	0.742	0.737
RP3	0.946	0.883	0.740	0.735	0.739
TP1	0.945	0.881	0.735	0.744	0.747
TP2	0.945	0.872	0.749	0.762	0.761
TP3	0.936	0.867	0.757	0.750	0.772
GRL1	0.849	0.940	0.744	0.737	0.715
GRL2	0.824	0.919	0.743	0.716	0.716
GRL3	0.879	0.927	0.763	0.756	0.735
ORL1	0.842	0.912	0.805	0.763	0.746
ORL2	0.857	0.935	0.804	0.753	0.749
ORL3	0.888	0.945	0.791	0.757	0.747
SEL1	0.859	0.905	0.728	0.744	0.713
SEL2	0.723	0.846	0.744	0.689	0.676
SEL3	0.850	0.929	0.773	0.733	0.731
SOL1	0.781	0.874	0.746	0.689	0.692
SOL2	0.886	0.924	0.777	0.743	0.750
SOL3	0.849	0.899	0.771	0.740	0.741
MS1	0.707	0.760	0.908	0.777	0.750
MS2	0.718	0.766	0.933	0.779	0.772
MS3	0.742	0.788	0.941	0.799	0.785
OMS1	0.663	0.700	0.924	0.735	0.731
OMS2	0.667	0.698	0.923	0.738	0.730
OMS3	0.681	0.715	0.931	0.747	0.734
PS1	0.810	0.822	0.867	0.804	0.747
PS2	0.764	0.808	0.873	0.786	0.756
PS3	0.738	0.785	0.874	0.765	0.734
AOV1	0.705	0.732	0.781	0.904	0.758
AOV2	0.643	0.665	0.779	0.868	0.749
AOV3	0.695	0.731	0.789	0.910	0.740
MW1	0.751	0.740	0.756	0.894	0.795
MW2	0.712	0.692	0.716	0.870	0.774
MW3	0.699	0.714	0.766	0.863	0.779
SC1	0.750	0.748	0.749	0.929	0.757
SC2	0.732	0.733	0.723	0.910	0.731
SC3	0.720	0.724	0.771	0.912	0.748
PMWB1	0.587	0.587	0.617	0.633	0.835
PMWB2	0.633	0.637	0.654	0.661	0.853
PMWB3	0.632	0.631	0.664	0.666	0.837
SCWB1	0.733	0.718	0.740	0.752	0.862
SCWB2	0.728	0.730	0.720	0.718	0.846
SCWB3	0.763	0.762	0.746	0.751	0.867
SWB1	0.634	0.646	0.676	0.719	0.844
SWB2	0.663	0.664	0.708	0.736	0.862
SWB3	0.636	0.633	0.689	0.710	0.832

Note: MW= Meaningful Work; SC= Sense of Community; AOV= Alignment with Organizational Values; MS= Manager Support; OMS= Other Manager Support; PS= Peer Support; SWB= Subjective Well-being; PMWB= Physical and Mental Well-being; SCW= Society Well-being; SEL= Self-Level; GRL= Group-Level; ORL= Organization Level; SOL= Social Level; TP= Task Performance; RP= Relationships Performance; LP= Learning Performance; IP= Innovation performance.

4. Inner model and hypotheses testing

For assessing the structural model, the bootstrapping resampling method, with 1,000 resamples, was utilized to examine the causal relationships between variables. The preliminary phase of the evaluation focused on confirming the direct relationship between perceived non-work constraints and withdrawal intention. As depicted in Table 4 and Figure 2, presented that workplace spirituality positively affected on workplace well-being and OCB, supporting H1 and H2 (WS -> WW: β= 0.504, t-value =5.170; WS -> OCB:β = 0.218, t-value = 1.570). The data showed that workplace allies positively affected t on workplace well-being and OCB (WA -> WW: β= 0.398, t-value =4.018; WA -> OCB: β = 0.456, t-value = 5.156), supporting H4 and H5. Meanwhile, the data showed that workplace well-being positively affected on OCB and job performance (WW -> OCB: β= 0.228, t-value =4.175; WW -> JP: β= 0.126, t-value =2.450), supporting H7 and H8. The data also OCB positively affected on job performance (OCB -> JP: β= 0.772, t-value =11.010), supporting H9. The data showed that H3 and H6 was not supporting.

Table 4: Structural Model Assessment Results

H	Relationship	P	T	Result
H1	WS -> WW	0.504	5.170***	supported
H2	WS -> OCB	0.218	1.989*	supported
H3	WS -> JP	0.114	1.570	Not supported
H4	WA -> WW	0.398	4.018***	supported
H5	WA -> OCB	0.465	5.156***	supported
H6	WA -> JP	-0.053	0.810	Not supported
H7	WW -> OCB	0.228	4.175***	supported
H8	WW -> JP	0.126	2.450*	supported
H9	OCB -> JP	0.772	11.010***	supported

Note1: WS= Workplace Spirituality; WA= Workplace Allies; WWB=Workplace Well-being; OCB= Organizational Citizenship Behaviors; JP= Job Performance.
Note2: * p-value <0.05; ** p-value < 0.01; *** p-value < 0.001.
Note3: Number of bootstrap samples = 10,000.

5. Testing of mediation effects

To evaluate whether the mediation model proposed in this study was statistically meaningful, path analysis and the Sobel test were used (Sobel, 1982). This study used the Sobel test to obtain Z values to approximate p-values in to judge whether there was significant indirect effect (as shown in Table 5). The mediator provides significant mediation effect between the independent variable and the dependent variable if the absolute z-value of a mediator is > 1.96.

The present study further used the Bootstrapping method with bias corrected confidence estimates to estimate effects of the mediators(Shiau et al., 2019). The researcher adopted the 95% confidence interval of the specific mediating effects was obtained with 10,000 bootstrap resamples. Zero value did not fall in the 95% confidence interval suggesting that the significance mediation effects confirmed.

Table 5: Mediation effects testing

Hypotheses	Relationship	Original Sample (O)	z-Value of Sobel test	Bias-corrected percentile bootstrap confidence intervals (95%)
H10	WS -> OCB -> JP	0.07	1.948*	(0.053, 0.375)
H11	WS -> WW -> JP	0.064	2.327**	(0.011, 0.119)
H12	WA -> WW -> OCB	0.091	2.661**	(0.026, 0.154)
H13	WW -> OCB -> JP	0.176	2.007**	(0.086, 0.268)
H14	WA -> OCB -> JP	0.049	4.442***	(0.181. 0.491)
H15	WW -> OCB -> JP	0.359	3.810***	(0.068, 0.256)

Note1: WS= Workplace Spirituality; WA= Workplace Allies; WWB=Workplace Well-being; OCB= Organizational Citizenship Behaviors; JP= Job Performance.
Note2: *p<0.05, ***p<0.001.

In this section, the researcher focuses on conducting path analysis to verify nine hypothetical relationships using data. Results indicate that seven of the hypothesized relationships are supported. Additionally, a goodness-of-fit analysis was performed, revealing a particularly good fit of the three variables. Findings are summarized in Figure 2

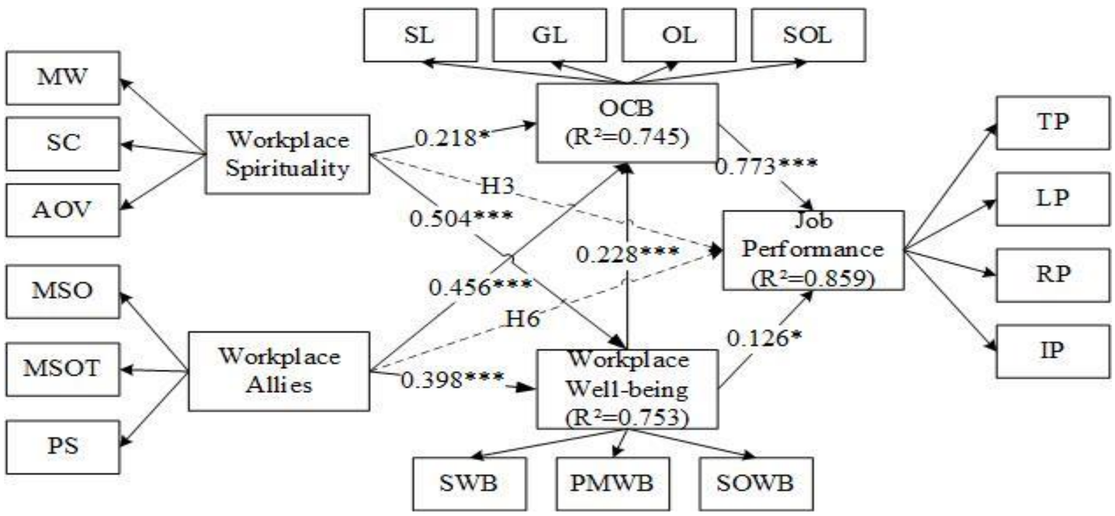

Figure 2: Structural Equation Modelling Results

Discussion

The study discovered that workplace spirituality significantly contributes to enhancing happiness, organizational citizenship behavior, and job performance in the workplace, thereby substantiating Hypotheses H1 and H2. This finding aligned with the research conducted by Chen (2021), Zou (2020) and Jena (2021) (Chen & Eyoun, 2021; Jena, 2022; Zou et al., 2020). Furthermore, the presence of allies in the workplace also positively affected these areas, supporting Hypotheses H5 and H6, which were consistent with Bartels's findings (Bartels et al., 2019; Indarti et al., 2017). However, in the high-pressure teaching environment of Henan Province's private primary schools, the effect of allyship among teachers on job performance was not markedly evident, leading to the non-confirmation of Hypotheses H3 and H6, in line with Wang and Liu's finding(Liu, 2021; Wang et al., 2024). The study further established that workplace allies positively influence organizational citizenship behavior and job performance, confirming Hypotheses H7 and H8. Additionally, it was found that organizational citizenship behavior positively impacts job performance, validating Hypothesis H9.

The study further established that workplace spirituality and organizational citizenship behavior mediate the relationship between workplace spirituality, workplace allies, and job performance, thus confirming Hypotheses from H10 to H15, which aligned with and supports the findings of Researcher (Li et al., 2023; Wut et al., 2022).

Implications for Behavioral Science

For schools in the private primary of Henan Province, the model would provide a systematic and scientific management tool that could help optimize their administrative processes and enhance management efficiency.

For teachers in the private primary of Henan Province, the study of significance lay in providing a clear career development pathway and incentive mechanism.

For students in the private primary of Henan Province, empowering teachers' job performance promoted students' learning outcomes and development. When teachers' job performance improved, their teaching quality and level of attention to students also increased correspondingly.

For future researchers, the research on job performance in China, especially in the private primary of Henan Province, is still in its infancy. The training program for empowering teachers' job performance in this study would not only have positive significance for private primary in Henan Province and even the whole of China empowering job performance, but it would also have reference value for researchers engaged in the empowerment of educational leadership in private primary in the future. Simultaneously, the study offered future researchers an interdisciplinary research perspective and methodological inspiration, helping to broaden their research horizons and ideas.

Suggestion

The study aimed to enhance the research design by addressing certain limitations. For instance, to minimize the impact of Common Method Variance or Same Source Bias(Podsakoff et al., 2003), the dissertation collected data from diverse regions in Henan, China. Additionally, to enhance the generalization of the findings, the study made utmost efforts to broaden the sample size and scope. Nevertheless, it is important to acknowledge that there are still some limitations in both the process and analysis, which might influence the research outcomes to some extent. Therefore, it is crucial to continue endeavors in future research. Although several strategies have been adopted in this study to minimize potential bias, research bias still exists. In the future, it is recommended to expand the sample size further, apply more advanced statistical methods, and deepen the theoretical framework to optimize the quality of the study continuously.

Subsequent research endeavors should depart from a diversified theoretical perspective to investigate the mechanisms through which workplace spirituality, workplace allies, workplace well-being, and Organizational Citizenship Behavior (OCB) affect job performance. It involved not only delving deeper into the analysis of these constructs from different theoretical frameworks and angles but also situating the research within the practical context of education for a multi-faceted exploration. It was essential to explore potential additional mediating variables among these constructs and how these variables interact with each other, thereby influencing teachers' job performance. Furthermore, future research should also consider the potential influence and effects of moderating variables within this mechanism.

Conclusion

Firstly, the model developed in this study provides a new theoretical perspective and practical guidance for enhancing the job performance of private primary school teachers in Henan Province, China. This model identifies vital factors affecting teachers' job performance and thoroughly explores the interactions among these factors. These finding aids private school administrators in more comprehensively understanding teachers' job performance complexities, thereby providing a basis for formulating more effective teacher management policies.

This study also reveals a positive correlation between teachers' workplace spirituality, workplace allies, organizational citizenship behavior, and job performance. Through empirical analysis, the effectiveness of the developed model in improving teachers' job performance is verified. This discovery offers private school administrators' new ideas for optimizing teacher resource allocation and enhancing teachers' overall quality, which contributes to improving the educational quality and competitiveness of the school. Meanwhile, professional development programs, changes in school organizational culture, or the introduction of new policies aimed at enhancing workplace spirituality and allies.

Lastly, this study's contribution lies in providing scholars in related research fields, both domestically and internationally, with a new research perspective and methodological reference. The proposed model demonstrates a certain degree of universality and promotional value by comparing the status and development trends of teacher empowerment in private schools across different countries. It will provide valuable insights and inspiration for future research, pushing the development of related fields deeper.

In conclusion, this study's contribution is reflected in not only theoretical innovation and development but also practical application and guidance.

Acknowledgement

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Data Sharing Statement

The data used to support the findings of this study are available from the corresponding author upon request.

Declaration of competing interest

The author declared that there was no competing financial interests or personal relationships that could have appeared to influence the work reported in the study.

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Quality of Working Life is A mediator Between The Factors That Influence Happiness at Work of Personnel Under The Northeastern Excise Office

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Abstract

The objectives of this research are 1. to study Organizational engagement; and the working environment that influences the happiness at work of personnel under the Northeastern Excise Office 2. to study Organizational engagement and the working environment that influences the quality of working life of personnel under the Northeastern Excise Office 3. To study Organizational engagement. and working environment that influences happiness at work through the quality of working life of personnel under the Excise Office Northeast. An example is personnel under the Northeastern Excise Office, namely the Excise Region 3 Office and the Excise Region 4 Office, classified as civil servants, permanent employees, government employees. and 400 temporary employees. A proportional stratified sampling method was used. Tools used include questionnaires. Statistics used include mean, percentage, standard deviation. and direct influence analysis and indirect influence. The results of the research found that 1. organizational commitment It has no influence on happiness at work. working environment and the quality of working life influences happiness at work. Statistically significant at the 0.01 level 2. Organizational commitment and the working environment has an influence on the quality of working life. Statistically significant at the 0.01 level 3. Organizational engagement and working environment Influences happiness at work through quality of working life Statistically significant at the 0.01 level.

Keywords: Organizational Engagement, Working Environment, Quality of Working Life, Happiness at Work.

Introduction

The Excise Department is a government agency under the Ministry of Finance. Its mission is to collect excise taxes. To provide income to the government sector from goods and services that have specific reasons and necessity, including investigating, preventing, and suppressing excise law offenders By virtue of the Excise Tax Act 2017 Excise Office in the Northeastern Region Consisting of the Excise Office Region 3 and Region 4, the organizational structure is divided into 2 departments: are agencies within the sector and agencies under the agency. Within the sector, there are 5 sections, consisting of the administration section and the information technology section. Tax collection administration section Prevention and suppression inspection section and legal section Agencies under its jurisdiction include the Excise Region 3 Office, 9 areas, and the Excise Region 4 Office, 11 areas, which have a role in tax collection administration. Prevent and suppress offenders according to the Excise Tax Act B.E. 2017 in the area of responsibility. to complete the operation Achieve the goal Personnel are therefore very important in driving the organization towards its highest goals. Therefore, the organization must pay attention and give importance to personnel by creating happiness at work. and make personnel feel. Be part of the organization To reduce the rate of personnel loss in the organization.

The Excise Department places importance on developing human resources to their potential. Aiming at developing personnel at all levels To be professional and to be a good, happy person by conducting a survey of opinions and satisfaction of personnel with the human resource management of the Excise Department. Fiscal year 2021 (survey conducted from 2 August 2021 to 16 August 2021) according to the project to create a 5-year human resource management strategic plan (2022-2026). For the benefit of improving the efficiency of human resource management. Results of a survey of personnel opinions regarding transparency and fairness in human resource management of the Excise Department. and Engagement to the organization, it was found that 92.21 percent agreed that overall The Excise Department is transparent and fair in human resource management. 18.73% of personnel have thought about resigning from government service. 15.68% of personnel have thought about transferring to other government agencies. 91.96% of personnel have thought about transferring to other government agencies. Agreed that the Department has published public relations information. Human resource management is always open and up to date with operations. and personnel 91.31 percent Agreed that the Department provides opportunities for personnel to express opinions and participate in operations at the Department level, such as being a working group, Engagement, team, or others, etc. and the results of a survey of personnel opinions regarding human resource management at the Department Excise should be urgently improved. It was found that the number 1 urgency was Improving the quality of working life, health, finances and society, the second priority is providing welfare other than what is required by law. Urgent No. 3: Planning manpower to be appropriate and consistent with the workload. Continue to change (Excise Department, 2023).

Therefore, it can be seen that personnel who are Engagement to the organization You will feel part of the organization and believe in it. in the mission and goals of the organization This results in a positive attitude towards the organization and a readiness to devote physical and mental effort. In work, in addition, personnel working in a suitable work environment Conducive to work You will feel at ease and relaxed, resulting in more concentration in your work. Work more efficiently and be happier. to work more Finally, personnel who have a good quality of working life You will have good physical and mental health while working.at full efficiency and be happier at work The researcher is therefore interested in studying Organizational Engagement. working environment Quality of working life that influences the happiness at work of personnel under the Northeastern Excise Office To use the results of the study to develop strategies and guidelines for promoting happiness in the work of personnel under the Northeastern Excise Office.

Objective

1. To study Organizational Engagement and the working environment that influences the happiness at work of personnel under the Northeastern Excise Office.
2. To study Organizational Engagement and the working environment that influences the quality of working life of personnel under the Northeastern Excise Office.
3. To study Organizational Engagement and the working environment that influences happiness at work Through the quality of working life of personnel under the Northeastern Excise Office.

Literature Review

The concept of Organizational engagement Suwannasap (2021) stated that Organizational engagement refers to the attitude or feelings of workers towards the organization. which arises from the perception of the operator Understand policies and values Feel part of the organization, love and bond, be proud, and be ready to work using your knowledge and abilities. Fully ready to always improve work, happy, and willing to protect the organization's reputation. Believe that organization will lead to success in life and are happy to stay working in the organization until retirement Kruesa (2021) argued that the importance of Organizational engagement is to create a sense of unity, commitment, dedication, and motivation among organizational members. They should also feel a sense of ownership of the organization, believe in its values and policies, and help to drive its success.

The concept of working environment Kathongthung (2017) defined work environment as "the things that happen and exist around the people who work, which occur while working. It is caused by the workers being aware of the goals, policies, information, career security, development of work potential, recognition for work, guidance in work, promotion of teamwork, having facilities to facilitate work, receiving appropriate compensation and other benefits from the agency." Phisanupong (2018) summarized the characteristics of the work environment that are elements that will facilitate the work into 10 aspects: security, opportunities for career advancement, organization and management, wages, specific job characteristics, supervision, means of livelihood, work-life balance, work that benefits society, and respect for their rights and duties. Chuthanom (2022) stated that having a good quality of work life is an important variable in predicting turnover rates. It results from the enhancement of quality and results in employees being satisfied with their work, committed to the organization, and feeling like they are part of the organization, ready to dedicate their knowledge and skills to lead to the organization's success.

The concept of happiness at work Thongyu (2021) defined happiness at work as "positive feelings that occur during work." Somsri (2021) stated that the importance of happiness at work is that happiness at work will make people want to work and use their full potential to work. They are dedicated and responsible for their work. Reduce absenteeism, reduce sick leave, and reduce lateness. Happiness at work is an increase in productivity of individuals, making the organization efficient and effective, achieving the organization's goals, and the awareness of factors that are related to happiness at work will allow the agency to use them to create those factors to be beneficial to work.

The theory of mediating variables (Mediator) Mediating variables (Mediator) is a variable that mediates the causal relationship between independent variables and dependent variables. It can be said that it is a third variable that comes to change the relationship between independent variables and dependent variables. The mediating variable will explain the relationship between independent variables and dependent variables because it is a variable that helps to understand the process of the independent variable in affecting the dependent variable. Baron and Kenny (1986) defined mediating variables as "mediator" or "mediating variable" is a variable that functions to transmit influence from the original variable to the dependent variable. The characteristics of variable transmission are two types: 1) Complete mediation or Full Mediation 2) Partial mediation

Based on the literature review, the researcher was able to set research hypotheses and summarize the conceptual framework of the research as follows:

Research hypotheses

H1: Organizational engagement has an effect on happiness at work.

H2: working environmenthas an effect on happiness at work.

H3: Quality of work life has an effect on happiness at work.

H4: Organizational engagement has an effect on quality of work life.

H5: working environmenthas an effect on quality of work life.

H6: Organizational engagement has an effect on happiness at work through quality of work life.

H7: working environment has an effect on happiness at work through quality of work life.

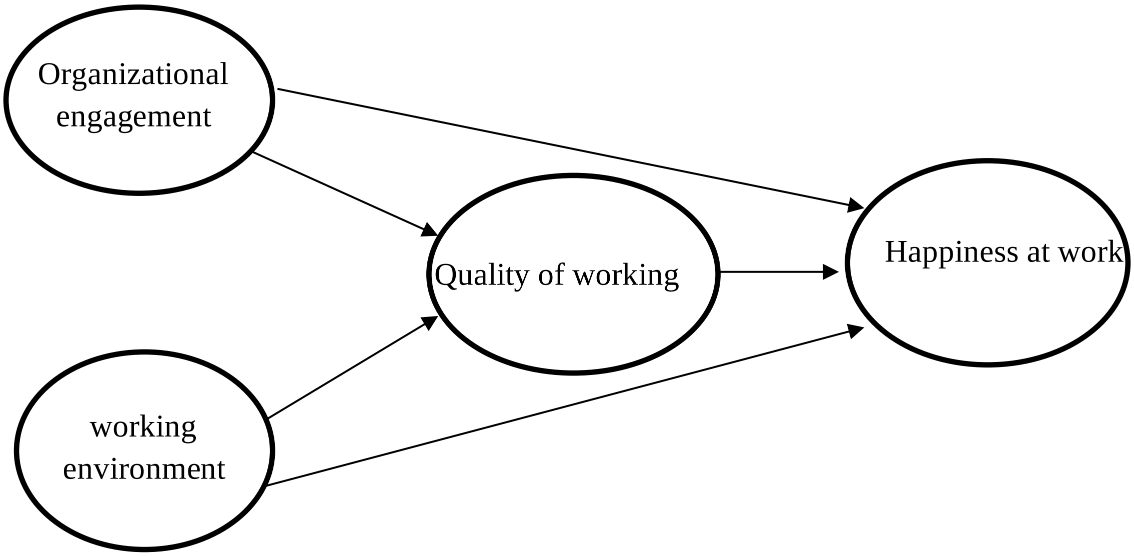

Figure 1: Research Framework

Research Methodology

Population and Sample

The population of this study is the personnel of the Excise Department in the Northeast region, a total of 1,228 people. The sample size was determined using the formula of Hair et al. (2010). The researcher used a sample size of 10 units per parameter. In this study, there were 40 questions, or indicators, for a total sample size of 400.

Sampling

The researcher used a proportional stratified random sampling method. This method is a type of probability sampling that ensures that the sample is representative of the population. The researcher divided the population into strata based on type of personnel (civil servant, permanent employee, government employee, and temporary employee). Then, a random sample was drawn from each stratum.

Research Finding

Table 1: Results of factor analysis

Latent Variable	Observed Variable	Factor Loading	Eigenvalue/ Cumulative	KMO/ (P.Value)
Organizational Engagement: OE	OE1 - OE10	0.30 - 0.91	3.58/35.8	0.82/0.01
Working Environment: WE	WE1 - WE10	0.30 – 0.91	2.79/27.9	0.80/0.01
Quality of Working Life: QWL	QWL1 - QWL10	0.42 – 0.66	2.52/25.2	0.80/0.01
Happiness at Work: HW	HW1 - HW10	0.30 – 0.77	3.42/34.2	0.50/0.01

From Table 1, the results of factor analysis (Factor Analysis) is an analysis to check the grouping of factors of the scale (Factor Analysis) to see if they can be grouped in the same group or not. The results of factor analysis of the indicators in the questionnaire. A total of 400 sets were tested. The researcher analyzed by determining the method of rotating the perpendicular axis. and setting an Eiken value greater than 1.0, it was found that all indicators could be classified in the same group. and every indicator of every measure is weighted in the same 1 component. Organizational engagement (OE) has a factor loading between 0.30 - 0.91, an Eigenvalue of 3.58 and a KMO of 0.82. Work environment (WE) has a factor loading between 0.30 - 0.91, an Eigenvalue of 0.44 and a KMO. Equal to 0.80. Quality of work life (QWL) has a factor loading between 0.42 - 0.66. Eigenvalue is equal to 2.52 and KMO is equal to 0.80. Happiness at work (HW) has a factor loading between 0.30 - 0.77. Eigenvalue is equal to 3.42. and has a KMO value of 0.80

The research instrument used in this study was a questionnaire. The questionnaire was divided into 6 sections: 1) general information about the respondents, 2) Organizational engagement, 3) working environment, 4) Quality of working life, and 5) happiness at work

Steps in Creating Research Tools

The researcher studied concepts, theories, and related research to provide a basis for selecting variables that covered the objectives. The data was used to create a questionnaire that was consistent with the research framework and defined the scope of the questionnaire. The researcher then presented the questionnaire to the advisor for verification and used the advisor's feedback to correct and improve the questionnaire as appropriate.

The researcher then sought the assistance of five experts to verify the accuracy and validity of the content in the questionnaire. The expert feedback was collected and analyzed to determine the index of congruence between the items and objectives using the Index of Item Objective Congruence (IOC) value. The results showed that the index of congruence was 1, indicating that the items were congruent or could be measured. The researcher then conducted a pilot study by distributing the questionnaire to a non-sample population of 50 employees at the Excise Department Region 5 to determine the reliability of the individual items using the Cronbach's Alpha coefficient. The results showed that each item had an overall reliability of 0.96.

Data Collection

The researcher submitted a letter of authorization to collect data from the Faculty of Business Administration and Management, Ubon Ratchathani Rajabhat University, to request permission to collect research data from the administrative department of the Excise Department Region 3 and the Excise Department Region 4 to cooperate in distributing the questionnaire that the researcher created to collect data from the sample personnel in the area of responsibility. The researcher then collected data by requesting the cooperation of personnel in the Excise Department Northeast Region from a sample of 400 people. The researcher collected data from the sample by distributing questionnaires to the sample at the designated locations. Before distributing the questionnaire to the sample, the researcher explained the purpose of the study and answered any questions.

The results of the descriptive statistical analysis of the respondents' answers about Organizational engagement, working environment, and quality of life that influence the happiness at work of personnel in the Excise Department Northeast Region found that there were 400 respondents. The majority of the respondents were female, with 219 respondents, or 54.80%. Most of the respondents were between the ages of 30 and 40, with 185 respondents, or 46.30%. The majority of the respondents had a bachelor's degree, with 313 respondents, or 78.30%. Most of the respondents were married, with 197 respondents, or 49.30%. Most of the respondents had been working for 5-10 years, with 146 respondents, or 36.50%. The majority of the respondents had a monthly income of 10,000-20,000 baht, with 252 respondents, or 63.00%. Most of the respondents were temporary employees, with 209 respondents, or 52.30%. And, 34 respondents, or 8.50%, were from the Excise Department Area Chaiyaphum.

Table 2: Intercorrelations between Variables

Variable	OE	WE	QWL	HW
OE	1			
WE	0.63**	1		
QWL	0.61**	0.70**	1	
HW	0.49**	0.59**	0.66**	1

** Statistical significance level at 0.01 level

From Table 2, it was found that all independent variables, including Organizational engagement (OE), working environment (WE), and quality of work life (QWL), which influence the happiness at work of personnel (HW), were significantly correlated with each other at the statistical significance level of 0.01. When considering the relationship between the variables, it was found that the correlation coefficients (r) between 0.49 and 0.70 (when r≤0.80). Nunnally (1978) Therefore, there is no problem with Multicollinearity. The data obtained is suitable for multiple regression analysis in the next step.

Table 3: Direct, Indirect, and Total Effects

Type Effect	Path	Estimate	SE	β	z	p
Direct	OE ⇒ HW	0.07	0.05	0.07	1.49	0.13
	WE ⇒ HW	0.20	0.05	0.21	3.87**	0.00
	QWL ⇒ HW	0.50	0.05	0.47	8.81**	0.00
Component	OE ⇒ QWL	0.26	0.04	0.27	6.26**	0.00
	WE ⇒ QWL	0.47	0.03	0.52	12.05**	0.00
Indirect	OE ⇒ QWL ⇒ HW	0.13	0.02	0.12	5.10**	0.00
	WE ⇒ QWL ⇒ HW	0.23	0.03	0.24	7.11**	0.00
Total	OE ⇒ HW	0.20	0.05	0.20	3.95**	0.00
	WE ⇒ HW	0.44	0.04	0.46	8.98**	0.00
F= 132 Sig. = 0.00 R = .63 R^2 = 0.39 R^2adj = 0.39						

** Statistical significance level at 0.01 level

From Table 3, the direct effects found that Organizational engagement (OE) had no effect on happiness at work (HW), while work environment (WE) and quality of work life (QWL) had direct effects on happiness at work (HW). Organizational engagement (OE) and working environment (WE) had direct effects on quality of work life (QWL) at a statistically significant level of P = 0.01. Therefore, the following direct effect equations can be written:

OE → HW, WE → HW, OE → QWL and WE → QWL

The indirect effects found that Organizational engagemen (OE) and working environment (WE) had indirect effects on happiness at work (HW) through quality of work life (QWL) at a statistically significant level of P = 0.01. Therefore, the following indirect effect equations can be written:

OE → QWL → HW and WE → QWL → HW

These equations suggest that Organizational engagemen (OE) and working environment (WE) have a significant impact on happiness at work (HW) through quality of work life (QWL).

The path of organizational engagement, working environment, and quality of work life influencing happiness at work of personnel in the Northeast Revenue Office can be seen in Figure 2.

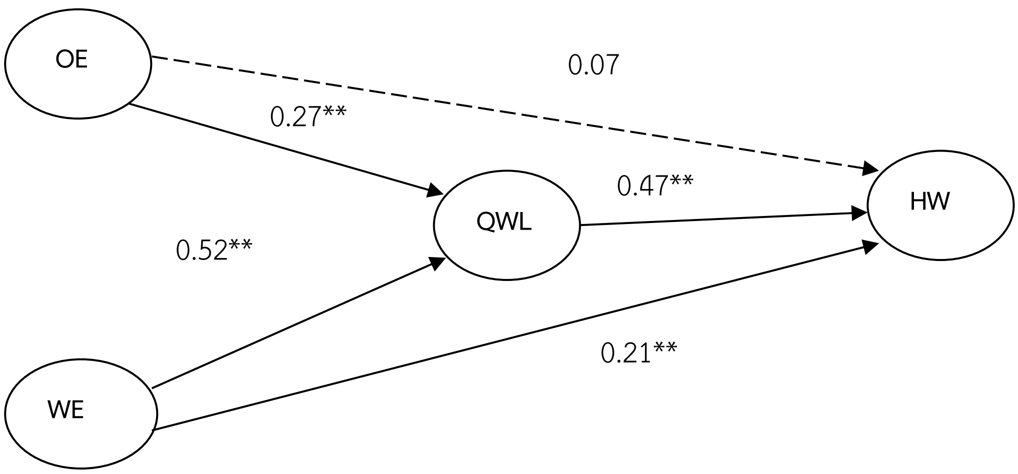

Figure 2: Path of organizational engagemen, working environment, and quality of work life Influencing happiness at work of Personnel in the Northeast Revenue Office

Discussions

The study on the influence of organizational engagemen, working environment, and quality of work life on happiness at work of personnel in the Office of the Excise Department, Northeast Region, can be discussed as follows:

Organizational engagement

The study found that the overall average Organizational engagement score was high. Personnel worked with full knowledge and ability for the success of the organization. Personnel tried to find ways to improve their work constantly, and personnel felt happy when they could complete their work, resulting in happiness at work. Organizational engagement had no direct influence on happiness at work of personnel in the Office of the Excise Department, Northeast Region. This may be because most respondents were relatively young (with work experience of between 5 and 10 years), and had not yet developed strong Organizational engagement. This could lead to personnel feeling like they are not part of the organization, feeling undervalued and unsupported, and feeling less pride in the organization and their work.

However, the study found that organizational engagement indirectly influenced happiness at work through the quality of work life of personnel in the Office of the Excise Department, Northeast Region, at a statistically significant level of 0.01. This is consistent with the findings of the study by Sonsawat and Bunyu (2021) on the mediating effect of work quality on happiness at work of employees at a gas station in Samut Sakhon province. The study found that work quality can influence happiness at work through the variable of organizational engagement. Good work quality can lead to personnel feeling satisfied with their work, feeling valued and recognized, and feeling pride in the organization and their work, resulting in greater happiness at work.

The findings of the study are also consistent with the findings of the study by Chotiwanich (2017) on the influence of work quality and organizational engagement on happiness at work of lecturers at Ubon Ratchathani Rajabhat University. The study found that work quality and organizational engagement have an impact on happiness at work of lecturers at Ubon Ratchathani Rajabhat University. Good work quality can lead to increased organizational engagement, which in turn leads to increased happiness at work of lecturers at Ubon Ratchathani Rajabhat University.

The findings of the study are also consistent with the findings of the study by Azim, Mahmood, and Sarwar (2020) on the relationship between organizational engagement and happiness at work through the mediating variable of work quality in employees of a bank in Pakistan. The study found that employees with strong organizational engagement, who feel attached to the organization, feel part of the organization, and believe that the organization is valuable, have a positive impact on the work quality of employees, in terms of having good relationships with others and feeling secure in their work, which in turn has a positive impact on the happiness at work of employees.

Working environment

The study found that the overall average of the agreement about the working environment is at a high level. This is due to the fact that the personnel receive guidance from their supervisors and colleagues, the organization promotes teamwork, the personnel are aware of the goals and policies of the organization's management, and the personnel are recognized for their work. These factors have a direct impact on the happiness at work of personnel in the Northeast Excise Office at a statistically significant level of 0.01.

This finding is consistent with the following research:

Bualoylert and Kulis (2022) studied the relationship between security and workplace environment and happiness at work of administrative personnel (support line) in the Office of the Permanent Secretary for Health. The study found that the personnel's workplace environment in terms of communication and organizational management and facilities and amenities are related to happiness at work in the same direction.

Sriplad (2022) studied the workplace environment and job characteristics that affect the happiness at work of Generation Y employees in Bangkok. The study found that the workplace environment in terms of opportunities for advancement, organization and management, working conditions and society, and remuneration and benefits together explain the variation in happiness at work.

Phowittayakorn, Buaphet and Issaramalai (2016) studied the factors that influence the happiness at work of employees of rubberwood processing factories in Mueang Yala district. The study found that a good physical environment helps employees feel comfortable, relaxed, and less stressed, resulting in increased concentration in work. A good social environment helps employees feel warm, with colleagues and supervisors to help and support, resulting in feeling valued and recognized at work. A good psychological environment helps employees feel free to work, feel challenged, and be developed in work, resulting in feeling proud of the organization and the work done, and being happier at work.

Indirectly, the workplace environment affects happiness at work through the quality of work life of personnel in the Northeast Excise Office at a statistically significant level of 0.01.

This finding is consistent with the following research:

Kamphaengngen, Bunyu and Buntanon (2019) studied the structural causal relationship model of organizational environment and quality of work life that affects the perceived happiness at work of employees of Krungthai Bank Public Company Limited, Ratburana Head Office. The study found that quality of work life is an intervening factor that links the influence of organizational environment to the perceived happiness at work.

Kokhunthot, Fongthanakit and Buranat (2019) studied the factors of happiness at work of employees in condominiums in Phuket province. The study found that the organizational atmosphere affects the happiness at work of employees indirectly through the quality of work life and organizational commitment. The study found that the factors that influence the happiness at work of employees in terms of organizational atmosphere have a positive relationship with the happiness at work of employees. In other words, the higher the factors in terms of organizational atmosphere, the higher the happiness at work of employees will be, through the quality of work life of employees.

Wu et al. (2022) studied the relationship between physical workplace environment and happiness at work through the mediating variable of quality of life in employees of a hospital in Taiwan. The study found that a good physical workplace environment leads to improved quality of work life for employees, and good quality of work life leads to improved happiness at work for employees.

Quality of work life

The study found that the overall average quality of work life is at a high level. This is due to the fact that the work benefits society, the personnel in the organization have the opportunity to work together and meet, and the organization has teamwork and care for each other. These factors have a direct impact on the happiness of personnel in the Excise Department, Northeast Region. This is because the personnel receive what they want and expect from their work.

Organizations should promote the quality of work life for their personnel so that they are happy at work. This can be done by creating awareness for personnel that the work benefits society, promoting teamwork and opportunities for personnel to meet, and supporting teamwork and care for each other to increase the happiness of personnel. Organizations should also provide more benefits, pay salaries or compensation that are in line with the position and responsibilities, and support personnel to advance their careers.

This study is consistent with the findings of previous studies.

Menchai et al. (2020) studied the factors that affect the happiness of personnel at Suan Dusit University. The study found that the factors of quality of work life in terms of a safe work environment, working environment, interaction with others, teamwork, participation or

Conclusion

Objective 1: To examine the influence of organizational engagement, working environment, and quality of work life on happiness at work.

Objective 2: To examine the influence of organizational engagement and working environment on quality of work life.

Objective 3: To examine the influence of organizational engagement and working environment on happiness at work.

Suggestions

The research on the mediation effect of quality of work life on the relationship between antecedents and happiness at work of personnel in the Northeast Excise Office found that organizational commitment and work environment had a positive influence on quality of work life, which in turn had a positive influence on happiness at work.

This finding suggests that quality of work life plays a mediating role between organizational engagement and work environment on happiness at work. In other words, organizational engagement and work environment can indirectly influence job satisfaction through quality of work life.

The research findings have implications for organizations. Organizations should focus on improving quality of work life in order to increase happiness at work among personnel. This can be done by:

1 . Creating a sense of meaningfulness in work. Organizations should help personnel understand the importance of their work and how it contributes to society.

2.Promoting teamwork and collaboration. Organizations should provide opportunities for personnel to work together and socialize with each other.

3.Supporting a positive work environment. Organizations should create a work environment that is safe, comfortable, and supportive.

By taking these steps, organizations can create a more positive work environment and increase job satisfaction among personnel.

In the specific case of the Northeast Excise Office, the following measures could be taken to improve quality of work life:

1. The organization could create a program to educate personnel about the importance of their work and how it contributes to society. This could be done through workshops, seminars, or other educational opportunities.

2. The organization could encourage teamwork and collaboration by organizing events and activities that bring personnel together. This could include social gatherings, sporting events, or volunteer opportunities.

3. The organization could create a more positive work environment by addressing issues such as safety, comfort, and support. This could involve making physical improvements to the work environment, providing employee assistance programs, or creating a more supportive organizational culture.

By taking these steps, the Northeast Excise Office can create a more positive work environment and increase job satisfaction among personnel.

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The Analysis of The Musical Structure and Aesthetic Expression of “Love Forever” by “Yimeng Mountain”

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Abstract

This article was on the analysis of the musical structure and aesthetic expression of “Love Forever” by “Yimeng Mountain”. The objective of this study To analyze the musical structure and aesthetic expression of “Love Forever” by “Yimeng Mountain”. The result of this study found that The main theme or melody of the music may undergo various variations in the repeated and developed sections, such as changes in melodic lines, repetition, or alterations in notes. These variations make the music richer and more diverse, capturing the audience's interest. Musicians may also employ counterpoint techniques, creating harmonic relationships between different voice parts. This can enhance the harmony and complexity of the music, conveying more layers of emotion. At times, the contrapuntal relationships in the music may undergo variations, meaning changes in the relationships between different voice parts. This can create more dynamics and emotional climaxes in the music.

Keywords: Musical Ananlysis, Musical Structure, Aestiatic Expression, Love Forever by Yimeng Mountain

Introduction

Chinese opera, which was originated in the early 20th century, is a mixture of traditional opera and western music art style of the comprehensive art form. The development of Chinese opera has gone through many stages from traditional song and dance to modern musical and rock opera (Fan. 2022: 5 -8). The creation and performance of Chinese opera, on the basis of the continuous practice of traditional Chinese aesthetic concepts, combined with new elements of the development of the times, has become a modern stage art with Chinese characteristics and innovative spirit (Xu. 2022: 78 -83). In modern China, opera as an important art form has been widely promoted and developed. In recent years, the scale of the creation and performance of Chinese operas has been continuously expanded, and the contents have become more diverse, “White-haired girl”, “The Red Detachment of Women” and “The Airwaves that Never Die” have become classics of Chinese Opera and have won critical acclaim from audiences, and has participated in many international arts festival performances. However, the development of Chinese opera also faces some difficulties and challenges (Zhang. 2022: 2).

The main problem is that the audience is still relatively small, brand awareness and international art level has a certain gap. In addition, due to funding, performance venues, performance timing, and other factors, some good creative performance can only be limited to a specific city or venue. In view of these problems, it is necessary to further expand the audience group of opera, improve the level of creation and performance, strengthen the investment of funds and venues, and formulate an art promotion policy which is more suitable for the actual situation in China, etc., to promote the development and progress of Chinese opera.

In recent years, the development of Chinese ethnic opera has garnered much attention, with more and more works appearing. "Yimeng Mountain", as one of the representative works of Chinese ethnic opera, is worthy of in-depth study. Meanwhile, the "Love Forever" tune in the opera has unique characteristics in melody and emotional expression, which could have a positive effect on exploring the charm of ethnic opera music, the way of emotional expression, and the implied meaning of Chinese ethnic culture (Zhou & Lin. 2018: 20-21). In-depth research on the vocalization tune "Love Forever" in the ethnic opera "Yimeng Mountain" could enhance people's understanding and recognition of musical theatre art, improve the artistic level of Chinese musical theatre, and promote the development of the Chinese musical theatre industry according to Lin (2018: 92-93). Moreover, the study of the "Love Always Exists" tune in "Yimeng Mountain" could enhance the audience's appreciation and comprehension ability of music works and increase their understanding and experience of traditional Chinese culture.

In summary, the analysis of the musical structure and aesthetic expression of “Love Forever” by “Yimeng Mountain”, the study of the classic song "Love Forever" from the local opera on “Yimeng Mountain” is an in-depth exploration of traditional Chinese music culture and a retrospective study of the development of Chinese music. It also provides complete content and resources for singing education. From this research, we will be able to better understand and express the unique aspects of Chinese music. With this importance, the researcher is, therefore, interested in the analysis of the musical structure and aesthetic expression of “Love Forever” by “Yimeng Mountain”

Objective

To analyze the musical structure and aesthetic expression of “Love Forever” by Yimeng Mountain”

Literature Review

Singing is one of those skills that must be taught properly. There is an important approach to cultivate students' musical literacy and artistic cultivation. Through the study of music, students can develop their aesthetic taste, expressive abilities, and collaborative skills. The aria "Love Forever" from the ethnic opera "Yimeng Mountain" is a well-known and profound musical work. Its research and application in music education hold significant meaning. Before delving into the study of "Love Forever," it is essential to gain a deeper understanding of the background and artistic characteristics of this musical piece. "Yimeng

Mountain" is a mass opera that reflects the rural revolutionary struggles in China. The aria "Love Forever" is one of the classic scenes in the opera (Cui. 2020: 39).

The study of "Love Forever" can help improve students' music appreciation and expressive abilities. Music, as an art form, possesses rich expressive power and the ability to convey emotions. Through studying and performing "Love Forever," students can acquire knowledge about rhythm, melody, harmony, and structure, cultivating a solid foundation in music appreciation. Furthermore, through singing and performing, students can enhance their music-expressive abilities, conveying inner emotions and sentiments (Du & Zhu. 2020: 36-38).

Moreover, the study of "Love Forever" can foster students' teamwork and collaboration. Choral singing is a common teaching method in music education, promoting teamwork and a sense of collective honor. Students can form a choir to learn and perform "Love Forever," achieving a harmonious musical expression through collaboration. This not only cultivates students' collaborative spirit but also enhances their confidence and stage performance skills (Du & Zhang. 2020: 65-68).

Additionally, studying "Love Forever" expands the content of music education. Music education should prioritize comprehensive development, focusing not only on basic music theory and skills but also on introducing excellent music works for students to understand and appreciate various genres and styles of music. Through studying "Love Forever," students can experience the unique charm and artistic value of ethnic opera, broadening their musical horizons (Duan & Zhang. 2019: 94-96).

Singing skills are the various techniques and methods used during the process of singing a song in order to achieve a more precise, moving, and outstanding singing effect. These specific techniques include breath control, which involves combining breath and song rhythm to perform the entire song seamlessly (Yang. 2020: 43-44), accurate pronunciation, where the singer should pay attention to enunciating clearly while maintaining natural and flowing delivery in line with the song melody (Wang. 2021: 93-94). Moreover, the singer should be able to master the sense of rhythm in the song, coordinate the rhythms of both the song and the singing to ensure a natural and smooth performance (Fan. 2019: 65-68), control the pitch, accurately grasp the pitch of the song, and make the voice rise and fall smoothly and sound great (Zhang. 2019: 83-86). Furthermore, more techniques include expressing emotions, paying attention not only to techniques such as intonation and pitch but also to express the emotion conveyed in the song, delivering touching feelings that allow the audience to better understand the emotions of the song (Bu & Liang. 2019: 47-49), demonstrating a personalized style by not merely copying the original singer, but by retaining the original character and adding one's own unique elements to highlight one's individual style, thus enhancing the character of the song and the singer's performance style (Chen. 2019: 63-64). In addition, Nie (2019: 67-71) suggests that the technique also includes transition from strong to weak, adequately controlling the changes in intensity of the song and its emotional expression by flexibly adjusting the volume according to the changes in the content of the song, in order to fully cooperate with the emotional expression sound processing, which is a crucial technique in singing. Moreover, where suitable, electronic and recording technologies are employed in the music production process to adjust the tone, volume, and reverb in order to make the song more moving (Lin. 2019: 98-100).

In conclusion, the study of the aria "Love Forever" from the ethnic opera "Yimeng Mountain" encompasses research on its background, artistic characteristics, music appreciation, expressive abilities, teamwork, and educational extensions. In-depth research and application of this work can enhance students' musical literacy, artistic cultivation, aesthetic taste, expressive abilities, teamwork, and stage performance skills. Therefore, conducting in-depth research on "Love Forever" holds great value and significance in music education.

Research Methodology

This study employed a one-on-one method interview questions and observation items, selected five music professors and five music students as key informants. The interviews were conducted in a semi-structured manner, with each participant provided a pre-designed interview guide to ensure consistency in the interview content. The main topics of the interviews include the participants' understanding of the artistic features of “Love Forever” analysis of its musical structure, recognition of singing techniques, and views on its teaching methods and educational significance in music education, and finally found the Analysis of the Melody of the Song.

Research Finding

1. The introductory section of the first 8 bars is in D minor, with a medium strength, using broken chords to enhance the overall and soothing qualities of the music. Together with the description of "Lin Sheng" on the beauty of his hometown, the beautiful melody line flows into the performer's psyche, evoking feelings of homesickness. The musical form uses parallel periods, with the upper phrase ending on the dominant note of the mode, and the lower phrase ending on the tonic note. The lower phrase repeats the material of the first half of the upper phrase, forming a structure of same beginning and ending, and echoing each other.

<table>
<tr><td colspan="5">A</td><td colspan="2">B</td></tr>
<tr><td colspan="5">||:A:|| ||:B:||</td><td colspan="2">||:C:|| ||:C‘:||</td></tr>
<tr><td>1-8</td><td colspan="2">9-25</td><td colspan="2">26-47</td><td>48-82</td><td>83-107</td></tr>
<tr><td>Introduction</td><td>a a1</td><td>b b1</td><td>expand</td><td>connect</td><td>C c1</td><td>d d1</td></tr>
<tr><td>8</td><td>8</td><td>9</td><td>21</td><td>1</td><td>16+16</td><td>8+16</td></tr>
<tr><td>D Dorian</td><td>D Dorian - G Mixolydian</td><td>D Dorian</td><td>G Mixolydian</td><td>e Feather</td><td>E (Shang) note</td><td>E (Shang) note</td></tr>
</table>

Figure 1: Musical Form

2. The exposition section from bars 9-25 consists of two segments, each of which is composed of a compound melody, in the key of D major, using a compound melody structure. The upper and lower segments have a large parallel relationship, with corresponding closure for each segment: the upper segment ends in an open dominant seventh chord cadence, while the lower segment ends in a full tonic chord cadence. The structure shares similarities with a parallel-periodic structure.

3. The main chord: the accompaniment texture of bars 8-16 features the tonic chord with the main melody. The main melody usually appears in the climax of the entire work, or in the opening part. The appearance of the main melody here echoes the ending climax, while also pushing forward the opening music. See Figure 4.2 for details.

Figure 2: Musical Notation Bar 9 –16

4. The accompaniment texture of bars 17-25 shifts to broken chords, and adopts the shaping technique in the musical form. From the same accompaniment texture, the fixed melody line can convey the emotional changes brought about by the repetitive section. See Figure 4.3 for details.

Figure 3: Musical Notation Bar 20 – 22

5. The creative techniques used in bars 26-47 include repetition and sequence. The repetition section completely repeats the preceding bars. The sequence technique uses the same accompaniment texture, repeating the preceding bar's melody with the previous note as the root note. The vocal part uses parallel sentence structure, with each phrase starting weakly, to express the feeling of homesickness and nostalgia for hometown in "Lin Sheng". The emotional atmosphere of sadness permeates the entire section. See Figure 4.4 for details.

Figure 4: Musical Notation Bar 28 – 37

6. Bars 48-82 are in the E minor pentatonic and adopt the rhythm of a march, expressing a sense of battle. This section reflects the determination of "Lin Sheng" when he joined the army, the willingness to die for the country, and his desire for victory. The changes in melody, dynamics, and tempo fully express the singer's internal changes. See Figure 4.5 for details.

Figure 5: Musical Notation 48 – 65

7. In bars 84-107, the material is developed based on the "3-7 perfect fifth relationship" motif from the first section, with a slower tempo and a stark contrast to the march-like rhythm of the first section. Parallel sections are the most important technique used in this section to express the music. The first phrase is identical to the second one, but the ending of the second phrase is different from the first.

Figure 6: Musical Notation 84 – 107

The interpretive section is the core of the work, typically comprising the main lyrics and emotional expression. In “Love Forever” the musical form of the interpretive section is often more complex, including multiple movements and musical elements. These elements can be related to harmony, melody, rhythm, and more. Usually, the musical form of the interpretive section varies based on the content of the lyrics and emotional expression. Musicians use different harmonies, melodies, and rhythms to convey various emotions and themes in the lyrics. For example, when expressing sorrowful emotions, the music may adopt a slower tempo and lower notes to intensify the depth of emotions. The interpretive section often consists of multiple movements, and these movements are usually interconnected through transitions or recurring elements. This helps enhance the continuity of the music and emotional expression.
In the repeated and developed sections of music, the musical form often undergoes various changes to increase the complexity and emotional climax of the music. These sections typically include elements of climax and heightened emotions, such as fast-paced notes and high-pitched tones. In these parts, musicians often employ various musical elements like polyphony, variations, counterpoint, and variances of counterpoint to enhance the complexity and expressiveness of the music. Musicians may introduce different melodic lines in these sections, allowing multiple melodic lines to coexist simultaneously, creating a polyphonic effect. This can add depth and complexity to the music, conveying a broader range of emotions. The main theme or melody of the music may undergo various variations in the repeated and developed sections, such as changes in melodic lines, repetition, or alterations in notes. These variations make the music richer and more diverse, capturing the audience's interest. Musicians may also employ counterpoint techniques, creating harmonic relationships between different voice parts. This can enhance the harmony and complexity of the music, conveying more layers of emotion. At times, the contrapuntal relationships in the music may undergo variations, meaning changes in the relationships between different voice parts. This can create more dynamics and emotional climaxes in the music. These changes and techniques contribute to the creation of musical climaxes and emotional highs. For instance, in an exciting section, musicians may use rapid notes and high pitches to express feelings of joy and excitement. In the repeated and developed sections, these elements might be emphasized and further developed, making the music more vivid and captivating. The variation and richness of the music's form in the repeated and developed sections are crucial components of musical expressiveness. They help increase the complexity and emotional climax of the music, making the musical piece more unforgettable. This guidance is essential for musicians and performers when singing “Love Forever” or other musical compositions.

Figure 7: Musical Notation Bar 99-107

The musical form plays a highly significant role in the song "Love Forever" aiding in organizing, presenting, and conveying the overall themes, emotions, and expressions of the entire piece. Let's delve into the specific roles of musical form within this song to better understand its contributions to the development and emotional expression of the song. The song typically begins with simple melodies and musical elements. In "Love Forever" the introduction features a melody in D minor, with a moderate musical intensity, employing arpeggios to enhance the overall mellowness. This part complements the lyrical descriptions of the beauty of "Lin Sheng" hometown, with a beautiful melodic line flowing into the performer's heart, evoking feelings of homesickness. The musical form adopts parallel sentence structures, concluding the upper part with the tonic chord and the lower part with the dominant seventh chord. The lower part repeats material from the first half of the upper part, establishing a structure with matching beginnings and endings that echo each other. As the song progresses to the interpretation section, the musical form begins to grow more intricate. It consists of two paragraphs, each composed of a compound melody in D major. There is a substantial parallel relationship between the upper and lower parts, with each paragraph concluding with corresponding cadences: the upper part ending with an open dominant seventh chord, and the lower part with a complete tonic chord cadence. This structure bears resemblance to the parallel sentence structure. In the music of the interpretation section, the accompaniment features a tonic harmony, with the main melody typically appearing at the climax or the beginning of the entire piece. The appearance of the main melody here both recalls the climax at the conclusion and propels the musical beginning. The accompaniment structure in this section shifts to arpeggios, utilizing shaping techniques within the musical form. Through the consistent accompaniment structure, the fixed melodic line can convey the emotional changes brought about by the repeated and developed sections. This is a key characteristic of the musical form, continually responding to and emphasizing the emotional shifts in the repeated and developed sections throughout the piece. This part employs different musical modes and rhythms, creating a martial atmosphere. The music is in E major, utilizing a march-like rhythm, conveying "Lin Sheng" determination when joining the army, the willingness to sacrifice for the country, and the desire for victory. The variations in melody, volume, and tempo effectively express the inner emotional changes of the performer. In the subsequent section, the musical material is developed based on the 3-7 perfect fifth relationship" motif from the first part of the composition. It employs a slower tempo, forming a distinct contrast to the march-like rhythm of the first part.

In these different sections, the changes and developments in the musical form reflect the emotional shifts and thematic progress of the piece. The introduction conveys emotions of homesickness and peace, the interpretation section enhances the complexity of the music, the repetition and development sections express determination and the desire for victory, and the final section, through its slow tempo and repetition of musical elements, conveys introspection and reflection of emotions. This diversity and development within the musical form assist the audience in better understanding the lyrical content and deeply experiencing the emotions and themes of the piece.

Discussion/Conclusion

Musical Form Characteristics

The singing section in "Love Foever" utilizes traditional folk modes with the main key of E minor. Throughout the section, the emotional development and change are reflected by the changes in tonality. The rhythm of the section is generally stable with a 4/4 meter, four beats per measure; however, the singer can exercise some degree of freedom in expressing emotions. The melody of the section is beautiful and moving, characterized by a simple folk style with some modern music elements, rendering a strong contemporary sense. The melody is mainly led by the singer's voice, expressing the emotional ups and downs in a clear and straightforward way. The musical form of the solo "Love Forever" performed by Lin Sheng in the opera is a typical ABA form. The introduction part is 8 measures long, followed by A part composed of two sections: a section (measures 9-25) and b section (measures 26-48). Each section consists of two corresponding phrases. The music starts from the lyrics "The wind blows over, the clouds float over," depicting the beautiful scenery of the protagonist's hometown. At the beginning of a section a, the tonality is mainly in D mode, which transforms into G mode in the repeating b section (measures 26-48), with the main note changing from D to G. This represents the return of the subdominant note to the main note in music. Part B immediately follows the connecting section and spans from measure 50 to 82. It is also divided into two sections, c section and d section, each consisting of two phrases. The music atmosphere changes from the previous lyric style to a marching style, with a lot of dotted notes simulating a sense of tension. The tonality of c section is E Aeolian mode, highlighting the desolate tone of war. Part C is relatively short from measure 83 to 98 and it changes from E Aeolian mode to E Phrygian mode, which is a transition to the same main key with styles more intense and sorrowful, making it more accurate in reflecting the emotional content of the work. The ending of the piece is from measures 99 to 107 with the use of E Phrygian mode, slowing down the pace and extending phrases to conclude the melody. From the beginning of the opera solo "Love Forever" the accompaniment mostly uses broken chords to pave the way for the music, emphasizing the smoothness of the music. Starting from measure 17 of a part of A section, the accompaniment is dominated by the broken chords of major triads, showing a bright and cheerful quality. From the 20th measure, the accompaniment uses chords that are mostly diminished seventh chords. With the change of harmony, the sound becomes more diminished and the music emotion becomes more complicated. Part B of A section is a supplement to the three-part form and is faster in tempo than a section. In the accompaniment, both the upper and lower voices mainly use eighth notes, enriching the chord progression and making the melody more layered. Compared to A section, part B has undergone significant changes. This section is faster in tempo. C part consists of a two-part form, which changes into a marching style in parallel, with the faster pace making the motive of the melody more passionate.

Melodic Features

In terms of melody, the melody mainly adopts the flat tone commonly used in Chinese folk music. The melody is graceful, smooth and full of appeal, reflecting the unique charm of Chinese national music. In addition, the song also uses different rhythm changes, thus creating a sense of rhythm and level. At the same time, the accompaniment of the harmony part of the use of a simple harmony processing, making the whole chorus more harmonious and unified. From the perspective of performance techniques, the singer of “Love Forever” shows a very high artistic level in voice performance, vocal style, music emotional performance and so on. The singer's voice performance is very pure, natural, strong, and the sound quality has the characteristics of Chinese national music. The Chinese folk music style is adopted in the vocal style, with a natural but not artificial, smooth and not intentional vocal style, so that the audience feel a deep emotion. In the aspect of music emotion expression, the singer successfully conveys the profound friendship and moving emotion expressed by the song through the means of voice and singing, the lyrics of the song “Love Forever” express the theme of the military and civilian fish and water, and show the deep feelings between the People's army and the people through the true description and rich emotional expression. The literary features of the lyrics are reflected in the simplicity of the language and the sincerity of the feelings.

Suggestion

1. You should study music analysis in other formats that can be useful in studying singing.

2. Should study contemporary music analysis that can be studied by people all over who are interested in contemporary singing.

3. You should study techniques for teaching singing in other formats that can be useful in developing singing teaching models.

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Beyond Numbers: The Role of Data Quality on Lean Accounting Implementation

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Abstract

This research explores the role of data quality on lean accounting implementation among Thai manufacturing companies. Through the utilization of a survey-based method, this research collected from 315 accounting executives. The results underscore the intricate relationship between data quality and the implications for lean accounting implementation, emphasizing the essential role of a solid foundation of data attributes for the successful integration of lean principles. In summary, this research elucidates the inherent significance of data quality in augmenting the efficiency and effectiveness of lean accounting implementation within the distinctive operational context of manufacturing firms in Thailand.

Keywords: Cost Accounting, Financial Reporting, Quality of Data, Manufacturing Firms

Introduction

In the modern corporate landscape, accounting information plays a pivotal role in informed decision-making (Mowen, Hansen, and Heitger, 2017). Intense competition demands a sophisticated approach to management accounting in contemporary manufacturing settings. According to Blocher, Stout, Juras, and Smith (2015), Lean accounting is indispensable for providing and analyzing high-quality management data, crucial for effectively overseeing the business process. Cescon, Costantini, and Grassetti (2016) highlight the criticality of accurate accounting information for successful management in such a fiercely competitive environment, emphasizing the need for precision in financial data.

The Thai manufacturing sector has been selected as the country's stimulating industry to enhance enterprise efficiency in a highly competitive environment (Dhanani & Scholtes, 2002). As Thailand's principal industry, the manufacturing sector continues to play a critical role in the country's economy (International Monetary Fund, 2019). Kiattikulwattana (2012) reports that Lean accounting implementation is widely embraced by Thai enterprises. As economies become increasingly interconnected, understanding the quality of accounting data in different regions, including Thailand, is crucial. International researchers can provide insights into how accounting practices and data quality in Thai manufacturing companies align with global standards, facilitating cross-border economic activities. Therefore, understanding how costs are managed in Thailand's industrial environment not only benefits developing nations but also the rest of the world.

The purpose of this research is to examine the role of accounting data quality on the implementation of lean accounting in Thai manufacturing companies. The insights gained from such studies have implications for investors, policymakers, and academics worldwide.

Objective

1. To study marketing mix factors that affect decision making. Apply for the Doctor of Philosophy degree program. Master's degree program universities in Bangkok
2. To study the comparison of decision making. Apply for the Doctor of Philosophy degree program. Master's degree program Universities in Bangkok Classified according to personal factors

Literature Review

The significance of data quality in planning and controlling for the identification and implementation of organizational goals has been underlined by Blocher et al. (2015). The authors stress that data quality of adequate quality enables management accountants to implement effective planning and control systems, comprehend their cost structure, and understand the activities that power their operations. Moreover, the International Accounting Standard Board (2015) defines data quality as characteristics that assist stakeholders in making investment, credit, and other choices. The qualities of data quality include relevance, faithful representation, comparability, understandability, timeliness, and verifiability (International Accounting Standard Board, 2015).

Relevance refers to the capacity of information to influence decisions by helping users in predicting or confirming past, present, or future events. It is ensuring that financial information presented is pertinent to the needs of users for decision-making.

Faithful representation is that the financial information accurately represents the economic substance of the transactions and events it purports to represent. This quality aligns with the principle of faithful representation, a key concept in accounting standards that emphasizes a reliable and accurate depiction of financial information.

Comparability refers to the ability of users to identify and understand similarities and differences among items in the financial statements over different periods or between different entities. Accounting standards promote comparability to ensure that financial statements are presented in a consistent manner, facilitating meaningful comparisons between different reporting entities or across different time periods.

Understandability indicates the clarity and ease with which users can comprehend the meaning of financial information presented in the financial statements. Accounting standards stress the importance of presenting financial information in a clear and understandable manner to meet the needs of various users, including investors, creditors, and other stakeholders.

Timeliness signifies the importance of providing financial information in a prompt manner, allowing users to make timely decisions based on current and relevant data. Accounting standards emphasize the need for timely reporting to ensure that financial information is relevant and useful for decision-making. Timeliness enhances the value of financial statements.

Verifiability refers to the ability to confirm the accuracy of reported financial information through independent and unbiased third-party verification or auditing. It aligns with the reliability principle in accounting standards, emphasizing the importance of providing information that can be verified by external parties, enhancing the credibility and trustworthiness of financial statements.

Accordingly, data quality is integral to the successful implementation of cost management strategies. Organizations rely on accurate, timely, and reliable cost data to make informed decisions, meet regulatory requirements, and drive continuous improvement. Accurate data is fundamental to determining and allocating costs effectively. If data quality is compromised, the cost information derived from it may be inaccurate, leading to misguided decisions in cost management.

The influence of contingencies on Lean accounting implementation has been reviewed by Gliaubicas and Kanapickiene (2015), highlighting the significance of business characteristics and competitiveness in Lean accounting implementation. Improved coordination of preparation and monitoring in cross-functional departments might result in Lean accounting implementation, which is also known as SMA. The emerging trend in Lean accounting implementation, as asserted by Blocher et al. (2015), is value creation, which includes cost reduction through resource efficiency. The most well-known Lean accounting implementation, according to Kelety (2006), offers the conceptual framework for Lean accounting implementation, emphasizing the significance of competition and company characteristics in influencing management decisions.

Cost management approaches for identifying value-added operations that meet customer needs include value chain analysis, as outlined by Blocher et al. (2015), and target pricing, which is a strategy technique for responding to consumer requests that require reprocessing before the final product meets customer criteria (Ghafeer et al., 2014). The concurrent process of designing, pricing, costing, and value engineering is impacted by the ferocious market, resulting in strong consumer expectation pressure.

Lean accounting implementation is a best practice of accounting methods that goes beyond traditional approaches by meticulously identifying and quantifying value-added activities within an organization. Coined by Arbula-Lopez and Fortuny-Santos (2010), this methodology transcends mere financial reporting and delves into the intricate processes that contribute meaningfully to overall value creation. It involves a systematic and dynamic approach that not only monitors but actively reports on the ongoing evolution of value within an operational framework.

By placing a heightened emphasis on efficiency and waste reduction, Lean accounting implementation serves as a strategic compass for businesses, aligning financial processes with the overarching goal of value maximization (Blocher et al., 2015). This methodology is not confined to a static representation of financial data but rather operates as a real-time feedback mechanism, providing timely and relevant information crucial for informed decision-making.

In essence, Lean accounting implementation is a transformative paradigm that encourages organizations to adapt their accounting practices to the principles of Lean thinking. As an integral component of Lean management philosophy, Lean accounting implementation not only captures the essence of financial metrics but also embraces a broader perspective that aligns financial strategies with the operational realities of a dynamic business environment. This study utilized Kelety's (2006) conceptual framework, which developed the conceptual framework for this research as follows:

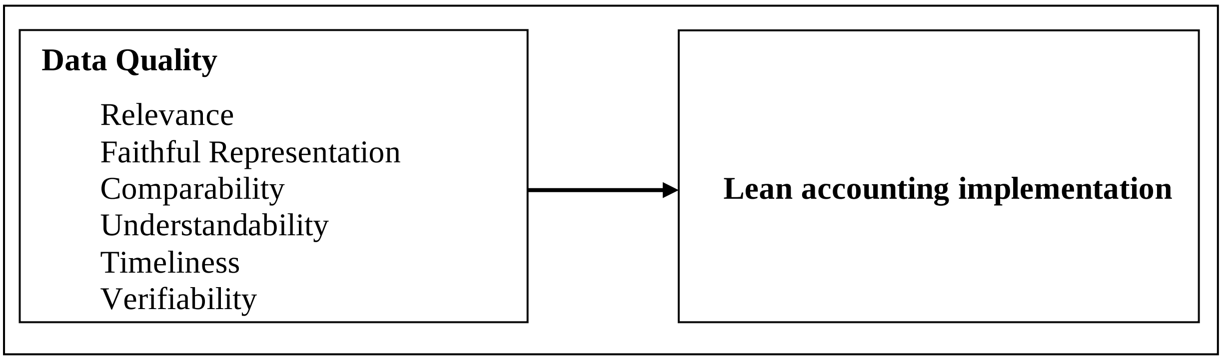

Figure 1: Conceptual framework

Drawing from the principles of Lean Accounting, we hypothesize that the relevance of accounting data is a key determinant of successful Lean accounting implementation. As organizations strive for efficiency and waste reduction, the timely availability of relevant financial information enables better decision-making and strategic alignment with Lean principles. Therefore, we predict a positive correlation between the relevance of accounting data and the effective adoption of Lean Accounting practices.

H1.1: Relevance is positively effect on lean accounting implementation

We posit that faithful representation, characterized by the accurate portrayal of financial information, plays a crucial role in Lean accounting implementation. Lean practices necessitate a high degree of accuracy in financial reporting to ensure a true reflection of value streams and operational efficiency. Thus, we hypothesize a positive relationship between faithful representation of accounting data and the successful implementation of Lean Accounting principles.

H1.2: Faithful representation is positively effect on lean accounting implementation

In the context of Lean Accounting, where benchmarking and continuous improvement are paramount, we propose that comparability of accounting data across various periods and entities positively influences the implementation of Lean practices. A standardized and comparable financial reporting system is anticipated to facilitate the identification of inefficiencies and support the continuous improvement efforts inherent in Lean principles. Consequently, we hypothesize a positive association between comparability of accounting data and the effective implementation of Lean Accounting.

H1.3: Comparability is positively effect on lean accounting implementation

Understanding the financial information is fundamental for making informed decisions in a Lean environment. Therefore, we hypothesize that the degree of understandability of accounting data positively affects the implementation of Lean Accounting. Clear and comprehensible financial information is expected to enhance communication, foster transparency, and contribute to a shared understanding of the organization's financial performance in alignment with Lean principles.

H1.4: Understandability is positively effect on lean accounting implementation Timeliness is a critical factor in the dynamic context of Lean practices, where real-time decision-making is essential. We hypothesize that the timely availability of accounting data positively influences the implementation of Lean Accounting. Swift access to financial information is expected to support proactive decision-making, aid in identifying bottlenecks, and facilitate the agile response required by Lean principles.

H1.5: Timeliness is positively effect on lean accounting implementation

In the pursuit of operational excellence and continuous improvement inherent in Lean Accounting, we posit that verifiability of accounting data is essential. We hypothesize that a higher degree of verifiability positively affects the successful implementation of Lean practices. Verifiable financial information is anticipated to enhance the credibility of data, instilling confidence in decision-makers and reinforcing the reliability of information crucial for Lean Accounting processes.

H1.6: Verifiability is positively effect on lean accounting implementation

Research Methodology

This research adopted mail survey method by collecting data from accounting executives of manufacturing establishments in Thailand. The population of this study was 69,420 manufacturing establishments in Thailand. This research adopted Krejcie and Morgan's (1970) sample size calculation, which result of 385 respondents are required. This research posted mail, and follow up with the manufacturing establishments as final result received 315 accounting executives responded.

The survey questionnaire consisted of four distinct components. The first section gathered basic information about the executive and the organization. The second section collected data on the quality of management accounting. The third section collected data on business planning, while the fourth section gathered information on Lean accounting implementation. The data were evaluated using item-total correlation, with a range of scores between 0.938 and 0.941. The results of a reliability test on accounting-related data consistency varied from 0.657 to 0.872.

Descriptive statistics, including frequency, percentage, means, and standard deviation, were utilized to describe the data's characteristics. Finally, a multiple regression analysis was conducted to examine the relationships between data quality and lean accounting implementation. This study draws from the existing literature by proposing following equation.

$$LEAN = \alpha + \beta_1 RELE + \beta_2 FAIT + \beta_3 CPAR + \beta_4 UNDE + \beta_5 TIME + \beta_6 VERI + \varepsilon \quad ......(1)$$

Where LEAN refers to lean accounting implementation
RELE refers to relevance
FAIT refers to faithful presentation
CPAR refers to comparability
UNDE refers to understandability
TIME refers to timeliness
VERI refers to verifiability

Research Finding

The descriptive statistics of the respondents reveal notable patterns. The majority of accounting executives are female, constituting 54.92% of the sample. In terms of age distribution, most accounting executives fall within the 36–40 age range, accounting for 28.57% of the participants. Furthermore, a significant proportion of respondents work for partnerships organisation (107 persons, 33.96%) and limited liability companies (83 persons, 26.34%). Regarding the financial scale, the majority of enterprises have total asset ranging from 201 to 400 million Thai baht, encompassing 56.50% of the sample. Lastly, concerning the workforce size, a substantial percentage of the enterprises employ more than 600 staff members, representing 30.79% of the respondents.

Descriptive statistics of data quality and lean accounting implementation in the view of 315 accounting executives can be reported as follows:

Table 1: Descriptive summary of the quality of data quality on lean accounting implementation.

Elements	**Mean**	**S.D.**	**Level of perception**	**Rank**
Relevance	3.710	0.575	Agree	6
Faithful presentation	3.742	0.551	Agree	5
Comparability	3.760	0.588	Agree	4
Understandability	3.786	0.57	Agree	3
Timeliness	3.795	0.615	Agree	2
Verifiability	3.821	0.656	Agree	1
Lean accounting implementation	3.878	0.599	Agree	-

The table presented in the study provides insight into the attitudes of 315 accounting executives toward various dimensions of data quality, including relevance, faithful presentation, comparability, understandability, timeliness, and verifiability. The results reveal that verifiability, which refers to the extent to which information can be reproduced given the same facts and assumptions, is the primary concern regarding data quality, with a mean score of 3.821. Following closely are Timeliness and Understandability, with mean scores of 3.795 and 3.786, respectively. These dimensions are crucial in management accounting as they focus on providing useful information for internal use. Moreover, the study found that lean accounting implementation, with a mean score of 3.878, which suggests that modern management accounting practices are well-adopted by Thai manufacturing firms. Overall, the results of the study provide valuable insights into the attitudes of accounting executives and the current state of management accounting practices in the Thai manufacturing industry.

Regarding to Lean accounting implementation, respond indicates that lean accounting implementation plays an important role in Lean accounting implementation features ($\bar{x}$ = 3.511). The firm is not only able to perform meritoriously cost analysis ($\bar{x}$ = 3.901), but it also focuses on readable and appropriate report for users ($\bar{x}$ = 3.896), so the firm is able to discover the actual cost-effectiveness ($\bar{x}$ = 3.623).

Next section provides correlation matrix among the independent variables in the study is presented in Table 2, with correlation coefficients ranging from 0.461 to 0.662 and a maximum value of 0.80, as reported by Hair et al. (2010) as details followed.

Table 2: Correlation matrix

	1	2	3	4	5	6	7
1) Relevance	1						
2) Faithful presentation	0.636	1					
3) Comparability	0.628	0.601	1				
4) Understandability	0.499	0.561	0.551	1			
5) Timeliness	0.620	0.607	0.654	0.641	1		
6) Verifiability	0.526	0.549	0.592	0.558	0.703	1	
7) Lean accounting implementation	0.417	0.368	0.414	0.439	0.487	0.512	1

This information provides important insights into the relationships among the independent variables in the study and highlights the need to consider these correlations when conducting further analyses. Specifically, the high degree of intercorrelation among these dependent variables suggests that they may be closely related and that they may jointly impact the outcome variable of interest. Therefore, it will be important to assess the unique contributions of each of these variables to the outcome variable while controlling for the effects of the other variables. By doing so, the study will be better equipped to draw accurate and meaningful conclusions regarding the factors that contribute to the outcome of interest.

Using multiple regression among the quality of data quality and lean accounting implementation, the details reveals are as follows:

Table 3: The role of data quality on lean accounting implementation

	Co-efficient	**S.D.**	***t Stat***
Intercept	0.923	0.296	3.12***
Relevance	0.132	0.087	1.506
Faithful presentation	-0.048	0.091	-0.522
Comparability	0.035	0.088	0.395
Understandability	0.154	0.084	1.846*
Timeliness	0.117	0.095	1.230
Verifiability	0.259	0.078	3.333***
F = 16.043 Adj R^2 = 0.299			

*** significant level at 0.01 *significant level at 0.10

This table presents the effect of data quality on lean accounting implementation with significant estimation at level of 0.05 (F = 16.043) where adjusted R^2 is shown at 0.299. The finding indicates that verifiability has significant impact on lean accounting implementation at significant level of 0.05. Thus, it should not reject H6 that verifiability has significant impact on Lean accounting implementation. However, it should reject H1-H5 that quality of Data Quality has distinctive significant impact on lean accounting implementation.

The results support the previous evidence, lean accounting implementation is also widely used in Thailand's industrial firms (Kiattikulwattana, 2012). The verifiability is the only element expected to play a crucial role in lean accounting implementation (Ward and Graves, 2004). This element of Data Quality has often been questioned during major accounting scandals. The situation could lead to a rethinking of accounting information quality and the advancement of block chain technology. Previously-unheard-of alignment inside and between organizations is now possible thanks to technology. On the other hand, this finding is among the first examples of technical disruption in management accounting literature. The application of block chain to accounting, according to Dai and Vasarhelyi (2017), is still under-explored. As a result, companies should keep in mind that cost management is a necessary survival strategy for the establishment of a proper data quality system.

Discussion/Conclusion

This research suggest that accounting executives have recognized the importance of data quality in their operations. It claims that the Lean accounting implementation practices are essential for business formulation and implementation in the current Thai manufacturing context. Overall, the quality of data quality has a positive impact on the lean accounting implementation of the Thai manufacturing industry; in this regard, it shows that cost management is a feasible approach based on a proper accounting system. Finding a balance between the three constraints of work demands, response time, and expense was the most challenging part of this report. Despite these drawbacks, the work was successfully concluded.

Based on the findings of this research, the following recommendations are made for management accountants and other stakeholders: all data consistency in accounting should be promoted, where the exercise of value, understandability, timeliness, and verifiability can be fruitful. In addition, the effectiveness of accounting systems and procedures is vital to business operation. Therefore, this research not only puts forward academic understanding of the implementation of lean accounting implementation but is also beneficial to industrial practice among lean accounting implementation firms.

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Cash Management and the Effectiveness of Companies in Thailand

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Abstract

This research aims to investigate a relationship between cash management and the effectiveness of companies in Thailand by employing correlation study method. 478 companies registered in the stock exchange of Thailand were the samples of this study and the data collection was their financial statements. The data was analyzed by correlation and multiple regression. The results revealed that cash flow management of the companies belong to SET ESG Ratings on Cash Flow from Operation (CFO) and Cash Flow from Investment (CFI) did not show relationship with the effectiveness on company's performance on Return of Assets (ROA), Return of Equity (ROE) and Net Profit Margin (NPM). Besides, the results also showed that Cash Flow from Fund (CFF) of these companies did not have an effect on Net Profit Margin (NPM); however, it showed negative relationship with Return of Assets (ROA) and Return of Equity (ROE) with statistical significance at 0.01 and 0.05 respectively.

Keywords: Cash Management, Effectiveness, Cash flow

Introduction

Cash flow information is now placed as important data because it has been a decade that high inflation has an effect on businesses. The rising of selling prices could be assumed to help increasing cash flow; however, rising costs, increased investment in working capital and the higher replacement costs of fix assets, all mentioned, are the causes of high pressure on cash flow. Inflation and the problem of climate changes contribute to an ultimate attention from management and users of financial statement on cash flow information. Inadequacy of cash flow information may lead investors and analyst have improper conclusion on effectiveness, financial flexibility and performance of a company. After an investigation on cash flow, the results found that many authors agree on how important it is.

Cash flow may be assumed as a company's core and company's performance according to a research of Jooste, L. (2006) about identity and stability of cash flow ratios from operating activities compared with financial ratios on accrual basis to examine a company's payment. Moreover, Palepu et al., 2000 also stated that cash flow ratios can be used to answer questions on a company's performance since debt obligations are met with cash. That analysis causes an unlimited of credit, unrestricted cash availability, debt maturity schedules with respect to financing requirements and the willingness to issue common equity. In addition, cash flow ratios also support to analyze a company's financial health and how a company manage cash flow from operating activities, investment and financial supply

Objective

This research aims to examine relationship between cash management and the effectiveness of companies in Thailand

Hypotheses

1. Cash flow has positive relationship on the effectiveness of Return of Equity
2. Cash flow has positive relationship on the effectiveness of Return on Assets
3. Cash flow has positive relationship on the effectiveness of Net Profit Margin

Literature Review

Afrifa, G. A. (2016) conclude in his research that cash flow has an effect on a company's performance. For example, Guney, Y., Ozkan, A. and Ozkan, N. (2003) found that on average, companies in England own their assets as cash for 10.3% of the total assets, so they are able to pay debt on time. Deloof, M. (2003) stated in his study that unrestricted cash flow could improve a company's performance by reducing external financial supply especially for SMEs because the more cash flow, the more operating activities since SMEs' cost is, compared with large company, higher in terms of business transactions. Tauringana, V. and Afrifa, G.A. (2013) suggested that cash flow availability can contribute a company to meet primary obligations and avoid financial problems compared with a company that facing cash flow fluctuation.

Adequacy of cash flow has an effect on a company's performance. The research showed that unrestricted cash flow helps increase higher investment on working capital. Baños-Caballero, S., García-Teruel, P.J. and Martínez-Solano, P. (2014) conclude in their research that even though financial cost contributes to a negative effect on working capital, a better access to capital market plays an important role to increase working capital and the proper level of investment on working capital depends on each company's financial strength.

In terms of accounting, an idea of cash flow has been mentioned for years; therefore, the availability of cash flow information help to set standard for company's evaluation. On the other hand, if cash flow is excluded, such result may not authenticate. Cash flow ratios is appeared in many professional business documents or used in financial statements in countries. As suggested by Jooste, L. (2006), users of financial statements evaluate company's financial statement to create strategies for liquidity, operating activities, assets, profitability and performance. Management team may involve for the inspection including for effectiveness. Normally users of financial employ traditional balance sheet and profit and loss statement to evaluate operating activities which is considered as main revenue-producing. Therefore, together with traditional operation, cash flow ratios also play an important role for performance. Moreover, cash flow helps comparing each company's performance. According to FASB, main purpose of cash flow is to evaluate liquidity, solvency, viability and financial adaptability. Cash flow ratios from operating activities could serve as indicator for company's performance.

Conceptual Framework

Cash management		**Performance**
1. Cash flow from Operations (CFO)	➡	1. Return Of Equity (ROE)
2. Cash flow from Investment (CFI)		2. Return On Assets(ROA)
3. Cash flow from Fund (CFF)		3. Net Profit Margin (NPM)

Figure1: conceptual framework of cash management on performance of registered companies in SET

Research Methodology

Population and sample

The population in this research were 511 companies belonged to SET, ESG Rating who registered in the Stock Exchange of Thailand with 5 years of business operation from period of 2017-2021. their financial statements and annual reports were used as research data. The sample were 478 out of 511 companies because some companies must be excluded due to the lack of some information.

Research Tools

This study used the following models to analyze relationship between cash flow management and performance of companies belonged to SET, ESG Ratings group registered in the Stock Exchange of Thailand.

Model 1: relationship between cash flow management and Return of Equity (ROE)

$$ROE_{it} = \alpha_0 + \beta_1 CFO_{it} + \beta_2 CFI_{it} + \beta_3 CFF_{it} + \varepsilon_{it}$$

Model 2: relationship between cash flow management and Return of Assets (ROA)

$$ROA_{it} = \alpha_0 + \beta_1 CFO_{it} + \beta_2 CFI_{it} + \beta_3 CFF_{it} + \varepsilon_{it}$$

Model 3: relationship between cash flow management and Net Profit Margin (NPM)

$$NPM_{it} = \alpha_0 + \beta_1 CFO_{it} + \beta_2 CFI_{it} + \beta_3 CFF_{it} + \varepsilon_{it}$$

when

CFO_{it}	=	cash flow from operations of company i at time t
CFI_{it}	=	cash flow from investment of company i at time t
CFF_{it}	=	cash flow from fund of company i at time t
ROE_{it}	=	Return of Equity of company i at the end of t
ROA_{it}	=	Return of Assets of company i at the end of t
NPM_{it}	=	Net Profit Margin of company i at the end of t
ε_{it}	=	Deviation of estimation of company i at time t

Data collection

The data used in this research were obtained from financial statements and notes to financial statements for the period from 2017-2021(5 years) of 478 companies belonged to SET ESG Ratings group that registered in Stock Exchange of Thailand (SET). Their information appeared in the database website of SET.

Data Analysis

This study used 2 types of statistics which were

1. Descriptive statistics: frequency, percentage, mean and standard deviation to explain independent variables

2. Inferential statistics: correlation analysis and multiple regression to test relationship between variables and hypotheses.

Research Findings

The results of relationship between cash flow management and performance of companies belonged to SET ESG Ratings group that registered in the Stock Exchange of Thailand are shown in Table1-Table 5

Table 1: Descriptive statistics of variables

Variables	Min	Max	Mean	S.D.
CFO	-88.54	1,308.70	15.11	70.34
CFI	-385.31	127.86	-10.44	34.31
CFF	-162.50	90.04	-1.25	16.69
ROE	-67.06	67.27	10.28	11.44
ROA	-23.37	49.62	5.82	6.51
NPM	-230.35	512.90	12.23	31.75

Table 1 shows that the companies registered in the Stock Exchange of Thailand (SET ESG Ratings group) acquire cash flow from operations, on average, 15.11 billion (THB), cash flow from investment is approximately -10.44 billion (THB). They also receive cash flow from fund -1.25 billion (THB). Their ROE, ROA and NPM are 10.28, 5.82 and 12.23 respectively.

Table 2: Correlation analysis of variables

Variables	CFO	CFI	CFF	ROE	ROA	NPM
CFO	1					
CFI	-0.426**	1				
CFF	-0.181**	-0.076	1			
ROE	0.035	-0.042	-0.134**	1		
ROA	-0.017	-0.041	-0.100*	0.691**	1	
NPM	0.000	-0.014	-0.045	0.348**	0.261**	1

**.Correlation is significant at the 0.01 level (2-tailed).

*.Correlation is significant at the 0.05 level (2-tailed).

Table 2 reports the results of relationship between variables from Pearson Correlation that cash flow from Fund (CFF) has 0.01 statistical significance of negative relationship with Return on Equity (ROE) and shows 0.05 statistical significance of negative relationship with Returen of Assets (ROA) which interpreted that short-term and long-term debt caused from investor's finances, owners or other activities creates changes about size and propotion of owners and loan that might affect company's performance

Table 3: relationship between cash flow management on performance of Return of Equity (ROE)

variables	Coefficient	P-Value	VIF
CFO	-0.003	0.758	1.295
CFI	-0.020	0.244	1.259
CFF	-0.097	0.003*	1.066

**.Correlation is significant at the 0.01 level (2-tailed).
R^2 = 0.021, Adj. R^2 = 0.015, F-Value = 3.382, Dubin-Watson = 1.848

Table 3 shows that management of cash flow on operations (CFO) and investment (CFI) have no relationship with Return of Equity (ROE). And cash flow on fund (CFF) shows negative relationship with Return of Equity (ROE).

Table 4: relationship between cash flow management on performance of Return of Assets (ROA)

variables	Coefficient	P-Value	VIF
CFO	-0.002	0.609	1.295
CFI	0.004	0.665	1.259
CFF	-0.040	0.029*	1.066

*.Correlation is significant at the 0.05 level (2-tailed).
R^2 = 0.012, Adj. R^2 = 0.006, F-Value = 1.882, Dubin-Watson = 1.698

Table 4 reports that management of cash flow on operations (CFO) and investment (CFI) shows no relationship with Return of Assets (ROA). management of cash flow on fund (CFF) has negative relationship with Return of Equity (ROE).

Table 5: relationship between cash flow management on performance of Net Profit Margin (NPM)

variables	Coefficient	P-Value	VIF
CFO	-0.009	0.696	1.295
CFI	-0.025	0.606	1.259
CFF	-0.097	0.284	1.066

R^2 = 0.003, Adj. R^2 = -0.004, F-Value = 0.422, Dubin-Watson = 1.987

Table 5 shows that management of cash flow on operations (CFO) along with cash flow on investment (CFI) and cash flow on fund (CFF) have no relationship with Net Profit Margin (NPM).

Discussion

Management of cash flow on operations has no relationship with performance of the companies of SET ESG Ratings group registration in the Stock Exchange of Thailand. This results is consistent with the study of Sawatkulsiri, T. & Mokhavesa, B. (2021) that cash flow from operating activities showed no relationship with Return of Assets of set50 group registration in the Stock Exchange of Thailand.

Management of cash flow on investment shows no relationship with performance of SET ESG Ratings group registration in the Stock Exchange of Thailand. The findings show same result as the study of Seribudh, T. (2017) that Return of Equity did not relate with cash flow from investments. And also, Sawatkulsiri, T. & Mokhavesa, B. (2021) did the research and found that cash flow from investment showed no relationship with Return of Assets (ROA) of set50 group registration in the Stock Exchange of Thailand.

Management of cash flow on fund shows negative relationship with ROE and ROA. While it does not relate with NPM of SET ESG Ratings group of registration in the Stock Exchange of Thailand. The results has a consistency with the studies of Seribudh,T.(2017) and Chalodhorn, N. & Rangkakulnuwat, P. (2021) respectively that ROA and ROE showed significant statistic relationship with cash flow on fund and every change of 1 THB of cash flow on fund had opposite effect on 0.094 THB of NPM.

Conclusion

Management of cash flow on operations, investment of SET ESG Ratings group registration in the Stock Exchange of Thailand has no relationship with performance on ROA, ROE and NPM. In addition, their cash flow management on fund also shows no relationship with NPM; however, shows negative relationship with ROA and ROE with 0.01 and 0.05 significant statistic respectively. Therefore, it can be implied that cash flow management is performance analysis to evaluate core value of the organizations and it could not be assumed as a method to forecast profits

Suggestion

Suggestion for using this research

the findings of this research could be a useful source for executives and share holders to analyze company's performance. Moreover, investors and interested person also use this study for their better decision-making.

Suggestion for the next study

1. a researcher could extend the population and sample by collecting more data in order to compare cash flow management in a different situation.
2. a researcher could extend his/her study by investigating other groups registration in SET and MAI.

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The Perceived Benefits, Ease of Use, Attitudes, and Reference Group Conformity Influencing the Intention to Use Mobile Banking Services Among Elderly Customers in Ubon Ratchathani Province: A Study of Government Savings Bank

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Abstract

This research aims to 1) to study the factors related to perceived benefits, perceived ease of use, and reference groups that influence the intention to use mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province; 2) to examine the influence of perceived benefits and perceived ease of use on the intention to use mobile banking services through attitudes; 3) explore the impact of perceived benefits and perceived ease of use on attitudes. The sample population consists of 500 elderly individuals using mobile banking services in Ubon Ratchathani Province, selected through probability sampling using a stratified sampling method. The questionnaire was the research tool used. The findings reveal that 1) perceived benefits and reference groups significantly influence the intention to use mobile banking services among the elderly in Ubon Ratchathani Province at a 0.01 significance level, whereas perceived ease of use does not have a significant effect; 2) perceived benefits and perceived ease of use significantly influence the intention to use mobile banking services through attitudes at a 0.01 significance level; 3) perceived benefits and perceived ease of use significantly affect attitudes at a 0.01 significance level.

Keywords: Perceived Benefits, Perceived Ease of Use, Attitudes, Reference Group Conformity, Intention to Use

Introduction

Thailand entered the phase of becoming an aged society since 2005 and has continued up to the present year of 2022. The country has a population of more than 12 million elderly people, or those aged 60 and above, accounting for approximately one-sixth of the Thai population, ranking it second in the ASEAN region, following Singapore. Moreover, Thailand is predicted to be the first developing country in the world to enter a complete aged society due to the continuous decline in birth rates, with only about 600,000 births per year. If this trend persists, not only will the total population of Thailand begin to decrease, but Thailand will also transition into a hyper-aged society, where the population aged over 65 years reaches 20% or more than 30% of the population aged over 60 years by 2041, moving faster than Japan. Thailand entered a full-aged society in 2022 with the elderly population being 20-30%, and importantly, Thailand will become a super-aged society similar to Japan, with 28% of its population aged 60 and above by 2031. (Post Today, 2021).

The wave of technology has significantly changed daily life behaviors, including banking. Currently, there are new forms of banks, such as mobile banking applications, which offer various financial transaction services from commercial banks or through electronic devices like mobile phones, PCs, or tablets. Hence, this form of service has continuously grown in popularity. In 2022, the number of customers using mobile banking services reached 96.70 million accounts, compared to 2021, which saw a growth of 12.41 million accounts or 14.72%. The volume of transactions in 2022 amounted to 22,840,921 thousand transactions, an increase from 2021 by 6,799,543 thousand transactions. (Bank of Thailand, 2023).

At present, the Government Savings Bank continues to operate under the Government Savings Bank Act (No. 4) B.E. 2017 in accordance with the stated mission framework and state enterprise strategic plan. Financial institution branches assigned a role It is a financial institution for development. and create opportunities for people to access financial resources thoroughly along with giving financial knowledge Including supporting the strengthening of the grassroots economy Develop the country's competitiveness and reduce inequality in society. As of September 2022, the Bank has a branch network covering all areas, totaling 1,052 locations, with service units (on districts, cars, and mobile boats) totaling 156 locations, automatic machines. Self service (Self-Service) totaling 7,681 devices to spread access to financial services. To all customer groups of the bank Number of Mobile Banking users: 12.85 million people. (Government Savings Bank, 2023).

However, some customers still feel uncertain about conducting transactions, which can arise from various reasons, such as the inconvenience of making transactions, concerns over the security of the system and personal data, and the environment or mindset that fosters such behaviors. Understanding and learning can help communicate directly with the targeted demographic as per generation, like the Baby Boomers, who are mostly entering old age. They have lived a life dedicated to work, and their acceptance and use of technology are relatively low. They tend to be conservative and lack experience in using it (Nimngen, 2020).

Given the significance and issues mentioned, it's evident that Thailand is transitioning into an aged society. However, financial technology has also evolved and developed, including banking. Nowadays, there are new forms of banking, such as electronic banks and mobile applications, requiring everyone to adapt. With Thailand moving towards an aged society, the elderly must adjust as well. The researcher is interested in studying the factors influencing the intention to use mobile banking services at the Government Savings Bank among elderly customers in Ubon Ratchathani Province. This study will examine the relationship between technology acceptance factors, including perceived benefits, perceived ease of use through attitudes, and reference group conformity, and their influence on the intention to use the service. The aim is to gather information affecting the intention to use the service to plan, improve quality, and develop applications suitable for the elderly, enabling them to use technology that will change in the future to meet their service needs as much as possible.

Objective

1. To study the factors related to perceived benefits, perceived ease of use, reference group conformity, and attitudes that influence the intention to use Government Savings Bank's mobile banking services among elderly customers in Ubon Ratchathani Province.

2. To examine the influence of perceived benefits and perceived ease of use on the intention to use mobile banking services at the Government Savings Bank among elderly customers in Ubon Ratchathani Province through attitudes.

3. To explore the impact of perceived benefits and perceived ease of use on attitudes.

Literature Review

The theory related to technology acceptance can be explained by the Technology Acceptance Model (TAM), which consists of two parts: 1) Perceived Ease of Use (PEOU) and 2) Perceived Usefulness (PU). The Technology Acceptance Model (TAM), referencing the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), was proposed by Davis et al. (1989) to study various factors related and affecting the decision-making behavior in adopting new technologies. The main factors directly influencing technology acceptance include: 1) Perceived Ease of Use (PEOU), interpreted as the belief that using the technology will be easy, convenient, and effort-minimal; 2) Perceived Usefulness (PU), interpreted as the belief that using the technology or information system will enhance job performance.

The theory about mediating variables states that a mediator variable is one that mediates the causal relationship between an independent variable and a dependent variable. It can be seen as a third variable that changes the relationship between the independent and dependent variables by explaining the relationship between them. According to Baron and Kenny (1986), a mediating variable (mediator) is defined as a variable that transmits influence from the independent variable to the dependent variable. The transmission of influence by a variable can be of two types: 1) Complete Mediation (Full Mediation) and 2) Partial Mediation.

The theory on intention to use is based on the Theory of Reasoned Action (TRA) or TRA model, focusing on attitudes, reference group compliance, intention, and behavior. The expectancy-value model provides a framework for understanding the relationship between an individual's attitudes and their underlying beliefs. The expected outcome is the belief that it will or will not lead to specific behavior. Ajzen and Fishbein (1980) stated that when no one believes that an action can lead to a specific outcome, there will be less motivation to exhibit the behavior. Due to the specific characteristics of the model, it proposes a way to predict behavioral intentions influenced by two factors: attitudes and reference group compliance. The Theory of Planned Behavior (TPB) extends from the Theory of Reasoned Action by Ajzen and Fishbein (1980), addressing the limitations regarding behaviors not under complete volitional control. Ajzen and Fishbien (1991) developed TPB to include Perceived Behavioral Control, discussing the perceived ease or difficulty of performing the behavior. TPB allows using perceived behavioral control to predict intentions.

From the literature review, the researcher can hypothesize as follows:
H1: Perceived Usefulness influences the intention to use.
H2: Perceived Ease of Use influences the intention to use.
H3: Reference Group Conformity influences the intention to use.
H4: Attitudes influence the intention to use.
H5: Perceived Usefulness influences attitudes.
H6: Perceived Ease of Use influences attitudes.
H7: Perceived Usefulness influences the intention to use through attitudes.
H8: Perceived Ease of Use influences the intention to use through attitudes.

Research Methodology

The population for this study consists of elderly individuals (aged 60 years and above) living in Ubon Ratchathani Province. According to 2023 statistics, the total elderly population in Ubon Ratchathani Province is 314,828, with 145,093 males and 169,735 females, distributed across all 25 districts. (The Bureau of Registration Administration (BORA), (2023).

The sample group consists of elderly customers who have previously used the mobile banking services of the Government Savings Bank in Ubon Ratchathani Province. The exact number of this group is not known. Therefore, the researcher uses hypothesis testing and analysis of research results, where the sample size for analysis can be calculated based on the ratio of sample units to the number of parameters, or variables, according to the formula by Hair et al. (2010). For multivariate statistical analysis, the sample size should be at least 10 times the number of indicators. With a questionnaire of 50 items, the minimum sample size should therefore be around 500 samples.

Sample selection from the population, knowing the total population number that has an equal chance of being sampled, was conducted using the Proportional Stratified Random Sampling method.

The tool used in this study to collect data from those who have previously used technology for various activities is a questionnaire developed by the researcher. This primary data collection instrument is divided into six sections, including personal information, perceived benefits, perceived ease of use, attitudes, reference group conformity, and intention to use.

The process of developing the research instrument involved studying concepts, theories, documents, and related research to form a basis for selecting variables covering the objectives to guide the creation of the questionnaire. The information gathered was used to develop a questionnaire aligned with the research conceptual framework and to define its scope. The questionnaire structure was adjusted to match the research concept, and the draft questionnaire was presented to the advisor for correctness verification and adjustments based on feedback. Then, the questionnaire was reviewed for accuracy and content validity by five experts, analyzed for item-objective congruence with the Index of Item Objective Congruence (IOC), yielding a congruence index of 1, indicating that the questions were aligned and could measure the intended objectives. A trial questionnaire (Try out) was distributed to a non-sample population in Amnat Charoen Province, with 50 sets to determine the instrument's reliability, analyzing the reliability of each question and the overall reliability score of 0.82.

Data collection involved creating a complete questionnaire with numbered sets from 1 to 500, conducted according to human research standards by soliciting cooperation from the customer group matching the sample criteria of the research framework to complete the questionnaire, with a total of 500 sets collected. Data was also gathered from academic documents and other materials, and the questionnaires were checked for accuracy and completeness for further analysis.

The researcher analyzed the data from the collected questionnaires for accuracy and completeness, coding the data, and recording it into a computer for processing with statistical software IBM SPSS Statistics 26 and jamovi-2.3.28.0-win64. The analysis included descriptive statistics, mean and standard deviation analyses, factor grouping analysis of the measures, correlation coefficient analysis for checking the discriminant validity between variables, direct effect, indirect effect, and total effect using GLM Mediation Analysis. Finally, the research hypotheses testing results were summarized.

Research Findings

The analysis of general information of the questionnaire respondents, including gender, age, marital status, level of education, monthly income, district of residence in Ubon Ratchathani Province, and duration of using Government Savings Bank mobile banking, involved 500 individuals. The data were analyzed using frequency and percentage statistics. It was found that the majority of respondents were female, totaling 257 individuals or 51.40%. The age group between 62-65 years old had 298 individuals, accounting for 59.60%. Those who were married registered 270 individuals or 54.00%. The majority held a bachelor's degree, with 201 individuals or 40.20%. The monthly income range of 10,000-20,000 THB had 139 individuals, representing 27.80%. Residents in Mueang Ubon Ratchathani District totaled 68 individuals or 13.55%. Additionally, 224 individuals or 44.80% had been using the Government Savings Bank mobile banking for more than 1 year.

Table 1: Factor Analysis Results

Latent Variable	Observed Variable	Factor Loading	Eigenvalue/ Cumulative	KMO/ (P-Value)
Perceived usefulness: PU	PU1-PU10	0.70-0.93	2.65/26.60	0.81/(0.00)
Perceived ease of use: PEOU	PEOU1-PEOU10	0.78-0.91	3.93/39.32	0.85/(0.00)
Subjective Norm: SN	SN1-SN10	0.77-0.85	4.29/42.96	0.85/(0.00)
Attitude: ATT	ATT1-ATT10	0.74-0.87	4.55/45.52	0.89/(0.00)
Intention to use: ITT	ITT1-ITT10	0.77-0.98	1.99/19.90	0.74/(0.00)

From Table 1, the factor analysis of indicators in the questionnaire, tested with a total of 500 sets, was conducted using the Varimax rotation method and an Eigenvalue criterion greater than 1.00. It was found that all indicators could be grouped into a single cluster, with each indicator of every measure weighing within one component as follows:

1.The Perceived Usefulness (PU) group had Factor Loadings ranging from 0.70 to 0.93, an Eigenvalue of 2.65, and a KMO value of 0.81.

2. Perceived Ease of Use (PEOU) had Factor Loadings ranging from 0.78 to 0.91, an Eigenvalue of 3.93, and a KMO value of 0.85.

3. Social Norms (SN) had Factor Loadings ranging from 0.77 to 0.84, an Eigenvalue of 4.29, and a KMO value of 0.85.

4. Attitude (ATT) had Factor Loadings ranging from 0.74 to 0.78, an Eigenvalue of 4.55, and a KMO value of 0.89.

5. Intention to Use (ITT) had Factor Loadings ranging from 0.73 to 0.98, an Eigenvalue of 1.99, and a KMO value of 0.74.

Table 2: Discriminant Validity

Variables	PU	PEOU	SN	ATT	ITT
PU	-				
PEOU	0.38**	-			
SN	0.40**	0.53**	-		
ATT	0.41**	0.50**	0.41**	-	
ITT	0.20**	0.19**	0.17**	0.24**	-

**Level of Significance 0.01

From Table 2, it was found that all independent variables, namely Perceived Usefulness, Perceived Ease of Use, and Reference Group, which influence the intention to use mobile banking through attitudes, have statistically significant correlations at the 0.01 level. Upon examining the relationships between variables, it was discovered that the correlation coefficients (r) ranged from 0.17 to 0.53 (when r≤0.80), indicating no Multicollinearity issues. All observed variables are on a common component. Therefore, the data obtained are suitable for further multiple regression analysis.

Table 3: Results of the Analysis for Direct Effect, Indirect Effect, and Total Effect

Type Effect	Path	Estimate	SE	β	z	p
Direct	PU⇒ ITT	0.11	0.04	0.13	2.73**	0.00
	PEOU⇒ ITT	0.06	0.04	0.07	1.42	0.15
	SN ⇒ ITT	0.12	0.04	0.13	2.98**	0.00
	ATT ⇒ ITT	0.17	0.04	0.22	4.32**	0.00
Component	PU ⇒ ATT	0.25	0.04	0.22	5.55**	0.00
	PEOU⇒ATT	0.34	0.04	0.34	7.82**	0.00
Indirect	PU ⇒ ATT ⇒ ITT	0.04	0.01	0.05	3.41**	0.00
	PEOU ⇒ ATT ⇒ ITT	0.06	0.01	0.07	3.78**	0.00
Total	PU ⇒ ITT	0.07	0.04	0.17	1.71**	0.00
	PEOU ⇒ ITT	0.12	0.04	0.14	2.96**	0.00
F= 80.10 Sig. = 0.00 R = 0.57 $R^{2 =}$ 0.32 R^2_{adj} = 0.32						

**Level of Significance 0.01

From Table 3, it was found that direct influences show that Perceived Usefulness, Reference Group, and Attitude have a statistically significant direct impact on the intention to use the service at the 0.01 level. Perceived Ease of Use does not have a direct influence on the intention to use. Thus, the equation can be formulated for Perceived Usefulness, Perceived Ease of Use, Attitude, and Reference Group that influence the intention to use Government Savings Bank's mobile banking services among elderly customers in Ubon Ratchathani Province. For indirect influences, it was found that Perceived Usefulness and Perceived Ease of Use have a statistically significant indirect influence on the intention to use through Attitude at the 0.01 level. Therefore, the equation can be formulated for Perceived Usefulness, Perceived Ease of Use, and Reference Group influencing the intention to use the service through Attitude, which impacts the intention to use Government Savings Bank's mobile banking services among elderly customers in Ubon Ratchathani Province.

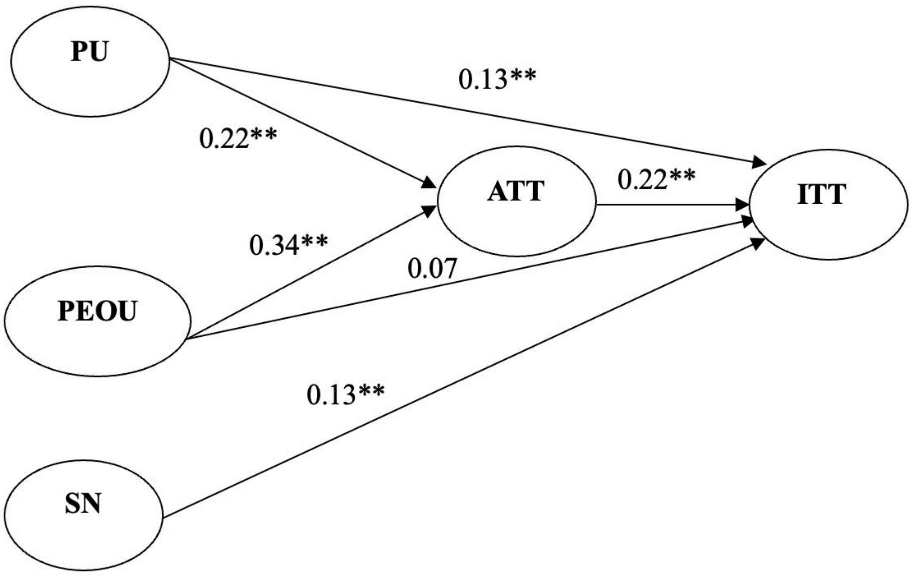

Figure 2: The Path Relationship of Perceived Usefulness, Perceived Ease of Use, Attitude, and Reference Group Influencing the Intention to Use

Discussions

The analysis of Perceived Usefulness found that, overall, it had a high average level, indicating that users perceive that using Government Savings Bank's mobile banking facilitates faster access to information and news, with accuracy and completeness, enhancing the efficiency of accessing financial information-related services and improving the performance of financial transactions. It makes financial transactions easier, and also helps save on transaction costs, such as being able to conduct transactions anytime, anywhere, with information updated 24 hours a day. This results in the intention to use the mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province, which has a direct influence on the intention to use these services. This is consistent with the research by Yamkleepbua (2022), which studied the influence of technology acceptance on consumers' intentions to purchase products through the E-commerce platform Lazada and found that perceived benefits of online shopping influence the intention to buy products online through E-commerce. Similarly, the research by Amornrattanakij (2017) on factors affecting the intention to use QR Code Payment through Mobile Banking in Bangkok and its vicinity found that perceived benefits influence the intention to use QR code payment through Mobile banking indirectly, leading to the intention to use mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province. This is in line with the research by Bothma and Mostert (2023), which applied the Technology Acceptance Model from the perspective of Namibia, finding that high perceived benefits of online banking systems result in a positive attitude towards online banking, leading to the intention and actual use of the service. Perceived usefulness is a key factor influencing the intention to use mobile banking services.

The analysis on Perceived Ease of Use found that, overall, it had a high average level, indicating that users perceive using Government Savings Bank's mobile banking as modern and up-to-date, providing significant convenience in conducting financial transactions. The promotion of the application plays an essential role in the decision to use the service, capable of creating confidence and satisfaction among users, such as receiving SMS notifications for every transaction. This leads to the intention to use the mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province, which has no direct influence on the intention to use these services. However, the perception of ease of use has a statistically significant indirect influence on the intention to use the mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province through attitudes at the statistical significance level of 0.01. This is consistent with the research by Tanurak (2017), which studied the influence of attitude on usage and related factors towards the technology usage intention behavior of industrial employees. It was found that the latent variable of perceived ease of use has an indirect positive influence on attitude towards usage and an indirect positive influence on positive intention behavior towards attitude and technology usage intention behavior of Thai wholesale and retail industry employees. This aligns with the research by Bothma and Mostert (2023), which studied the application of the Technology Acceptance Model: A perspective from Namibia, finding that high perceived ease of use of online banking systems results in a positive attitude towards the online banking system, leading to the intention to use the system and ease of use of the system as key factors influencing the intention to use mobile banking services.

The analysis on Reference Group found that, overall, it had a high average level, indicating that service users would recommend the use of Government Savings Bank's mobile banking to people they know. Influential people or those of interest have an impact on the decision or interest to use the mobile banking services. Additionally, bank staff recommendations contribute to the intention to use the mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province, which has a direct influence on the intention to use these services. This aligns with the research by Boonyathawornchai (2020), which studied attitudes and service impacts on the consumer behavior of dietary supplement products among the elderly in Bangkok and its vicinity, finding that influencers on the intention to consume dietary supplements among the elderly are family, friends, and acquaintances. It also found it easy for the elderly to access and consume dietary supplements, with convenient communication steps, sales staff able to explain product details attentively, and coordination between sales and delivery staff. This is consistent with the research by De Leon (2019), which examined factors influencing the intention to use mobile banking services among retail customers, finding that the social influence of reference groups significantly positively impacts the behavioral intention to use mobile banking. This also aligns with the study by Tian, Nguyen, and Tang (2023) on the influence of subjective norms on teachers' intention to use social media for work, finding that reference groups affect teachers' intentions to use apps for work. This study highlights various issues in Vietnam related to social media use at the institutional level, presenting irreversible solutions in the new educational context of modern society.

The analysis on Attitude found that, overall, it had a high average level, indicating that service users perceive that using the Government Savings Bank's mobile banking helps in receiving information and news more quickly, with accuracy and completeness, enhancing the efficiency of accessing services related to financial information, and improving the performance of financial transactions, making financial transactions easier. Additionally, it helps save on the costs associated with financial transactions, such as being able to conduct transactions anywhere, anytime, with information updated 24 hours a day. This leads to the intention to use the mobile banking services of the Government Savings Bank among elderly customers in Ubon Ratchathani Province, which has a direct influence on the intention to use these services. This is consistent with the research by Panichkul (2020), which studied the acceptance of technology and the intention to use mobile banking applications by the elderly in Bangkok. It was found that the acceptance of mobile banking technology, particularly attitude, influences the intention to use mobile banking applications among the elderly in Bangkok. This aligns with the research by Weng et al. (2018), which studied the Technology Acceptance Model (TAM) regarding attitudes towards usage and the intention to use mixed media by teachers in schools. It was discovered that attitudes towards usage still have an influence on the intention to use.

Conclusion

From the study on direct influence, it was found that Perceived Usefulness (PU), Reference Group (SN), and Attitude (ATT) significantly influence the intention to use at the statistical significance level of 0.01 (accepting hypotheses H1, H3, H4). In contrast, Perceived Ease of Use (PEOU) does not influence the intention to use (rejecting hypothesis H2). In terms of indirect influence, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) significantly influence the intention to use the Government Savings Bank's mobile banking services among elderly customers in Ubon Ratchathani Province through Attitude (ATT) at the statistical significance level of 0.01 (accepting hypotheses H7, H8). The study also found that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) significantly influence Attitude (ATT) at the statistical significance level of 0.01 (accepting hypotheses H5, H6).

The factors can be categorized as follows:

Regarding attitude, attitude factors are direct variables and also Mediator variables that influence the service users' intention to use. The attitude issues that will make service users intend to use include the application being interesting, worth trying, reliable, and secure in protecting personal data. Service providers should prioritize these issues, as attitude variables significantly affect the intention to use in all aspects. Therefore, we should focus on the attitudes of service users to encourage continued use and increase future usage.

Regarding perceived benefits, it is important to emphasize issues related to the rapid receipt of information and news, accuracy, and completeness, which help enhance the efficiency of accessing services related to financial information and improve the performance of financial transactions. Prioritizing these issues can lead to increased service usage and retention of the existing customer base. Therefore, banks should focus on these issues to develop their mobile banking services further. Additionally, perceived benefits also have an indirect effect on the intention to use through attitudes. Hence, service providers should pay attention to the attitudes of users, which affect the intention to use, to ensure users continue to intend to use the services in the future.

Regarding perceived ease of use, it has no direct influence on the intention to use, but it does have an indirect influence on the intention to use through attitudes. This indicates that perceived ease of use does not directly impact the users' intention to use the service. However, when mediated by attitudes, it leads to an intention to use the service. Therefore, service providers should not overlook the factor of attitude as a Mediator variables that influences users' intention to use. The attitude issues that will make service users intend to use the service include the application being interesting, worth trying, reliable, and secure in protecting personal data. Service providers should prioritize these issues to increase the use of Government Savings Bank's banking services.

Regarding the reference group, it is important to focus on key factors such as celebrities or individuals of interest who influence thoughts or the interest in using the service. Banks should engage in promotions using well-known personalities who are trending at the time to influence more users to utilize the services and for users to recommend the Government Savings Bank's mobile banking services to people they know. This shows that banks should prioritize these main influencing factors, as they have a significant impact on service usage.

Suggestions

From the study on perceived benefits, perceived ease of use, attitude, and reference group influencing the intention to use Government Savings Bank's mobile banking services by elderly customers in Ubon Ratchathani Province, the variables that have a direct influence on the intention to use are perceived benefits and reference group. Meanwhile, the variables that have an indirect influence on the intention to use through attitude are perceived benefits and perceived ease of use.

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The Relationship Between Passengers' Expectations of Automatic Check-in System and Service Quality at Suvarnabhumi Airport

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Abstract

This research examined the relationship between passengers' expectations using an automatic check-in system and service quality at Suvarnabhumi Airport. It focused on passengers' expectations of automatic check-in systems, which included websites, mobile applications, kiosks, and service quality. Quantitative data was collected from 404 samples focusing on Thai passengers experienced with automatic check-in and traveling from Suvarnabhumi Airport. The questionnaire was divided into three parts: general information, passengers' expectations of automatic check-in, and service quality. Statistics were used to analyze data to find the frequency, percentage, mean, standard deviation, and correlation. The result of the study showed that passengers' expectations about automatic check-in systems were at a high level while the service quality of automatic check-in systems was at the intermediate level.

Keywords: Expectations of Automatic Check-In System, Service Quality

Introduction

After COVID-19, the world has changed in a good direction regarding innovation. The world started to transform digitally, and people adopted new technologies and resources to create new opportunities in our real-life situations (Techsauce Team, 2020). claimed that the tourism industry has recovered from COVID-19, and the needs of passengers are the main driver of the growth in Thailand. Since the tourism industry is growing, air travel is always the best option. Besides, the airport facilities will be the priority. The airline business has also developed platforms to simulate the needs of passengers, for example, the view of a cabin and seat map to help passengers see a clear picture before booking tickets. In addition, the airline business has started to use "Digital Twin Technology" to simulate structures from real objects. The airline also uses sensors to help detect changes in real-time in terms of aiding the design and manufacture of the aircraft, which includes detecting and fixing various engineering systems within the airport. This technology will increase safety and reduce the risk of system failures, which affects traveling time. During the pandemic, passengers were familiar with touchless or contactless systems that helped them go through every step quickly. Bringing intelligent systems solutions is to create more efficient self-service capabilities from the check-in service to the immigration process.

Figure 1: Passenger Flow Solutions
Source: https://www.salika.co/2023/04/24/5-hi-tech-airport-trend-for-thaland/

To make systems and processes digitally, Airports of Thailand will use the Passenger Validation System or PVS at Suvarnabhumi Airport. They are located at the entrance of departure areas, both domestic and international, to check passengers' traveling information and increase passengers' screening efficiency to meet international safety standards. This solution enables a quick and independent experience using a boarding or e-boarding pass. It will screen and check passengers' travel information to prevent unauthorized persons from entering restricted areas (Manageronline, 2020).

The researchers conducted this research based on previous research, "The Relationship between Automatic Check-in Systems and Passenger's Expectations and Service Quality at Suvarnabhumi Airport." The research question: "Is there a relationship between passenger expectations regarding the service quality of the automatic check-in system at Suvarnabhumi Airport?"

Objective

1. To survey passengers' factors who used the automatic check-in system at Suvarnabhumi Airport.
2. To survey passengers' expectations of the automatic check-in system in terms of convenient processing, efficient processing, and customer experience.
3. To survey the automatic self-check-in services in terms of airline websites, mobile phones, and automatic self-check/kiosks.
4. To survey the service quality of the automatic self-check-in system.
5. To study the relationship between the self-check-in system, and passengers' expectations toward the service quality at Suvarnabhumi Airport.

Hypotheses

Hypotheses 1: There is a relationship between passengers' expectation and automatic check-in service quality

Hypotheses 2: There is a relationship between passengers' expectation and automatic check-in system

Scope of the study

1. Population

Thai passengers who used the automatic self-check-in systems; airline websites, mobile phones, and the airline's automatic self-check-in kiosks.

2. Area

Questionnaires were collected at Suvarnabhumi Airport.

3. Content

-Independent variables consisted of personal factors and self-check-in systems..

-Dependent variables consisted of service quality (SERQUAL) and passengers' expectations of self-check-in systems.

4. Timing

Data collection was from November 2022 – February 2023.

Expected Benefits of Research

1. The results could be used as guidelines to improve and develop the automatic check-in system's competencies at Suvarnabhumi Airport to meet passengers' satisfaction.

2. The research could benefit students, teachers, and researchers to further their studies.

Conceptual Framework

Independent Variables

Personal factors
- Gender
- Age
- Occupation
- Income
- Frequency of traveling

Passengers' expectations
- Convenient processing
- Efficient processing
- Customers' experience

Vroom, V.H (1970),

Dependent Variables

Self-check-in systems
- Airline websites
- Automatic check-in kiosk (KIOSK)
- Mobile phones

Meuter, O., Roundtree. B (2000)

Service quality of self-check-in
- Tangibility
- Reliability
- Responsiveness
- Assurance
- Empathy

Parasuraman, A., Zeithaml, V. A., & Berry, L.L. (1988)

Figure 2: Conceptual Framework

Literature Review

Concepts and theories in automatic self-service systems

Self-service technology (SST) is the technology that allows customers to interact with products independent of direct service. Customers also interact with technology to create service outcomes instead of interacting with service employees (Bitner, M.J, Meuter, M.L, Ostrom, A.L, Roundtree, R.I 2000). It shows that customers will be a part of the service. Using service technology will benefit both the service recipient and the service provider. Also, the service recipients will receive the best service quality. More importantly, they will receive lower service costs. On the other hand, service providers will benefit from management efficiency, for example, lower administrative costs and labor problems.

According to self-service technology, customers primarily interact in three ways: telephone, websites, and automatic check-in systems. These are the three main technologies self-services used by airlines.

Supimaros, T. (2020) studied readiness of Thai passengers to use automatic check-in system of low cost airlines and found that the relationship between efficiency expectation factors and social influence factors was positive with the readiness of Thai passengers to use the automatic check-in system at a statistical significance level of 0.01.

Concepts, theories, and research related to expectations

Parasuraman, A., Zeithaml, V. A., & Berry, L.L. (1988) stated that expectations are the attitude of desire or consumers' needs, which reflect service quality to meet specific needs and will evaluate whether received from expectations and needs. Expectations are influenced by people's lifestyles. This will motivate them to meet their needs. Besides, Vroom, V. (1964) said that people have different goals and can be motivated if they have specific expectations. So, motivation is affected by people's expectation that a specific level of effort will lead to the performance goal. Moreover, motivation is also affected by people's chances of getting various outcomes to accomplish their goals. It means people are motivated to value the outcomes and will try hard to reach their goals.

Venkatesh, V., Morris, M.G., Davis, G.B., and Davis, F.D. (2003) stated that there are four factors directly related to Behavioral Intention or BI, and Use Behavior or UB: Performance

Expectancy or PE, Effort Expectancy or EE, Social Influence or SI, and Facilitating Conditions or FC.

Performance Expectation or PE means the degree of a person's expectation who believes the system will have high proficiency for users. They consist of six items of Performance Expectation or PE as below:

1. The automatic self-check-in system will save time.
2. The automatic self-check-in system must be accurate.
3. The automatic self-check-in system makes check-in more convenient than check-in at the airline counter.
4. The automatic self-check-in system can change or select seats.
5. The automatic self-check-in system can choose or switch to various languages.
6. The automatic self-check-in system can support group check-in.

Effort Expectancy, or EE, means the degree of individual expectation which the system should be easy and not be complicated. They consist of six items of Effort Expectancy or EE as below:

1. Making transactions through an automatic self-check-in system should be easy.
2. Making transactions through an automatic self-check-in system should not be complicated.
3. Learning to use an automatic self-check-in system should be easy and not difficult to understand.
4. The automatic self-check-in system is easy to use.

Martngern, T. (2020) studied the passengers' expectation towards service innovation of full service airlines and found that passengers' expectation of air travelling tended to adopt the touchless technology. The airlines tended to develop airlines service innovation to serve the next normal service provision to increase competitiveness for the airlines as well as ensure the travelling confidence for the passengers.

Concepts, theories, and research related to service quality

Parasuraman, A., Zeithaml, V.A., and Berry, L.L. (1988) defined service quality as the difference between customers' expectations and perception of actual service. They created an instrument called SERVQUAL for assessing customer perceptions of service quality into five categories:Tangibility, Reliability, Responsiveness, Assurance, and Empathy.

Oliver, R.L. (1993) studied A Conceptual Model of Service Quality and Service Satisfaction: Compatible Goals, Different Concepts. Advances in Services Marketing and Management found that the satisfaction of the university's students who studied at private universities was high, including the qualified and knowledgeable faculty resources.

Cronin, J.J., Jr., Taylor, S. (1992) A studied Measuring Service Quality: A Reexamination and Extension and found that service quality affected satisfaction and attitude. From those two researchers, the experiences and expectations of service receivers could be measured.

Srikhaors, U., Tongsuddhi, V. (2021) studied Service Quality Expectations of the 5-Star Hotel Front Office Department, Case Study: The Intercontinental Hotel Bangkok and found that expectations of service quality of front desk at the Continental Hotel Bangkok were high in terms of concept aspect of service, the needs of service recipients, reliability of the service, and the concrete aspect of service.

Research Methodology

The research was quantitative. The questionnaires were used as the instrument with Thai passengers at Suvarnabhumi Airport who are experienced with airline website check-in, mobile application check-in, and self-check-in KIOSK. The researcher used a calculation method using the Cochran formula (Cochran, 1953) to find the sample size of 384 people with an additional 20 sets of questionnaires (total sample 404 people) using the Non-Probability Sampling method and performed specific Random sampling or Purposive Sampling. The four hundred and four questionnaires were used to collect data.

Research Instrument

There were 3 parts of the questionnaire.

Part 1 consisted of personal factors and passenger travel behavior.

Part 2 consisted of the service quality of the automatic self-check-in system.

Part 3 consisted of expectation factors towards the service quality of the automatic self-check-in system.

The questionnaire was validated based on the Index of Item Objective Congruence or IOC by 3 experts. The validity was between 0.67-1.00. The questionnaire has been revised based on their advice. The questionnaire was used to find the reliability of 30 items and the scale's reliability was 0.957.

Data Analysis

Descriptive Statistics were used to describe the personal factors, and the automatic self-check-in system using Frequency Distribution, Percentage, Mean, and Standard Deviation. However, inferential statistics hypothesis testing using t-test statistics to find differences in gender variables that affect expectations of the quality of automatic self-check-in services. F-test (One-way ANOVA) statistics were used to find the expectations of the service quality of automatic self-check-in the system, and the Correlation Coefficient was used to measure the statistical relationship among the variables (Best, J. 1977).

Research Finding

Table 1: personal factors

Variables	Personal factors	Respondents	Percentage
1. Gender	Male	187	46.3
	Female	217	53.7
	Total	**404**	**100**
2. Age	Under 21 years old	35	8.7
	21-30 years old	213	52.7
	31-40 years old	106	26.2
	Older than 41 years old	50	12.4
	Total	404	100
3. Occupation	Students / College students	123	30.4
	Private company employees	108	26.7
	Business owners	117	29.0
	Other	56	13.9
	Total	**404**	**100**
4. Income	Below or 10,000 Baht	67	16.6
	10,000-15,000 Baht	139	34.4
	15,001-20,000 Baht	102	25.2
	More than 20,001 Baht	96	23.8
	Total	**404**	**100**
5. Frequency of traveling	Less than 1 time / 3 months	231	57.2
	1 time / 3 months	95	23.5
	More than 3 times / 3 months	78	19.3
	Total	**404**	**100**

The result found that mostly the respondents were females (mean =53.17%) and then males (mean =46.3%). The highest ages are between 21-30 years old and then 31-40 years old. The highest occupations were students, then the personal business, the income per month was 10,000-15,000 Baht. The highest travelling frequency was less than 1 time per 3 months.

Table 2: data analysis of passengers' expectations with service quality of the automatic self-c heck-in

Passengers' expectations	n	($\bar{x}$)	S.D.	Level
Convenient processing	404	4.05	0.74	High
Efficient processing	404	4.10	0.72	High
Customer experience	404	3.97	0.82	High
Total	**404**	**4.04**	**0.67**	**High**

The result found that overall service expectation towards automatic check-in system was at a high level (mean =4.044). When considering each factor, the efficiency in service provision is the highest, and then the convenience in use was at high level (mean = 4.050) and experience in use was at high level (mean =3.977).

Table 3: data analysis on the use of the automatic self-check-in system

The automatic self-check-in	n	($\bar{x}$)	S.D.	Level
1. Airline's websites	404	2.09	0.76	Moderate
2. Mobile Application	404	2.22	0.68	Moderate
3. Automatic self-check-in KIOSK	404	2.04	0.81	Moderate
Total	**404**	**2.11**	**0.50**	**Low**

The result found that overall using the automatic check-in system was at low level (mean =2.119). When considering each factor, the self-service automatic check-in box was at a low level (mean = 2.045).

Table 4: data analysis of service quality of the automatic self-check-in system

Service quality of automatic self-check-in system	n	MEAN ($\bar{x}$)	S.D.	Level
Tangibility	404	4.04	0.74	High
Reliability	404	3.94	0.76	High
Responsiveness	404	3.97	0.82	High
Assurance	404	4.03	0.75	High
Empathy	404	3.97	0.75	High
Total	**404**	**3.99**	**0.69**	**High**

The result found that overall service quality of the automatic check-in system was at a high level at 3.99. Considering each aspects, it found that Tangibility was high at 4.04 and the lowest was Reliability at 3.94

Table 5: The relationship between the self-check-in system, and passengers' expectations toward the service quality at Suvarnabhumi Airport.

The results of hypotheses of expectations on the service quality of the automatic self-check-in at Suvarnabhumi Airport were:

Hypothesis 1 Passengers' expectations related to the service quality of the automatic self-check-in system

Correlation		**Service quality of the automatic self-check-in**	**Passengers' expectations**
Passengers' expectations	Pearson Correlation Sig (2-tailed) N	1 404	.840** .000 404
Service quality of the automatic self-check-in	Pearson Correlation Sig (2-tailed) N	.840 .000 404	1 404

The result found that the relationship between service expectation towards automatic check-in system was less than a statistical significance level of 0.05 (Sig.=0.00). This means the acceptance of the proposed hypothesis. The correlation coefficient was at a high level at a statistical significance level of 0.05 (r =0.840).

Hypothesis 2 Passengers' expectations related to automatic self-check-in system

Correlation		**The automatic self-check-in system**	**Passengers' expectations**
Passengers' expectations	Pearson Correlation Sig (2-tailed) N	1 404	0.377 .000 404
The automatic self-check-in system	Pearson Correlation Sig (2-tailed) N	0.377 .000 404	1 404

The result found that the hypothesis statement of relationship between passengers' expectation towards check-in system was accepted at a statistical significance level of 0.05 (Sig.=0.00). The Coefficient Correlation at statistical significance level of 0.05 was at a medium level (r= 0.377).

Discussion

Objective 1 found that passengers who used the automatic check-in system at Suvarnabhumi Airport were female aged between 21-30 years old and were students. Talking about income, the average income was between 10,000-15,000 Baht and the frequency of traveling was 1 time / 3 months. According to the concept of Solomon (2007) stated that customers and desire needs would represent marketing strategies and would influence each market segments.

Objective 2 found that passengers' expectations of service quality in automatic check-in system was a high level at 4.044. Considering each aspect, it found that the efficiency in service quality was the highest. It was different and found that passengers' expectations in efficiency in service quality of automatice check-in and technology were in moderate.

Objective 3 found that the overall use of automatic check-in was low at 2.119. Regarding aspect, it showed that the least was check check-in through self service check-in kiosks at 2.045. Khammarapat, N. (2018) found that the bevavior of using the automatic check-in system in Effort Expectancy was high and the different ethnicities and ages affected the acceptance of factors which also affected the behavior in using the automatic check-in system differently.

Objective 4 showed that overall quality of service in the automatic check-in system was high ($\bar{x}$= 3.99). Regarding each aspect found that Tangibility was high ($\bar{x}$ = 4.04). Similiry with Srikhaors, U., & Tongsuddhi, V. (2020), it found expectations of service quality of front desk service at the Intercontinental Hotel, Bangkok was high. According the service quality from the highest and lowest would be the confidende aspect of service, the aspect of meeting the needs of the service recipient, the reliability of service and the concrete aspect of service.

Objective 5 found that the result of hypothesis statement 1: There is a relationship between passengers' expectations and check-in system service quality found that the hypothesis was accepted (Sig.0.05) at a statistical significance level of 0.05. The Correlation Coefficient was at a high level (r= 0.84). The previous study explained that service quality is the difference between perceived service and expected service which was measured by SERVQUAL. The results of this study can be similar to the study of Srikhaors, U., & Tongsuddhi, V. (2020), who conducted related research regarding the service quality of the hotel, which result was at a high level. The result of hypothesis statement 2: There is a relationship between passengers' expectations and the automatic check-in system found that the hypothesis was accepted (Sig. =0.05) at a statistical significance level of 0.05. The Correlation Coefficient was at a moderate level (r= 0.37). The result of the study was similar to the related study, in that learning how to use an automatic check-in system was simple, and could be done by oneself.

Conclusion

Regarding the personal details of the 404 passengers at Suvarnabhumi Airport, most of the respondents were female (217). The primary age of the respondents was between 21 and 30 years old (213). Also, 123 people were students or college students. A total of 139 people earned 10,000-15,000 Baht a month, and 231 people traveled less than 1 time / 3 months. Besides, passengers' expectations of the automatic self-check-in system at Suvarnabhumi Airport were high ($\bar{x}$ = 4.04), with the highest in service efficiency ($\bar{x}$ =4.10). Using the service of three automatic check-in systems at Suvarnabhumi Airport was at a moderate level. Overall, the automatic self-check-in systems were low ($\bar{x}$ =2.19).

Regarding the service quality, it was found that the service quality was high ($\bar{x}$= 3.99) and tangibility was the highest ($\bar{x}$ =4.04). The hypothesis statement proposed that the expectation towards service quality of the automatic check-in system was accepted (Sig. = 0.00) at a statistical significance level of 0.05. The Pearson's Correlation value was at a high level (r = 0.84). The hypothesis statement proposed that expectation towards the check-in system was accepted (Sig.=0.00) at a statistical level of 0.05. Pearson's Correlation value was at a moderate level (r = 0.37).

Suggestion

1. The efficiency of processing in the automatic self-check-in system was very low. There should be a system in which passengers would be able to change or select seats.
2. The reliability was low. The automatic self-check-in system should be developed to provide good service to passengers.
3. Several airlines should provide more automatic self-check in KIOSK and also inform passengers regarding the automatic self-check in KIOSK. This way, passengers would be aware of the system.

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Factors Affecting The Purchasing Intention and Willingness to Pay for Slow Fashion of Generation Z in Bangkok

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Abstract

This research aimed to study the influence of factors affecting purchasing intention behavior and consumer willingness to pay on slow fashion products. In which the factors of lifestyle will be studied Environmental attitude factor Factors of conformity according to reference groups. And product quality factors That is the default variable. this study used an online questionnaire as a tool to collect data from a sample group, Generation Z. The data were analyzed by descriptive statistics, percentage, mean, standard deviation. Pearson correlation coefficient and multiple linear regression analysis

The results of the study found that lifestyle factors, environmental attitudes, subjective factors and product quality factors positively influenced the purchase intent and willingness to pay for the slow fashion of the Generation Z in Bangkok; The factors that most positively influenced purchase intent and willingness to pay for slow fashion products were lifestyle factors. And being willing to pay 61.4 percent

Keywords: Slow Fashion, Environmental Attitude, Product Quality, Purchase Intention, Willingness to Pay

Introduction

The environmental crisis, culminating in global warming, stems from human consumption behaviors, particularly the impact of the fashion industry, which has significantly contributed to environmental degradation, ranking among the top causes. The production processes within this industry have led to pollution, and with the continuous growth of the fashion sector, the severity of global warming continues to escalate without end (Suthamas Thawan, Tanachot Thongrak, and Kulika Kaewnaluang, 2020).

Currently, the behavior of new-generation consumers shows an increased concern for the environment, prompting the fashion industry to pay attention to natural aspects and the trend towards sustainable development. This shift has led to the concept of slow fashion, recognized as a means to address environmental issues caused by the industry's detrimental effects on the planet. Slow fashion stands for sustainability, using eco-friendly fibers and production processes that consider future environmental impacts. It emphasizes the production of high-quality products with a long lifespan and also considers fair labor practices and wages.

In Thailand, the movement towards eco-friendly fashion has gradually gained momentum among business organizations, though it has not yet fully awakened (Vogue Thailand, 2020). To encourage Thai consumers to adopt slow fashion, it is necessary to explore the factors that influence their purchasing intentions and willingness to pay.

In the research study "The Relationship between Awareness, Attitudes, and the Decision-Making Process of Buying Eco-Friendly Fashion Products among Consumers in Bangkok," it was found that females aged 31-40 years old made the most purchases (Acharapan Narong, Dr. Sirirat Kosakarika, and Assoc. Prof. Yupawan Vorawanich, 2020). The researchers therefore noted that previous studies still have a gap in exploring the consumer group of Generation Z, which possesses purchasing power and could become a driving force for slow fashion apparel in the future.

Given all the reasons mentioned, the research team became interested in studying "The Factors Influencing the Purchase Intention and Willingness to Pay for Slow Fashion Products among Generation Z Consumers." This study examines four factors: lifestyle, environmental attitudes, conformity to reference groups, and product quality, to find ways to encourage Thai consumers to shift towards slow fashion products, driven by Generation Z consumers. This has benefits for business organizations in leveraging and using this insight for the development of more appealing slow fashion products, and it can also serve as a guideline for developing other eco-friendly products.

Objective

1. To study the positive influence of lifestyle factors on the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.
2. To investigate the positive influence of environmental attitude factors on the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.
3. To examine the positive influence of conformity to reference group factors on the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.
4. To explore the positive influence of product quality factors on the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.

Terminology Definition

Slow fashion: refers to products that do not follow social trends, have good quality with a long lifespan, and are produced through processes that do not harm the environment.

Lifestyle: refers to the activities, interests, or thoughts of an individual that reflect their values or tastes towards fashion purchasing behavior.

Environmental attitude: refers to the thoughts and feelings of consumers on issues related to the environment, which are often considered to lead to purchasing intentions for environmental conservation.

Subjective norm: refers to an individual's tendency to conform to those who have influence over them, such as family, friends, acquaintances, and society, in their behaviors or in making decisions to purchase fashion products.

Product quality: refers to products that are of such a standard that they meet consumer needs, create satisfaction, and make consumers willing to pay the price to acquire that satisfaction.

Purchase intention: refers to the likelihood or tendency of consumers to buy a product or service.

Willingness to pay: refers to the consumer's happiness or readiness to pay for goods or services at various price levels voluntarily.

Concepts, Theories, and Related Research

Lifestyle

Lifestyle refers to the pattern of living as depicted by consumers through their activities, interests, and opinions, or as “patterns of spending money and time” (Engel, Blackwell, & Miniard, 1993, pp. 368-369). The consumption of various products can indicate different lifestyles, with individuals choosing products that maintain their lifestyle, including behaviors related to purchase intention and willingness to pay for environmentally friendly products that reflect a consumer's lifestyle (Laroche, Bergeron, & Barbaro-Forleo, 2002). Moreover, research studies on lifestyle, which is one of the factors affecting the intention to buy eco-friendly products, highlight that individual living conditions differ, and these differences in lifestyles act as motivations leading to specific actions (Hatice Aydın & Sevtap Ünal, 2015).

Environmental attitude

Environmental attitude involves an individual's assessment of liking or disliking products, which originates from knowledge, understanding, and feelings, leading to a tendency towards intentional behavior or future actions (Gibson, 2000). Environmental attitude reflects a person's thoughts and feelings about the environment, an understanding of environmental issues positively, and a propensity to exhibit behaviors of purchase intention and willingness to pay for products that address environmental problems. Kanchanapibul, Lacka, Wang, & Chan (2014) investigated green product purchasing behavior and found that the intention to buy green products results from knowledge and emotional responses to environmental issues, leading to actual buying behavior. Consumers with more knowledge about green issues are more likely to participate in purchasing green products.

Subjective norm

Subjective norm is a behavior influenced by societal models or significant and related groups, such as family, friends, close individuals, and influential societal figures. This influence molds behaviors and opinions, leading consumers to follow the actions of their reference groups. Behaviors influenced by others significantly impact purchase intentions (Levine & Moreland, 2004). If individuals who are environmentally conscious or interested in slow fashion influence a consumer, it can make the consumer more interested in these products. According to research by Anvar & Venter (2014) on factors affecting consumer attitudes towards purchasing environmentally friendly products, social influence, environmental awareness, and price impact attitudes and buying behaviors for these products. The influence from peers prompts consumers to follow the behaviors of their influential reference groups.

Product quality

Product quality refers to the attributes of a product that meet the needs of consumers. The quality of a product is determined by the consumer's past experiences, which set the standard for the expected quality of a product. The quality of environmentally friendly or slow fashion products is crucial in generating purchase intention and willingness to pay, depending on how well the product's functionality meets the consumer's needs (Kotler & Keller, 2016).

Purchase intention

Purchase intention is the feeling of a consumer that arises from experiences with a product (Spears & Singh, 2004), reflecting the behavior of choosing a particular product as a primary option. Eagly & Chaiken (1993) found that purchase intention is an emotion indicating a desire for a product, triggered by internal and external motivations, affecting actual future purchases. The intention of consumers to buy slow fashion products depends on various factors that influence the consumer to ultimately exhibit purchasing behavior.

Willingness to pay

Willingness to pay is the consumer's happiness to pay for goods or services at various price levels. The extent to which consumers are willing to pay for slow fashion products depends on their recognition of the value that will provide utility or satisfaction from consuming slow fashion products. Several factors influence consumers' willingness to pay for slow fashion products, as evidenced by Muhammada et al. (2015), who found that consumers are willing to pay based on their confidence in the product's quality.

Research Conceptual Framework

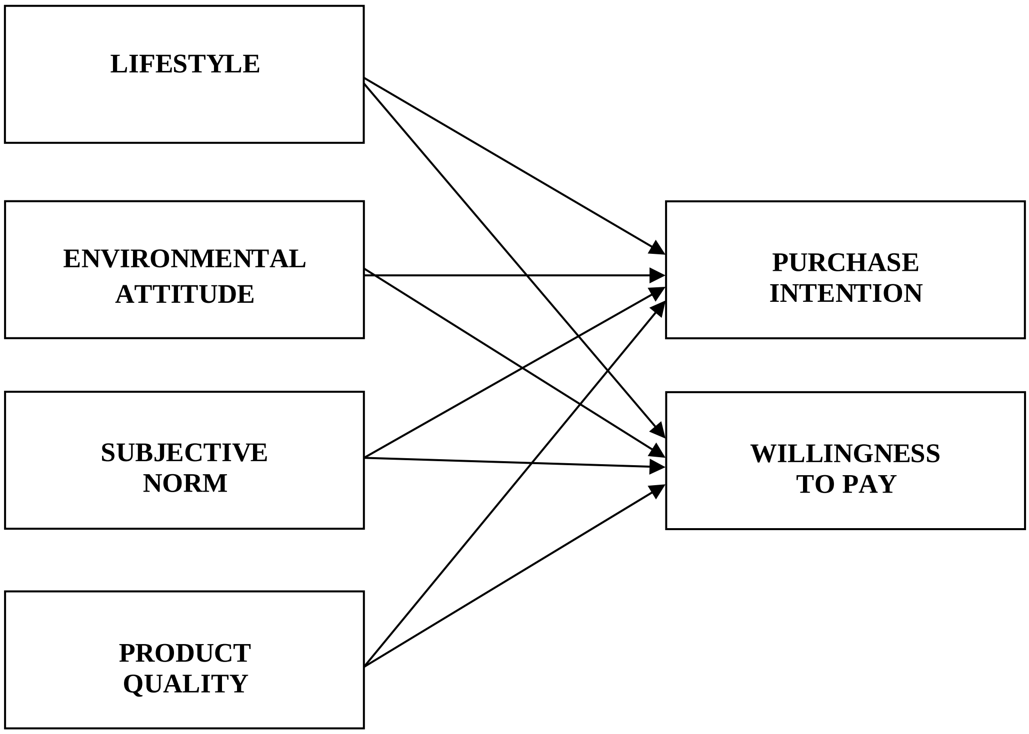

Figure 1: Research Conceptual Framework

Research Methodology

This research is a quantitative study employing a survey research technique to collect cross-sectional data. The population consists of Generation Z consumers, both males and females, aged 18-24 years. The sample size was determined using the formula by Hair et al. (2010), which suggests that the appropriate sample size for statistical analysis should be at least 5-10 times the number of indicators. Therefore, with a confidence level of 95% and a margin of error of 0.5, and considering there are 35 questions related to independent and dependent variables in the study, the sample size for this research was set at a minimum of 350 respondents. To minimize data estimation errors, the data collection was extended to 400 sets using a non-probability sampling method, specifically purposive sampling, for selecting the samples.

The research team employed a 5-point rating scale measurement method, ranging from 5 (the most) to 1 (the least). Subsequently, the researchers conducted a pilot study with a sample group of 50 individuals to test the questionnaire's validity using the Cronbach's Alpha Coefficient (α). The lifestyle variable had a reliability score of 0.783, environmental attitude had a reliability score of 0.817, subjective norm had a reliability score of 0.913, product quality had a reliability score of 0.889, purchase intention had a reliability score of 0.900, and willingness to pay had a reliability score of 0.913. This indicates that the questionnaire is reliable. Following this, the research team collected data from a real sample group online, totaling 400 sets, using descriptive statistics analysis, including percent, mean, standard deviation (S.D.), Pearson correlation, and multiple linear regression analysis.

Research Results

Results of the Preliminary Screening of Basic Statistical Data on Demographic Characteristics

The preliminary demographic characteristics data was collected from 413 respondents, with the majority being female, accounting for 69.7%. The age range of 22-24 years was the most common, representing 61.5% of the respondents. A vast majority were single, accounting for 97.3%, and students, comprising 80.1%. Most respondents were pursuing a bachelor's degree, making up 72.2%, and had an average monthly income of no more than 15,000 THB, representing 57.9%. The frequency of purchasing fashion clothing was 1-2 times per month for 50.8% of the respondents, and the expenditure on clothing per occasion did not exceed 1,000 THB for 51.1%.

The analysis results of the level of lifestyle factors, environmental attitude factors, subjective norm factors, and product quality factors that positively affect the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.

Table 1 : Mean, Standard Deviation, and Opinion Level of Independent and Dependent Variables

Opinion Level of Independent and Dependent Variables	X	S.D.	Opinion level
Factors related to lifestyle patterns	3.7546	.62958	High level
Factors regarding environmental attitudes	3.7716	.63742	High level
Factors associated with reference group influence	3.5884	.86372	High level
Product quality factors	4.1069	.66113	High level
Purchase intention	3.7224	.67560	High level
Willingness to pay	3.6097	.78227	High level
Total	**3.7589**	**.57484**	**High level**

From Table 1, presents the analysis results of the level of factors such as lifestyle, environmental attitudes, subjective norms, and product quality that have a positive effect on the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok. The opinion level of consumers towards all variables is on the high side, with the product quality factor having the highest average value of 4.1069 (S.D. = 0.66113).

The analysis of the relationship between factors affecting the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, using Pearson Correlation Coefficient statistics.

Table 2 : Analysis of the Correlation Coefficient between Independent and Dependent Variables using Pearson Correlation Formula

Correlations						
	X_1	X_2	X_3	X_4	Y_1	Y_2
Lifestyle factors (X_1)	1					
Environmental Attitude Factors (X_2)	.735**	1				
Factors for conformity to the reference group (X_3)	.501**	.589**	1			
Product quality factors (X_4)	.605**	.613**	.327**	1		
Purchase intention (Y_1)	.694**	.700**	.551**	.621**	1	
Willingness to pay (Y_2)	.616**	.627**	.489**	.459**	.769**	1

**Statistically significant 0.01

From Table 2, the Pearson Correlation analysis of the relationship between the independent variables (X1: Lifestyle factors, X2: Environmental attitude factors, X3: Subjective norm factors, X4: Product quality factors) and the dependent variables (Y1: Purchase intention, Y2: Willingness to pay) shows that all variable pairs have a statistically significant positive correlation at the 0.01 level, with correlation coefficients less than 0.80, ranging between 0.327 and 0.769. This indicates that the independent and dependent variables have a normal level of relationship, or that the independent and dependent variables do not have excessive interrelations within each variable, thus avoiding multicollinearity issues among two or more predictor variables. Therefore, all independent and dependent variables can be utilized in multiple linear regression analysis in the next steps of hypothesis testing.

The hypothesis testing results using Multiple Linear Regression analysis to study the factors affecting the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.

Table 3: Hypothesis Testing using Multiple Linear Regression Analysis to Study the Factors that Positively Influence the Purchase Intention and Willingness to Pay for Slow Fashion Products among Generation Z Consumers in Bangkok.

Variable	Unstandardized Coefficients		Standardized Coefficients	T	Collinearity Statistics	
	B	Std.Error	Beta		Tolerance	VIF
Constant	-0.010	0.144		-0.067		
Lifestyle factors	0.298	0.052	0.273	5.714**	0.412	2.425
Environmental attitude factor	0.255	0.056	0.237	4.587**	0.354	2.826
Factors for conformity to the reference group	0.154	0.031	0.194	5.033**	0.638	1.568
Product quality factors	0.254	0.042	0.245	6.002**	0.567	1.764
R = 0.784 R Square = 0.614 Adjusted R Square = 0.611 Durbin-Watson = 1.899 F = 162.553						

**Statistically significant 0.01

From Table 3, the hypothesis testing using Multiple Linear Regression Analysis to study the factors that positively influence the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok showed that the variance inflation factor (VIF) values for each independent variable did not exceed 5. This indicates that each independent variable is independently varied, thus avoiding the issue of multicollinearity.

The hypothesis testing revealed that all independent variables collectively have a significant relationship with the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok. Together, they can predict 61.4% of the variance in the dependent variables, with statistical significance at the 0.01 level.

The predictive equation for purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, using raw scores, can be written as follows: $\hat{Y} = -0.010 + 0.298X1 + 0.255X2 + 0.154X3 + 0.254X4$. From this regression equation ($\hat{Y}$), the following can be concluded:

1. The lifestyle factor (X1) has a statistically significant value of 0.01. Therefore, the lifestyle factor positively influences the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, aligning with the established hypothesis.

2. The environmental attitude factor (X2) has a statistically significant value of 0.01. Hence, the environmental attitude factor positively influences the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, consistent with the established hypothesis.

3. The subjective norm factor (X3) has a statistically significant value of 0.01. Thus, the subjective norm factor positively influences the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, in agreement with the established hypothesis.

4. The product quality factor (X4) has a statistically significant value of 0.01. Therefore, the product quality factor positively influences the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, supporting the established hypothesis.

The predictive equation for purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok, using standardized scores, can be written as follows: Standardized $\hat{Y} = 0.273X1 + 0.237X2 + 0.194X3 + 0.245X4$.
Therefore, it can be concluded that at the 0.01 level of significance, the lifestyle factors, environmental attitude factors, subjective norm factors, and product quality factors have a positive influence on the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok.

Discussion/Conclusion

The study of factors influencing the purchase intention and willingness to pay for slow fashion products among Generation Z consumers in Bangkok concludes that the most influential factor is lifestyle. This is because Generation Z consumers have a lifestyle preference for environmentally friendly products to match their personal lifestyles, with a belief that the environment needs to be preserved. This aligns with the study by Aydın et al. (2015), which found that lifestyle is a factor affecting the intention to buy environmentally friendly products as the lifestyle environment acts as a motivator, leading consumers to intend to purchase slow fashion products. This is consistent with Laroche et al. (2002), which found that consumers are willing to spend money on environmentally friendly products that reflect their lifestyle.

Following this, the product quality factor is significant because Generation Z consumers perceive that slow fashion products have good quality, durability, comfort, and safety for the wearer. This corresponds with Natthanicha Nisaisook (2013), who studied factors affecting consumer purchases of environmentally friendly products and found that consumers place a high average importance on product features and quality.

Next in order is the environmental attitude factor, as Generation Z consumers have positive attitudes towards reliable, high-quality slow fashion products made from environmentally friendly materials, safe for the wearer. This aligns with Kanchanapibul et al. (2014), who found that the intention to buy green products results from knowledge and emotional responses to environmental issues, where consumers knowledgeable about green issues are more likely to have the intention and willingness to pay for green products.

Lastly, the subjective norm factor shows that Generation Z consumers value the influence from their reference groups, such as friends or close acquaintances, as a part of the reason for their intention to purchase slow fashion products. This is in agreement with Anvar et al. (2014), which found that social influence impacts consumer behavior towards buying environmentally friendly products. Additionally, Choo and Kim (2014) found that consumers are willing to pay for fashion products to be socially accepted.

Suggestions

Recommendations for Applying Research Findings

This research studied various factors to encourage consumers to become familiar with and increasingly purchase slow fashion products. The researcher suggests the following approaches: Businesses should integrate marketing activities and advertisements that reinforce brand recall to make slow fashion products a part of consumers' lifestyles. Marketers should study and design or develop slow fashion products that fit the lifestyle patterns of consumers. Regarding environmental attitudes, businesses should market to consumer groups that are interested and have positive attitudes towards the environment, making them aware of the benefits of slow fashion products. For subjective norm, marketers should communicate environmental marketing campaigns to friends or family of the target group to encourage word-of-mouth or improve attitudes among Generation Z consumers. In terms of product quality, marketers should highlight the quality and durability of the products to emphasize their longevity and practical use.

Suggestions for Future Research

This quantitative research study faced limitations regarding the sample group and the accuracy of the questionnaire, as well as the respondents themselves. Furthermore, it was found that there are many other factors related to slow fashion products that are interesting, such as perceptions of product quality and social responsibility. Therefore, to obtain more detailed and quality data, researchers are advised to conduct qualitative research, such as observations and in-depth interviews or focus group interviews, to obtain specific, unbiased information. Additionally, expanding the sample size, changing the survey area, and comparing results can enhance the accuracy and reliability of the data. Researchers may also explore the aforementioned factors as guidelines for future research studies. With the variety of slow fashion products, it's recommended to thoroughly study the data to prevent potential errors and achieve a true understanding.

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Development an IoT-Embedded Smart Drip Irrigation System for Livestock Feed Corn Fields

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Abstract

The objectives of this study were: 1. To develop an IoT-embedded drip irrigation system for livestock feed corn fields. 2. To study the outcomes of implementing the IoT-embedded drip irrigation system within the Efficient Agriculture Learning Community (EALC) network, specifically among corn farmers in Tambon Kok Chamrae, Thung Sri Udom District, Ubon Ratchathani Province. The study involved 10 households covering an area of 10 acres the method of Purposive Selection is employed to select a sample group based on specific criteria or objectives. This research serves as a learning point to showcase the IoT-embedded SmartFarm drip irrigation system in livestock feed corn fields. The objectives include providing a learning resource for farmers within and outside the area to study and experiment with the actual use of the irrigation system. The study results from implementing the IoT-embedded drip irrigation system for livestock feed corn fields are as follows: 1. Electricity consumption reduced by 40% 2. Farmers no longer require manual labor for irrigation 3. Water consumption decreased by 40%. Moreover, the system's implementation allowed farmers to have more free time from irrigation activities, providing opportunities to explore additional sources of income within their households.

Keywords: Drip irrigation System for Livestock Feed Corn Fields, IoT Embedded System

Introduction

Currently, feed corn is extensively utilized as a primary ingredient in the continuously expanding animal feed production industry, in line with the growth of the livestock sector, particularly poultry and swine. There are over 376,000 households of feed corn farmers across the country, alongside a vast array of corn-related business groups at various levels, including crop trade groups, central markets, exporters, animal feed factories, and livestock farmers. Thailand's annual feed corn production is approximately 4 million tons. Feed corn consumes less water than rice cultivation—about half, or approximately 450-500 cubic meters per rai per production season—and offers better profitability, making it a popular choice for cultivation in areas outside of irrigation zones. Typically, there are two growing seasons for feed corn: 1) the rainy season crop, planted around April to June and harvested from August to November, and 2) the dry season crop, planted around December to February and harvested from March to May (Agricultural Research and Development Agency, 2019). In Thung Si

Udom district, Ubon Ratchathani province, most farmers prefer to grow feed corn due to its higher yield and income potential, especially since buying companies offer a guaranteed price of 7 to 9 baht per kilogram, making it a significant source of household income. A research survey identified that in a 10-rai area, farmers spend 6-8 hours watering their corn crops and found that over 90% lack the knowledge and skills to apply technology and innovation to reduce the workload of corn cultivation. Researchers believe that incorporating IoT embedded technology could help alleviate labor usage in watering, managing resources such as electricity costs, and optimizing water use, since IoT connects various everyday devices to the internet for data exchange and collaborative operation, from household appliances to industrial and agricultural equipment, enabling remote control and monitoring from any internet-connected location (Nishimura et al., 2016). Further research by Sermsak Tipmongkolsilp (2015) on continuing the legacy of alternative energy inspired by royal initiative, developing an automatic watering system powered by solar cells for watering Nam Dok Mai mango trees, showed it could reduce watering workload and use solar power instead of electricity. This has led to the idea of developing an IoT-based SmartFarm technology as a learning plot and demonstration site for district-level agricultural community education, applying innovations and technology to enhance feed corn production efficiency, driven by the BCG (Bio-Circular-Green) Economy Model in a SmartFarm setup, utilizing IoT technology to reduce labor time in cultivation and allow farmers to use their saved time for other income-generating activities, ultimately increasing household income.

Objective

1. To develop an drip irrigation system for livestock corn fields using embedded IoT technology.
2. To study the effects of using an drip irrigation system for livestock corn fields with embedded IoT technology.Theories and related research

Literature Review

1.Water-saving irrigation methods or low-volume watering techniques

Micro-irrigation, or low-volume irrigation, is a method of watering plants in small amounts but frequently, with a low application rate and without covering the entire root zone area. It relies on the soil's properties to help spread the water around, keeping a limited volume of soil moist, and it's a system that prevents overlapping wetted areas from different types of emitters such as minisprinklers, microsprinklers, microjets, microsprays, mistsprays, and drip irrigation. This water-saving irrigation method is becoming increasingly popular and plays a growing role in the future because it can be applied to various types of fruit trees, significantly saving water. It's suitable for lychees, mangoes, durians, rambutans, limes, pomelos, longkongs, as well as some vegetables and field crops, from when the fruit trees are small until they are fully grown by adjusting the wetted radius to match the size of the trees. For instance, microjets may be used when the fruit trees are small, and as they grow, they might be switched to minisprinklers by changing only some parts of the minisprinkler emitter but still using the old sprinkler body or just changing the nozzle.

2. Internet of Things (IoT)

IoT constitutes a network of objects, devices, or things embedded with electronics, software, sensors, and connectivity which enables these objects to collect and exchange data freely. It allows for these things to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems. This could result in improved efficiency, accuracy, and economic benefit. Each object is uniquely identifiable through its embedded computing system and can interoperate within the existing Internet infrastructure such as LAN, Wi-Fi, 3G, 4G, etc. Experts predicted that by 2020, there would be around 50 billion IoT devices (Saaid M.F., Yahya N.A.M., Noor M.Z.H., Megat Ali M.S.A, 2013). Utilizing IoT in agriculture can solve various problems for farmers, leading to precision agriculture that meets the specific needs of plants or animals. Furthermore, farmers can use resources more efficiently and appropriately for their agricultural areas. They can also closely monitor and maintain through computer devices with the internet as a medium for data transmission, ensuring that the output matches the caretaker's requirements because variables can be controlled and adjusted as needed.

Micro Controller Board

The Arduino Microcontroller board is an open-source AVR microcontroller development project, evolving from another open-source AVR project called "Wiring." However, the "Wiring" project initially chose the ATmega128 microcontroller, which has a substantial amount of memory and numerous input/output options. Importantly, the ATmega128 chip uses an SMD package, posing challenges for beginners in creating and using their circuits due to its large size, which might seem excessive for novices, leading to its limited popularity. However, Arduino adapted and refined the "Wiring" code to be compatible with smaller AVR microcontrollers like the Mega8 and Mega168, making circuit building more accessible and significantly reducing the cost of board production. This adaptability has contributed to Arduino's rapid popularity surge (Saaid M.F., Yahya N.A.M., Noor M.Z.H., Megat Ali M.S.A, 2013). The Arduino Uno R3 board utilizes the ATmega328 chip with a 16 MHz frequency, 32 KB of flash memory, and 2 KB of RAM. It operates on a power supply of 7 to 12 V and has an operating voltage and signal voltage level of 5 V (TTL). It features 14 digital input/output pins, 6 analog input pins, one Serial UART, one I2C, and one SPI communication set. Programming is done using the Arduino IDE software and through a USB port.

Related Research

Poltep Wengsoongnern (2014) studied the suitable factors for growing hydroponics plants using a vapor-compression refrigeration system, divided into three parts: studying the temperature distribution of the solution used in hydroponics through computational fluid dynamics, determining the appropriate length and number of growing channels through experimentation, and examining the effects of reducing the temperature of the plant nutrient solution in hydroponics with a vapor-compression refrigeration system. To compare the economic value of installing or not installing the refrigeration system, Green Oak lettuce was used for the experiment. The study found that increasing the channel length slightly raised the solution's temperature. The suitable length for growing channels was found to be 6 meters. The experiment showed that the average temperature in the nutrient solution tanks for systems with and without refrigeration was 26.4°C and 30.1°C, respectively, a statistically significant difference at the 0.05 level, with the refrigeration system reducing the solution temperature by 3.7°C. The average temperatures at the head and end of the growing channels for both cooled and uncooled systems were 27.1°C and 30.1°C, respectively, showing no change. The average weight of hydroponics plants per channel for the cooled and uncooled systems was 830.00 grams and 647.50 grams, respectively, a statistically significant difference at the 0.05 level. The research concluded that lowering the temperature affects the growth of hydroponics plants. However, when comparing economic value through Benefit-Cost Ratio (BCR) analysis, the BCR values for the tables with and without the cooling sy stem were 0.16 and 8.31, respectively, indicating that tables without the cooling system were economically more viable than those with the cooling system.

Arattapol Kanhaeweg (2007) studied the design of an automatic control system for regulating the electrical conductivity (EC) and pH levels of the solution used in plant cultivation, to maintain conditions optimal for plant growth. The experiment compared plant growth with and without the use of the automatic system, finding that plants grew faster with the system in place. Furthermore, in terms of investment recovery, the automatic system also resulted in a shorter payback period. The test used 45 Green Oak lettuce plants per trial, divided into four operational stages: 1) Designing a hydroponic NFT (Nutrient Film Technique) plant cultivation plot, 2) Preparing the nutrient solution and adjusting its pH to suit the specific plant type, 3) Designing an automatic solution control unit, and 4) Designing a control unit for automatically opening and closing to introduce the solution into the system. The study found that the system automatically measures and controls the EC and pH levels of the solution in the system to suit the plants at all times. By measuring EC and pH levels and transmitting this data to a microcontroller, which compares it with predefined ranges, the microcontroller then automatically controls the opening and closing of valves to adjust the EC and pH levels of the solution entering the system as calculated.

Research Methodology

This research is an action-based study involving a sample group from the Learning Community for Agricultural Efficiency Enhancement (LCAEE) among feed corn farmers in the Kok Cham Rae network, Thung Si Udom district, Ubon Ratchathani province, consisting of 10 households. The implementation involved field visits and participating in various activities in collaboration with farmers and government agencies that support and promote agriculture, including the Thung Si Udom District Office and the Thung Si Udom District Agricultural Office, the Ubon Ratchathani Provincial Agricultural Office, and the LCAEE Kok Cham Rae group of feed corn farmers in large plots. The research was conducted following these steps:

1. Surveying the problems and needs of farmers by the research team conducting field visits in the community of farmers cultivating feed corn in large plots, in collaboration with the Thung Si Udom District Agricultural Office, Ubon Ratchathani province.

Figure 1: conducting a field survey on the problems and needs of farmers

From Figure 1, conducting a field survey on the problems and needs of farmers by the research team in the community of farmers cultivating feed corn in large plots and the Thung Si Udom District Agricultural Office.

Figure 2: Survey the area for cultivating feed corn

From Figure 2, conducting a field survey for analyzing and designing an drip irrigation system for feed corn plots using IoT embedded technology, studying the ratio of cultivation area, water sources, water pipe pathways, electrical pathways, and the drip irrigation system through pumps.

2. Analyze and design an drip Irrigation system for feed corn plots

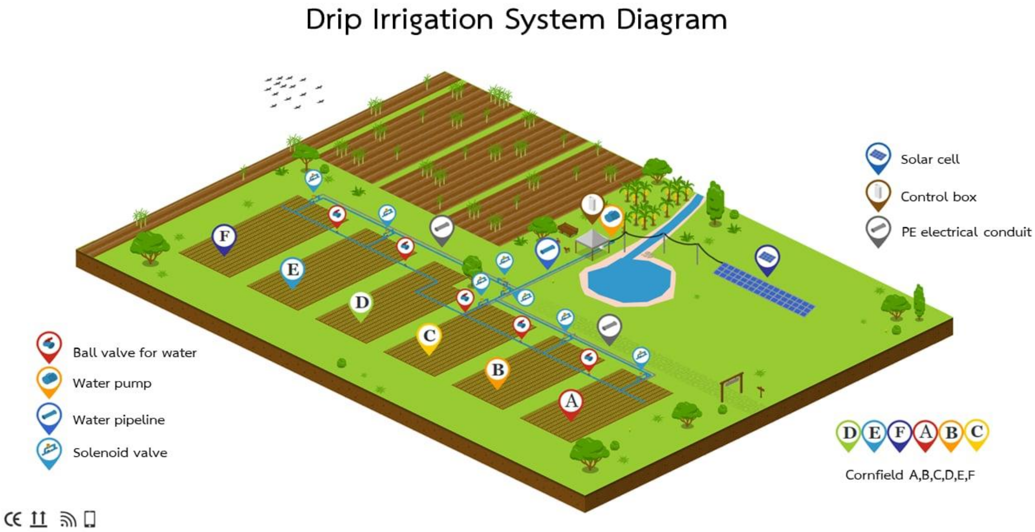


Figure 3: Design the waterway system in the cultivation plots.

From Figure 3, designing the waterway system in the feed corn cultivation plots, totaling 10 rai, to integrate with IoT technology in a SmartFarm format. This allows farmers to manage the drip irrigation of the feed corn cultivation plots through an application on the farmer's smartphone.

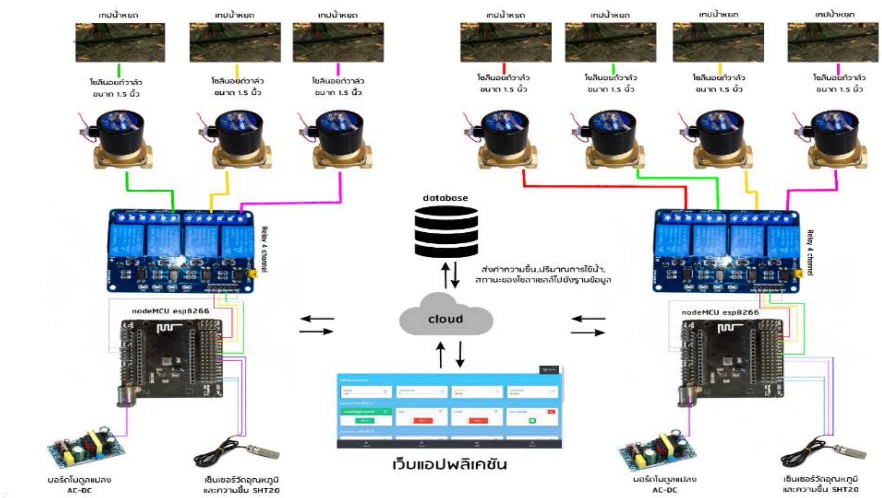


Figure 4: Design overview of the control devices for the drip irrigation system of feed corn plots.

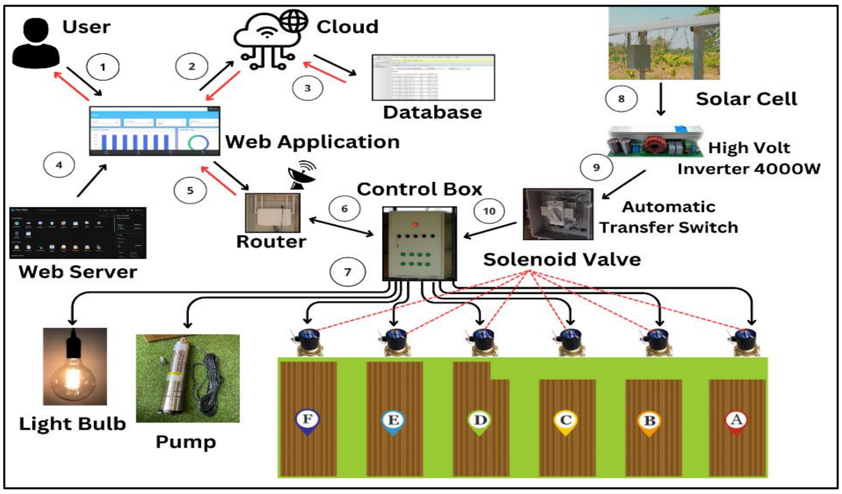


Figure 5: Design overview of the control devices for the drip irrigation system of feed corn plots using solar cells.

From Figure 4 and 5, the design overview involves devices in the drip irrigation system of feed corn plots through drip tape, where the system operation includes a microcontroller board receiving moisture levels from sensors and then operating based on programmed conditions. The system utilizes relays for switching electrical currents on and off to solenoid devices, which are electric water valves for water distribution. Additionally, cloud computing is used for solenoid control due to the large cultivation area and the extensive use of electric water valves. Cloud processing also controls the solar cells to monitor the energy status, indicating whether it is using solar power or electrical energy and how much energy remains.

3. Developing the drip irrigation system for feed corn plots with embedded IoT technology. This involves advancing embedded IoT technology in a SmartFarm format, with the following development steps:

3.1 Install and set up electrical wiring in the designed cultivation area to connect with the control box.

Figure 6: Laying out the electrical conduit along the crop rows.

3.2. Installing the water piping system to connect with the existing pipe system in the area and installing electric valves at different nodes where water is distributed.

Figure 7: Laying out the water piping system along the crop rows.

3.3. Developing and installing the control box, which is a step in the development of the control box from the design overview of control devices to be used in managing the system's operations. This includes 1) controlling the operation of solenoid valves for opening and closing the water valves, 2) detecting soil moisture levels in the cultivation plots, 3) monitoring the flow rate of water, and 4) controlling the operation of solar cells.

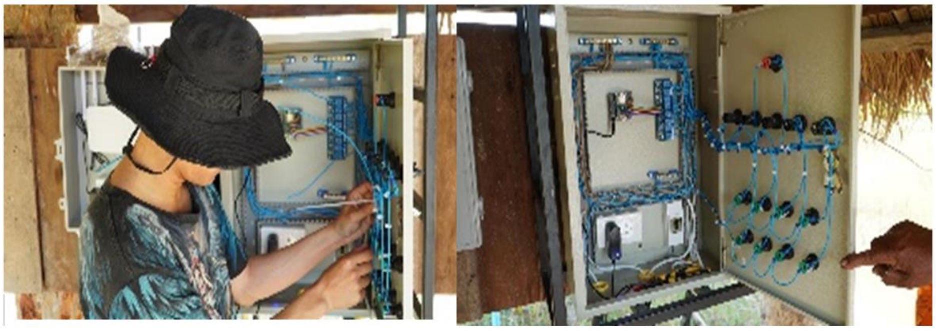


Figure 8: Developing and installing the control box

From Figure 8 Developing and installing the control box as a step from the design overview of control devices for managing the system's operations, which includes 1) controlling the operation of solenoid valves for opening and closing the irrigation valves, 2) detecting soil moisture levels in the cultivation plots, 3) monitoring the water flow rate and the amount of water used in each irrigation event, and 4) controlling the operation of solar cells to switch between electric power and solar energy.

3.4 Programming for operational control, which involves writing control software for the feed corn drip irrigation system using embedded IoT technology, divided into three parts: 1) Writing software for an application (App) to command automatic watering through moisture detection, where the system will water until the moisture level reaches a predefined threshold if the moisture is low. 2) Writing software to allow farmers to manually water using on-off switches in the app installed on smartphones. 3) Developing a web application (Web App) for collecting data on temperature, humidity, and water usage rates in the feed corn plots for each watering event.

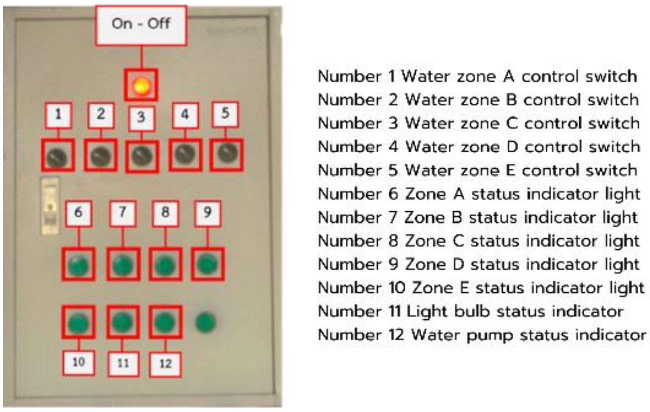


Figure 9: The operational status of the control box during irrigation in different zones.

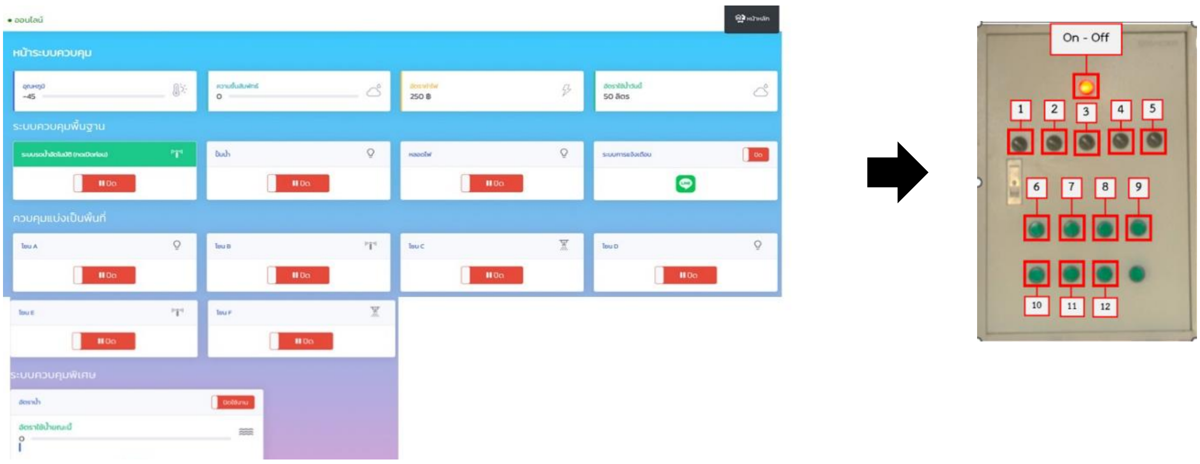
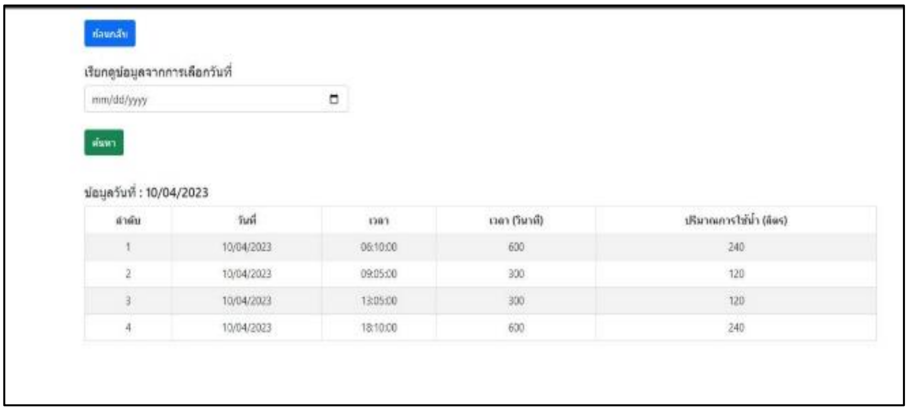


Figure 10: The application for controlling the operation of the control box.

From Figure 10, the application controls the operation of devices in all 7 irrigation zones (Zones 1-7) within a 10-rai area, and Zone 8 controls the lighting to illuminate the learning and demonstration building where the drip irrigation system is installed.



ย้อนกลับ

เรียกดูข้อมูลจากการเลือกวันที่

mm/dd/yyyy

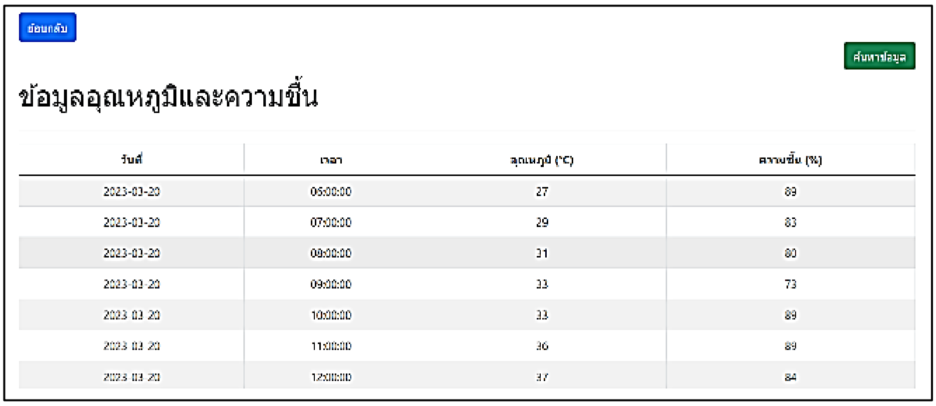
ค้นหา

ข้อมูลวันที่ : 10/04/2023

ลำดับ	วันที่	เวลา	เวลา (วินาที)	ปริมาณการใช้น้ำ (ลิตร)
1	10/04/2023	06:10:00	600	240
2	10/04/2023	09:05:00	300	120
3	10/04/2023	13:05:00	300	120
4	10/04/2023	18:10:00	600	240

Figure 11: Data on water usage for each irrigation event.

From Figure 11, the web application is used to view data on water usage for each event, allowing for historical data search.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ค้นหาข้อมูล

ข้อมูลอุณหภูมิและความชื้น

วันที่	เวลา	อุณหภูมิ (°C)	ความชื้น (%)
2023-03-20	05:00:00	27	89
2023-03-20	07:00:00	29	83
2023-03-20	08:00:00	31	80
2023-03-20	09:00:00	33	73
2023-03-20	10:00:00	33	89
2023-03-20	11:00:00	36	89
2023-03-20	12:00:00	37	84

Figure 12: Data on temperature and humidity in the feed corn plots.

From Figure 12, the web application is used to view temperature and humidity data in the feed corn plots.

The developed web application can store operational data of the drip irrigation system for feed corn plots, including temperature and humidity data at different times, drip irrigation schedules, duration of each drip irrigation event, and daily water volume for drip irrigation in the feed corn plots.

Temperature, humidity, timing of each drip irrigation event, duration of watering, and volume of each irrigation event data are sent to a Cloud Database to display information in numeric and graphical formats.

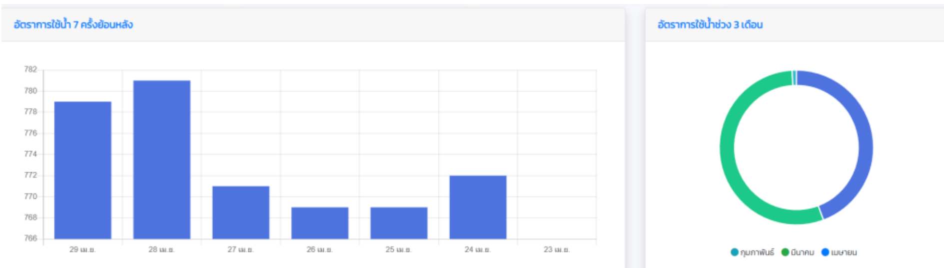

Figure 13: Graph showing daily water usage data for each plot.

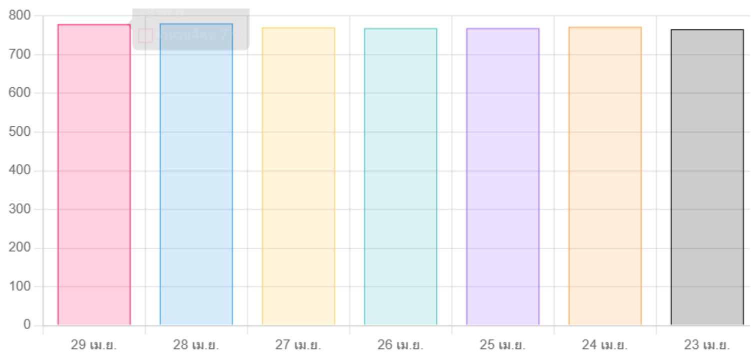

Figure 14: Graph showing water usage data for the plots.

4. Developing a demonstration learning site for the

system of feed corn plots using embedded IoT technology, aimed at providing a learning resource for local and non-local farmers to study and experiment with the drip irrigation system for feed corn. The development of the demonstration learning site is a collaboration between researchers, the Ubon Ratchathani Provincial Agricultural Office, and the Thung Si Udom District Agricultural Office. As a result of developing the demonstration learning site, a significant number of farmers from outside the area have come to study and observe the project.

Figure 15: Demonstration learning site for the drip irrigation system of feed corn plots using embedded IoT technology in the SmartFarm format

5. Conducting training sessions to transfer knowledge about the importance of technology and innovation in the cultivation of feed corn, developing skills in using the drip irrigation system for feed corn plots with embedded IoT technology for the sample group of farmers, and evaluating the practical training outcomes from the transfer of technology and innovation knowledge, as well as the skills in using the drip irrigation system for feed corn plots by embedded IoT technology, as shown in Figure 16.

Figure 16: Training on the Transfer of Knowledge on an IoT Embedded Smart Brain Technology Corn Feed Irrigation System

6. Monitoring and Reflecting Outcomes: The impacts of using an IoT embedded smart brain technology in a corn feed drip irrigation system to reduce labor time, decrease electricity costs, efficient use of water resources in cultivation, and avenues for generating household income from the time savings introduced by employing technology and innovation.

Figure 17: Monitoring and Reflecting Outcomes: The impacts of using an IoT embedded smart brain technology in a corn feed irrigation system.

Research Findings

From the development of the corn feed drip Irrigation system using IoT embedded smart brain technology, a learning and demonstration point has been established at the Community Learning Group for Enhanced Agricultural Efficiency (CLGEAE) among corn feed growers in the Kok Cham Rae sub-district network, Thung Si Udom District, Ubon Ratchathani Province. The operation included training sessions to transfer knowledge and skills on using the corn feed drip irrigation system with IoT embedded smart brain technology to farmers, as well as reflecting on the impacts of using the system over a 4-month planting and harvesting cycle. The results are as follows:

1. The assessment of satisfaction with the training and skill transfer of the corn feed drip irrigation system using IoT embedded smart brain technology as shown in Table 1.

Table 1: Overall satisfaction assessment with the training and skill transfer of the corn feed drip irrigation system using IoT embedded smart brain technology.

Satisfaction	$\overline{x}$	S.D	Level
1. Training methods	4.50	0.35	Highest
2. Training instructors	4.50	0.40	Highest
3. Training location	4.61	0.45	Highest
4. Training objectives	4.30	0.38	Highest
5. Training content	4.35	0.42	Highest
Overall	**4.45**	**0.40**	Highest

From Table 1, the overall satisfaction assessment with the training and skill transfer for the corn feed drip Irrigation system using IoT embedded smart brain technology among farmers found that satisfaction in all aspects was at the highest level ($\overline{x}$=4.45). Specifically, the satisfaction levels were as follows: for the training location at the highest level ($\overline{x}$= 4.61), training methods ($\overline{x}$= 4.50), training instructors ($\overline{x}$= 4.50), training content ($\overline{x}$= 4.35), and training objectives ($\overline{x}$= 4.30).

2. The study of electricity usage, irrigation time by farmers, and water usage rate before using the corn feed drip Irrigation system with IoT embedded smart brain technology over a 4-month planting and harvesting cycle.

Table 2: Study of corn cultivation data for livestock before using the corn feed irrigation system.

Month	Electricity Usage Rate (Baht)	Irrigation Time (Hours)	Water Usage Rate (Liters)
1	1,576	248	447,640
2	1,576	248	447,640
3	1,423	224	404,320
4	788	93	167,865
Overall	5,363	813	1,467,465

From Table 2, the electricity usage rate over one planting and harvesting cycle (4 months) was found to be: 1) The electricity usage rate for cultivation stood at 5,363 Baht, 2) The irrigation time utilized by farmers, through manual operation of opening and closing

Table 3: Study of electricity usage, irrigation time by farmers, and water usage rate after employing the corn feed irrigation system.

Month	Electricity Usage Rate (Baht)	Irrigation Time (Hours)	Water Usage Rate (Liters)
1	946	-	268,584
2	940	-	268,440
3	854	-	242,592
4	473	-	100,719
Overall	**3,213**	**-**	**880,479**

From Table 3, the electricity usage rate over one planting and harvesting cycle (4 months) after employing the IoT-embedded smart technology in the corn feed drip irrigation system showed that from month 1 to month 4: 1) The electricity usage rate for cultivation was at 3,213 Baht, 2) Farmers did not spend time on irrigation, and 3) The water usage rate was at 880,799 liters.

The study on electricity usage, irrigation time by farmers, and water usage rate before and after using the IoT-embedded smart technology corn feed drip irrigation system found that 1) Electricity usage decreased by 40%, 2) Farmers had no labor costs for irrigation, and 3) Water usage decreased by 40%.

Application

In developing the corn feed drip irrigation system with IoT-embedded smart technology, a trial was conducted over a 4-month planting and harvesting cycle, analyzing system usage data, labor usage in irrigation, electricity costs, and water usage rates before and after the system's application. This also included exploring supplementary occupation opportunities from the time saved by the system among the sample groups. Subsequently, it was developed into a learning and demonstration site through a collaboration between the research faculty, the Ubon Ratchathani Provincial Agriculture Office, and the Thung Si Udom District Agriculture Office, serving as a learning resource for local and external farmers to study and trial the drip irrigation system in actual cultivation areas. The results of the operation led Ubon Ratchathani Province to set it as a policy direction to promote the use of technology and innovation in irrigation for garden and field crops. Meetings were held on assistance strategies for farmers between the Bank for Agriculture and Agricultural Cooperatives and the Provincial and District Agriculture Offices, including low-interest loans for farmers adopting the IoT-embedded smart technology corn feed irrigation system.

Discussions

In the process of developing the corn feed drip irrigation system with IoT embedded smart technology, and its transformation into a learning and demonstration site, farmers have been enabled to study and experiment with the technology and innovation in corn cultivation for livestock. This has equipped farmers with knowledge and understanding of the technology and innovation that can help reduce the burden of cultivation and equipped them with the skills to use technology to control cultivation through their smartphones. The use of the IoT-embedded smart technology corn feed drip irrigation system has brought convenience to farmers by using technology in corn cultivation for livestock, resulting in reduced labor for irrigation, reduced electricity costs, and efficient water management as the system provides an appropriate amount of water to the corn cultivation areas. Additionally, the IoT-embedded smart technology corn feed drip irrigation system can collect cultivation data through a cloud database system, which includes temperature, humidity, and water usage daily up to the harvesting cycle. This data can then be analyzed and processed into agricultural academic information to be disseminated, enabling farmers to produce livestock feed corn efficiently The stability of the drip irrigation system has been enhanced, The system now undergoes self-booting every week at midnight to prevent any interruptions, ensuring error-free operation, IoT-Embedded Smart drip Irrigation System for Livestock Feed Corn Fields used for animal feed isn't constrained by the size of the cultivation area. This is in line with the research of Khemchat Cheychom (2019) and Parichat Rungreungnattakul (2019), which studied the development of smart farming models and found that if farmers use smart farming management, it can help reduce labor and costs in the long term, This is in line with the research of Phennet, T., Yowaphuy, K., Jarangsub, C., & Boonrom, P. (2023) which developed an environment control system for the Bhutan oyster mushroom cultivation house by using the IoT embedded system capable of controlling temperature and humidity in mushroom greenhouses, resulting in reduced caretaking time for mushroom farmers.

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