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"Shaping the future : Trends and insights for tomorrow"

**22 NOVEMBER
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Schedule
The 2nd International Conference on Multidisciplinary Research
2024
22th November 2024, Hybrid Conference (ICMR)
Via Internet (Zoom meeting)

09.00 a.m.-09.10 a.m. Opening Ceremony of the International Conference

By President of Shinawatra University

Associate Professor Zhou Fei

09.10 a.m.-11.00 a.m. (Keynote Speakers):

- Associate Professor Zhou Fei

- Prof Dr.Chai Ching Tan

- Mr.Petrus Loo.SE.M.S

(Guest Speakers):

- Albert Efendi Pohan

11.00 a.m.-11.05 a.m. Group Photo Session

13.00a.m.-16.30 a.m. Research Presentations

(maximum 15 minutes per/ presentation, including 5 minutes for Q&A)

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Preface

The 2nd International Conference on Multidisciplinary Research on Sustainable Development was organized to serve as a global platform for knowledge sharing and dissemination of cutting-edge research on sustainable development - a crucial issue requiring worldwide collaboration.

This conference has brought together researchers, academics, and experts from diverse disciplines to present their latest research findings, novel concepts, and exchange experiences in driving sustainable development across economic, social, and environmental dimensions.

We hope that this conference will foster international academic collaborations and pave the way for advanced research addressing sustainable development challenges in the future. It is also expected to inspire innovations for the betterment of humanity.

Table of Content

No.	Title	Page
1	ORGANIZATIONAL COMMUNICATION FOR ENHANCING EMPLOYEE RELATIONSHIP MANAGEMENT: A CASE STUDY OF HG ENTERPRISE Zhuohang Yuan, Jirapong Ruanggoon, and Patcharapa Euamornvanich	1
2	EXPLORING ENTREPRENEURIAL SPIRIT: CULTURAL, ORGANIZATIONAL, AND LEADERSHIP INSIGHTS FROM HG GROUP Yiran Hao and Jirapong Ruanggoon	12
3	ESG INITIATIVES FOR ENHANCING STAKEHOLDER ENGAGEMENT AND SUSTAINABLE DEVELOPMENT: A CASE STUDY OF SN AUTOMOBILE COMPANY Tianxi Yang and Jirapong Ruanggoon	22
4	HUMAN RESOURCE MANAGEMENT PRACTICES FOR ENHANCING EMPLOYEE MOTIVATION AND PERFORMANCE IN SMALL ACCOUNTING FIRM: A CASE STUDY OF D ACCOUNTING FIRM IN GUANGXI, CHINA Donglin Jiang and Jirapong Ruanggoon	33
5	THE EFFECT OF ORGANIZATIONAL CULTURE, ORGANIZATIONAL COMMITMENT, AND ORGANIZATIONAL LOYALTY OF EMPLOYEES IN PRIVATE ENTERPRISES IN BEIJING, CHINA Junhan Zhang and Jirapong Ruanggoon	45
6	ANALYSIS AND ENHANCING CAREER PLANNING AND DEVELOPMENT PRACTICES AT FG COMPANY Yin Hongshuai and Jirapong Ruanggoon	55
7	ELEVATED TASTE: EXPLORING THE IMPACT OF ALTITUDE AND PROCESSING METHODS ON CUP QUALITY Soe Myint Than, Htin Aung Kyaw, Su Nandar Linn, Hlaing Hlaing Than Tun Aung, Win Sanda Kyaw, and Aye Thida	65
8	ANALYZING MARKETING MIX EFFECTS ON COFFEE CONSUMER DECISIONS AND BRAND LOYALTY: A CASE STUDY OF THE COFFEE MARKET IN MYANMAR Soe Myint Than, Elmi Moe, May Phyu Sin Ohn Shwe, Ni Ni Win Shwe, Min Ko Naing, and Kaung Thu Kha Maung	73
9	A COMPOSITION “ALWAYS IN YOUR HEART” FOR ELDERLY CHOIR Kuakul Deachmee and Karn Gularnupong	81
10	THE PARTICIPATION OF PUBLIC TOWARDS THE PROBLEMS SOLVING OPERATION ON SUSTAINABLE POVERTY OF BAN TALAT NONG PHLING, MUEANG NAKHON SAWAN DISTRICT, NAKHON SAWAN PROVINCE Boonpeng Janngam, Supakran Mangkronsurakarn and Kittiamphol Sudprasert	98
11	FORECAST HYPERTENSION AND DIABETES INCIDENTS IN BANG TOEI, SAM KHOK, PATHUM THANI Chatsiri Chatphuti, Suchat Sujintawong and Vadhana Jayathavaj	106

12	SENSOR ALERT SYSTEM A CASE STUDY OF WORKERS TRAPPED IN CONFINED SPACES Pornpimol Chawengsaksopark, Wasurat Bunpheng and Chongkol Sungoum	114
13	THE RELATIONSHIP BETWEEN INDUSTRY 4.0 AND CIRCULAR ECONOMY: A SUSTAINABLE HEALTHCARE SECTOR PERSPECTIVE Tanyalak Kawicha	120

ORGANIZATIONAL COMMUNICATION FOR ENHANCING EMPLOYEE RELATIONSHIP MANAGEMENT: A CASE STUDY OF HG ENTERPRISE

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ABSTRACT

This study aimed to: 1) identify the key components of the entrepreneurial spirit within the HG Group; 2) examine the roles of culture, organization, and leadership in fostering this spirit; and 3) propose a model of entrepreneurial spirit from the HG Group's perspective. A qualitative research design was employed, beginning with an in-depth analysis of HG Group's internal documents. Data were analyzed using qualitative content analysis, which categorized themes such as leadership, cultural elements, organizational practices, and entrepreneurial spirit. Findings were validated through semi-structured interviews with three experts in entrepreneurship and organizational behavior, whose feedback enhanced the study's credibility. Results revealed that HG Group's entrepreneurial spirit is rooted in leadership, organizational practices, and corporate culture. Leadership, particularly the CEO's personal attributes, played a pivotal role. Organizational practices, including staff training and equity incentives, promoted internal mobility and aligned employee interests. Corporate culture, infused with traditional Chinese virtues and a "Wolf culture" emphasizing unity, teamwork, and customer focus, further reinforced the entrepreneurial environment. The study also highlighted the interconnected roles of culture, organizational practices, and leadership in fostering entrepreneurship. Leadership established corporate values and vision, while organizational practices like job rotation and equity incentives supported their realization. This synergy fostered an environment conducive to innovation. The proposed model of HG Group's entrepreneurial spirit underscored the alignment of leadership, organizational practices, and culture, which together created a resilient and innovative entrepreneurial ecosystem that drives growth and leadership development within the organization.

Keywords: organizational communication; employee relationship management; human resource management

1. Introduction

Employee participation was vital to enterprise success, fostering innovation, productivity, and growth [1]. Effective employee relationship management became a key factor in sustainable success, but research lacked understanding of how it directly influenced outcomes [2]. Employee relationship management included labor relations, communication, conflict resolution, and corporate culture development, employing non-coercive methods to enhance cooperation and loyalty [3]. Some viewed it narrowly as labor relations, while others broadened it to team building and welfare, a concept vital but challenging to measure [4]. It played a crucial role in times of turmoil, yet the link between relationship management and productivity or innovation needed exploration [5]. Research had yet to clarify how communication, feedback, and recognition influenced motivation, satisfaction, and performance, especially within HG Enterprise. Effective communication strengthened relationships, improved workflows, and enhanced cohesion [6], laying the foundation for satisfaction and retention [7]. Specific pathways linking relationship management to outcomes remained underexplored, requiring analysis of employee communication's impact on engagement and satisfaction [8].

A key research gap was understanding how specific communication channels, frequency, and transparency influenced employees' perceptions of organizational support and commitment. While various communication channels exist—such as face-to-face meetings, digital platforms, and formal feedback systems—little is known about how these channels individually or collectively impact employees' feelings of support and their commitment to the organization [9]. For instance, the frequency of communication might reinforce employees' sense of inclusion and awareness, whereas transparency in communication could build trust and reduce uncertainty about organizational objectives. Further research could delve into which combinations of these factors best foster a sense of belonging and organizational loyalty, particularly across different organizational levels or types of employees.

The influence of leadership communication on organizational culture and values also presents a valuable avenue for exploration. Leaders often set the tone for communication within an organization, shaping its overall culture and guiding employee behavior and attitudes [10]. While some research has touched on this, a more detailed understanding of how leadership communication styles—such as transformational, transactional, or servant leadership—directly influence employees' alignment with company values and the broader organizational culture is still lacking. This gap is particularly relevant in complex, diverse, or multinational organizations, where leaders' communication may need to be adapted for varying cultural or regional contexts.

Despite extensive research on Employee Relationship Management (ERM) communication, several significant gaps remain unaddressed. The effectiveness of informational communication and participative decision-making processes requires deeper examination. While informational communication is crucial for knowledge sharing and transparency, its impact on employee responsiveness, comprehension, and engagement in decision-making is still unclear. Research highlighted those varying types of information—whether related to daily tasks or strategic objectives—may affect employee engagement differently [11]. Additionally, participative decision-making can enhance employee empowerment and engagement, but understanding the nuances of how varying levels of involvement—such as consultation versus full collaboration—affect employee satisfaction and motivation is critical [12].

Feedback mechanisms and cross-cultural communication are further areas warranting attention. Different feedback types—constructive versus positive—can have distinct effects on employees' perceptions of support, inclusion, and motivation [13]. Additionally, cross-cultural communication within global organizations remains an underexplored area. The effectiveness of communication strategies across cultural boundaries may vary significantly, especially regarding perceptions of risk and understanding of corporate messaging. Future studies could address how cultural differences shape employee reactions to ERM practices, ensuring inclusivity and cohesion across diverse teams. Research on communication in employee relationship management within multinational corporations reveals a substantial gap in identifying communication initiatives tailored to these diverse environments [14].

Furthermore, limited comparative studies exist that benchmark Chinese employee relationship practices against international standards, highlighting a need for cross-cultural understanding within global enterprises [15]. For companies like HG Enterprise, understanding how cultural differences shape employee relationship management is crucial, as effective practices must align with varied cultural expectations and norms [16]. Addressing these research gaps could enhance

employee engagement and satisfaction, leading to greater organizational success through improved relationship management practices.

In response to these needs, this study aims to investigate the role of communication in employee relationship management within HG Enterprise, identify the specific strategies used, and propose communication initiatives designed to strengthen employee relationships within the organization.

2. Literature Reviews

2.1 Role of Communication in Employee Relationship Management

Communication is central to building trust, mutual understanding, and collaboration between employees and their organization, all of which are critical elements of employee relationship management (ERM). Effective communication channels facilitate interactions that foster alignment with organizational goals, job satisfaction, and improved teamwork [17]. Studies have shown that open channels and clarity in messaging reduce misunderstandings, ultimately strengthening employee engagement and commitment [18]. In fostering collaboration and trust, clear, consistent communication is essential in creating a supportive environment that encourages employees to contribute ideas and feel valued within their organization [19].

In particular, the choice of communication channels—ranging from digital platforms to in-person meetings—affects the quality and frequency of information exchange, shaping employees' perceptions of organizational support and transparency [20]. Effective communication strategies are further reinforced through intentional interactions that promote trust, mutual understanding, and teamwork, as these factors are closely linked to overall organizational success and employee retention [21].

2.2 Communication Strategies for ERM Enhancement

Various communication strategies support ERM, including transparent communication, active listening, feedback mechanisms, and cross-cultural communication. Transparent communication enhances trust and is linked to employee perceptions of fairness and commitment to organizational goals [22]. Active listening, a foundational element of ERM, involves acknowledging employee input and responding in a way that shows empathy, leading to stronger employee loyalty and reduced turnover [23]. Feedback mechanisms, whether one-way or two-way, are critical for reinforcing employee contributions and addressing issues proactively. One-way feedback allows for consistent messaging from leadership, while two-way feedback fosters dialogue and enables employees to voice concerns, leading to higher engagement levels [24]. Cross-cultural communication is especially important in multinational organizations, where cultural sensitivity in messaging can prevent misunderstandings and foster a more inclusive work environment [25]. Leadership communication styles also play a significant role, with transformational and servant leadership styles associated with greater trust, empathy, and empowerment among employees [26]. Leaders who communicate with empathy and transparency create a culture where employees feel valued, increasing their commitment to the organization [27].

2.3 Communication Initiatives for Enhancing Employee Relationship Management

Research highlights several initiatives to strengthen ERM through communication, including establishing open communication channels, transparent information-sharing practices, feedback mechanisms, and leadership communication practices. Open communication channels empower employees to express their opinions, which research indicates is critical for fostering an inclusive culture [28]. Transparent information sharing, particularly in times of change or uncertainty, reassures employees and aligns them with organizational values [29].

Employee feedback mechanisms are central to continuous improvement in ERM, as they allow organizations to gauge satisfaction levels and identify areas for intervention [30]. Implementing leadership communication practices that promote openness and clarity in messaging enhances employee trust, particularly when leadership demonstrates a commitment to ethical and transparent communication. Furthermore, training programs on effective communication have been shown to improve both leader and employee communication skills, fostering a more positive organizational culture [31]. These initiatives collectively contribute to enhanced employee satisfaction, engagement, and loyalty, supporting organizational resilience and adaptability.

2.4 Conceptual Framework

Conceptual framework as show in Figure 1. The conceptual framework underscores the pivotal role of communication in establishing and nurturing relationships between employees and the organization. It emphasizes the significance of effective communication channels, messages, and

interactions in cultivating trust, understanding, and collaboration among employees and with the organization. The framework delves into specific communication strategies and practices utilized by HG Enterprise to enhance employee relationship management (ERM). These strategies encompass transparent communication, active listening, two-way feedback mechanisms, and leadership communication styles that foster trust, empathy, and empowerment.

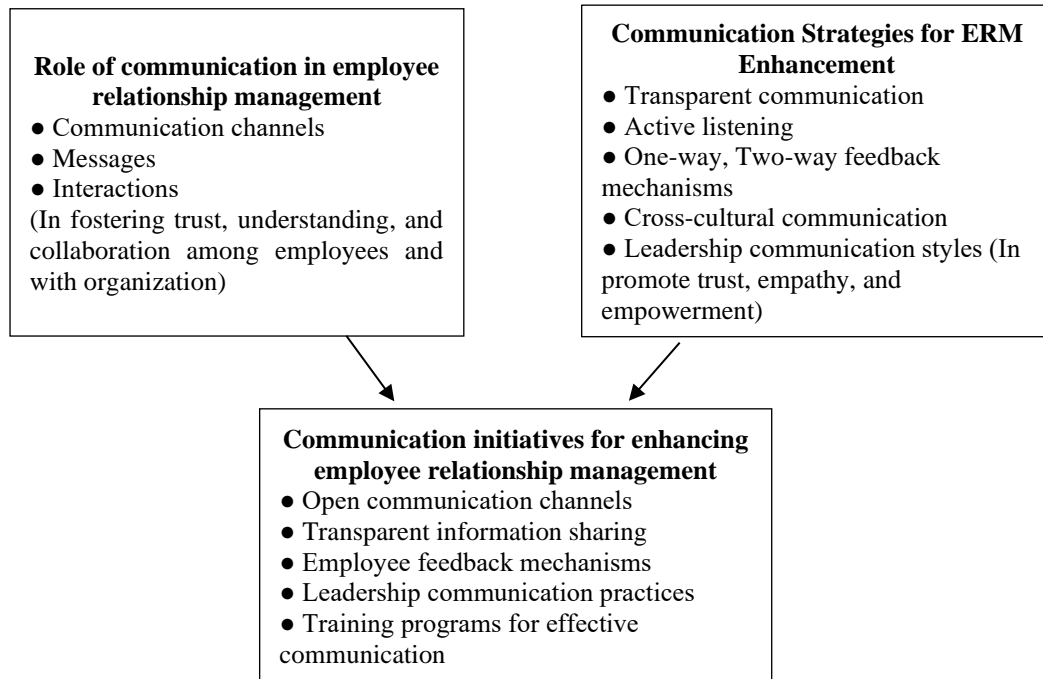


Figure 1 Conceptual framework

Moreover, the framework delineates communication initiatives geared towards augmenting ERM within the organization. These initiatives revolve around fostering open communication channels, advocating for transparent information sharing, emphasizing the importance of establishing formal feedback mechanisms, implementing initiatives for leadership communication practices, and offering training programs aimed at equipping employees with effective communication skills. Through these initiatives, Haier Group Enterprise can cultivate a communicative culture that strengthens employee relationships, enhances engagement, and drives organizational success.

3. Methodology

3.1 Research Design

This study utilized a qualitative research design to deeply investigate the communication practices at HG Enterprise and their impact on employee relationship management (ERM). Qualitative research was chosen for its ability to capture in-depth understanding and complex insights into human behavior and interactions, particularly within the organization [32]. This approach was well-suited for exploring how communication shaped ERM, capturing the participants' perspectives and experiences, as well as offering the flexibility to adapt as themes emerged during the research process [33]. By focusing on a participant-centered design, this research aimed to elicit authentic and detailed data, offering a nuanced understanding of organizational communication and its influence on ERM.

3.2 Key Informants

The study involved interviewing a diverse group of key informants at HG Enterprise, A total of 30 participants, including 5 senior managers, 10 department managers, 10 front-line employees and 5 personnel from the human resources department. Each group brought unique insights: executives provided strategic viewpoints on communication's role in ERM, managers offered perspectives on operational implementation, team leaders contributed knowledge on team-level dynamics, and staff members shared frontline experiences [34]. This selection strategy ensured comprehensive perspectives

on communication practices across organizational levels, enriching the study’s insights into how communication strategies affected ERM.

3.3 Data Collection

The data collection process included document analysis and semi-structured interviews to ensure a robust exploration of communication practices within HG Enterprise. Document analysis involved reviewing internal documents, such as memos, policies, and reports, to understand formal communication structures that shaped ERM. Additionally, semi-structured interviews with key informants captured personal experiences and viewpoints on communication’s role in ERM, offering narrative depth that complemented the document analysis. This triangulation of data sources aimed to provide a well-rounded perspective on communication’s impact on ERM and informed practical recommendations for enhancing communication practices at HG Enterprise.

3.4 Data Analysis

Interview data was transcribed and coded using thematic analysis to identify recurring themes and insights [35]. By cross-validating and triangulating findings from data sources, the study enhanced reliability and provided an integrated understanding of how communication practices influenced ERM at different organizational levels, culminating in data-driven recommendations for HG Enterprise.

4. Results

4.1 Role of communication in employee relationship management at HG Enterprise

Table 1 Role of communication in employee relationship management at HG Enterprise

Communication Aspect	Role in Employee Relationship Management	Description and Impact
Communication channels	Enhance trust and collaboration within the organization	HG Enterprise uses diversified communication channels (formal meetings, emails, internal social platforms) to bridge employees and management, ensuring accurate information delivery and timely feedback. This builds trust by reducing misunderstandings and facilitates direct communication through inter-departmental meetings, enhancing teamwork and collaboration efficiency.
Information clarity	Enhance employee engagement through clear and consistent communication	Clarity of information is prioritized by HG, which uses standardized terminology and transparent communication to ensure employees accurately understand company objectives and feel respected. This transparency fosters a sense of belonging and loyalty, while engaging employees through feedback, recognition, and responsiveness boosts motivation and job satisfaction.
Interactive communication	Promote understanding, conflict resolution, and collaboration among employees	Interactive communication is encouraged through team-building activities, internal training, and knowledge-sharing platforms. This approach helps employees understand each other’s work backgrounds, builds trust, and enables conflict resolution through feedback mechanisms, fostering a collaborative and harmonious work environment.

HG Enterprise recognizes the crucial role of communication in strengthening employee relationships. Effective communication channels, like formal meetings and internal platforms, help convey accurate information and foster trust, reducing misunderstandings and promoting collaboration. Clear and consistent information policies, using transparent updates and standardized language, ensure employees understand company goals, enhancing their sense of belonging and loyalty. HG also values interactive communication by encouraging team-building activities and knowledge-sharing, which foster

mutual understanding and teamwork. By using feedback channels to address conflicts, HG maintains a harmonious environment, boosting overall engagement and team efficiency.

4.2 Communication strategies implemented by HG Enterprise to enhance employee relationship management

Table 2 Communication strategies implemented by HG Enterprise to enhance employee relationship management

Strategy	Description	Impact on Employee Relationships
Transparent communication	HG shares company goals, policies, and updates through internal tools, employee handbooks, and town hall meetings.	Strengthens trust and engagement by ensuring employees understand operations and can contribute meaningfully.
Active listening	Leaders and managers engage in feedback through surveys and conversations, focusing on emotional and psychological needs.	Enhances employees' sense of belonging and loyalty by addressing their concerns and supporting personal growth.
Effective feedback mechanisms	HG utilizes anonymous feedback boxes and online platforms to gather employee opinions, promoting continuous improvement.	Increases satisfaction and drives innovation by applying feedback to enhance work conditions and employee benefits.
Cross-cultural communication	HG conducts training on cultural diversity and facilitates open channels for raising questions about cultural differences.	Bridges cultural gaps, fosters respect, and improves teamwork among diverse employee groups.
Leadership communication styles	Leaders prioritize honest communication, empathy, and employee empowerment in decision-making processes.	Builds trust and motivation while enhancing responsibility and collaboration within teams, improving overall efficiency.

HG Enterprise implements several communication strategies to enhance employee relationship management. Transparent communication is prioritized, as the company shares important information about goals and policies through internal tools and regular meetings, fostering trust and engagement among employees. Active listening is another key strategy, with leaders engaging in feedback sessions to understand and address employees' emotional and psychological needs, thereby strengthening their sense of belonging and loyalty. The company also established effective feedback mechanisms through anonymous platforms, promoting continuous improvement and innovation based on employee input. In the context of its diverse workforce, HG emphasizes cross-cultural communication by providing training on cultural sensitivity and encouraging open dialogue to bridge cultural gaps and foster respect. Lastly, the leadership communication style at HG focuses on transparency, empathy, and empowerment, allowing employees to participate in decision-making and fostering a sense of responsibility and collaboration. Together, these strategies significantly improve employee trust, engagement, and satisfaction within HG Enterprise.

4.3 Communication initiatives implemented by HG Enterprise to enhance employee relationship management

Table 3 Communication initiatives implemented by HG Enterprise to enhance employee relationship management

Initiative	Description
Smooth Communication Channels	Establishes a multi-channel platform (corporate mailboxes, internal forums, instant messengers) and holds regular staff meetings to facilitate timely face-to-face communication, reduce misunderstandings, and promote collaboration.
Transparent Information Sharing	Regularly publishes important company information (financial reports, business progress) and encourages employee participation in decision-making to strengthen trust and enhance a sense of belonging among employees.
Employee Feedback Mechanism	Implements various feedback channels (hotlines, online systems) and conducts employee satisfaction surveys to address concerns and improve job satisfaction and loyalty while providing insights for continuous improvement.
Shaping Leadership Communication Practices	Focuses on developing leaders with strong communication skills who engage employees in an open, respectful manner, fostering a positive atmosphere and encouraging collaboration in company development.
Training Program for Effective Communication	Offers training in communication skills, emotion management, and teamwork to enhance employee communication efficiency, improve cooperation, and strengthen trust and relationships among employees.

HG Enterprise has implemented several communication initiatives to enhance employee relationship management. They have established smooth communication channels through a multi-platform system, including corporate mailboxes and internal forums, alongside regular staff meetings to encourage collaboration and reduce misunderstandings. The company prioritizes transparent information sharing by regularly disseminating important updates and involving employees in decision-making, which fosters trust and a sense of belonging. An effective employee feedback mechanism allows for timely collection and analysis of employee opinions through various channels, addressing concerns and improving job satisfaction. Leadership communication practices focus on developing leaders who engage openly and respectfully with employees, cultivating a positive work environment. Additionally, HG offers training programs to improve communication skills, teamwork, and emotional management, further enhancing collaboration and trust among employees. Collectively, these initiatives contribute to increased employee satisfaction, loyalty, and organizational growth.

5. Conclusion and Recommendation

5.1 Conclusion

HG Enterprise has recognized the fundamental importance of effective communication in strengthening employee relationships and fostering a positive work environment. By implementing a range of communication strategies, including transparent information sharing, active listening, and feedback mechanisms, HG has successfully enhanced employee trust, engagement, and satisfaction. These initiatives not only contribute to improved organizational performance but also cultivate a culture of collaboration and inclusivity, which is vital for sustaining employee loyalty and organizational growth. The findings from HG Enterprise underscore the profound impact that effective communication has on employee relationship management, serving as a cornerstone for organizational success. Transparent communication, which encompasses regular updates and open dialogue, is instrumental in fostering an environment where employees feel informed, engaged, and valued. This is particularly important in today's fast-paced business landscape, where information overload can lead to confusion and disengagement. Clear communication not only enhances employee engagement but also significantly reduces the likelihood of misunderstandings, which can have detrimental effects on morale and productivity [36]. HG's commitment to using standardized language in its communications further supports this notion, ensuring that all employees, regardless of their roles or backgrounds, can comprehend the information being shared. This approach minimizes ambiguity and creates a unified understanding of organizational goals and expectations.

Moreover, the emphasis on active listening within HG aligns closely with the research highlights the critical nature of understanding employees' emotional and psychological needs [37]. This

form of communication fosters a deep sense of belonging and loyalty among employees, as they feel their voices are heard and their opinions valued. By creating opportunities for dialogue, such as feedback sessions and informal discussions, HG promotes an inclusive culture where employees are encouraged to express their thoughts and feelings. This is particularly crucial in today's diverse work environment, where varying perspectives can lead to richer insights and more innovative solutions.

The establishment of robust feedback mechanisms, including anonymous channels for input, has proven highly effective in promoting continuous improvement and innovation within HG Enterprise. This practice echoes the findings of [38], which emphasize the necessity of integrating employee feedback into organizational practices to enhance adaptability and responsiveness. By providing employees with safe spaces to voice their concerns and suggestions, HG not only empowers its workforce but also fosters a culture of trust and collaboration. This responsiveness to employee feedback enables the organization to identify areas for improvement and implement changes that align with employee expectations, ultimately leading to higher job satisfaction and retention rates.

In addition, HG's focus on cross-cultural communication training effectively addresses the challenges posed by a diverse workforce. This initiative facilitates respect and understanding among employees from various backgrounds, which is essential in today's globalized business environment [39]. By equipping employees with the skills to navigate cultural differences, HG cultivates an inclusive workplace that values diversity and promotes harmonious interactions. Such training not only enhances communication but also builds stronger teams capable of leveraging diverse perspectives to drive innovation and performance.

Furthermore, the leadership communication practices at HG, which prioritize transparency and empathy, significantly enhance employee empowerment. This approach aligns with transformational leadership theories, as articulated by [40], which advocate for inclusive decision-making processes that allow employees to actively participate in shaping their work environment. By fostering a culture where leaders are approachable and open to feedback, HG creates a supportive atmosphere that encourages collaboration and collective problem-solving. This empowerment leads to higher levels of engagement and motivation, as employees feel their contributions directly influence the organization's direction and success.

In conclusion, the findings illustrate that effective communication is not merely a tool for disseminating information but a vital element of employee relationship management. By fostering transparency, active listening, feedback mechanisms, cultural sensitivity, and empathetic leadership, HG Enterprise has positioned itself as a forward-thinking organization that values its employees and prioritizes their well-being. Such initiatives are essential not only for enhancing employee satisfaction and loyalty but also for driving overall organizational growth and success.

5.2 Recommendation

To build on the successes of its communication initiatives, HG Enterprise should consider several key recommendations aimed at further enhancing employee relationship management. First, enhancing training programs is essential. The company should continue to expand training that focuses on communication skills, cultural sensitivity, and conflict resolution. Second, HG should leverage technology for communication. Investing in advanced communication technologies can facilitate real-time feedback and collaboration, making it easier for employees to share their thoughts and ideas instantly. Additionally, it is crucial for HG to monitor and evaluate communication effectiveness. Regular assessments of communication strategies through employee surveys and feedback mechanisms will help identify areas for improvement. Finally, HG should foster a culture of recognition. Implementing initiatives that recognize and reward employee contributions can encourage ongoing engagement and reinforce the value of open communication. By adopting these recommendations, HG Enterprise can continue to enhance its employee relationship management strategies, leading to greater employee satisfaction and long-term organizational success.

Future research could explore the long-term impact of HG Enterprise's communication initiatives on employee performance and organizational outcomes. Additionally, comparative studies could be conducted to assess how communication strategies in HG Enterprise differ from those in other organizations within the same industry, providing insights into best practices. Another avenue for research could focus on the role of technology in facilitating remote communication and its effect on employee engagement in hybrid work environments. Lastly, examining the effectiveness of recognition programs on employee motivation across diverse demographic groups could offer valuable information for tailoring strategies to meet the needs of all employees.

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EXPLORING ENTREPRENEURIAL SPIRIT: CULTURAL, ORGANIZATIONAL, AND LEADERSHIP INSIGHTS FROM HG GROUP

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ABSTRACT

This study aimed to: 1) identify the key components of the entrepreneurial spirit within the HG Group; 2) examine the roles of culture, organization, and leadership in fostering this spirit; and 3) propose a model of entrepreneurial spirit from the HG Group's perspective. A qualitative research design was employed, beginning with an in-depth analysis of HG Group's internal documents. Data were analyzed using qualitative content analysis, which categorized themes such as leadership, cultural elements, organizational practices, and entrepreneurial spirit. Findings were validated through semi-structured interviews with three experts in entrepreneurship and organizational behavior, whose feedback enhanced the study's credibility. Results revealed that HG Group's entrepreneurial spirit is rooted in leadership, organizational practices, and corporate culture. Leadership, particularly the CEO's personal attributes, played a pivotal role. Organizational practices, including staff training and equity incentives, promoted internal mobility and aligned employee interests. Corporate culture, infused with traditional Chinese virtues and a "Wolf culture" emphasizing unity, teamwork, and customer focus, further reinforced the entrepreneurial environment. The study also highlighted the interconnected roles of culture, organizational practices, and leadership in fostering entrepreneurship. Leadership established corporate values and vision, while organizational practices like job rotation and equity incentives supported their realization. This synergy fostered an environment conducive to innovation. The proposed model of HG Group's entrepreneurial spirit underscored the alignment of leadership, organizational practices, and culture, which together created a resilient and innovative entrepreneurial ecosystem that drives growth and leadership development within the organization.

Keywords: entrepreneurial spirit; leadership; organizational practices; corporate culture

1. Introduction

China's economic landscape underwent dramatic transformations over the past few decades. With strategies aimed at both qualitative improvements and quantitative growth, Chinese enterprises played a critical role in this economic evolution. Amid this growth, entrepreneurial spirit played a fundamental role in the success and sustainability of businesses. However, shifts in the corporate mindset—especially post-WTO accession—saw businesses adopt advanced foreign technologies and prioritize innovation. Simultaneously, issues like declining social responsibility and unethical practices emerged, prompting concerns over the preservation of entrepreneurial values [1]. Theoretical literature on entrepreneurship acknowledged its importance but failed to address the nuanced components [2] that contributed to fostering such a spirit within organizations like HG Group. The theoretical gap lay in understanding how entrepreneurial spirit manifested within specific organizational frameworks, particularly in culturally distinct environments like China. While existing research offered insights into entrepreneurship, few studies focused on identifying the specific components that constituted the entrepreneurial spirit within established, globally competitive enterprises like HG Group.

Founded in the 1980s, HG Group became a leading information and communication technology (ICT) company and a global pioneer in 5G technology. HG Group leader, deeply embedded in traditional Chinese virtues and modern business strategies, made HG Group an exemplary case for studying entrepreneurial spirit. The company's success in balancing innovation, ethical management, and global competitiveness further strengthened its relevance as a subject of study. This paper used content analysis and literature research to investigate HG Group's entrepreneurial spirit and provided a model that highlighted the interplay of leadership, organizational practices, and culture.

While previous studies have extensively explored the relationship between culture, leadership, and organizational practices with entrepreneurship, there is a gap in understanding how these elements combine to form a cohesive entrepreneurial spirit within established and globally competitive organizations like HG Group. Current literature primarily focuses on entrepreneurial startups or small to medium enterprises (SMEs), often overlooking large corporations [3]. Moreover, little attention has been paid to the cultural and organizational nuances that shape entrepreneurial behavior in Chinese companies, particularly those with global operations [4]. This research aims to fill that gap by examining the components of entrepreneurial spirit specific to HG Group. It delves into how organizational culture, leadership, and internal practices intersect to foster innovation and entrepreneurship within a mature, global enterprise. The study's findings will contribute to a more comprehensive understanding of how entrepreneurial spirit is cultivated and sustained in large corporations, especially within the Chinese context.

The research objectives of this study were: 1) to identify key components and characteristics of the entrepreneurial spirit as demonstrated by the HG Group, 2) to examine the role of culture, organizational structure, and leadership within HG in nurturing and promoting an entrepreneurial spirit, and 3) to propose a model of entrepreneurial spirit from the perspective of the HG Group. This study aimed to offer a refined theoretical model of entrepreneurial spirit, with implications for both academic research and practical business strategy.

2. Literature Reviews

2.1 Entrepreneurial Spirit: Definition and Key Characteristics

Entrepreneurial spirit is often described as a dynamic force that drives innovation, risk-taking, and the pursuit of opportunity within uncertain environments [5]. Entrepreneurial individuals and organizations exhibit characteristics such as creativity, resilience, and a proactive attitude toward change [6]. This spirit not only fosters innovation but also strengthens an organization's ability to adapt to rapidly evolving market conditions. In the context of HG Group, the entrepreneurial spirit has been a key factor in its growth as a global ICT leader [7].

Research by [8] highlights the importance of opportunity recognition, a critical component of the entrepreneurial process. Opportunity recognition, combined with a willingness to innovate, enables firms like HG Group to maintain their competitive edge. This study explores how HG Group has identified key opportunities in the ICT sector, particularly its leadership in 5G technology, through the entrepreneurial vision of its founder and leadership team.

2.2 The Role of Organizational Culture in Fostering Entrepreneurial Spirit

Organizational culture plays a pivotal role in shaping the entrepreneurial spirit within a firm [9]. Corporate culture consists of shared values, beliefs, and practices that influence employees' behavior

and decision-making [10]. Cultures that promote openness, risk-taking, and innovation are often better positioned to cultivate entrepreneurial behavior [11]. HG Group's corporate culture, deeply rooted in the leadership principles established by its founder, has been crucial in fostering a spirit of entrepreneurship.

Cultural dimensions such as innovation, team orientation, and risk acceptance have been identified as key drivers of entrepreneurship in organizations [12]. HG Group, with its focus on continuous innovation and open collaboration, exemplifies this approach. The organization's ability to adapt to technological changes and maintain a forward-thinking perspective has helped it to become a global leader in ICT.

2.3 Organizational Practices and Entrepreneurial Behavior

Organizational practices, including systems, structures, and processes, significantly influence entrepreneurial behavior within companies [13]. A flexible organizational structure that supports autonomy, encourages experimentation, and rewards innovation can drive entrepreneurial initiatives. Studies suggest that companies that invest in employee development, provide resources for innovation, and encourage decentralized decision-making are more likely to foster entrepreneurial spirit [14]. At HG Group, organizational practices such as encouraging innovation and maintaining an agile structure have been key in nurturing entrepreneurship. The company has instituted processes that allow for swift adaptation to market shifts, fostering an environment where new ideas can be tested and implemented [15]. These practices not only support entrepreneurial initiatives but also enhance the company's competitiveness in the global ICT market.

2.4 Leadership and Entrepreneurial Spirit

Leadership is a critical factor in shaping entrepreneurial behavior within organizations. Entrepreneurial leaders inspire and motivate their teams by fostering a vision of innovation and risk-taking [16]. Research shows that leaders who encourage creativity, offer support for experimentation, and tolerate failure are more likely to cultivate entrepreneurial behavior among their employees [17].

HG Group's leadership, especially under the guidance of its founder, has been instrumental in creating a corporate environment that promotes entrepreneurial spirit. Founder's leadership style, characterized by visionary thinking and strong ethical standards, has played a vital role in shaping HG's entrepreneurial culture, ability to inspire his team and encourage a forward-looking approach has helped the company stay ahead in the highly competitive ICT industry.

2.5 Conceptual Framework

Conceptual framework as show in Figure 1.

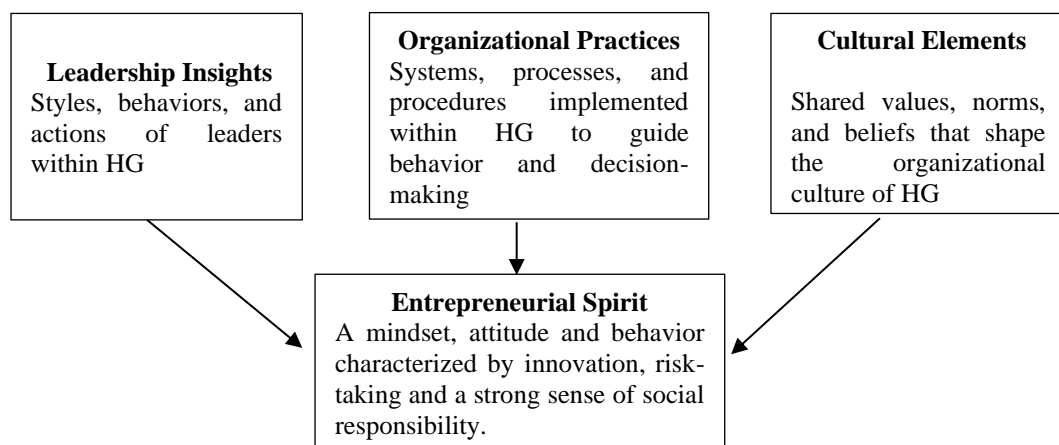


Figure 1 Conceptual framework

The conceptual framework underpinning this study delves into various aspects of entrepreneurship in the context of the HG Group. Entrepreneurship is defined as a combination of mindsets, attitudes and behaviors characterized by innovation, risk-taking and a strong sense of social responsibility. These elements were discovered through a detailed content analysis of HG Group's activities, strategies, and communications.

Cultural elements within HG Group constitute the shared values, norms, and beliefs shaping its organizational culture. The influence of these cultural elements is scrutinized concerning their facilitative or inhibitive effects on the development and expression of entrepreneurial spirit within the

organization. Organizational practices encompass the systems, processes, and procedures instituted within HG Group to guide behavior and decision-making. These practices are scrutinized to comprehend their role in either fostering or constraining entrepreneurial behavior among employees. Leadership approaches within HG Group encapsulate the diverse styles, behaviors, and actions exhibited by its leaders. Their influence is explored to discern how leadership practices either catalyze or impede entrepreneurial initiatives and mindset within the organization.

In essence, the conceptual framework provides a structured approach to scrutinizing the entrepreneurial spirit within the HG Group, incorporating internal factors such as culture, practices, and leadership, alongside external factors such as industry trends and competitive dynamics.

3. Methodology

This research employed a qualitative design that integrated a document study and expert validation to examine HG Group's entrepreneurial spirit. The document sources included annual reports, corporate communications, strategic plans, internal memos, policy documents, and relevant publications, which provided insights into HG's entrepreneurial spirit, leadership approaches, and organizational practices. The research incorporated insights from five experts. Purposive sampling identified experts with substantial knowledge in entrepreneurship, organizational behavior, and HG Group's operations. These experts consisted of current or former employees, industry analysts, academics, and consultants.

The research utilized two primary instruments for data collection. For the document analysis, a predefined coding framework was employed to categorize entrepreneurial initiatives, leadership styles, cultural elements, and organizational practices. Data extraction sheets systematically captured relevant details from each document, ensuring a thorough and organized analysis. In addition, structured interview guides were developed for the expert validation phase. These guides included open-ended interview questions designed to explore key themes such as leadership, organizational practices, and the entrepreneurial climate at HG Group. By engaging with experts, the research aimed to gather in-depth perspectives that would validate the findings from the document study.

Data analysis employed qualitative content analysis [18] to identify recurring patterns within the documents, applying a coding framework to categorize data related to innovation, risk-taking, and leadership. Triangulation ensured the reliability of the findings by cross-referencing different data sources [19].

4. Results

4.1 Key components and characteristics of the entrepreneurial spirit as demonstrated by the HG Group

The entrepreneurial spirit of HG Group is anchored in three pivotal components: leadership, organizational practice, and corporate culture.

1) Leadership within HG Group showcases two distinct styles: military transformational leadership and charismatic technology leadership. This duality is exemplified by its founder, who embody different yet effective leadership traits. The research indicates that entrepreneurial leadership is characterized by subjective initiative and robust personal traits shaped by individual life experiences, values, and environments. While other leaders can learn from these styles, replication is impractical due to their unique contexts. The effectiveness of these leadership styles in navigating the challenges faced by HG Group highlights qualities such as adaptability to change, a strong respect for technology, and keen market insights, offering valuable lessons for aspiring entrepreneurs while underscoring the importance of authenticity in leadership.

2) Organizational practice, seen as institutional practice, serves as the most objective aspect of HG Group's entrepreneurial spirit. This practice prioritizes employee training and talent development and emphasizes the implementation of systematic policies. Notable initiatives, such as the job rotation and equity incentive systems, illustrate HG Group's commitment to fostering internal mobility and economic equity among employees. These practices combat the "big company disease," which often stifles career progression in larger organizations by ensuring that employees are rotated regularly based on quantifiable indicators. By aligning personal interests with organizational goals through its equity incentive policies, HG Group successfully motivates employees, particularly in its technology-focused environment, driving continuous innovation and attracting top talent.

3) Corporate culture serves as the spiritual foundation of HG Group, embodying its historical narrative and guiding principles. This culture is divided into macro, intermediate, and micro levels. At

the macro level, it reflects the traditional virtues of Chinese culture, emphasizing values such as kindness, humility, and tolerance. The intermediate level encompasses the "Wolf culture" and nationalist spirit, which are rooted in the experiences of HG Group's leadership and emphasize teamwork, perseverance, and patriotism. These cultural elements not only foster a resilient spirit within the organization but also enable HG Group to navigate crises effectively. On a micro level, the corporate culture is manifest in employee work standards, which prioritize customer satisfaction, hard work, self-criticism, openness, sincerity, and teamwork. This alignment between individual actions and overarching corporate values reinforces a cohesive organizational identity, enhancing HG Group's ability to thrive in the competitive marketplace.

In summary, HG Group's entrepreneurial spirit, characterized by its leadership styles, organizational practices, and corporate culture, exemplifies a holistic approach to fostering innovation and resilience. By embracing these components, HG Group not only navigates its unique challenges but also cultivates an environment conducive to sustained growth and success.

4.2 Role of the cultural, organizational, and leadership within HG in nurturing and promoting an entrepreneurial spirit

The analysis of the three elements of entrepreneurship—leadership, organizational practices, and corporate culture—reveals their interrelatedness and collective influence on cultivating an entrepreneurial spirit at HG Group. Leadership serves as the catalyst for entrepreneurship, being directly infused by the founder and core leadership team. This leadership not only communicates values but also shapes the corporate culture, aligning with HG Group's military transformational leadership style. This style embodies strong enterprising and creative thinking, fostering an environment where innovative ideas can flourish. Additionally, this leadership approach resonates with traditional Chinese virtues, which emphasize moral character, integrity, and the importance of team development. By embodying these virtues, the leadership at HG Group instills a sense of purpose and direction, encouraging employees to embrace an entrepreneurial mindset.

Organizational practices play a supportive role in this entrepreneurial ecosystem by providing the institutional framework necessary for fostering entrepreneurial leadership. These practices, including the post-rotation and equity incentive systems, serve as tangible carriers of the entrepreneurial spirit, translating lofty ideals into actionable frameworks that guide daily operations. The significance of these practices is exemplified by HG Group's long-standing commitment to developing a Basic Law of Management, which chronicles the company's evolution and serves as a roadmap for future progress. This structured approach not only ensures that entrepreneurial values are consistently applied but also empowers employees to take initiative and engage in innovative endeavors.

Corporate culture acts as the spiritual foundation of HG Group and is integral to the entrepreneurial model. It not only directly influences and reflects the entrepreneurial spirit but is also deeply intertwined with leadership and organizational practices. Effective leadership, rooted in a strong corporate culture, must align with organizational practices to ensure the sustainability of the entrepreneurial spirit. This alignment fosters an environment where employees feel empowered to express their creativity and pursue innovative solutions, ultimately contributing to the company's growth and resilience. Together, these elements create a cohesive ecosystem that nurtures and promotes entrepreneurship within HG Group, driving innovation and growth in an increasingly competitive landscape.

In this context, the synergy between leadership, organizational practices, and corporate culture becomes evident. Leaders who actively promote a culture of entrepreneurship instill confidence in their employees, encouraging them to take calculated risks and pursue new opportunities. Simultaneously, organizational practices that reward innovation and provide clear pathways for advancement reinforce this culture, making it easier for employees to engage with the entrepreneurial spirit of the company. This interconnectedness cultivates an environment where innovation thrives, enabling HG Group to adapt to changing market conditions and maintain its competitive edge.

Furthermore, the role of corporate culture in reinforcing entrepreneurial values cannot be overstated. A robust corporate culture fosters trust and collaboration among employees, encouraging them to share ideas and collaborate on projects without fear of failure. This openness leads to a continuous cycle of feedback and improvement, where innovative ideas can be tested, refined, and implemented effectively. As a result, HG Group's entrepreneurial spirit becomes ingrained in its daily operations, influencing not only the behavior of its employees but also the strategic decisions made at the highest levels of leadership.

Ultimately, the interplay of leadership, organizational practices, and corporate culture creates a fertile ground for cultivating an entrepreneurial spirit at HG Group. By leveraging these elements effectively, the company positions itself to capitalize on new opportunities, drive innovation, and achieve sustainable growth in an ever-evolving business landscape. This holistic approach to entrepreneurship serves as a model for other organizations seeking to foster a similar spirit within their own corporate environments.

4.3 Model of entrepreneurial spirit from the perspective of the HG Group

The entrepreneurial spirit model derived from this research provides a compelling framework, drawing on the unique characteristics of HG Group within the context of Chinese entrepreneurship. This model is not merely theoretical; it is grounded in extensive empirical research, including a detailed examination of HG Group and its industry practices against the backdrop of China's socio-economic landscape. Model of entrepreneurial spirit from the perspective of the HG Group as show in Figure 2.

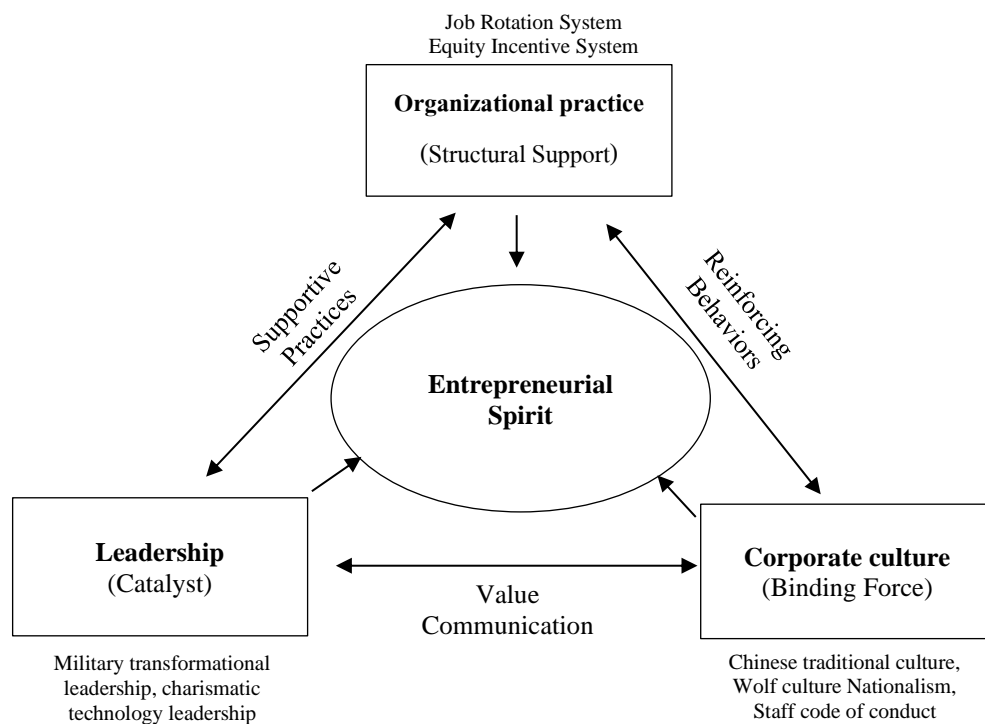


Figure 2 Model of entrepreneurial spirit from the perspective of the HG Group

Model of entrepreneurial spirit from the perspective of the HG Group reveals a complex interconnection that fosters a strong entrepreneurial spirit. Leadership serves as the primary catalyst, directly influencing the organization's direction and values. The personal experiences of leaders, shape their unique leadership styles—characterized by decisiveness, strength, and creativity. These traits not only guide employees in performance but also cultivate an entrepreneurial mindset, emphasizing risk-taking and innovation.

Leaders at HG Group embody and communicate corporate values, creating a culture that promotes entrepreneurship and aligns personal visions with organizational goals. This leadership-driven culture reinforces a sense of shared purpose among employees, ensuring that entrepreneurship becomes a core aspect of the company's identity. On the structural side, organizational practices provide the essential framework that operationalizes the entrepreneurial spirit. Through a blend of formal and informal systems—such as internal training programs, collaborative models, and resource allocation—HG's organizational practices institutionalize entrepreneurship, enabling employees to take ownership of their projects and innovate. These practices reflect leadership's priorities, ensuring flexibility and responsiveness that foster an entrepreneurial mindset. Culture, as the binding force, sustains and

propagates this entrepreneurial spirit within HG Group. The "Wolf Culture" emphasizes resilience, adaptability, and competitiveness, traits that resonate with current employees and extend to alumni and entrepreneurs trained by HG. Cultural narratives and rituals continuously remind members of their entrepreneurial mission, serving as a reminder of the values instilled by leadership.

Ultimately, the relationship among leadership, organizational practices, and culture is synergistic and self-reinforcing. Leadership initiates the entrepreneurial vision, organizational practices provide the mechanisms to support it, and culture sustains and amplifies it throughout the organization. This cohesive environment, where each element enhances the others, fosters continuous innovation and growth, making entrepreneurship ingrained in HG Group's DNA. As a result, HG Group not only embodies a national enterprise known for strength and integrity but also influences broader industries and shapes future entrepreneurial leaders.

Experts affirmed that the entrepreneurial spirit model aligned well with HG Group's internal environment and training methods. They suggested incorporating innovation-driven development strategies into the model to reflect the current demands of the Chinese government and better meet the needs of Chinese enterprises. By adding innovation to the corporate culture section, the experts emphasized that the model would gain greater relevance and practical applicability.

Experts highlighted the importance of ensuring that academic models remain objective and operable. They noted that while the entrepreneurial leadership examples drawn from HG Group are valuable, the uniqueness of HG Group's success might pose challenges for practitioners seeking to replicate their leadership style. To enhance the model's realism and objectivity, one expert recommended placing greater emphasis on the role of practice and culture within the entrepreneurial model.

Moreover, the experts underscored the significant impact that the company's promotion of entrepreneurship has on its employees, particularly through its corporate culture. They introduced the concept of "cushion spirit," illustrating how employees often work long hours while using cushions for comfort during breaks. This practice symbolizes HG Group's dedication, perseverance, and commitment to maximizing creativity within the workplace.

5. Conclusion and Recommendation

5.1 Conclusion

The entrepreneurial spirit model developed from this research offers a nuanced framework that captures the distinctive characteristics of HG Group within the broader landscape of Chinese entrepreneurship. This model is not merely a theoretical construct; it is firmly rooted in extensive empirical research that includes an in-depth analysis of HG Group's practices and their interplay with China's socio-economic context.

1) Dimensions of the entrepreneurial spirit model

The proposed model encompasses two essential dimensions. First, it is extensive, reflecting the collective experiences of numerous Chinese enterprises that emerged during the reform and opening-up period, particularly in Shenzhen. This city has gained recognition for its rapid development and innovation, making it a fertile ground for technological enterprises. The model encapsulates the spirit of this era, wherein various local companies thrived, facing a range of opportunities and challenges typical of this transformative period [20]. Consequently, HG Group serves as a representative case study that illustrates the entrepreneurial journeys of many Chinese firms amidst evolving market dynamics and social transformations.

Second, the model highlights the unique entrepreneurial spirit that distinguishes HG Group from its competitors. This uniqueness arises from several factors, including significant advancements in communication technology, the life experiences of the founder, Mr. R, and the company's resilience in the face of external sanctions. The attributes of "wolfism," nationalism, and patriotism, combined with the infusion of traditional Chinese cultural values, establish an entrepreneurial spirit that is deeply ingrained in the organization's identity. These qualities foster a strong sense of loyalty and commitment among employees, shaping a collective ethos that is challenging to replicate in other organizations [21].

2) Core components of the model

At the heart of this research model is the concept of entrepreneurship, supported by three critical elements: leadership, organizational practices, and corporate culture. This arrangement emphasizes the interconnectedness of these components, where leadership and culture provide subjective, thought-based support, while organizational practices serve as the objective, material foundations for entrepreneurial activities.

Leadership, within HG Group, the leadership style embodies transformational qualities that prioritize motivation, innovation, and a strong commitment to the company's vision. Such leadership not only guides the strategic direction but also inspires employees to adopt an entrepreneurial mindset, fostering an environment conducive to creativity and risk-taking [22].

Organizational practices, these practices are the tangible manifestations of the entrepreneurial spirit within HG Group. The focus on innovative systems, such as post-rotation and equity incentive programs, cultivates a culture of engagement and initiative, translating the leadership's vision into actionable goals. This strategic alignment encourages employees to actively participate in the entrepreneurial process, thereby enhancing organizational performance [23].

Corporate culture, serving as the spiritual backbone of HG Group, corporate culture encapsulates the values and beliefs that shape behavior and decision-making. The culture at HG Group promotes resilience, adaptability, and a robust sense of identity among its members, aligning with traditional Chinese values that emphasize community and collective success. This cultural framework enables the organization to navigate challenges and capitalize on opportunities effectively [24].

3) Integration of subjective and objective factors

The entrepreneurial spirit model articulates a comprehensive view of entrepreneurship by integrating both subjective and objective factors. This dual focus enhances the robustness of the findings, providing a holistic understanding of how entrepreneurship manifests within HG Group. By adopting a macro-to-micro perspective, the model illustrates the multifaceted nature of entrepreneurial development, shedding light on how leadership, organizational practices, and corporate culture interact to foster an environment ripe for innovation and growth [25].

The entrepreneurial spirit model derived from HG Group not only offers an exemplary framework for understanding entrepreneurship within the context of Chinese enterprises but also highlights the unique attributes that characterize HG Group's approach to business. This model is anticipated to provide valuable insights for both scholars and practitioners, illuminating the intricate relationships between leadership, organizational practices, and corporate culture in nurturing entrepreneurship.

5.2 Recommendation

Based on the findings presented in this research, the entrepreneurial spirit model developed from the study of HG Group offers significant theoretical implications and future research directions.

Firstly, this model expands existing entrepreneurial frameworks by highlighting the intricate interplay between leadership, organizational practices, and corporate culture. This multidimensional approach emphasizes the necessity for more holistic frameworks that capture the nuances of entrepreneurship, particularly in rapidly evolving markets like China. Additionally, the findings underscore the critical role of cultural context, illustrating how traditional Chinese values, such as collectivism and patriotism, shape the entrepreneurial spirit. This insight calls for future research to incorporate cultural dimensions as essential factors influencing entrepreneurial behavior and organizational identity.

Moreover, the integration of subjective and objective factors in the model presents a comprehensive perspective on entrepreneurship, encouraging further exploration into how these dimensions can be effectively measured and evaluated across various contexts. This dual focus enhances the understanding of the multifaceted nature of entrepreneurial development, shedding light on how leadership, organizational practices, and corporate culture collectively foster innovation and growth. The dynamic nature of the entrepreneurial spirit, as indicated by the research, invites scholars to investigate how external factors, including governmental policies and market changes, can influence the entrepreneurial characteristics of firms over time.

In terms of future research suggestions, comparative studies between HG Group and other Chinese enterprises would be valuable to identify commonalities and differences in leadership styles, organizational practices, and cultural attributes that impact entrepreneurial success. Longitudinal studies could provide insights into how the entrepreneurial spirit within HG Group evolves in response to external pressures, such as economic fluctuations and technological advancements. Additionally, researchers could test the broader applicability of the entrepreneurial spirit model in different industries or geographical contexts, validating its robustness across various cultural and economic environments. Exploring the individual components of the model—leadership, organizational practices, and corporate culture—would further deepen the understanding of their specific impacts on entrepreneurial outcomes.

Finally, investigating the influence of technology on entrepreneurship and incorporating employee perspectives could yield valuable insights into how corporate culture and leadership styles

affect motivation and innovation. By addressing these theoretical implications and future research avenues, scholars can contribute to a more nuanced understanding of entrepreneurship within the unique context of HG Group and similar enterprises.

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In closing, my journey at Dhonburi Rajabhat University has been transformative. I am deeply grateful to my advisor, Assistant Professor Dr. Jirapong Ruanggoon, for his invaluable support, and to my family for their encouragement. I also carry a heartfelt appreciation for my homeland, which has empowered me to pursue my academic goals. As I graduate, I cherish the experiences and friendships I've gained here. Thank you.

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ESG INITIATIVES FOR ENHANCING STAKEHOLDER ENGAGEMENT AND SUSTAINABLE DEVELOPMENT: A CASE STUDY OF SN AUTOMOBILE COMPANY

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ABSTRACT

The research objectives were as follows: 1) to examine the ESG initiatives implemented at SN Automobile Company; 2) to analyze the barriers and facilitators in the implementation of ESG initiatives for stakeholder involvement and sustainable development in the context of SN Automobile Company; 3) to propose ESG initiatives for enhancing stakeholder involvement and sustainable development at SN Automobile Company. This study employed a qualitative case study, including semi-structured interviews and document analysis, to fully understand SN's experiences and challenges in ESG practices. The key informants were 16 in total and consisted of senior management, middle management, SN Company staff, ESG experts/consultants, and other industry experts. Secondary data sources included the SN official website for ESG reports, financial databases for impact analysis, news media for public opinions, and government websites for relevant policies. Thematic analysis was used for data analysis. This findings revealed that: 1) SN implemented a series of ESG initiatives in the environmental, social, and governance areas, such as carbon reduction, renewable energy utilization, employee care, community engagement, and transparent management; 2) the barriers and facilitators in the implementation of ESG initiatives for stakeholder involvement and sustainable development included unscientific emission reduction target setting, low employee engagement, fragmented community activities, and opaque decision-making processes; 3) to promote the effective implementation of ESG practices, the study proposed specific initiatives, including clarifying emission reduction targets, enhancing employee training and career development, systematizing community engagement activities, and optimizing decision-making processes. These findings underscored the critical importance of how companies could enhance stakeholder engagement and promote sustainable development through ESG initiatives.

Keywords: ESG initiatives; stakeholder engagement; sustainable development

1. Introduction

Corporate sustainability became increasingly crucial as businesses addressed environmental and social challenges. The Environmental, Social, and Governance (ESG) framework emerged as a key strategy for companies to operationalize their commitment to sustainable development [1], particularly in industries like automotive, where environmental impacts were significant. The global shift in the automotive industry, driven by the need to combat climate change, made electric vehicles (EVs) a promising solution [2]. However, EV production posed sustainability challenges, including sourcing battery materials and managing vehicle end-of-life [3]. This research focused on SN Automobile Company (SN), a leading Chinese EV manufacturer, and its current ESG initiatives. Despite China's ambitious goals for transitioning to electric vehicles, there was limited research on the practical implementation of ESG strategies in China's EV sector, particularly regarding the barriers and facilitators that affected these initiatives [4].

While numerous studies explored ESG frameworks broadly, few examined their practical implementation in specific sectors like the Chinese electric vehicle (EV) industry [5]. A key theoretical gap existed in understanding how ESG principles were applied within this unique context. There was also a lack of in-depth analysis on the barriers and facilitators that affected the success of ESG initiatives in the EV sector [6], particularly in relation to China's regulatory, technological, and market landscape. Furthermore, research often overlooked the critical role of stakeholder involvement. Stakeholder perceptions—whether from employees, customers, or investors—were instrumental in shaping the effectiveness of ESG initiatives [7], yet these dynamics remained underexplored in the literature.

Another theoretical gap related to the industry-specific challenges of ESG adoption. Existing studies tended to generalize ESG practices across industries, failing to address the unique issues faced by EV manufacturers, such as battery sourcing and recycling [8]. These challenges necessitated tailored ESG strategies. Lastly, while theoretical insights on ESG were prevalent, there was a gap in translating them into practical, actionable strategies, particularly for emerging industries like EV manufacturing [9]. This study aims to address three key objectives:

- 1) To examine the current ESG initiatives implemented at SN Automobile Company
- 2) To analyze the barriers and facilitators in the implementation of ESG initiatives for stakeholder involvement and sustainable development at SN
- 3) To propose new ESG initiatives that can enhance stakeholder engagement and promote sustainable development at SN.

By exploring SN's ESG strategies and the unique challenges they face, such as battery sourcing and recycling, this research fills a theoretical gap by focusing on the practical barriers and facilitators influencing ESG adoption in China's EV industry. It also examines how stakeholder perceptions—employees, customers, investors, and regulators—affect the success of these initiatives. The findings will contribute both theoretical insights and practical recommendations for improving ESG practices in the automotive sector.

2. Literature Reviews

2.1 Sustainable Development

Sustainable development refers to the process of meeting current needs without compromising the ability of future generations to meet their own needs [10]. It encompasses three interconnected pillars: environmental protection, social equity, and economic growth [11]. In the corporate context, sustainable development involves integrating these principles into business operations, with the aim of reducing environmental impacts, ensuring social responsibility, and fostering economic resilience [12]).

For companies like SN Automobile, sustainable development plays a crucial role in shaping long-term business strategies. The automotive industry, known for its environmental footprint, faces increasing pressure to adopt sustainable practices, such as reducing emissions, minimizing resource use, and transitioning to renewable energy sources [13]. Social aspects of sustainable development, such as fair labor practices, community engagement, and diversity, are also critical for maintaining a socially responsible brand image and ensuring positive stakeholder relationships [14].

To achieve sustainable development, companies must adopt a holistic approach that integrates environmental, social, and governance (ESG) strategies. This includes not only addressing immediate sustainability issues, such as reducing carbon emissions or improving labor practices, but also anticipating future challenges and preparing for long-term environmental and social trends [15].

Sustainable development, therefore, is closely tied to ESG initiatives, as it requires a balanced and integrated effort across all dimensions of a company's operations.

Entrepreneurial Spirit: Definition and Key Characteristics

2.2 Environmental, Social, and Governance (ESG) Initiatives

ESG initiatives are increasingly recognized as essential in shaping an organization's long-term success, particularly in industries with significant environmental and social impacts, such as the automotive sector. ESG frameworks encourage companies to adopt policies, practices, and programs that balance profit-making with positive contributions to society and the environment [16]. ESG initiatives typically focus on reducing environmental footprints, fostering social responsibility, and improving corporate governance structures [17]. At SN Automobile Company, the current ESG initiatives likely focus on reducing carbon emissions, ensuring compliance with environmental regulations, enhancing employee well-being, and improving supply chain transparency. The automotive industry has been particularly proactive in adopting environmental sustainability measures, including developing electric vehicles (EVs) and implementing energy-efficient manufacturing processes [18]. Companies in this sector also address social aspects, such as labor practices and community engagement, as well as governance elements like board diversity and ethical decision-making [19].

2.3 Barriers and Facilitators of ESG Implementation

2.3.1 Internal Factors

Organizational culture plays a critical role in ESG implementation. A culture that prioritizes sustainability and ethical behavior tends to facilitate the adoption and success of ESG initiatives [20, 2010]. For instance, companies where sustainability is embedded in the corporate values are more likely to see employees and managers actively participating in ESG practices [21]. In contrast, a lack of awareness or understanding of ESG's importance within the organizational culture can be a significant barrier [22].

The role of leadership is pivotal in driving ESG initiatives. Leaders who support sustainable development create an environment where ESG objectives align with the company's overall strategic goals [23]. Leadership commitment ensures the necessary resources are allocated to ESG projects and fosters a top-down approach where sustainability is integrated into every level of the organization [24]. However, a lack of leadership involvement or conflicting priorities within management can hinder ESG adoption [25].

Resource constraints are a frequent internal barrier to effective ESG implementation. While companies often recognize the value of ESG initiatives, limited financial, human, and technological resources can impede their ability to fully implement such programs [26]. For example, introducing green technologies or comprehensive social programs may require significant upfront investments, which not all companies are prepared to undertake [27]. On the other hand, firms that allocate sufficient resources often benefit from long-term savings, improved reputation, and better stakeholder relationships [28].

2.3.2 External Factors

Government regulations and international standards are key external drivers of ESG initiatives. For instance, automotive companies must adhere to stringent environmental regulations that limit carbon emissions and promote cleaner production methods [29]. Compliance with these regulations can serve as both a facilitator and a barrier; while it may drive ESG adoption, the complexity and cost of compliance can pose challenges [30].

Stakeholders, including customers, investors, and communities, increasingly demand companies to implement robust ESG practices. Customers are showing a preference for products from environmentally responsible companies, while investors are factoring ESG performance into their decision-making processes [31]. Failing to meet these expectations can damage a company's reputation and competitiveness. However, aligning ESG initiatives with stakeholder interests can strengthen relationships and improve overall organizational performance [32].

Market conditions also impact ESG implementation. Economic downturns or volatile market environments may limit a company's ability to invest in ESG initiatives due to resource scarcity or shifting business priorities [33]. Conversely, market trends toward sustainability, such as increasing demand for electric vehicles, can facilitate ESG adoption by opening new business opportunities [34].

2.5 Conceptual Framework

To enhance stakeholder engagement and promote sustainable development, SN Automobile Company should consider introducing innovative ESG initiatives. For instance, deepening the company's commitment to sustainable product innovation by expanding its electric vehicle lineup or investing in renewable energy for its operations could demonstrate a proactive approach to environmental

responsibility [34]. Additionally, social initiatives focusing on workforce development, community support programs, and diversity in leadership would strengthen the company’s social impact and enhance its reputation among stakeholders [35]. Further, governance-related initiatives such as transparent reporting, anti-corruption policies, and fostering boardroom diversity could bolster SN’s overall ESG performance. Establishing regular stakeholder consultations or partnerships with environmental and social organizations can also promote better stakeholder engagement and ensure that ESG initiatives are aligned with external expectations [36]. Conceptual framework as show in Figure 1.

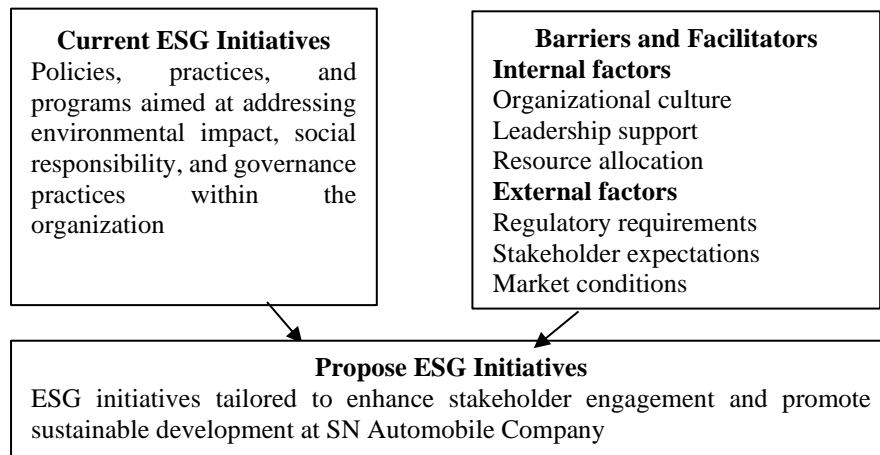


Figure 1 Conceptual framework

This study focuses on identifying and evaluating the Environmental, Social, and Governance (ESG) initiatives currently implemented at SN Automobile Company. It will comprehensively examine policies, practices, and programs aimed at addressing environmental impact, social responsibility, and governance practices within the organization. Additionally, the research will analyze internal factors such as organizational culture, leadership support, and resource allocation, alongside external factors like regulatory requirements, stakeholder expectations, and market conditions that influence the implementation of these initiatives. Based on these findings, the study will propose new ESG initiatives designed to enhance stakeholder involvement and foster sustainable development at SN Automobile Company. These recommendations will be informed by identified gaps, industry best practices, and stakeholder feedback obtained throughout the research process, provides a framework for examining the specific practices and strategies implemented by SN.

3. Methodology

This study employed a qualitative case study approach to explore how Environmental, Social, and Governance (ESG) initiatives influenced stakeholder involvement and sustainable development at SN Automobile Company. The methodology involved semi-structured interviews and document analysis to capture the experiences and perceptions of key stakeholders regarding the company's ESG initiatives.

Semi-Structured Interviews
 A purposive sample of 16 participants was carefully selected for the semi-structured interviews, comprising senior executives, middle managers, company staff, ESG experts, and industry specialists. Participants were chosen based on their direct involvement in ESG initiatives and their minimum of two years of relevant experience. The interviews focused on key themes, including participants' understanding of ESG initiatives, their perceptions of the effectiveness of these initiatives, the challenges encountered during implementation, and the initiatives' impact on stakeholder engagement and sustainable development. Secondary data was collected from a variety of sources, including corporate ESG reports spanning 2021 to 2023, media reports, and relevant academic literature. To ensure the validity of the findings, a triangulation approach was utilized, incorporating diverse data sources to corroborate insights gathered from the interviews.

Thematic analysis was employed to systematically process the data obtained from both interviews and documents. The analysis began with familiarization, where the researcher reviewed the qualitative data to develop a comprehensive understanding of its content [37]. Initial coding then took

place, involving the assignment of labels to segments of data that captured important concepts. Following this, codes were grouped into broader themes, such as the effectiveness of ESG initiatives, stakeholder involvement, and the overall impact on sustainable development. Each theme was meticulously reviewed, defined, and named to ensure an accurate representation of the data. The final analysis culminated in a narrative presentation of the identified themes.

4. Results

4.1 The current ESG initiatives implemented at SN Automobile Company.

SN Automobile Company has implemented a series of comprehensive ESG (Environmental, Social, Governance) initiatives aimed at balancing economic benefits with social responsibility and ensuring long-term sustainable development.

Table 1 Current ESG initiatives implemented at SN Automobile Company

ESG Initiatives	Details
1. Environmental Initiatives	Carbon Reduction and Energy Efficiency: Set specific targets, optimized production processes, adopted energy-saving technologies, and installed solar panels for renewable energy. Waste Management: Established waste classification and treatment systems to increase recycling and strengthened environmental monitoring. Green Supply Chain: Requires suppliers to comply with environmental regulations and use eco-friendly materials.
2. Social Initiatives	Employee Care and Career Development: Offers training, fair promotion mechanisms, and welfare activities to boost employee satisfaction. Community Engagement: Sponsors community projects and encourages volunteer participation. Product Responsibility: Ensures product safety and provides comprehensive after-sales services.
3. Governance Initiatives	Transparent Management: Releases regular ESG reports and maintains communication with investors and the public. Board Diversity and Governance Structure: Has a diversified board and strong internal governance for effective decision-making. Stakeholder Communication: Organizes investor meetings and customer symposia to maintain stakeholder communication.

SN Automobile Company has implemented a series of comprehensive ESG (Environmental, Social, Governance) initiatives aimed at balancing economic benefits with social responsibility and ensuring long-term sustainable development.

In the realm of environmental initiatives, SN has set specific carbon reduction targets and is optimizing production processes by introducing advanced energy-saving technologies and improving energy efficiency. The company has also installed solar photovoltaic panels to promote renewable energy usage. To enhance waste management, SN established a strict waste classification and treatment system to increase recycling rates and strengthened its environmental monitoring to minimize the impact of production activities. Additionally, the company emphasizes a green supply chain by requiring suppliers to comply with environmental regulations and provide eco-friendly materials.

On the social front, SN prioritizes employee care and career development by offering training opportunities, establishing fair promotion mechanisms, and organizing various welfare activities to enhance employee satisfaction. The company actively engages with the community by sponsoring projects and encouraging employee participation in volunteer services. Furthermore, SN ensures product responsibility by maintaining product safety and providing a comprehensive after-sales service system to protect consumer rights.

Governance initiatives at SN include transparent management practices, where the company releases regular ESG reports to disclose its performance and maintains open communication with investors and the public. The company has a diversified board of directors and a strong internal governance structure to ensure effective decision-making. Lastly, SN organizes regular investor meetings, customer symposia, and other activities to facilitate ongoing communication with stakeholders and adjust its strategies as necessary.

4.2 The barriers and facilitators in the implementation of ESG initiatives for stakeholder involvement and sustainable development in the context of SN Automobile Company.

Table 2 Barriers and facilitators in the implementation of ESG initiatives for stakeholder involvement and sustainable development

Category	Barriers	Facilitators
Environmental	<ul style="list-style-type: none"> - Difficulty in setting and achieving emission reduction targets due to lack of scientific basis and effective monitoring mechanisms. - High traditional energy use and poor energy management hinder progress. 	<ul style="list-style-type: none"> - Technological Advancement: Innovations in renewable energy and production technologies support ESG initiatives.
Social	<ul style="list-style-type: none"> - Limited employee awareness and engagement in ESG initiatives. - Underdeveloped stakeholder communication mechanisms. - Fragmentation in community engagement and public welfare activities hinders effectiveness. 	<ul style="list-style-type: none"> - Leadership Support: Strong commitment and active involvement from leadership drive the implementation of ESG initiatives.
Governance	<ul style="list-style-type: none"> - Lack of transparency and fairness in the decision-making process. - Inadequate or inaccurate ESG information disclosure. 	<ul style="list-style-type: none"> - Resource Allocation: Adequate resources (budget, human resources, and technical support) ensure smooth implementation of ESG projects. - Regulatory Requirements: Guidelines and incentives from regulatory frameworks promote the adoption of ESG practices. - Market Demand: Growing consumer and investor awareness of ESG issues drives prioritization of initiatives.

The implementation of Environmental, Social, and Governance (ESG) initiatives at SN Automobile Company faces several significant barriers while also benefiting from various facilitators. On the environmental front, challenges arise in setting and achieving emission reduction targets due to a lack of scientific basis and effective monitoring mechanisms, compounded by high traditional energy usage and inadequate energy management. Socially, limited employee awareness and engagement hinder the effectiveness of ESG initiatives, exacerbated by underdeveloped communication mechanisms with stakeholders and fragmentation in community engagement efforts. Governance-related issues further complicate matters, with a lack of transparency and fairness in decision-making processes and inadequate ESG information disclosure.

However, strong leadership support plays a crucial role in driving the implementation of these initiatives, as committed leaders can inspire and mobilize resources effectively. Adequate resource allocation, including budgetary, human, and technical support, is essential for the smooth execution of ESG projects. Additionally, regulatory frameworks provide necessary guidelines and incentives, while increasing market demand driven by consumer and investor awareness further propels companies to prioritize ESG practices. Innovations in renewable energy and production technologies also serve as vital facilitators, supporting the effective implementation of ESG initiatives and fostering sustainable development.

4.3 ESG initiatives for enhancing stakeholder involvement and sustainable development at SN Automobile Company

To enhance stakeholder involvement and promote sustainable development, SN Automobile Company can adopt a comprehensive set of ESG initiatives across environmental, social, and governance dimensions. Environmentally, the company should clarify its emission reduction targets by establishing specific, quantified, and scientifically-based goals with clear timelines and milestones. Additionally, improving energy efficiency through the promotion of renewable energy, strengthening energy management, and upgrading production equipment is crucial. Enhancing waste management practices by improving waste classification, treatment systems, and upgrading environmental monitoring

equipment will ensure data accuracy. On the social front, strengthening employee training through personalized plans and diverse career development paths will elevate employee skills and satisfaction.

Table 3 ESG initiatives for enhancing stakeholder involvement and sustainable development at SN Automobile Company

Category	ESG Initiatives
Environmental	<ul style="list-style-type: none"> - Clarify Emission Reduction Targets: Set specific, quantified, and scientific targets with clear timelines and milestones. - Improve Energy Efficiency: Promote the use of renewable energy, strengthen energy management, and upgrade production equipment. - Enhance Waste Management: Improve waste classification and treatment systems, and upgrade environmental monitoring equipment for accurate data.
Social	<ul style="list-style-type: none"> - Strengthen Employee Training: Develop personalized training plans and provide diverse career development paths to enhance employee skills and satisfaction. - Systematize Community Engagement: Create long-term plans for community participation and public welfare, integrate internal and external resources, and establish feedback mechanisms. - Promote Diversity and Inclusion: Formulate policies for diversity and inclusion, recruit employees from diverse backgrounds, and create an inclusive work environment.
Governance	<ul style="list-style-type: none"> - Optimize Decision-Making Process: Strengthen internal control mechanisms, improve information collection and analysis, and increase stakeholder participation in decision-making. - Improve ESG Information Disclosure: Develop unified disclosure standards, enhance data acquisition and verification, and establish regular communication with investors. - Enhance Stakeholder Communication: Create diversified communication channels, hold regular stakeholder events, and strengthen cross-cultural communication training to foster understanding and trust.

Systematizing community engagement by developing long-term participation plans and integrating internal and external resources will further enhance public welfare efforts. Promoting diversity and inclusion by formulating relevant policies, recruiting from diverse backgrounds, and creating an inclusive work environment is also vital. In terms of governance, optimizing the decision-making process by strengthening internal control mechanisms, improving information collection and analysis capabilities, and increasing stakeholder participation will enhance overall governance quality. Furthermore, improving ESG information disclosure through unified standards and regular communication with investors will foster transparency. Lastly, enhancing stakeholder communication by establishing diverse communication channels and conducting regular engagement events will strengthen trust and understanding among stakeholders.

5. Conclusion and Recommendation

5.1 Conclusion

This study provided valuable insights into the influence of Environmental, Social, and Governance (ESG) initiatives on stakeholder involvement and sustainable development at SN Automobile Company. Through a qualitative case study approach, the research highlighted the significant role that well-structured ESG initiatives play in enhancing stakeholder engagement and promoting sustainable practices within the corporate landscape. The semi-structured interviews and document analyses revealed that participants perceived these initiatives as vital not only for compliance and risk management but also for fostering a positive corporate reputation and driving innovation.

Moreover, the study identified key challenges encountered during the implementation of ESG initiatives, such as resource constraints and the need for greater awareness and training among employees. These challenges underscored the importance of continuous improvement and adaptation in ESG strategies to maximize their effectiveness and impact. Ultimately, the findings demonstrated that a robust commitment to ESG principles can lead to enhanced stakeholder relationships and contribute

significantly to sustainable development goals. The research aligns with contemporary studies in the field, suggesting that organizations must prioritize ESG initiatives as integral components of their overall strategy to achieve long-term success and resilience in an increasingly complex business environment. This study serves as a foundation for future research, encouraging further exploration of the dynamic interactions between ESG initiatives and stakeholder engagement in diverse organizational contexts.

This study provided valuable insights into the influence of Environmental, Social, and Governance (ESG) initiatives on stakeholder involvement and sustainable development at SN Automobile Company. Through a qualitative case study approach, the research highlighted the significant role that well-structured ESG initiatives play in enhancing stakeholder engagement and promoting sustainable practices within the corporate landscape. The semi-structured interviews and document analyses revealed that participants perceived these initiatives as vital not only for compliance and risk management but also for fostering a positive corporate reputation and driving innovation.

The findings are consistent with the literature indicating that effective ESG practices can enhance stakeholder trust and commitment [38]. As organizations increasingly prioritize sustainability, stakeholders expect companies to be accountable for their social and environmental impacts [39]. This alignment between stakeholder expectations and corporate strategy can lead to enhanced loyalty and competitive advantage [40]. Moreover, the study identified key challenges encountered during the implementation of ESG initiatives, such as resource constraints and the need for greater awareness and training among employees. These challenges underscore the importance of continuous improvement and adaptation in ESG strategies to maximize their effectiveness and impact. Previous studies have similarly noted that organizations often struggle with integrating ESG considerations into their operational frameworks due to a lack of resources and expertise [41]. Consequently, providing training and resources for employees is crucial in fostering a culture of sustainability and ensuring that ESG initiatives are effectively implemented [42].

The findings demonstrated that a robust commitment to ESG principles can lead to enhanced stakeholder relationships and contribute significantly to sustainable development goals. This is in line with the arguments made by [43], who emphasizes that organizations must balance social, environmental, and economic performance to achieve sustainable development. The research aligns with contemporary studies in the field, suggesting that organizations must prioritize ESG initiatives as integral components of their overall strategy to achieve long-term success and resilience in an increasingly complex business environment [44]. This study serves as a foundation for future research, encouraging further exploration of the dynamic interactions between ESG initiatives and stakeholder engagement in diverse organizational contexts. Investigating the factors that facilitate or hinder the successful implementation of ESG initiatives across various industries could provide further insights into best practices and strategies that enhance sustainability efforts. Additionally, longitudinal studies could help determine the long-term impacts of ESG commitments on organizational performance and stakeholder relationships.

5.2 Recommendation

To effectively enhance its Environmental, Social, and Governance (ESG) initiatives, SN Automobile Company should prioritize several key actions. First, the company should invest in employee training programs to educate staff on ESG principles and practices. By fostering a culture of sustainability through workshops and continuous development, employees will be better equipped to contribute to the company's ESG goals. Second, it is crucial to allocate sufficient financial and human resources to support ESG implementation. This could involve hiring dedicated personnel or establishing cross-functional teams to ensure effective execution of ESG strategies.

Moreover, developing targeted stakeholder engagement strategies is essential. By implementing regular communication and feedback mechanisms, the company can build trust and garner support for its ESG efforts. Additionally, measuring the impact of these initiatives is vital. Establishing metrics to evaluate their effectiveness will enable the company to track progress and make informed decisions based on key performance indicators (KPIs). Lastly, forming an ESG task force with representatives from various departments can enhance coordination and ensure alignment with best practices in sustainability.

For future research, several avenues could yield valuable insights into ESG practices. Conducting longitudinal studies would allow researchers to examine the long-term effects of ESG initiatives on organizational performance and stakeholder engagement. Additionally, exploring comparative studies across different industries could uncover sector-specific challenges and effective strategies that might be applicable to SN Automobile Company. Employing quantitative analysis methods would further aid in understanding the relationship between ESG performance and financial

outcomes. Investigating stakeholder perspectives on ESG initiatives is another vital area for future studies. Understanding how various stakeholders perceive and value these initiatives can inform more effective engagement strategies. Finally, examining the impact of evolving regulations on ESG practices will provide guidance on compliance and best practices for organizations navigating the complex landscape of sustainability.

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HUMAN RESOURCE MANAGEMENT PRACTICES FOR ENHANCING EMPLOYEE MOTIVATION AND PERFORMANCE IN SMALL ACCOUNTING FIRM: A CASE STUDY OF D ACCOUNTING FIRM IN GUANGXI, CHINA

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ABSTRACT

The research objectives were as follows: 1) to investigate the current human resource management practices employed by D Accounting Firm in Guangxi, China; 2) to study the problems and gaps in human resource management practices affecting employee motivation and performance at D Accounting Firm in Guangxi, China; 3) to propose human resource management practices for enhancing employee motivation and performance at D Accounting Firm in Guangxi, China. This study adopted a mixed-methods research approach. Data were collected through interviews, questionnaires, and document analysis. The respondents who completed the questionnaires and participated in the interviews were all employees of the company, totaling 23 individuals. The data were analyzed using content analysis, descriptive statistics, and fuzzy-set Qualitative Comparative Analysis (fsQCA). The qualitative and quantitative statistical analyses were combined to fully understand human resource management practices and their impact on employee motivation and performance.

The results of the study showed that: 1) the human resource management practices at D Accounting Firm were inadequate, with issues such as an unbalanced employee structure, an unreasonable compensation system, overly subjective performance evaluations, a lack of systematic training and development support for employees, and an imperfect work environment; 2) problems and gaps in human resource management practices, including inadequate compensation, unclear appraisals, and limited career growth, hindered employee motivation and performance. High workloads and insufficient support led to burnout and reduced initiative, despite positive feedback on job security; 3) human resource management practices needed comprehensive improvements to enhance employee motivation and performance, including more objective performance evaluations, a revised compensation structure, systematic training programs, and an improved work environment. By implementing the proposed improvements, D Accounting Firm could effectively increase employee satisfaction, motivation, and performance, thereby creating a more engaged and efficient workforce.

Keywords: Employee Motivation; Employee Performance; Human Resource Management

1. Introduction

Small businesses play a very important role in the global economy and can even be said to be the main pillar of economic development [1]. Not only do they contribute a significant proportion to economic growth, they are also an important source of employment. However, low-quality human resource management is limiting the development of small businesses [2]. For instance, in Nigeria, talent acquisition and retention barriers hinder small business success [3]. Similarly, in Canada, labor shortages exacerbate the difficulties small businesses face in recruiting, retaining, and developing employees [4]. In China, brain drain and inadequate human resource management practices pose significant challenges to small businesses [5].

Small accounting firms, as part of the small business sector, play a vital role in providing financial services and consulting to other small businesses [6]. However, in China, small accounting firms are grappling with intense competition, high employee turnover, and low work quality [7]. These issues highlight the need for effective human resource management practices in small accounting firms [8]. In small businesses, people are important assets and a source of competitive advantage, and human resource practices have a positive impact on performance [9]. Research has found that human resource practices have a significant impact on organizational performance, and the success of an organization largely depends on human resource practices [10]. According to relevant research, effective human resource management practices, such as fair compensation systems, performance appraisals, employee development programs, and an improved work environment, can improve employee motivation and work performance [11].

This study focuses on D Accounting Firm, an established accounting firm in Guangxi, China, which primarily engages in auditing, attestation, and evaluation services. The firm is currently facing significant challenges, including high employee turnover, low enthusiasm, and stagnant employee performance. Internal employees have reported that "many leave after a year, lacking motivation and simply working for the sake of working." They also perceive the company's salary, performance evaluations, and career development support to be falling behind industry standards. These issues have created considerable management challenges and are hindering the firm's sustainable development. Therefore, the primary objective of this study is to investigate the current human resource management practices at D Accounting Firm and identify the problems and gaps that are affecting employee motivation and performance. Furthermore, the study aims to propose improved human resource management practices that can enhance employee motivation and performance. By doing so, the research not only seeks to address the specific issues faced by D Accounting Firm but also aims to provide valuable insights for improving human resource management in small accounting firms and small enterprises, ultimately contributing to their sustainable development.

2. Literature Reviews

This study starts from the resource-based view (RBV). Wernerfelt first proposed RBV, emphasizing that an enterprise is a collection of a series of resources and exploring how these resources affect the strategic choices and competitive position of an enterprise [12]. Subsequently, Barney emphasized the key role of resources in building an enterprise's competitive advantage and pointed out that sustainable competitive advantage depends on valuable, scarce, difficult to imitate and irreplaceable resources and capabilities controlled by the enterprise [13]. Rumelt further proposed that a unique combination of resources is the key to maintaining an enterprise's competitive advantage and emphasized the existence of "isolating mechanisms" that make it difficult for other enterprises to imitate and replace the enterprise's advantageous resources [14]. Peteraf proposed four conditions for building sustainable competitive advantage: resource heterogeneity, resource scarcity, resource inimitability and resource liquidity constraints, providing a theoretical framework for how enterprises can obtain and maintain competitive advantages through unique resources and capabilities [15].

In today's era of science and technology and knowledge economy, knowledge has become a key resource for enterprises, and knowledge workers are the carriers of knowledge value-added [16]. Therefore, knowledge workers have become the core competitiveness of small and medium-sized enterprises. Especially for knowledge-based service enterprises such as small accounting firms, their core resources are knowledge workers, and their work motivation and performance are directly related to the growth and development of accounting firms. Research has shown that employee performance is the cornerstone of organizational success and competitiveness, and is a key driver for achieving strategic goals and maintaining competitive advantage in today's dynamic business environment. High-performing

employees not only meet but often exceed job expectations, thereby catalyzing a variety of positive results such as increased productivity, enhanced innovation, and higher levels of customer satisfaction, all of which help drive organizational growth and prosperity [17]. There are also studies showing that motivation is at the core of employee performance, and that human resource management practices are catalysts for promoting a motivational culture within an organization [18]. Employee motivation is the cornerstone of an organization's success architecture and a catalyst for improving productivity and cultivating strong employee engagement [19]. Motivated employees tend to show higher levels of commitment, originality, and job satisfaction, thus making significant contributions to the overall performance and sustainability of the organization [20].

In addition, some studies combine the resource-based view and dynamic capability theory, arguing that the competitive advantage of enterprises comes not only from resources, but also from how to effectively manage and utilize these resources. The success of service organizations such as accounting, consulting and law firms depends largely on their human resources. They conducted longitudinal tests in the context of professional service companies and further pointed out that high-performance work systems, as a human resource management practice, can provide enterprises with competitive advantages [21]. High Performance Work System (HPWS), as a human resource management practice, can be regarded as a key resource of an enterprise because it can create talent, social and organizational capital that is difficult to be copied by competitors [22]. In the human resource management practice under the HPWS framework, Awan et al. used relevant practices such as performance appraisal, compensation and benefits, training and development, and participatory decision-making to enhance employee motivation and thus improve employee performance [23]. Especially in employee training and development, Marin and Tomas found through research that the AMO model is an excellent and effective theoretical model. They believe that well-trained and skilled employees will perform better, proactive employees will be willing to make more efforts, and similarly, if the work environment does not provide enough opportunities, both ability and motivation may become meaningless. Such a theoretical model helps to understand the relationship between human resources and performance and explore the impact of human resource services on performance [24]. In their study of human resource practices in small and medium-sized enterprises, Alkhalaf and Tabbaa believed that the AMO theory is to improve the performance of small and medium-sized enterprises through systematic human resource management (HRM) practices and by improving employees' abilities, motivations and opportunities [25].

Combining the above contents, Yin analyzed the existing literature in 2023 and believed that HPWS is an organic combination of a set of human resource management policies and practices, such as selection, training, evaluation and salary incentives, which can not only improve employees' abilities, motivation and performance, but also help improve employee performance by improving employee motivation [26]. Somu and other scholars believe that high motivation and high performance are the key sources of organizational competitive advantage. Through research, they found that in human resource management practices, employee training and development, performance evaluation, compensation system and supportive working environment can effectively help employees play a role in improving motivation and performance [27]. Among them, competitive salaries, performance-based bonuses, and recognition programs are commonly used incentives in accounting firms, which significantly affect employees' attitudes and behaviors [28]. An effective performance appraisal system provides employees with clear performance expectations, work feedback, and development opportunities. Regular performance reviews and constructive feedback help improve work performance and employee satisfaction [29]. Professional development programs, such as continuing education and technical training, are essential to improving the skills and performance of accounting firm employees. Investing in employee development can improve job satisfaction and retention [30]. Work-life balance and employee well-being measures, such as flexible work arrangements and health programs, are essential to reducing employee stress and improving job satisfaction. These measures help improve employee engagement and performance [31].

According to the above explanation, we define HPWS as a set of interrelated but complementary human resource management practices that are designed to improve employee motivation and performance. These practices, including but not limited to employee training and development, compensation system, performance appraisal, and work environment, not only help motivate employees and improve employee performance, but also play a key role in cultivating a motivated and skilled workforce, bringing competitive advantages to the company. Based on the above arguments, this paper explores the human resource management practices of D Accounting Firm to

improve employee motivation and employee performance by focusing on compensation, performance appraisal, employee training and development, and work environment.

3. Methodology

According to the research of predecessors, mixed method research has become a powerful way to deeply study human resource management (HRM) practices and their subsequent impact on employee motivation and performance [32], [33]. Therefore, this study adopts a mixed method, combining qualitative and quantitative research methods, collecting valid data within three months from July to September 2024, and using literature analysis, interviews and questionnaires to deeply examine the current human resource management practices of Guangxi D Accounting Firm and their impact on employee motivation and performance.

First, the participants' experiences, concepts and attitudes were deeply studied through interviews and open-ended questionnaires, thereby conducting in-depth exploration [34]. This approach produced rich and detailed data, revealing the complexity inherent in human resource management practices and their impact on individuals. Qualitative methods provide a contextual understanding that acknowledges organizational culture, norms, and dynamics that shape the implementation and acceptance of HRM practices within an organization. This awareness of context is critical to understanding the subtle interactions between various factors. To this end, we selected 12 employees at different levels for interviews, including executives, HR managers, department heads, and employees at different levels, who provide nuanced perspectives for the study, validate the findings, and increase the comprehensiveness and validity of the study. The interviews were coded and analyzed using thematic analysis to reveal potential factors that influence motivation and performance [35].

Secondly, quantitatively, statistical tools such as surveys with Likert scale items were integrated to measure employee motivation, job satisfaction, and performance indicators. The company currently has a total of 23 employees, and this study focuses on questionnaires for these 23 employees. Through descriptive statistics and fuzzy set qualitative comparative analysis (fsQCA), researchers can quantify the relationship between HR practices and performance outcomes, adding empirical weight to qualitative insights.

The study adopted a comprehensive, triangulated data collection method by integrating documentary research, interviews, and questionnaires [36]. This approach ensured a thorough examination of the human resource management practices of D Accounting Firm, capturing the depth and breadth of employee experiences and perceptions. The combination of documentary research, interviews, and questionnaire data increased the validity and reliability of the research findings, providing a comprehensive basis for proposing actionable strategies to improve human resource management practices and enhance employee motivation and performance.

4. Results

4.1 Respondent and key informants' data

The organizational structure of D Accounting Firm is divided into two levels: management and staff. The management level includes 1 manager, 2 deputy managers, 1 auditor, 1 department and human resources manager, and 1 department manager. They are the core figures of the entire company, basically composed of certified public accountants or accounting talents above the intermediate level. The grassroots employees include the administrative office and two audit departments, including 1 person in the administrative office (directly managed by the manager), 9 business personnel in the first audit department, and 7 business personnel in the second audit department. They are responsible for completing the company's daily main business and are also an important part of the company. It can be clearly seen that the management level of D Accounting Firm is relatively flat, with only two management levels overall. This reduction in the complexity of the management structure is not only conducive to faster and more direct information transmission, but also improves the efficiency and flexibility of decision-making.

In addition, the human resource structure of D Accounting Firm shows obvious age characteristics. Overall, the proportion of employees aged 20-29 and over 50 is relatively high, at 30.43% and 43.48% respectively. In terms of length of service, more than 60% of employees have more than 10 years of work experience, showing a longer tenure, but there is only one employee with 5-10 years of service. In terms of education level, 82.61% of employees have a bachelor's degree, which indicates that the company has relatively low requirements for basic education. In addition, 34.78% of employees have

junior accountant qualifications, and 47.83% have CPA certificates or intermediate and senior accountant qualifications, reflecting that the firm has a strong professional team.

However, the imbalance in the company's employee structure is still obvious. Young employees (under 30 years old) lack rich practical experience, while employees over 50 years old are experienced but their physical fitness is gradually declining, which may affect work efficiency. The interview results show that many new employees regard the firm as a "stepping stone", resulting in an increase in turnover, further exacerbating the imbalance in the employee structure. In addition, the number of employees in the key age groups (30-39 and 40-49 years old) is small, reflecting the defects in the construction of talent echelons. This situation may be due to the company's insufficient salary and performance appraisal incentives, as well as the lack of investment in employee training and career development, which in turn affects employee retention and loyalty. Therefore, D Accounting Firm urgently needs to solve the problems of talent loss and development bottlenecks to improve the overall quality and stability of the team.

4.2 Current human resource management practices employed by D Accounting Firm in Guangxi, China

4.2.1 Compensation management practice

The salary management practice of Guangxi D Accounting Firm is mainly based on basic salary plus business commission, supplemented by the prepaid salary system. Among them, the basic salary consists of basic salary, practice allowance and position allowance, which reflects the differentiated salary policy. Allowances are paid according to positions, years of service and certificates or qualifications obtained, in order to fairly compensate employees for their abilities and experience. According to the description of the deputy manager, the company hopes to encourage employees to work hard and obtain higher professional qualifications through such salary structure and targeted allowance policy, with the aim of attracting and retaining high-quality talents. However, through semi-structured interviews, it was found that the current basic salary distribution policy is gradually losing its original effect. Employees generally reflect that the basic salary is low, the incentive effect is not obvious, it is difficult to retain employees, and it is impossible to reflect personal value and sense of belonging.

The prepaid salary system refers to the monthly prepayment of a certain amount of project commission based on the lowest income and living standard of employees over the years. Business commission is the main source of employee income. It evaluates the income coefficient of employees based on their length of service, certificates, qualifications, positions, work attitudes, and service quality, and then allocates a certain proportion of operating income according to the coefficient. Through interviews, we found that in the current practice, on the one hand, the fairness of project allocation is questioned, and on the other hand, as the difficulty of work increases, employees' expectations for salary levels also increase, making it difficult to balance the company's cost control and employee incentives.

In terms of employee benefits, Accounting Firm D provided travel subsidies and holiday benefits that satisfied most employees, but the insurance contribution base was low and there was a lack of attention paid to employees' future lives, which led to employees' worries and insecurity about the future.

From the descriptive data analysis, employees at accounting firm D were generally moderately satisfied with current compensation management practices, with an average score of 2.82. While some employees found their compensation acceptable, there is clearly still room for better alignment of compensation with their expectations. Employees also expressed moderate agreement with the impact of compensation on performance ($\mu = 2.82$), suggesting that while compensation does affect productivity to some extent, it may not be a strong driver of improved performance under the current system. However, the data highlighted significant improvements in motivation from salary increases, with an average score of 4.32, a finding that suggests that even modest salary levels can lead to higher effort and motivation if there are clear incentives. Other aspects such as bonus structure and medical benefits were also rated moderately ($\mu = 2.82$ and 2.73, respectively), and employees seemed to be moderately satisfied with these aspects, suggesting that these benefits could be further improved to better meet their needs. Similarly, employees felt that they were moderately rewarded for their efforts ($\mu = 2.73$), suggesting that the overall compensation package may not fully reflect the value they believe they bring to the company. The results show that although the compensation management practices of accounting firm D are moderately effective, there is still considerable potential for improvement. The company can benefit from improving its compensation policy, especially by increasing basic salary,

improving the compensation structure and increasing the insurance contribution base to more effectively satisfy employees and improve their performance.

4.2.2 Performance appraisal practice

D The performance appraisal system of accounting firms is closely linked to the project commission coefficient. Every year, the company will evaluate employees based on their accounting and auditing experience, attendance, work attitude, business quality, professional qualification certificates obtained, and CPA exam subject pass status, and determine the employee's project commission coefficient for the year. This system is designed to motivate employees to continuously update their knowledge, improve their professional skills and work ability, thereby helping the company increase revenue and obtain more projects.

However, through interviews, we found that the performance appraisal system also caused some problems. First, the appraisal indicators are too focused on certificates, especially CPA certificates, which leads to a lack of motivation and even slacking of employees without certificates but strong work ability. Second, the appraisal method is too subjective. For example, indicators such as work attitude and business quality are easily affected by subjective factors, which leads to employees' dissatisfaction with the appraisal results. Finally, an overly strict attendance system does not effectively improve employee performance, but may reduce employee job satisfaction and enthusiasm.

According to the descriptive data analysis, the current performance appraisal system of D Accounting Firm still has significant room for improvement in terms of objectivity and quantification, especially in terms of quantification and fairness (mean score 3.00, standard deviation 0.75593). This shows that although most employees believe that performance appraisal is objective and quantitative to a certain extent, some employees still disagree with this. This may be because there is subjectivity in the appraisal process or the appraisal criteria are not clear enough. Therefore, the company needs to strengthen the quantification and fairness of the appraisal process to ensure that the appraisal results can more accurately reflect the work ability and efficiency of employees.

In addition, employees have a high degree of recognition of the correlation between performance appraisal and compensation plan (mean score 3.72, low standard deviation), which shows that employees generally believe that performance appraisal is closely related to compensation plan. The company should further clarify the connection between the two and continue to maintain this positive factor. However, employees have a low degree of recognition in helping employees identify their personal strengths and weaknesses (mean score 2.72, slightly below the median, high standard deviation), which may be because the appraisal feedback is not specific or frequent enough. The company should provide more constructive opinions in the feedback stage and improve performance appraisal to help employees improve their self-awareness more comprehensively.

Performance appraisal has a significant effect on improving work motivation (mean score of 3.55, low standard deviation), showing its important role in motivating employees. The company should continue to strengthen its construction in this area. Overall, the performance appraisal system received a high score (mean of 3.16), especially in terms of incentives and compensation linkage. However, there is still room for improvement to ensure the objectivity of the appraisal process and comprehensively evaluate employee capabilities. By improving these aspects, the company can further enhance employee motivation and satisfaction, thereby improving overall performance.

4.2.3 Employee training and development practice

Although D Accounting Company currently encourages employees to learn and grow, there are some problems with its training and development practices. The company mainly relies on practical guidance and employee self-study, lacks systematic training and career development support, resulting in weak professional knowledge, rigid thinking, and high work pressure among employees, which in turn affects work efficiency and job satisfaction, leading to an increase in turnover. Although the job opportunities provided by the company have improved employees' knowledge level and career development potential to a certain extent, overall, the company still needs to improve its training and development mechanism.

From the descriptive data analysis, the training program of D Accounting Firm significantly improved the knowledge level of employees in related fields, with an average score of 3.2273 and a standard deviation of 0.9223, showing a good knowledge enhancement effect. Employees generally believe that training helps improve work performance, with an average score of 3.09, indicating that they perceive the positive impact of training on improving productivity. However, in encouraging a culture

of continuous learning, the average score was 2.90 and the standard deviation was 0.9714, indicating that despite certain results, there is still room for improvement.

In terms of career development, employees rated the benefits of their current job for future career development the highest, with an average score of 3.81 and a standard deviation of 0.5889, reflecting their high recognition of the experience and value accumulated through work. Regarding the opportunity to discuss training and development needs with the employer, the average score was 3.09 and the standard deviation was 1.0649, showing that the company provides effective communication channels, but the implementation effect varies greatly among departments. Regarding the company's support for personal career development, the average score was 2.82 and the standard deviation was 1.0064, which shows that although some employees feel supported by the company, many employees still want to see stronger support measures.

Overall, accounting firm D performed well in improving employee knowledge and resumes, with an average score of 3.1591, but still needs to be strengthened in stimulating learning willingness and providing comprehensive career development support. In addition, ensuring the balanced implementation of training mechanisms among departments is also the key to improving overall employee satisfaction.

4.2.4 Work environment practice

The working environment of D Accounting Firm has certain advantages in general, which are mainly reflected in safe and reliable office conditions and friendly working atmosphere. On the one hand, the company provides a safe office environment and is equipped with necessary office equipment and audit software, which effectively reduces the workload of employees. In addition, the company actively creates a friendly working atmosphere and encourages direct communication between employees and management to ensure that problems can be solved in a timely manner. In addition, the company also enhances communication and cohesion among employees by organizing travel, dinners and sports activities.

However, there are also some challenges in the working environment of D Accounting Firm. First, chaotic data management is a significant problem. Employees reported that the company's document management was chaotic, resulting in a messy office environment and seriously affecting work efficiency. Secondly, software operation difficulties are also an important problem. New employees are unfamiliar with the operation of audit software and lack professional training, resulting in low work efficiency. In addition, the existing office chairs are not designed reasonably, and long-term use can easily cause lumbar spine injuries and affect employee health. Finally, weak corporate culture is also an issue that cannot be ignored. The company lacks clear values and development goals, resulting in insufficient sense of belonging and identity among employees and low work enthusiasm.

According to the descriptive data analysis of the working environment of D Accounting Firm, the employees' satisfaction with the working facilities is 3.1818, with a standard deviation of 0.79501, indicating that most employees believe that the facilities provided by the company are sufficient, but still need to be improved. The average score of the safety and security system is 3.2727, with a standard deviation of 0.76730, showing the company's effective support for employee safety and comfort. However, in the evaluation of the comfort of the workspace, the average score is only 2.0909, and the standard deviation is as high as 1.19160, indicating that there are large differences among employees. Optimizing the working environment will significantly improve the employee experience. In addition, the score of internal communication channels is 3.2273, with a standard deviation of 0.81251, indicating that most employees recognize the company's communication mechanism. However, the average score of the company's overall atmosphere is 2.82182, with a standard deviation of 1.05272, indicating that the corporate culture needs to be improved urgently to enhance employees' sense of belonging and identity. Based on these data, employees' overall satisfaction with the company's working environment is within an acceptable range, with an average score of 2.92, but employees hope for better improvements.

4.3 Problems and gaps in human resource management practices affecting employee motivation and performance at D Accounting Firm in Guangxi, China.

4.3.1 The current situation of employee motivation

The overall status of employee motivation in D accounting firm is at a medium level, mainly due to the impact of work practice on professional development, a good working atmosphere and a stable working environment.

However, based on the descriptive data analysis, we found that the overall employee motivation level is medium, with an average score of 2.8000, showing that there are significant differences in employee motivation in various aspects. In terms of work participation, the average score of employees is 2.9091, which is concentrated in the data, indicating that although most employees have a certain enthusiasm for work participation, incentives still need to be increased under the current system. Employees have a high degree of recognition of the long-term sense of security brought by work, with an average score of 3.3636 and a standard deviation of 0.84771, reflecting that the company provides a stable working environment.

In terms of work initiative and extra efforts for the organization, the average scores of employees are 2.7273 and 2.3182 respectively. The data are highly dispersed, showing that most employees only complete the prescribed tasks and lack the motivation to find opportunities or solve problems. In addition, the average score of employees in the pursuit of excellence is 2.6818, and the data dispersion is moderate, indicating that employees' pursuit and commitment to excellence are at a medium level, and they are more focused on completing basic tasks. These data show that although D Accounting Firm has achieved some results in motivating employees, there is still much room for improvement, especially in improving employee initiative and motivation to contribute to organizational goals. It is recommended that the company further enhance employee enthusiasm and motivation by providing more training opportunities, improving performance evaluation and strengthening corporate culture.

4.3.2 The current situation of employee performance

According to the descriptive data analysis table, the employees of Guangxi D Accounting Firm have the following performance in various aspects. The average score of employees in achieving work goals is 3.0909, and the standard deviation is 0.92113, indicating that there are large differences in performance between employees, and some employees may not have achieved their goals well, and further individual guidance is needed. In terms of effective performance, employees performed well, with an average score of 3.6818 and a low standard deviation of 0.64633, showing that the consistency of performance between employees is high, and most employees can achieve a high level of performance, which may reflect a good working environment and effective management.

In terms of task completion ability, the average score is 3.1364 and the standard deviation is 1.03719, indicating that employees are generally able to complete tasks within the specified time, but due to the large standard deviation, there may be individual employees who often delay completing tasks. In terms of accurate completion of work, the average score is 3.1364 and the standard deviation is 0.88884, showing that employees generally perform well in accuracy, but there are still individual differences. In terms of high-quality work output, the average score was 2.8182 and the standard deviation was 1.09702, reflecting the large differences in employee skill levels and indicating that employees may need more support or resources in their pursuit of high-quality results. In terms of efficient completion of work tasks, the average score was 2.5909 and the standard deviation was 1.29685, indicating that employees performed poorly in terms of efficiency and may need targeted support and improvement measures. The overall average score was 3.0758 and the standard deviation was 0.90812, indicating that employee performance was highly consistent, but most employees performed at a medium level and needed further training and support to improve overall performance and efficiency.

4.4 Human resource management practices for enhancing employee motivation and performance at D Accounting Firm in Guangxi, China.

This section uses the fuzzy set qualitative comparative analysis (fsQCA) method and combines interview data to conduct an in-depth analysis of the human resource management practices of Guangxi D Accounting Firm.

Table 1 Analysis of necessity of each variable of

Condition	Consistency (Motivation)	Coverage (Motivation)	Consistency (Performance)	Coverage (Performance)
Compensation	0.85	0.78	0.88	0.80
Performance Appraisal	0.92	0.83	0.90	0.81
Training and Development	0.88	0.82	0.89	0.82
Work Environment	0.83	0.79	0.85	0.80

According to Table 1, we find that performance appraisal is identified as a necessary condition, with consistency scores of 0.92 (employee motivation) and 0.90 (employee performance), and coverage of 0.83 and 0.81, indicating that a good performance appraisal system is crucial to employee motivation and performance. In contrast, although the impact of salary is significant, it is not a decisive factor. Its consistency scores are 0.85 (employee motivation) and 0.88 (employee performance), and coverage is 0.78 and 0.80, respectively, indicating that non-monetary factors such as training and development and working environment also have an important impact on employee motivation.

Training and development is regarded as a key means to improve employee capabilities and performance, with consistency scores of 0.88 (employee motivation) and 0.89 (employee performance), and coverage of 0.82, emphasizing the importance of continuous development in maintaining employee enthusiasm. The study also found that the work environment has a relatively weak impact on employee motivation, with consistency scores of 0.83 (employee motivation) and 0.85 (employee performance), and coverage between 0.79 and 0.80, which may be the area that companies need to focus on improving in the future.

Based on the above findings, we put forward a series of improvement suggestions based on the interview results to improve employee motivation and performance. These include improving the performance appraisal system, optimizing the appraisal indicators to make them more objective and comprehensive, improving the attendance system to play a more motivational role, and establishing an effective feedback mechanism. At the same time, optimize the salary structure, improve the fairness of project allocation, and increase the social security contribution base to ensure the basic living needs of employees and ensure long-term welfare of employees. Secondly, strengthen training and development, introduce systematic training plans, and increase attention to employee development plans to promote work efficiency and career growth. In addition, improving the working environment, optimizing office conditions and corporate culture can also improve employee satisfaction and productivity. Through these improvements, companies can effectively improve employee capabilities and satisfaction and achieve higher employee retention and performance.

5. Conclusion and Recommendation

This study identified several key issues in the human resource management practices of accounting firm D that negatively impact employee motivation and performance. The findings are consistent with previous research on human resource management challenges in accounting firms, highlighting the importance of addressing compensation, performance evaluation, training and development, and work environment issues to achieve a high-performance work system (HPWS).

Based on the two-factor theory, through the study of skilled talents, it is found that the salary incentive of the enterprise significantly affects employee satisfaction, which in turn has a significant impact on work performance [37]. Among them, health-related compensation (such as basic salary) has a greater effect on satisfaction than incentive compensation (such as bonuses and other benefits). In this study, it is also shown that compensation plays an important role in employee motivation and performance. In particular, when talking about "the significant improvement of motivation by salary increase", most employees highly agree. Moreover, according to the description of the department manager, the current basic salary of the firm lacks competitive advantages, which is an important reason for the loss of talent. Therefore, improving the compensation structure has a positive significance for improving employee motivation and performance in D Accounting Firm.

Uyanik [38] found that from the perspective of RBV, performance appraisal not only plays a vital role in evaluating the effectiveness of human resources within an organization, but also plays a key

role in HPWS by determining employees' career paths, rewards and development opportunities. This is consistent with the conclusion of this study. In the human resource management practice of D Accounting Firm, performance appraisal is a necessary condition for creating high motivation and high performance. In addition, some scholars have found that performance appraisal can enhance employees' perception of fairness in HPWS, so that they believe that their time, energy and effort will be rewarded [39]. Therefore, it is particularly important to improve appraisal indicators, attendance system and establish feedback mechanism for establishing a high-performance work system.

Nwaeke & Obiekwe [40] examined the impact of employee training and development on organizational productivity and found that this factor can directly improve employee capabilities, including skills, knowledge and attitudes, and is the basis for achieving the requirements of a high performance work system. Different scholars have also found that through new learning, employees can complete their job responsibilities more effectively, thereby improving productivity and quality, which is consistent with the AMO framework [41]. From the data information of this study, employee training and development have an important role in promoting employee motivation and performance in D Accounting Firm. Moreover, the data on the source of employee motivation also shows that current work practices are helpful in improving employee skills and development potential, which is consistent with the AMO theoretical framework. Therefore, further introducing systematic training and increasing attention to employee development plans will also promote employee motivation and productivity.

Research has confirmed that a good work environment can significantly improve employee performance by enhancing employee motivation, so organizations should strive to create a more positive and productive work environment [42]. Although the work environment is not a key factor in improving employee motivation and performance at D Accounting Firm in this study, the role of improving the work environment cannot be ignored. Anggraini's research shows that a positive and supportive work environment will make employees feel motivated, often making them more engaged in work and more productive [43]. Therefore, optimizing the work environment and strengthening corporate culture can still contribute to the long-term success of D Accounting Firm.

This study summarizes the four major factors that affect the high-performance work system of D accounting company, namely compensation, performance evaluation, employee training and development, and work environment, which play a key role in improving employee motivation and work efficiency. By optimizing these factors, the company can significantly improve its core competitiveness and sustainable development capabilities. However, the scope of this study is mainly focused on a specific type of accounting firm, which limits its universality in a wider range. Future research is recommended to expand to include large and international accounting firms to verify the wide applicability of the results. At the same time, it is recommended to conduct longitudinal research to track the long-term effects of HRM practices, conduct comparative studies across regions and industries to identify best practices, and explore cross-disciplinary research with psychology, sociology, and organizational behavior to deeply understand the internal mechanisms of HRM practices. Through these extensions, the research results will provide more comprehensive guidance and application value for HRM practices in the audit industry.

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THE EFFECT OF ORGANIZATIONAL CULTURE, ORGANIZATIONAL COMMITMENT, AND ORGANIZATIONAL LOYALTY OF EMPLOYEES IN PRIVATE ENTERPRISES IN BEIJING, CHINA

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ABSTRACT

The objectives of this research were: 1) to study the effect of organizational culture and organizational commitment on organizational loyalty in private enterprises in Beijing, China; and 2) to propose guidelines for improving employee loyalty in these private enterprises. The research employed a mixed methods approach. Quantitative data were gathered from a sample of 510 employees across 32 small-scale private companies in Beijing, spanning industries such as electronics, retail, consulting, and machinery manufacturing, using simple random sampling. Data analysis included frequency, percentage, mean, standard deviation, Pearson's correlation, multiple regression analysis, and mediation effect testing. Qualitative data were collected through document reviews and interviews with 12 managers from private companies, who served as key informants. Content analysis was applied to the qualitative data to identify areas for improvement and establish guidelines. The research findings revealed that: 1) organizational culture, including bureaucratic, innovation, and supportive cultures, significantly influenced employee loyalty in Beijing's private enterprises, with organizational commitment being the strongest predictor. Commitment also mediated the culture-loyalty relationship; and 2) to improve loyalty, companies should align culture with employee values, foster open leadership, ensure fair policies, promote career development, and respect work-life balance, thereby creating a supportive environment that enhances commitment and loyalty. This research provided valuable insights for private enterprises in Beijing, offering practical strategies to enhance employee loyalty by understanding the impact of organizational culture and commitment to create more effective work environments.

Keywords: organizational culture; organizational commitment; organizational loyalty

1. Introduction

Employees formed the foundation of an enterprise's survival, underscoring the critical importance of their quality for private enterprises. As private enterprises underwent gradual development, there was increasing recognition of the importance of managing employee loyalty, prompting a surge in in-depth research activities [1]. Study emphasized the necessity for private enterprises to analyze factors influencing loyalty and align their development strategies accordingly. Findings suggested that loyalty directly influenced service quality, customer satisfaction, and, ultimately, firm profitability [2].

The study highlighted factors such as communication, training, and supportive work environments as key drivers of loyalty, contributing to employees' commitment to the organization. However, a research gap remained in understanding the unique dynamics of employee loyalty in private enterprises, especially the roles of organizational culture and commitment [3]. Literature suggested that integrating a positive corporate culture and implementing clear employee incentive systems could enhance loyalty in private enterprises [4]. Nonetheless, many small enterprises struggled with employee turnover due to outdated management practices and limited resources to retain talent [5]. External factors, including industry-wide wage competition and policy variations, also played a significant role in shaping employee loyalty and retention.

While prior research has underscored the positive impact of a strong organizational culture on employee loyalty, most studies focus on Western or general contexts. There is limited research on how specific cultural dimensions, such as hierarchy, collectivism, or traditional values in Chinese private enterprises, shape loyalty differently [6]. Since organizational culture in Beijing's private sector may reflect unique socio-cultural and economic factors, examining this interaction could provide insights into region-specific organizational behaviors and expectations that influence loyalty. Although organizational commitment has been linked to employee loyalty, studies have yet to fully explore its mediating role between organizational culture and loyalty in the context of Chinese private enterprises. Organizational commitment could serve as a bridge, where a positive culture enhances commitment, which in turn strengthens loyalty [7]. Understanding this mediating role can clarify how private enterprises can leverage culture-building initiatives to foster loyalty indirectly through commitment.

Previous studies often emphasize loyalty drivers like job satisfaction, work-life balance, or compensation, but provide limited actionable guidelines tailored to SMEs in Beijing's competitive market. SMEs face unique challenges, such as limited financial resources and frequent brain drain, which may restrict their ability to implement conventional loyalty-enhancing measures [8]. Developing practical guidelines based on SME constraints is essential to address loyalty challenges specific to smaller enterprises. Given these insights, this study aimed to examine the effects of organizational culture and organizational commitment on employee loyalty in private enterprises in Beijing, China. Additionally, it sought to develop practical guidelines to enhance employee loyalty within this specific context, addressing both internal and external factors affecting private enterprise stability and competitiveness.

2. Literature Reviews

Employee loyalty is a critical factor for the long-term success of organizations, especially in private enterprises where turnover can be high. Understanding the impact of organizational culture and commitment on loyalty is essential for developing strategies that foster loyalty in employees. This section reviews relevant literature on the relationship between organizational culture, organizational commitment, and organizational loyalty, focusing on private enterprises in Beijing, China.

2.1 Organizational culture and organizational loyalty

Organizational culture has been widely recognized as a key determinant of employee loyalty. It embodies the shared values, beliefs, and norms that shape employee attitudes and behaviors within an organization [9]. Different types of cultures can uniquely impact loyalty. For instance, bureaucratic culture emphasizes structure and formal control, which may limit flexibility but can enhance job security and stability, thus fostering loyalty in employees who value these attributes [10], [11]. Alternatively, innovative culture encourages creativity and risk-taking, which may appeal to employees who value personal growth and autonomy, thereby enhancing loyalty among these employees [12]. Supportive culture, characterized by collaboration and mutual respect, has been shown to significantly enhance loyalty as it fosters a sense of belonging and trust within the organization [13]. In Beijing's

private enterprises, which often operate in a highly competitive market, organizational culture may be a crucial factor in cultivating loyalty among employees who face intense external job opportunities.

2.2 Organizational commitment and organizational loyalty

Organizational commitment is another fundamental factor that influences employee loyalty. Organizational commitment as a psychological state that characterizes an employee's relationship with their organization and has been linked to reduced turnover intentions and increased loyalty [14]. Organizational commitment typically comprises three components: affective commitment, which refers to emotional attachment; continuance commitment, which is based on the costs associated with leaving; and normative commitment, which reflects a sense of obligation to remain [15]. High levels of affective commitment, in particular, have been associated with stronger loyalty, as employees are more likely to remain with an organization they feel emotionally connected [16]. Research in private enterprises suggests that commitment can mediate the effects of organizational culture on loyalty, indicating that fostering commitment within a supportive or innovative culture may lead to higher loyalty levels [17].

2.3 Interplay between organizational culture, organizational commitment, and organizational loyalty

Studies have demonstrated that organizational commitment may mediate the relationship between organizational culture and loyalty. For example, supportive and innovative cultures often enhance affective commitment by providing an environment in which employees feel valued and respected, thereby strengthening loyalty [18]. In contrast, bureaucratic cultures might foster continuance commitment by providing job security and structured career paths, indirectly supporting employee loyalty by reducing turnover intentions [19]. The mediating role of commitment highlights the complex interplay among culture, commitment, and loyalty, suggesting that private enterprises in Beijing could benefit from shaping a supportive culture to build both commitment and loyalty among employees.

2.4 Guidelines for improving employee loyalty

In the context of private enterprises in Beijing, employee loyalty is increasingly essential for competitiveness and sustainability. High turnover rates pose significant challenges, as experienced talent is often recruited by other firms offering higher compensation or better benefits [20]. This competitive market underscores the importance of organizational culture and commitment in fostering loyalty. Previous studies indicate that private enterprises may need tailored approaches to build loyalty, focusing on creating supportive cultures that resonate with employees' expectations and improve commitment [21]. Based on the literature, private enterprises can improve employee loyalty by focusing on specific cultural dimensions and commitment-building initiatives. Implementing a supportive culture that emphasizes teamwork, recognition, and open communication may be particularly effective in enhancing loyalty [22]. Additionally, fostering affective commitment by recognizing employees' contributions and aligning organizational goals with employee values can further strengthen loyalty [23]. For private enterprises in Beijing, balancing bureaucratic stability with supportive and innovative cultural elements can create a comprehensive approach to loyalty enhancement that resonates with the diverse workforce.

2.5 Conceptual Framework

Conceptual framework as show in Figure 1.



Figure 1 Conceptual framework

The conceptual framework elucidates the interconnected elements of organizational culture, organizational commitment, and organizational loyalty, providing a structured approach to understanding and improving employee loyalty in private enterprises in Beijing, China. The proposed

guidelines serve as a practical roadmap for organizations seeking to create a workplace environment that fosters commitment and loyalty among employees.

3. Methodology

3.1 Research Design

The study adopted a questionnaire survey. Based on insights from the literature, a structured Likert scale questionnaire was developed to assess factors influencing employee stability and loyalty in private enterprises. The survey targeted employees across various companies in Beijing and was refined based on preliminary findings for broader deployment. Semi-structured interviews with employees from different industries provided qualitative insights into organizational culture and loyalty. These interviews highlighted core issues affecting employee loyalty, adding depth and specificity to the findings from the questionnaire.

3.2 Population and sample size

The sample focuses on 32 small-scale private companies in Beijing across sectors like electronics, retail, consulting, and machinery manufacturing. This sectoral diversity reflects the broad characteristics of private enterprises in the region. Using judgment and convenience sampling, the study aims to survey approximately 510 respondents and conduct interviews with 12 key informants selected based on criteria such as industry expertise, leadership roles, and tenure in the organization.

3.3 Data collection

Data collection is a two-fold process involving both quantitative (questionnaires) and qualitative (interviews) methods. A Likert-scale questionnaire was developed, containing sections on organizational culture (bureaucratic, innovative, and supportive), organizational commitment, and organizational loyalty. This tool quantified employee perceptions on a scale from "strongly agree" to "strongly disagree." The interviews covered questions on organizational culture, commitment, and loyalty, aiming to gather detailed personal insights and observations from employees and key informants. The research instruments underwent quality checks, demonstrating content validity (IOC = 0.70) and reliability (≥ 0.70) for all variables that met the established criteria [24]. This approach enables the study to gather structured responses on organizational culture, commitment, and loyalty while also gaining detailed insights through interviews.

3.4 Data analysis

Quantitative analysis involved using descriptive statistics, such as the mean and frequency distribution, to summarize Likert scale responses. Pearson correlation examined the relationships among organizational culture, commitment, and loyalty. Regression analysis and thematic analysis of interview data categorized responses into themes related to organizational culture, commitment, and loyalty. This analysis enhanced the understanding of how these factors interacted and affected employee loyalty, ultimately supporting the development of actionable guidelines for private enterprises in Beijing.

4. Results

4.1 Respondent and key informants' data

The demographic profile of the 510 respondents, as shown in Table 4.1, reveals significant insights into the composition of the workforce. In terms of age distribution, the largest group consisted of individuals aged 26 to 35, making up 47.5% of respondents, while those aged 18 to 25 accounted for 23.9%. A smaller percentage fell into the 36 to 45 age range (20.6%), and only 8.0% were aged 46 to 55. Gender representation was relatively balanced, with 50.6% identifying as female and 49.4% as male. Regarding professional roles, a significant majority held entry-level positions (62.4%), followed by mid-range employees at 27.1%, and only 10.6% occupying advanced roles. In terms of tenure, respondents were fairly evenly distributed: 37.6% had been with their organization for 1 to 5 years, 27.8% for 6 to 10 years, and another 27.8% for over 10 years, while just 6.7% had been with their organization for less than a year. This demographic composition highlights a predominance of younger employees in entry-level positions, suggesting an organizational focus on developing and nurturing talent.

The 12 key informants represented a range of sectors, including technology, finance, manufacturing, and healthcare, ensuring a comprehensive understanding of how organizational culture and commitment vary across industries. Each informant held a leadership position, such as department head or senior manager, providing valuable insights into the dynamics of employee engagement and

loyalty. Their tenures ranged from five to over twenty years, allowing them to offer perspectives on both historical and current organizational practices.

4.2 Correlation analysis

Through correlation analysis, this paper explores the relationship among organizational culture, organizational commitment and organizational loyalty. Calculation of Pearson correlation coefficients to determine the strength and direction of the association between these variables.

Table 1 Correlation coefficients among organizational culture, organizational commitment and organizational loyalty

	Bureaucratic culture	Innovative culture	Supportive culture	Organizational commitment	Organizational loyalty
Bureaucratic culture	1				
Innovative culture	0.410	1			
Supportive culture	0.251	0.329	1		
Organizational commitment	0.454	0.500	0.364	1	
Organizational loyalty	0.392	0.395	0.334	0.482	1

4.3 Regression analysis

In order to further explore the influence of organizational culture and organizational commitment on employee’s organizational loyalty, this paper makes a regression analysis. Regression analysis can help us understand how different dimensions of organizational culture independently affect organizational loyalty while controlling for other variables. By constructing multiple linear regression models, we were able to assess the predictive power of individual organizational culture dimensions on organizational loyalty.

Table 2 Multiple linear regression model for predicting organizational loyalty

Model	Unstandardized coefficient		Standardization coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	1.220	0.145		8.438	0.000
Bureaucratic culture	0.143	0.036	0.172	4.007	0.000
Innovation culture	0.117	0.039	0.136	3.034	0.003
Supportive culture	0.118	0.034	0.143	3.512	0.000
Organizational commitment	0.281	0.046	0.284	6.150	0.000
R ²	0.305				
D-W	1.927				
F	55.516***				

The regression analysis conducted in this study aimed to explore the influence of organizational culture and organizational commitment on employee loyalty. By employing multiple linear regression models, the analysis provided insights into how various dimensions of organizational culture impact loyalty while controlling for other relevant variables. The model achieved a significant F-statistic of 55.516, indicating that the predictors included—organizational culture dimensions and organizational commitment—collectively contribute to explaining employee loyalty.

The R-squared value of 0.305 revealed that approximately 30.5% of the variance in organizational loyalty can be accounted for by these independent variables, highlighting the moderate explanatory power of the model. Each dimension of organizational culture demonstrated a positive

relationship with loyalty. Specifically, the bureaucratic culture was associated with a coefficient of 0.143, suggesting that for every unit increase in bureaucratic culture, employee loyalty increased by 0.143 units. This effect was statistically significant ($p = 0.000$). Similarly, the innovative culture showed a coefficient of 0.117, indicating that fostering innovation within the organization contributes positively to loyalty, supported by its significance ($p = 0.003$). The supportive culture also proved impactful, with a coefficient of 0.118 and a significance level of $p = 0.000$, emphasizing the importance of creating a supportive work environment for enhancing loyalty.

Moreover, organizational commitment emerged as a strong predictor, with a coefficient of 0.281 and a significance level of $p = 0.000$. This indicates that higher levels of commitment significantly boost employee loyalty. Additionally, the Durbin-Watson statistic of 1.927 suggested that there was no significant autocorrelation in the residuals, affirming the model's reliability. In conclusion, the regression analysis highlights the critical role of organizational culture and commitment in influencing employee loyalty.

4.4 Mediation effect analysis

In order to test the mediation effect of organizational commitment on organizational culture and employee organizational loyalty, this paper uses Bootstrap sampling test method to study the mediation effect of organizational commitment. The sampling times are 5000 times, and the test results of mediation effect model are shown in Table 3:

Table 3 Results of mediation effect test

	Organizational loyalty	Organizational commitment	Organizational loyalty
Constant	1.488***(0.143)	0.953***(0.134)	1.220***(0.145)
Bureaucratic culture	0.207***(0.035)	0.228***(0.033)	0.143***(0.036)
Innovative culture	0.198***(0.038)	0.286***(0.035)	0.117***(0.039)
Supportive culture	0.162***(0.034)	0.158***(0.032)	0.118***(0.034)
Organizational commitment			0.281***(0.046)
Sample size	510	510	510
R ²	0.253	0.355	0.305
Adjust R ²	0.249	0.352	0.300
F Value	F (3,506) = 57.251	F (3,506) = 93.023	F (4,505) = 55.516
P (F Value)	0.000	0.000	0.000

The results of the mediation effect test provide significant insights into the intricate relationships between organizational culture, organizational commitment, and organizational loyalty. The analysis consisted of three models, each focusing on different aspects of these constructs.

In the first model, the impact of organizational culture on organizational loyalty was assessed, revealing that approximately 25.3% of the variance in loyalty could be explained by the independent variables, with an adjusted R² of 0.249. The F-value of 57.251, coupled with a p-value of 0.000, confirmed the statistical significance of the model. Notably, all dimensions of organizational culture—bureaucratic, innovative, and supportive—were found to have strong positive relationships with organizational loyalty, indicating that improvements in these cultural dimensions lead to enhanced loyalty among employees.

The second model examined the influence of organizational culture on organizational commitment, explaining about 35.5% of the variance in commitment, with an adjusted R² of 0.352. The F-value of 93.023 and a p-value of 0.000 underscored the model's significance. The positive coefficients for the cultural dimensions suggested that a robust organizational culture fosters greater commitment, with the innovative culture exhibiting the highest impact.

In the third model, the direct effect of organizational commitment on organizational loyalty

was explored. This model explained approximately 30.5% of the variance in loyalty, with an adjusted R² of 0.300 and a significant F-value of 55.516. The coefficient for organizational commitment, at 0.281, indicated that higher levels of commitment correspond to increased loyalty among employees.

Overall, the findings suggest that organizational commitment serves as a crucial mediator between organizational culture and loyalty. Enhancements in organizational culture not only bolster commitment but also significantly influence loyalty outcomes. These insights emphasize the importance of cultivating a strong organizational culture and fostering commitment to improve employee loyalty. The statistical significance of the relationships demonstrated by the F-values and p-values highlights the relevance of these constructs in shaping effective management practices aimed at enhancing employee engagement and retention in private enterprises.

4.5 Guidelines for improving employee loyalty in private enterprises

Table 4 Guidelines for improving employee loyalty in private enterprises

Guideline	Description
Cultural alignment	Foster alignment between individual values and organizational culture through values-driven recruitment and engagement initiatives.
Leadership and communication	Enhance accessibility of leaders and promote open communication channels to create an inclusive environment that supports dialogue.
Career development opportunities	Provide clear pathways for professional growth with training, mentorship, and development programs to enhance employees' career prospects.
Work-life balance	Implement policies that respect employees' personal time and promote a healthy balance between work and personal life, reducing stress and increasing job satisfaction.
Fairness in policies	Ensure transparency and fairness in organizational policies, including compensation, promotion, and evaluation processes, to foster trust and commitment among employees.

To improve employee loyalty in private enterprises, several key guidelines emerged from the qualitative insights gathered during semi-structured interviews, complementing the quantitative data from the questionnaire survey. First, fostering cultural alignment between individual values and organizational culture is crucial. Respondents emphasized that when employees' personal values resonate with the company's culture, their commitment and loyalty significantly increase. Conversely, a mismatch between these values can lead to employee alienation and a decline in loyalty.

Second, the leadership style and communication mechanisms within the organization play a vital role. Employees reported feeling more committed and loyal when leaders are accessible and foster open dialogue. In contrast, perceptions of leadership as distant or unapproachable often result in feelings of isolation, negatively impacting commitment. Additionally, providing clear career development opportunities is essential. Employees who perceive that their organization offers professional growth tend to exhibit greater loyalty, while those who feel limited in their career prospects show lower levels of commitment.

Work-life balance emerged as another important factor. Interviewees expressed that organizations respecting personal time and promoting a healthy work-life balance are more likely to retain loyal employees. Conversely, those facing high work demands and stress reported dissatisfaction and a lack of loyalty. Finally, fairness in organizational policies, including those related to compensation, promotion, and evaluation, is critical. Employees who perceive the decision-making processes as transparent and equitable demonstrate higher loyalty levels.

In summary, these qualitative insights not only confirm the quantitative findings but also provide a deeper understanding of the complex interplay between organizational culture, commitment, and employee loyalty in private enterprises in Beijing, China. By implementing these guidelines, organizations can enhance employee loyalty and foster a more committed workforce.

5. Conclusion and Recommendation

5.1 conclusion

The research indicates a significant impact of organizational culture and commitment on employee loyalty within Beijing's private enterprises. A robust organizational culture characterized by bureaucratic, innovative, and supportive dimensions fosters greater employee commitment, which in turn enhances loyalty. This relationship underscores the necessity for organizations to nurture a positive culture to promote employee engagement and retention.

To enhance employee loyalty, private enterprises in Beijing should focus on several key strategies: aligning individual values with organizational culture, enhancing leadership accessibility and communication, providing career development opportunities, promoting work-life balance, and ensuring fairness in organizational policies. Implementing these guidelines can create a committed workforce, ultimately leading to improved loyalty and reduced turnover.

The findings of this study align with existing literature emphasizing the crucial role of organizational culture in shaping employee outcomes. A strong organizational culture not only promotes employee engagement but also significantly influences organizational commitment, which is a well-established predictor of employee loyalty [25]. The positive relationships found between the various dimensions of organizational culture—bureaucratic, innovative, and supportive—and organizational loyalty echo earlier studies that identified similar constructs as pivotal in enhancing loyalty and retention [26]. Furthermore, the study's results regarding the mediating role of organizational commitment corroborate prior research suggesting that commitment acts as a conduit through which organizational culture impacts loyalty [27]. Higher levels of commitment lead to increased loyalty, confirming the notion that when employees feel a deep connection to their organization, they are more likely to remain committed and engaged [28]. This finding highlights the necessity for organizations to foster a culture that supports employee development and satisfaction, as evidenced by the significant coefficients observed in the regression analysis.

The guidelines proposed for improving employee loyalty are supported by empirical research demonstrating that cultural alignment and leadership practices significantly influence employee engagement and retention [29]. By focusing on these areas, private enterprises can create a conducive work environment that enhances commitment and loyalty. Additionally, promoting work-life balance and fairness in policies aligns with contemporary HR practices aimed at increasing job satisfaction and reducing turnover rates [30]. This research contributes to the growing body of knowledge on organizational behavior by elucidating the interdependencies between organizational culture, commitment, and loyalty in the context of Beijing's private sector, providing actionable insights for practitioners seeking to enhance employee engagement and retention.

5.2 Recommendation

To enhance employee commitment and loyalty within private enterprises in Beijing, organizations should prioritize creating a supportive organizational culture that encourages open communication and teamwork. This can be achieved through regular feedback mechanisms and initiatives that promote collaboration among employees. Additionally, enhancing leadership accessibility is crucial; leaders must be approachable and engage in active listening to better understand employee needs and concerns. Regular one-on-one meetings or town hall sessions can strengthen the leader-employee relationship, fostering a sense of belonging and loyalty. Furthermore, providing structured career development opportunities, including mentorship and clear pathways for advancement, can significantly improve employee satisfaction and commitment. It is equally important to promote work-life balance through policies that support flexible work arrangements and wellness programs. Lastly, ensuring fairness and transparency in HR policies, particularly regarding promotions and rewards, can build trust among employees.

Future research should consider conducting longitudinal studies to assess how changes in organizational culture impact employee commitment and loyalty over time. Additionally, sector-specific studies could reveal unique cultural dynamics within different industries in Beijing, offering comparative insights that enhance understanding across various contexts. Investigating the influence of organizational culture on loyalty among diverse employee groups, such as those differentiated by gender, age, or ethnicity, could provide valuable insights into inclusivity and engagement strategies. As remote work becomes more prevalent, it would also be beneficial to explore how organizational culture and commitment evolve in remote settings. Finally, further quantitative studies could analyze the relative impact of various dimensions of organizational culture and commitment on employee loyalty, enabling organizations to prioritize their improvement efforts effectively.

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ANALYSIS AND ENHANCING CAREER PLANNING AND DEVELOPMENT PRACTICES AT FG COMPANY

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ABSTRACT

The objectives of this research were: 1) to analyze the current state of career planning and management practices within FG Company; 2) to identify gaps and deficiencies in existing career planning and management practices within FG Company; 3) to propose implementation guidelines for improving employee career planning and management practices within FG Company. This research employed a mixed methods approach. The sample included 384 employees selected through stratified random sampling. The 29 key informants consisted of HR managers, middle-level leaders, and employees who were purposefully selected. Data collection involved document analysis, questionnaires, and in-depth online interviews. The questionnaires were analyzed using descriptive statistics, including frequency distribution, percentages, means, and standard deviations, while document data and interview data underwent content analysis.

The findings revealed that 1) FG Company's career planning practices showed a moderate understanding of SMART goals, but uncertainty about deadlines limited clarity. Employees faced challenges in career advancement due to insufficient support, highlighting the need for clearer career frameworks. Additionally, underutilized development programs required better promotion; 2) Key gaps included unclear goal-setting, undefined career paths, inconsistent skill assessments, and weak succession planning, leaving employees uncertain about advancement; 3) To improve employee career planning, FG Company needed to standardize goal-setting with a formal SMART framework and implement a digital tracking system for accountability. Clear career path frameworks were necessary to provide transparency and empower employees to proactively manage their growth. Offering cross-departmental opportunities and expanding career development programs, including leadership training and mentorship, would help build a versatile workforce. A robust succession planning process would ensure future leadership readiness and boost employee engagement, satisfaction, and retention.

Keywords: career planning; career development; human resource management

1. Introduction

Effective career planning and management are widely recognized as critical components for fostering employee growth and ensuring long-term organizational success. Aligning individual career aspirations with organizational goals not only enhances employee motivation and engagement but also improves retention. Numerous studies highlight the positive impact of structured career planning on employee development, organizational performance, and talent retention [1]. However, many organizations, including FG Company, continue to face challenges in implementing comprehensive career planning frameworks that meet both employee needs and strategic objectives.

In the case of FG Company, there is an urgent need to assess and improve its current career planning and management practices. While some career development initiatives are in place, preliminary observations indicate they may lack cohesion and alignment with the company's broader business goals. Additionally, employees may not have sufficient access to the necessary resources, guidance, or opportunities to develop clear career paths. This lack of support can lead to dissatisfaction, disengagement, and even turnover, all of which negatively impact organizational performance [2].

Although career planning and management practices have gained considerable attention in recent years, existing frameworks exhibit several theoretical gaps that limit their applicability, particularly in dynamic industries like FG's. For example, traditional models such as the Protean Career Model and the Boundaryless Career Model emphasize individual responsibility for career development, yet often fail to integrate personal aspirations with organizational strategic objectives [3]. This disconnect poses a significant challenge for companies like FG, where aligning employee career goals with business needs is crucial. Moreover, many of these models are designed for stable environments and lack the flexibility required to adapt career planning to rapidly changing industries, where skill sets and job roles are constantly evolving.

The current literature focuses on generic career management approaches, without addressing the specific challenges that FG Company faces, such as its unique organizational culture, industry demands, and employee demographics. There is also a lack of detailed, actionable guidelines tailored to FG's needs for improving career planning and management practices. To address these theoretical and practical gaps, this study aims to:

- 1) To analyze the current state of career planning and management practices within FG Company.
- 2) To identify gaps and deficiencies in existing career planning and management practices within FG Company
- 3) To propose implementation guidelines for improving employee career planning and management practices within FG Company.

This research will provide a deeper understanding of FG Company's career development practices and offer targeted recommendations to strengthen its approach. Ultimately, these efforts will contribute to increased employee satisfaction and improved organizational performance.

2. Literature Reviews

2.1 Theoretical Foundations of Career Planning and Development

In the study of career planning theory, Ma [4] refined and expanded upon the research of management scientist Dr. Pemberton and other scholars. Ma proposed that a complete career planning system should be established, which includes key components such as targeted employee training, job rotation opportunities, sufficient development space, fairness in employee advancement, and reasonable career choices. This framework emphasizes the need for structured organizational support to ensure employees' career growth. Similarly, Cai [5] highlighted in practical research that career design should focus on strengthening employee education, aligning organizational goals with individual development, establishing evaluation institutions, and providing timely information relevant to employee career paths.

Yu [6] defined a career as the entire process of an individual's work life, from start to finish, and argued that career planning and refined management involve the effective alignment of personal work experiences with organizational objectives. This refined management approach requires analyzing factors that influence career growth and applying this understanding to set personal development goals. In addition, Yu stressed that career planning from an employee's perspective must align with organizational strategies, providing opportunities such as education and job rotations to facilitate employee growth. This dual approach helps organizations and employees mutually benefit from planned career development efforts.

Despite the theoretical advancements, several issues persist in corporate career management. Hu [7] identified key problems such as insufficient attention from management, flaws in career management systems, and high turnover among knowledge workers. These issues arise from a lack of understanding of the value of knowledge workers, limited communication between leadership and staff, and inadequate career development pathways for employees. To address these challenges, Hu proposed strategies such as enhancing leadership engagement in career management, improving career management systems, and analyzing employees' career stages to better support both individual and organizational growth.

2.2 Career Anchors, Career Planning, and Career Development

The research on the Indian IT industry, linked career success to employee "career anchors" [8]. This study found that employees who had clear self-perceptions regarding their career anchor types were more likely to stay with their organization when targeted support was provided. This research highlights the practical significance of aligning organizational initiatives with employees' personal career drivers to improve retention and engagement. Career development practices have evolved significantly over the past century, incorporating diverse theoretical perspectives to meet changing societal and workplace demands [9]. According to recent literature [10], career development interventions have broadened to include individual behaviors, vocational psychology, sociology, and cultural diversity. Modern approaches integrate objectivist and constructivist perspectives, recognizing the importance of relational and cultural contexts in shaping career trajectories [11]. Additionally, efforts are being made to make career counseling theories more inclusive and applicable to diverse populations, with an emphasis on defining competencies for professional practice.

Career planning and development is instrumental in boosting employee engagement, job satisfaction, and overall growth [12]. When organizations understand and support employees' personal development needs, they enable employees to set clear career goals. This process not only enhances employees' self-awareness but also clarifies their long-term opportunities within the company. In turn, employees develop greater job satisfaction, which benefits the organization by driving higher levels of commitment and productivity. Effective career planning and development thus becomes a strategic tool for organizational development and employee growth.

2.3 Conceptual Framework

Conceptual framework as show in figure 1.

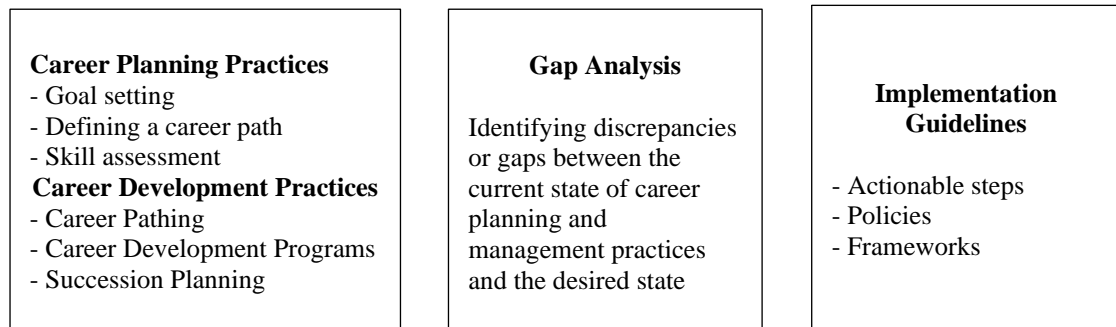


Figure 1 Conceptual Framework

The conceptual framework illustrates career planning practices, this variable encompasses the methods, strategies, and processes employed by FG Company to facilitate employee career planning. It includes elements such as goal setting, career path development, and skill assessment. Career management practices are highlighted, focusing on the mechanisms and initiatives implemented by the company to manage employees' careers effectively [13], [14], [15]. This variable includes career pathing, career development programs, and succession planning.

Gap analysis is another key component of the framework, involving the identification of discrepancies or gaps between the current state of career planning and management practices and the desired state. This process evaluates areas of improvement based on employee feedback, performance metrics, and industry benchmarks.

Implementation guidelines are outlined within the framework, encompassing proposed recommendations and strategies for enhancing career planning and management practices within FG Company. This variable includes actionable steps, policies, and frameworks aimed at addressing the identified deficiencies and gap of career planning and management practices.

3. Methodology

The research begins by studying the background and existing problems in corporate employee career planning, organizing relevant theoretical and practical significance, and reviewing research methods in the field. Field research, manager interviews, and questionnaire surveys will analyze the professional career planning of FG company employees, focusing on goal setting, career path development, and challenges. Gap Analysis is used to identify gaps in career planning and management. Finally, specific suggestions for career path design will be proposed, followed by an evaluation by three experts for consistency and feasibility.

The study population includes 9,865 employees, The sample will consist of 384 employees, 7 managers, and 14 middle-level leaders, selected using stratified random sampling. Key informants are 7 HR managers, and 14 middle-level leaders at FG company.

The research tools consist of questionnaires and interview guidelines, designed based on a thorough literature review of career planning and management practices. These tools have been scientifically validated, achieving an Item-Objective Congruence (IOC) score ranging from 0.67 to 1, along with a Cronbach's Alpha coefficient of 0.700 or higher. This indicates that the research instruments are of high quality and suitable for use in the study [16].

Statistical methods such as frequency count, percentages, means, and standard deviations will be used. A five-point Likert scale will measure the level of career planning issues. Content analysis will be used to examine interview responses, and the findings will guide the development of career planning guidelines, focusing on actionable steps, policies, and frameworks.

4. Results

4.1 Current state of career planning and management practices within FG Company 1) Analysis of Questionnaire Data

Table 1 Descriptive statistics of career planning and development practices within FG Company

Dimension	Mean	Std. Deviation	Interpret
Goal setting	3.09	1.294	Moderate
Defining a career path	3.08	1.324	Moderate
Self-assessment	3.12	1.315	Moderate
Career pathing	3.09	1.323	Moderate
Career development Programs	3.07	1.359	Moderate
Succession Planning	3.08	1.327	Moderate
Total	3.09	1.324	Moderate

Table 1 reveals that the overall satisfaction score for the company's career development support and programs is 3.09, indicating a moderate level of satisfaction. The standard deviation of 1.324 reflects considerable variation in employee feedback, suggesting inconsistency in how support is perceived across the workforce. This highlights the need for more uniform and targeted career development efforts.

In terms of goal setting, the average score of 3.09 shows that employees are generally neutral about the support provided. While some find goal-setting effective, others feel it lacks specificity and personalization. A standard deviation of 1.294 indicates minor variations in feedback, but overall, responses are relatively similar.

For career development, the average score of 3.08 also reflects a moderate level of satisfaction. However, the larger standard deviation (1.324) suggests wide variation in employee experiences. This implies that while some employees feel well-supported, others may not have access to the same resources, pointing to uneven distribution of career development opportunities.

The self-assessment dimension scores slightly higher, at 3.12, indicating that employees are somewhat satisfied with the tools and processes provided for self-evaluation. Nonetheless, a standard

deviation of 1.315 suggests that experiences with self-assessment vary significantly among employees, highlighting a need for more consistency in this area.

Regarding career pathing, employees again exhibit moderate satisfaction, with an average score of 3.09. The standard deviation of 1.323 suggests that while some employees are satisfied with the clarity of their career progression, others may find it unclear or lacking in guidance.

For career development programs, the average score is 3.07, indicating moderate effectiveness. However, the high standard deviation (1.359), the largest among all dimensions, suggests significant variation in employee perceptions. While some employees benefit from these programs, others may find them inadequate or inaccessible.

Finally, succession planning receives an average score of 3.08, showing that employees feel moderately supported in understanding leadership development and succession processes. The standard deviation of 1.327 indicates substantial variation in perceptions, with some employees finding the process clear, while others experience a lack of transparency.

2) Analysis of Interview Data

Table 2 Career planning and development practices at FG Company

Practice	Current State
Goal Setting	Goal setting occurs during annual reviews but varies across departments. Some managers take a collaborative approach, while others leave it to the employees. Informal communication and lack of documentation result in inconsistent follow-up and limited development opportunities.
Defining a career path	The process is informal and inconsistent, with limited guidance on role transitions. Existing frameworks are poorly communicated, leaving employees to shape their own paths. Manager involvement is crucial but inconsistent, relying heavily on employee initiative.
Skill Assessment	Skills are assessed primarily during annual reviews, with occasional 360-degree feedback for leadership. Competency frameworks are inconsistently applied, and assessments often depend on informal evaluations by managers. More structured discussions are needed for skill alignment with career paths.
Career Pathing	Career pathing is informal, with employees often navigating their own trajectories. Frameworks for growth exist but are not well communicated, leading to difficulties envisioning long-term career development. Manager involvement varies widely, creating inconsistent experiences.
Career Development Programs	FG offers programs like leadership development, technical training, mentorship, and job rotation. However, participation is low, and awareness of these programs is inconsistent across departments. Promotion and follow-up need improvement to boost engagement.
Succession Planning	Succession planning is informal and reactive, focusing on leadership roles. Efforts to identify successors exist but lack structure and communication. High turnover and operational pressures complicate the process, leading to a disconnect between leadership development and advancement opportunities.
Overall Analysis	FG Company shows strengths in flexibility and initiative but lacks structure, transparency, and communication in career planning. Employees struggle to align personal goals with organizational objectives, leading to challenges in career progression. A more structured framework, better promotion of programs, and proactive succession planning are recommended.

FG Company's career planning and management practices exhibit significant variability and informality. Goal setting generally occurs during annual performance reviews, but approaches differ by department, resulting in inconsistent communication and follow-up. Career path development lacks formal guidance, with employees often needing to create their own paths, relying heavily on manager involvement, which also varies. Skill assessments are primarily conducted during annual reviews and rely on informal evaluations, highlighting the need for more structured discussions. While FG offers various career development programs, participation and awareness are low, necessitating better promotion and follow-up. Succession planning is informal and reactive, focusing mainly on leadership roles, which creates a disconnect between leadership development and available advancement

opportunities. Overall, the company would benefit from implementing a more structured framework for career planning and enhancing communication to align individual goals with organizational objectives.

4.2 Gaps and deficiencies in existing career planning and management practices within FG Company

Table 3 Gaps and deficiencies in existing career planning and development practices at FG Company

Practices	Gaps and Deficiencies
Goal Setting	There is inconsistency across departments in goal-setting practices, leading to uncertainty about career advancement steps. The focus on short-term project goals neglects long-term career aspirations, and the overall approach is reactive rather than structured.
Defining a career path	Employees report a need for clearer career paths and promotion requirements. The lack of formalized processes and insufficient communication regarding advancement opportunities result in misalignment with organizational objectives and transparency issues in promotions.
Skill Assessment	Existing skill assessment mechanisms are vague and inconsistent, with managers poorly trained to guide employees. There is no robust system for tracking skills in relation to career goals, and a formalized skill assessment structure aligned with career progression is missing.
Career Pathing	Career pathing is informal and lacks a structured framework. Employees manage their own development without adequate guidance, leading to missed growth opportunities and weak cross-departmental collaboration.
Career Development Programs	While employees value existing programs, they find them overly focused on technical skills. There is a demand for balanced programs that address leadership and soft skills, and the effectiveness of these programs on career advancement is unclear. Additionally, formal mentorship programs are lacking or insufficiently promoted.
Succession Planning	Succession planning is poorly integrated into the overall career development framework, resulting in a disconnect between individual career goals and the company's leadership needs. The absence of a structured succession planning process hinders the preparation of employees for leadership roles and limits follow-up on career goals.

FG Company's career planning and management practices exhibit several significant gaps and deficiencies. In goal setting, there is noticeable inconsistency across departments, leading to employee uncertainty about the steps required for career advancement. This inconsistency is compounded by a reactive approach that emphasizes short-term project goals at the expense of long-term career aspirations. Similarly, the career path development process lacks clarity, with employees expressing a need for clearer pathways and a better understanding of promotion requirements. The absence of formalized processes and insufficient communication regarding advancement opportunities contribute to confusion and dissatisfaction.

Additionally, skill assessment mechanisms are vague and inconsistent; managers are not well-equipped to guide employees, and there is no robust system for tracking skills in relation to career goals. The informal nature of career pathing leaves employees to navigate their development without adequate support, resulting in missed opportunities for growth. While employees appreciate existing career development programs, they find them overly focused on technical skills, with a desire for more balanced offerings that include leadership and soft skills.

Moreover, the lack of clarity regarding the effectiveness of these programs in facilitating career advancement further complicates the situation. Finally, the approach to succession planning is poorly integrated into the overall career development framework, leading to a disconnect between individual career goals and the company's leadership needs. This deficiency hinders the preparation of employees for leadership roles and limits necessary follow-up on career objectives, ultimately impacting organizational effectiveness.

4.3 Implementation Guidelines for Improving Career Planning and Management Practices at FG Company

Table 4 The implementation guidelines for improving career planning and development practices at FG Company

Guideline	Recommendations
Standardize and Enhance Goal-Setting Practices	<ul style="list-style-type: none"> - Implement a formalized SMART goal framework through training for consistency across departments. - Align short-term and long-term career goals in performance reviews. - Develop a goal-tracking system for documentation and feedback.
Establish Clear and Transparent Career Path Frameworks	<ul style="list-style-type: none"> - Design structured career pathways with clear skills and qualifications needed for advancement. - Require quarterly career development discussions between managers and employees. - Promote cross-departmental development opportunities.
Implement a Structured Skill Assessment and Development Framework	<ul style="list-style-type: none"> - Develop formal skill evaluation tools including self-assessments and manager evaluations. - Use 360-degree feedback for leadership roles. - Create Individual Development Plans (IDPs) for personalized skill development.
Enhance Career Development Programs and Increase Participation	<ul style="list-style-type: none"> - Diversify development programs to include leadership, soft skills, and mentorship. - Launch a communication campaign to promote programs and track participation. - Establish a formal mentorship program for career guidance.
Strengthen Succession Planning and Leadership Development	<ul style="list-style-type: none"> - Develop a comprehensive succession planning process with talent reviews and leadership programs. - Align individual career goals with organizational leadership needs. - Conduct annual leadership readiness assessments to identify development gaps.
Foster a Culture of Proactive Career Development	<ul style="list-style-type: none"> - Encourage employees to take ownership of their career growth through workshops. - Recognize and reward career development initiatives to boost motivation. - Establish continuous feedback loops for ongoing career discussions.

To enhance career planning and management practices at FG Company, several key implementation guidelines are recommended.

First, the company should standardize and enhance goal-setting practices by adopting a formalized SMART goal framework. This includes providing training to ensure consistency across departments, aligning short-term and long-term career goals during performance reviews, and developing a digital goal-tracking system for documentation and feedback.

Second, FG Company needs to establish clear and transparent career path frameworks by designing structured career pathways that outline the necessary skills and qualifications for advancement. Quarterly career development discussions between managers and employees should be mandated to ensure proactive engagement, alongside promoting cross-departmental development opportunities.

Third, a structured skill assessment and development framework should be implemented, which includes formal skill evaluation tools such as self-assessments and manager evaluations. Additionally, a 360-degree feedback mechanism should be introduced for leadership roles, coupled with Individual Development Plans (IDPs) tailored to employees' career goals.

Fourth, FG Company should enhance its career development programs by diversifying offerings to include leadership training, soft skills development, and formal mentorship programs. A communication campaign is essential to promote these programs and track participation rates effectively.

Fifth, the company must strengthen its succession planning and leadership development by creating a comprehensive succession planning process that identifies and prepares high-potential employees for leadership roles. Aligning individual career goals with organizational leadership needs is crucial, and conducting annual leadership readiness assessments will help identify development gaps.

Finally, fostering a culture of proactive career development is vital. Employees should be encouraged to take ownership of their career growth through workshops, and a recognition program should acknowledge those who actively engage in career development. Establishing continuous feedback loops between employees and managers will ensure ongoing support in career development discussions.

Together, these guidelines will create a structured, supportive environment that promotes effective career planning and management at FG Company.

5. Conclusion and Recommendation

5.1 Conclusion

1) Current state of career planning and management practices within FG Company.

The assessment of career planning and management practices at FG Company reveals a foundational understanding of SMART goals among employees, with moderate engagement in setting and achieving personal and professional objectives. While employees recognize the importance of goal-setting for clarity, focus, and progress measurement, their uncertainty regarding time-bound goals highlights a critical gap in the goal-setting process. This suggests that FG Company must place greater emphasis on incorporating deadlines into its goal-setting framework to enhance clarity and accountability across departments.

The analysis of career development programs and succession planning at FG Company reveals a need for more systematic and effective strategies. Despite offering a variety of development programs, low participation rates and limited awareness indicate that these initiatives are not fully meeting employee needs. A lack of communication surrounding available programs diminishes their perceived value and effectiveness. Moreover, the informal approach to succession planning raises concerns about the organization's ability to prepare future leaders adequately. To enhance these practices, FG Company should develop a comprehensive communication strategy that promotes available development opportunities while ensuring regular updates and feedback mechanisms. Additionally, implementing a structured succession planning framework can help identify and nurture potential leaders more effectively, thereby bridging the gap between leadership development and career advancement opportunities [17]. By focusing on these areas, FG Company can cultivate a more engaged and competent workforce, ultimately driving organizational success.

2) Gaps and deficiencies in existing career planning and management practices within FG Company.

The analysis of FG Company's career planning practices reveals several critical gaps that hinder employee development and progression. Despite moderate engagement levels in goal-setting, employees lack a strong understanding of the importance of time constraints and the tools necessary for measuring progress. This inconsistency is compounded by the absence of formal guidance on goal-setting practices across departments. Consequently, employees may feel uncertain about their career advancement paths and less motivated to pursue long-term goals. To address these shortcomings, FG Company must prioritize the establishment of a structured framework for goal-setting that emphasizes both short-term and long-term objectives, ensuring clarity and direction for all employees. FG Company's career planning practices reveal significant gaps that hinder employee engagement and development. Despite moderate engagement scores, the lack of clarity and structure in goal-setting practices stands out as a primary issue. Employees express uncertainty about how to set and achieve career goals, pointing to an inconsistency in the application of SMART criteria across departments. This inconsistency can lead to feelings of stagnation and dissatisfaction, as employees may struggle to visualize a clear path for advancement [18]. The overemphasis on short-term project goals further compounds this issue, neglecting the long-term career aspirations of employees. A more structured approach to goal setting, along with formal guidance and training, could empower employees to take ownership of their career trajectories and foster a culture of proactive engagement in their professional development.

3) Implementation guidelines for improving employee career planning and management practices within FG Company.

FG Company has a significant opportunity to enhance its career planning and development practices through a comprehensive approach that standardizes goal-setting, establishes clear career pathways, and implements structured skill assessments. By adopting a formalized SMART goal framework and aligning both short-term and long-term career objectives, FG Company can create a more consistent and actionable goal-setting process. The introduction of a digital goal-tracking system will not only facilitate employee progress monitoring but also foster accountability and ongoing communication between managers and their teams. FG Company has identified critical strategies to enhance its career planning and development practices, particularly through the standardization of goal-setting practices and the establishment of clear career pathways. The proposed implementation of a formalized SMART goal framework will address inconsistencies in goal-setting across departments, enabling employees to

set specific, measurable, achievable, relevant, and time-bound objectives. By aligning both short-term and long-term career goals during performance reviews, FG Company can foster a more comprehensive approach to employee development. Additionally, the introduction of a goal-tracking system will facilitate ongoing feedback and accountability, which are essential for maintaining motivation and commitment to career advancement [19].

5.2 Recommendations

1. Practical Recommendation

FG Company should provide formal training to all employees and managers on the SMART goal framework, emphasizing the importance of time-bound objectives. Regular goal-setting workshops and training can help employees set both short-term and long-term career goals, promoting consistent progress toward their personal and professional development. FG Company should establish a formal succession planning framework that identifies high-potential employees and prepares them for leadership roles. Regular talent reviews and leadership readiness assessments can ensure smooth transitions and maintain organizational.

2. Theory Implication

FG Company's current career planning and management practices show inconsistencies in applying SMART goals, particularly the time-bound aspect. According to Locke and Latham's goal-setting theory, specific and challenging goals, combined with appropriate feedback, can enhance employee performance. FG Company should emphasize the importance of time-bound goals as part of its formalized goal-setting framework, ensuring that deadlines drive accountability and motivation. Workshops focused on the SMART criteria, with special attention to the "Time-bound" element, should be implemented to improve goal attainment and foster commitment. Additionally, introducing a digital goal-tracking system can facilitate continuous feedback and improve employees' ability to monitor progress.

Employees at FG Company report confusion about career advancement opportunities due to the lack of transparent career paths. Hirschi's career path theory suggests that providing clear and structured career pathways significantly impacts employees' career development by giving them a sense of direction and purpose. FG Company should design and communicate structured career pathways, ensuring that employees are aware of promotion criteria and available opportunities. Regular career discussions between managers and employees should be scheduled to support their career progression, leading to improved satisfaction and retention.

3. Future research suggestion

Future research could investigate the effectiveness of digital platforms and tools in facilitating career planning and management within organizations. This study could focus on how technologies like career development apps, online mentoring platforms, and goal-tracking systems influence employee engagement, satisfaction, and career progression. It would be beneficial to explore how these digital tools can standardize practices, enhance communication between managers and employees, and provide personalized development opportunities. Another area for future research could examine the differences in career planning and management preferences among various generational cohorts within the workforce, such as Baby Boomers, Generation X, Millennials, and Generation Z. This study could explore how each generation perceives career advancement, the importance of mentorship, and their engagement with development programs. Understanding these differences could help organizations tailor their career management practices to meet the diverse needs of a multi-generational workforce, enhancing overall employee satisfaction and retention.

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ELEVATED TASTE: EXPLORING THE IMPACT OF ALTITUDE AND PROCESSING METHODS ON CUP QUALITY

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ABSTRACT

This study investigates the impact of altitude and processing methods on coffee quality in Ywa-Ngan Township, Myanmar, to provide empirical evidence to optimize cultivation practices and enhance coffee quality. Coffee production in Myanmar is gaining recognition for its distinctive flavor profiles and increasing quality. This research examines the effects of different altitudes on coffee quality. It evaluates different processing methods –thoroughly washed and naturally dry, to determine the most effective methods for improving coffee flavor and value. Based on the Specialty Coffee Association (SCA) protocol standard, here are the findings: At an altitude of 1350 meters, the dry method yielded a score of 85.06, while the wet method resulted in a score of 84.82; at an altitude of 1550 meters, the dry method produced a score of 86.64, and the wet method achieved a score of 86.14 total cup quality. The findings showed that coffee produced at higher altitudes using the dry method achieved slightly higher overall quality ratings, which assisted local farmers in making informed decisions. This research provides valuable insights into how environmental and processing factors influence coffee quality, with practical implications for enhancing agricultural practices and market competitiveness.

Keywords: Altitude, Processing methods, Coffee Density, Cup Quality

1. Introduction

Coffee is a widely consumed commodity, and numerous brands are available in the global market. As coffee consumption continues to rise, coffee culture is becoming increasingly recognizable and embraced by many worldwide [1]. The quality of coffee is greatly influenced by geographical factors such as altitude and processing methods, particularly the thoroughly washed and natural (dry) processes [2]. Higher altitudes enhance coffee's sensory and chemical characteristics, improving acidity and flavor complexity [3]. Post-harvest storage, drying processes, and access to essential resources significantly enhance coffee yields and cup quality [4]. Altitude and processing methods are critical factors influencing coffee quality. In Myanmar, coffee production has gained international recognition for its unique flavor profiles, especially in regions like Ywa-Ngan Township. Myanmar's coffee production reached 8,880 tons in 2022, up from a low of 923 tons in 1976. The northern regions, including Shan State, Mandalay Region, Kayin State, and Chin State, offer significant potential for high-quality Arabica coffee due to favorable conditions such as elevations over 3,300 feet and fertile red soils. Myanmar has identified over 200,000 acres of land with the ideal soil, altitude, and climate conditions to produce Premium and Specialty Arabica coffee [5]. This research aims to provide actionable insights for farmers in Ywa-Ngan and other regions of Myanmar to optimize coffee cultivation practices.

2. Literature Reviews

The significance of coffee in global trade and local economies is well-documented [6]. The International Coffee Organization (ICO) reported that global green bean exports reached 10.76 million bags in May 2024, a 12.0% increase from the 9.61 million bags exported in May 2023. This brought the cumulative total for the 2023/24 coffee year up to May to 84.02 million bags, an 11.6% rise compared to the 75.31 million bags exported during the same period the previous year. The growth was primarily driven by Brazilian Naturals, which contributed 118.4% of the 1.15-million-bag increase in total exports [7].

Both altitude and processing methods influence coffee quality. Altitude affects coffee attributes such as acidity, body, and aroma. Higher altitudes, such as 1050 meters, typically enhance coffee quality by promoting slower fruit maturation and more significant accumulation of sugars, which improves flavor and aroma [8]. High altitude leads to a more extended maturation period due to cooler temperatures, and shade can enhance coffee's sensory qualities [9].

Processing methods play an essential role in determining coffee quality. The two primary methods are wet and dry processing. Wet processing, which involves soaking beans for 36–40 hours, generally produces coffee with higher acidity and cleaner flavors. In contrast, dry processing results in coffee with a fuller body and lower acidity due to extended drying and fermentation [10]. The processing method choice can significantly impact the final cup profile, including flavor, body, and acidity [2].

Although several authors mentioned the critical role of altitude and processing method to maintain coffee cup quality, there is still lack of evidence in Myanmar. Coffee farmers face challenges such as limited knowledge of advanced agricultural practices. This study explores which factors affect coffee quality in Ywa-Ngan Township, Myanmar. By focusing specifically on the effects of altitude and comparing the washed and natural (dry) processing methods, the research seeks to provide empirical evidence.

3. Methodology

The study was conducted in the farm of Ywa-Ngan Township, Taunggyi District, located in the Southern Shan State, Myanmar, with altitudes ranging from between 1,300 and 1,600 meters above sea level and at the exact geographical coordinates, latitude and longitude — 21.1678559, 96.4450158. For this study, the samples were collected from two different altitudes, 1350 meters and 1550 meters above sea level, respectively. The two coffee farms in Ywa-Ngan township, namely Lae Ghaing (farm-A) and Mae Nae Taung Village (farm- B), were purposely selected.

A locally-focused study design was used for coffee quality's observational and experimental aspects. For density analysis, two samples of coffee beans were added to the 100 ml measuring cylinder, and the beans were weighed to calculate their weight and volume (gram/milliliter). From the obtained data, the correlation between the altitudes and density of coffee beans was calculated. For sensory analysis, the processed coffee beans were sent to certified coffee experts, and then coffee testing was performed according to the protocols of the Coffee Specialty Association. The experts scored the cup quality of the coffee. Expert coffee tasters, known as cuppers or sensory analysts, participated in

evaluating coffee quality. The experts' evaluated data were collected using the Specialty Coffee Association (SCA) protocol cupping form, a standardized method for assessing coffee quality. SCA consists of sensory attributes such as aroma, flavor, acidity, and body to ensure the coffee's consistency and analyze the cup's quality.

The image displays the Specialty Coffee Association (SCA) Arabica Cupping Form. It includes the SCA logo, the title 'Specialty Coffee Association Arabica Cupping Form', and fields for Name, Date, and Table no. A 'Quality Scale' table is provided, ranging from 6.00 (Good) to 9.00 (Outstanding). The main form consists of three identical evaluation sheets for 'Sample No.', 'Sample Level of Sample', and 'Notes'. Each sheet contains various sensory attributes such as Fragrance/Aroma, Flavor, Acidity, Body, Mouthfeel, Balance, Sweetness, and Defects (Astringent), each with a corresponding scale or checkbox for evaluation. A 'Final Score' field is located at the bottom right of each sheet.

Figure 1: Specialty Coffee Association (SCA) protocol cupping form

4. Results

Table 1 shows two samples from two different altitudes, where sample A from an altitude of 1350 meters and sample B from 1550 meters, and the densities of coffee beans. It describes the correlation between high-altitude cultivated coffee and higher densities of coffee beans. The data shows that as altitude increases, the density of coffee beans also increases. For the samples measured, Sample A (1350 meters) had a 0.667 g/ml density. Sample B (1550 meters) had a higher density of 0.716 g/ml. This data indicates a strong positive correlation (approximately 99%), suggesting that higher altitudes are associated with greater coffee bean density.

Table 1: Density of Coffee Samples at Different Altitudes

Sample	Altitude (Meter)	Density (Gram/Milliliter)
Sample A	1350	0.667g/ml
Sample B	1550	0.716g/ml

Sensory Evaluation Scores of Coffee Samples at Different Altitudes

Since no defects are present in any of the samples, a score of 10 each is provided for Uniformity/Clean Cup and Sweetness for all the samples. Hence, an additional 30 points are added to the total score. Sample A (1350 meters) achieved an overall score of 84.82. Sample B (1550 meters) scored higher, with an overall score of 86.14. The results suggest that coffee from higher altitudes tends to have better cup quality attributes, as indicated by higher scores in aroma, flavor, acidity, body, and overall balance.

Table 2: Sensory Evaluation Scores of Coffee Samples at Different Altitudes

Sample	Altitude	Aroma	Flavor	Acidity	Body	Finishing After taste	Balance	Overall	Total
Sample A	1350 m	7.58	7.91	7.75	8	7.58	8	8	84.82
Sample B	1550 m	7.91	8.08	7.91	7.91	8	8.08	8.25	86.14

Sensory Evaluation Scores of Coffee Samples by Processing Method and Altitude

Sensory attributes of coffee samples were analyzed using radar charts created in Microsoft Excel based on cupping scores from the Specialty Coffee Association (SCA). The charts compared attributes such as aroma, flavor, acidity, body, finishing/aftertaste, balance, and overall impression across different processing methods (dry and thoroughly washed) and altitudes. Radar charts effectively visualize multidimensional data, making it easier to compare and understand the impact of these factors on coffee quality.

Table 3: Sensory Evaluation Scores of Coffee Samples by Processing Method and Altitude

Sample	Method	Aroma	Flavor	Acidity	Body	Finishing /Aftertaste	Balance	Overall	Total
Sample A (1350)	Dry	7.83	7.83	7.66	8.08	7.66	8	8	85.06
Sample A (1350)	Fully washed	7.58	7.91	7.75	8	7.58	8	8	84.82
Sample B (1550)	Dry	8.08	8.16	7.83	8.16	8	8.08	8.33	86.64
Sample B (1550)	Fully washed	7.91	8.08	7.91	7.91	8	8.08	8.25	86.14

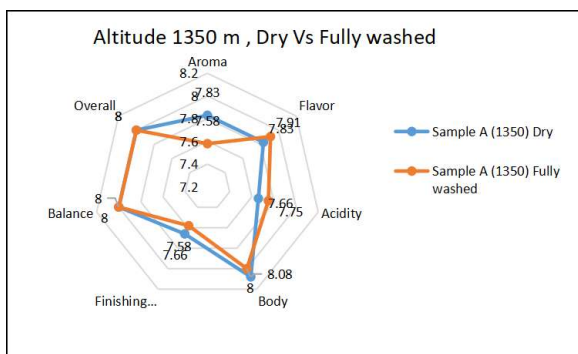


Figure 2. Sensory diagram of altitude 1350m by different processing method

At an altitude of 1350 meters, the dry-processed coffee (Sample A) exhibits a marginally higher total score of 85.06 compared to the thoroughly washed version, which scores 84.82 (Figure 2). The differences between these two processing methods are subtle but significant in specific attributes. The dry process results in a slightly better aroma score of 7.83, compared to the thoroughly washed coffee's score of 7.58, suggesting that a more pronounced aroma is achieved when the beans are processed without water. However, the thoroughly washed sample demonstrates a marginally better flavor profile, scoring 7.91 compared to the 7.83 dry sample, indicating that washing may enhance specific flavor notes. The thoroughly washed sample also exhibits higher acidity, scoring 7.75 versus the 7.66 dry-processed sample, aligning with the expectation that washing often highlights acidity. In terms of the body, the dry-processed coffee stands out with a score of 8.08, compared to the thoroughly washed sample's 8.00, suggesting that the drying process may retain more natural oils, leading to a richer mouthfeel. The finishing scores are very close, with the dry sample at 7.66 and the thoroughly washed at 7.58, and both methods are equally balanced at 8. Overall, the dry process edges out the thoroughly washed overall score due to its more muscular body and aroma.

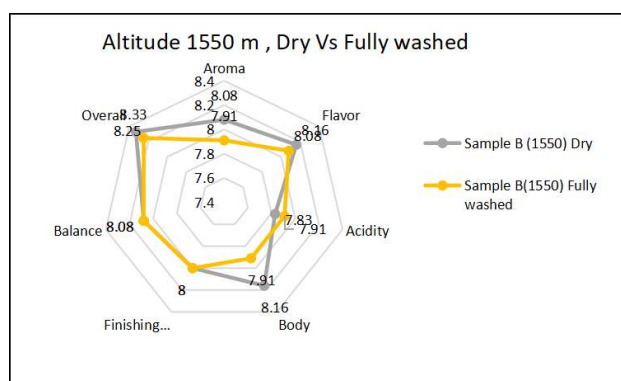


Figure 3. Sensory diagram of altitude 1550m by different processing method

At an altitude of 1550 meters, the dry-processed coffee (Sample B) scores slightly higher overall, with a total of 86.64 compared to the fully washed sample's 86.14 (Figure 3). The dry method has a slight edge in most attributes except for acidity. Specifically, the dry-processed sample achieves a slightly better aroma score of 8.08 compared to the fully washed sample's 7.91, indicating a more robust aromatic profile. The flavor scores are nearly identical, with the dry sample scoring 8.16 and the fully washed sample close behind at 8.08. Acidity is where the fully washed sample shows its strength, with a score of 7.91 compared to the dry-processed sample's 7.83, consistent with the trend of increased acidity in washed coffees. The body of the dry sample stands out at 8.16, higher than the 7.91 of the fully washed sample, indicating a fuller and richer mouthfeel. Both samples score equally in finishing, with a score of 8.00. The balance remains consistent at 8.08 for both samples, but the dry-processed coffee achieves a

slightly higher overall score of 8.33 compared to 8.25 for the fully washed, making it the preferred method at this altitude.

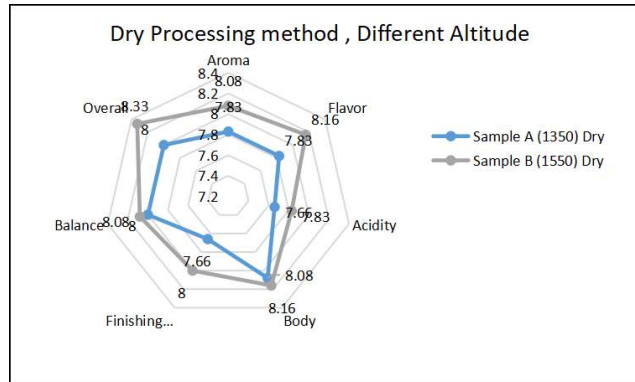


Figure 4. Sensory diagram of dry processing method in different altitude

When comparing the dry-processed samples from 1350 meters (Sample A) and 1550 meters (Sample B), the higher altitude sample (Sample B) shows superior overall quality with a score of 86.64 compared to the lower altitude sample's 85.06 (Figure 4). The higher altitude seems to enhance several attributes. Sample B has a slightly stronger aroma, scoring 8.08 compared to Sample A's 7.83, suggesting that altitude may boost the aromatic qualities in dry-processed coffee. The flavor profile is also enhanced at the higher altitude, with Sample B scoring 8.16 against Sample A's 7.83, indicating that altitude contributes to more complex flavors in dry-processed coffee. While the acidity in Sample B is higher at 7.83 compared to Sample A's 7.66, the difference is not as pronounced as between different processing methods at the same altitude. Sample B again demonstrates a stronger body with a score of 8.16, surpassing Sample A's 8.08, indicating a fuller mouthfeel at higher altitudes. Additionally, Sample B scores higher in finishing, with 8.00 compared to Sample A's 7.66, suggesting a more satisfying aftertaste. Overall, Sample B shows a slight edge in balance and overall score, making it the more robust coffee due to the benefits of higher altitude in dry processing.

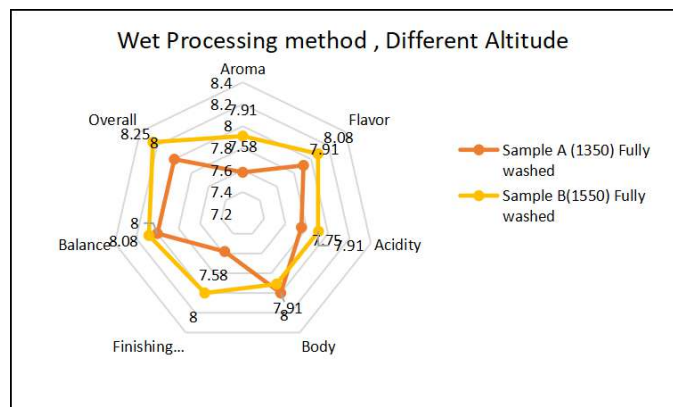


Figure 5. Sensory diagram of wet processing method in different altitude

Comparing the fully washed samples, the coffee processed at the higher altitude of 1550 meters (Sample B) slightly outperforms the lower altitude sample (Sample A) with a total score of 86.14 compared to 84.82 (Figure 5). The higher altitude seems to confer a slight advantage in several attributes. Sample B demonstrates a better aroma score of 7.91 compared to Sample A's 7.58, suggesting that fully washed coffee at higher altitudes may develop more aromatic complexity. The flavor scores are closely matched, with Sample B scoring 8.08 compared to Sample A's 7.91, indicating that altitude may enhance flavor even in fully washed coffee. Sample B also exhibits slightly higher acidity, with a score of 7.91 compared to Sample A's 7.75, consistent with the trend of increased acidity at higher altitudes. In terms

of body, both samples are comparable, with Sample A scoring 8.00 and Sample B slightly lower at 7.91, indicating that body may not be significantly affected by altitude in fully washed coffee. However, Sample B scores better in finishing, with a score of 8.00 compared to Sample A's 7.58, suggesting a more pleasing aftertaste at higher altitudes. Both samples are equally balanced at 8.08, but Sample B has a slightly higher overall score of 8.25 compared to 8.00 for Sample A, indicating a slight advantage for fully washed coffee at higher altitudes. The results show that both processing methods yield high-quality coffee, with dry processing slightly outperforming fully washed processing in both altitude samples. The overall quality scores are high for both methods, indicating that the choice of processing method has a noticeable but not dramatic impact on cup quality.

5. Conclusion and Recommendation

This study investigated the impact of altitude and processing methods on the cup quality of coffee grown in Ywa-Ngan Township, Myanmar, by analyzing two samples processed using dry and thoroughly washed methods at different altitudes of 1350 meters and 1550 meters. The findings reveal that both altitude and processing methods significantly influence the sensory attributes of coffee, which in turn affect its overall quality. The results indicate that at an altitude of 1350 meters, the dry-processed coffee marginally outperforms its thoroughly washed counterpart, with a slightly higher overall score. At a higher altitude of 1550 meters, the dry-processed coffee again scores slightly higher than the thoroughly washed sample.

The current study reveals that altitude and processing methods both significantly influence coffee quality. Higher altitudes, such as the 1550 meters in Sample B, consistently yielded better scores in Aroma, Flavor, and Body, likely due to slower fruit maturation, which allows for a more complex flavor profile. This finding aligns with the research by [10], which also found that altitude positively impacts the sensory characteristics of Arabica coffee, with higher altitudes producing coffees with superior flavor profiles. When comparing the processing methods, the Dry Process slightly outperformed the Fully Washed Process in this study, especially in Aroma and Body. The Natural (Dry) Process tends to retain more robust flavor attributes compared to the Fully Washed Process, though the differences were subtle. The improved quality of the dry-processed coffee at high altitudes highlights the positive impact of altitude on coffee cup quality. Future research should examine different processing methods as combination of dry and washed methods, to examine the potential leveraging the strengths of each to enhance specific coffee attributes further. Studying other environmental factors, such as microclimates and soil types at various altitudes, could offer more profound insights.

Acknowledgement

We would like to thank Dr. Soe Myint Than, the principal of BBA College, who organized the research study trip to make this paper possible. Special thanks to Ma Sunandar Lin and Shwe Ywa Ngan Company for showing and explaining everything from planting coffee trees to harvesting and producing coffee powder during the excursion.

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ANALYZING MARKETING MIX EFFECTS ON COFFEE CONSUMER DECISIONS AND BRAND LOYALTY: A CASE STUDY OF THE COFFEE MARKET IN MYANMAR

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ABSTRACT

The coffee industry in Myanmar is experiencing significant growth. Although Myanmar's coffee market has emerged noticeably, more scientific research is needed on the elements of the marketing mix that impact consumer buying behavior and brand loyalty. This study addresses the gap by analyzing the influence of marketing mix elements on consumer purchasing decisions and brand loyalty among coffee drinkers in Myanmar. The research utilized a descriptive and correlational research design and surveyed 407 coffee consumers using a structured questionnaire. The findings reveal that the distribution place has the most substantial positive effect on consumer purchase decisions, followed by product quality and pricing. Promotion has the most negligible impact on purchase decisions and significantly negatively affects brand loyalty. The study also demonstrates that purchase decisions significantly influence brand loyalty. The results of this study serve as a roadmap for the future of the coffee industry in Myanmar.

Keywords: Marketing Mix, Purchase Decision, Brand Loyalty, Coffee, Myanmar

1. Introduction

Myanmar currently boasts approximately 49,000 acres of coffee plantations, with 38,000 acres dedicated to Arabica coffee for export and an additional 12,000 acres allocated to Robusta coffee. Recognizing the potential of areas like Pyin Oo Lwin in the Mandalay Region and Ywa-ngan in Shan State, known for producing internationally recognized specialty coffee, Myanmar's business community must try harder to get the market share for trademark and quality coffee products globally. By doing so, they can position Myanmar as an alarming player in the competitive international coffee market [1]. Coffee, the second most popular drink in Myanmar, has become profoundly ingrained in Burmese people's daily lives. Coffee consumption per capita reached 0.960 kg in 2021 in Myanmar, which is 17.1% more than in the previous year [2]. The Myanmar Coffee Market's revenue is poised for significant growth, reaching US\$34.40m in 2024. With an anticipated annual growth rate of 11.78% (compound annual growth rate 2024-2029), the market volume is projected to reach US\$60.03m by 2029. As the coffee business expands, there is a growing need to shape customer preferences and foster brand loyalty through a robust marketing mix.

The marketing mix explains the range of marketing decisions and tactics to get maximum sales revenues, return on investment, and profit. Frequently, the marketing mix impacts the marketing decision process of the consumer concerning the final purchase. Product is mentioned as a physical product or service to the consumer for which he is eager to pay [3]. Price indicates the right product offered at the correct cost. Place suggests the right product at the right price and is readily available at the customers' convenience. Promotion indicates being in contact with both recent and potential customers about the availability of the product, its price, and its place [4]. Previous authors mentioned the association between buying behavior and marketing strategy as the success of companies' marketing strategies and to recognize consumer behavior [5]. Consumer purchasing decisions are complicated procedures impacted by several factors, such as cultural, social, personal, and psychological components. Individual consumers' preferences, choices, and tastes determine their buying behavior. In the global context, several studies have been done on the impact of marketing mix on consumer buying behavior [6].

In Myanmar, Thu researched the influence of marketing mix on consumer purchase intention of cosmetic products and interpreted that product quality and promotion lead to high consumer purchase intention in this study, while price and place do not significantly impact [7]. However, the previous study did not describe the effect of marketing mix elements in the Myanmar coffee market. To survive in the competitive business environment, it is essential, therefore, for coffee producers to provide the right product at the right price and in the right place for their customers. With no research on the influence of marketing mix on consumer buying behavior in the coffee industry in Myanmar, it is difficult to conclude whether the way consumers behave is affected by marketing mix elements. Hence, this study focuses on determining how the marketing mix influences the consumers' buying behavior in the Myanmar coffee industry.

2. Literature Reviews

Consumer behavior is defined as people's activities to consume and dispose of products and services [8]. Consumer buying behavior consists of the multi-step decision-making process in which people participate and consumers' actions to fulfill their market requirements and wants [5]. Consumer behavior is often determined by many influences: social, marketing, situational, and psychological. The influential degree of these factors has been related to buying and consumption decisions. Knowing customer behavior is essential for any organization before launching a product. When purchasing products, consumers typically follow the five stages of the buying decision process. Consumer behavior through all of these stages may differ according to their previous experience, interests, and situation [5]. Understanding consumers, their needs, buying behavior, and the buying decision process is critical to successful marketing. The marketing mix consists of everything the coffee producers could do to impact the demand for their products. Customer appreciation boosted by marketing mix elements helps buyers make positive purchases to buy the same product or brand called "brand loyalty". Brand loyalty persuades consumers to buy the same brand routinely and restricts them to the same brand [9]. Previous research found that marketing mix influences customer purchase decisions and brand loyalty [10].

A product was a marketing mix strategy in which organizations offered consumers symbolic and experiential attributes to evolve their products from competitors [5]. The qualities of a good product

are associated with product reliability, durability, ease of use, a trusted brand name, and ease of maintenance. Consumers sometimes go for better-quality brands rather than considering the product's price [11]. Product packages contain visual and sensual characteristics that communicate to consumers. Product packaging is used to persuade attention and describe the product on retailer shelves, encouraging customers to buy a product. There was a positive direct impact of perceived quality on purchase decisions [12]. Perceived product quality and brand association did not influence purchase decisions in this study [13]. The literature highlights the critical role of product quality in buying behavior.

Price refers to what a consumer gives up (measured in monetary terms) to get a wanted good or service [5]. They suggest that price is the most critical factor for the average consumer when buying products. Price was one of the most critical elements of the marketing mix. Unlike product features, promotion, and distribution channels, it could be modified rapidly. Hence, it could be used as a competitive measurement. The study pointed out that consumers were significantly sensitive to price and would easily change from one brand to another with price changes. In Saudi Arabia, the researchers found a positive relationship between prices and consumer buying behavior [14]. The findings involved a direct relationship between price and customer satisfaction.

Promotion is the activity that communicate the product's benefits and attract target customers [5]. Advertising and sales promotion combined with the image of a company to make a buying decision [15]. The promotional mix includes advertising, sales promotions, personal selling, and public Relations. Hence, promoting a product is an excellent way to attract more customers to buy this product. Promotion strategies such as free samples, buy-one-get-one-free, coupon discounts, and price discounts significantly impact buying behavior [16]. Attractive sales promotion strategies enhance customer repurchase intention and recommendations to other customers by raising customer satisfaction. Location is related to convenience, accessibility, and availability of a premise [5]. Consumers purchase products not only due to product quality, promotion, and loyalty schemes but also because of convenience. With the right place strategy, consumers can access the offered product. When the products are readily available for customers, they make higher purchase decisions.

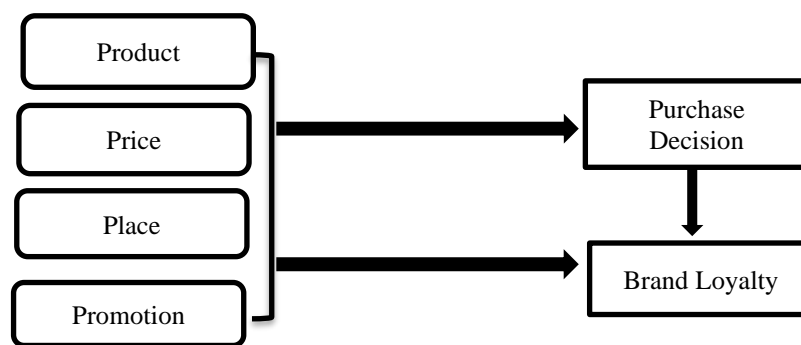


Figure 1: Conceptual Framework

3. Methodology

This study applied a quantitative method, a crucial tool in defining situations or events that impact people. Quantitative research is useful for generating data through statistics and presenting the findings using numeric reports. This method analyzed the marketing mix elements, consumer buying behavior, and brand loyalty. The descriptive research design provided a detailed description of the marketing mix elements of coffee. Data was collected through survey questionnaires. Coffee consumers were selected as participants using the convenience sampling method. The convenience sampling approach was chosen for its advantages, including the ease of reaching respondents at a lower cost within a shorter timeframe than other sampling methods. The correlational research design was used to test and quantify the magnitude of the correlation between variables, making it possible to predict values. The researchers used Yamane's (1967) sample size calculation formula to calculate the appropriate and

representative sample size from an estimated population of one hundred thousand in Mandalay who drink at least five cups per week and are aged 18 years and above.

$$n = N / (1 + (N * e^2))$$

$$n = 100000 / (1 + 100000 * (0.05)^2) = 399.8 = 400$$

n is the sample size of 400; N is a population of 100000;

where:

e is the margin of error of 0.05; Confidence interval =95%

According to the sample size calculation, the sample size was 400. To ensure a representative sample size and recover the non-response rate, the researchers added 100 respondents to the sample size. Thus, the targeted sample for this study was 500. The questionnaire, designed as a series of five-point Likert scale items, was deemed an appropriate strategy for gathering information on coffee drinkers. It covered consumer buying behavior, Marketing mix elements, and brand loyalty. Secondary data on Marketing mix elements and consumer buying behavior were sourced from the literature. To ensure clarity and prevent misunderstandings, the questionnaires were translated into Burmese. The researcher used Google Forms to distribute the questionnaire and posted it on social platforms such as Viber and Facebook. The researcher used both online and offline methods to collect data. Before collecting data, the researchers informed participants about the confidential issues and replied that the data was used for academic purposes only. Respondents have the right to withdraw freely from this survey without any consequences. All personal and private data of respondents are strictly confidential, and their responses to this questionnaire were not exposed to any third parties.

4. Results

A total of 407 coffee lovers actively participated in data collection through a questionnaire. Most respondents are residents of Mandalay, and others are from various districts. Nearly half of the respondents (48.6%) were between 28 and 37 years, and 24.8% were between 18 and 27 years. From an education perspective, 48.9% of respondents are bachelor's degree holders, and 24.8% are master's degree holders. Over one-third of respondents (37.6%) have 100001 to 500000 kyats of monthly income, whereas 27% of participants have more than or equal to 13,000,001 kyats. The income gap among participants is enormous. 37.8% of participants drink a minimum of five cups of coffee per week, while 25.1% drink 10 cups and above per week. 36.9% of respondents consumed 3 1 coffee, followed by 23.1% consumed instant pure coffee, and 17.7% selected grounded roasted coffee. 14.5% consumed specialty coffee. Nearly one-third (32.7%) purchased coffee at convenience places (no specific place to purchase coffee), followed by 27.8% who bought coffee at shops, 21.6% at shopping centers, and 15.7% at coffee shops.

Table 1: Personal factors of respondents

Personal Factors	Frequency	Percentage	
Age	18 to 27 years	101	24.8%
	28 to 37 years	198	48.6%
	38 to 47 years	89	21.9%
	48 years and above	19	4.7%
Education	High school	76	18.7%
	Diploma	23	5.7%
	Bachelor	199	48.9%
	Master	101	24.8%
	Ph.D	8	2.0%
Monthly income	<= 100000	22	5.4%
	100001 to 500000	153	37.6%
	500001 to 900000	82	20.1%
	900001 to 1300000	40	9.8%
	>1300001	110	27.0%
Drinking coffee cups per week	<=5 cups	154	37.8%
	6 to 7 cups	80	19.7%
	8 to 9 cups	71	17.4%
	10 cups and above	102	25.1%

Type of Coffee	Grounded roasted coffee	72	17.7%
	Instant pure coffee	94	23.1%
	2 in 1 coffee	32	7.9%
	3 in 1 coffee	150	36.9%
	Specialty coffee	59	14.5%
Purchase Location	Shopping centers	88	21.6%
	Online Shops	9	2.2%
	Shops	113	27.8%
	Coffee shops	64	15.7%
	Others	133	32.7%

The descriptive statistics table (table 2) shows respondents' perceptions of applied questions. The results indicate that the respondents positively perceive coffee product quality, packaging, price differentiation, distribution place, and purchase decision, where mean scores are 3.69, 3.12, 3.33, and 3.53, respectively. However, respondents have a low perception of promotion (mean = 3.27). Participants also expressed their perception to purchase the same product brand as brand loyalty, and their product selection in markets (mean: 3.7, and 3.59, respectively).

Table 2: Descriptive statistics

Descriptive Statistics			
	N	Mean	Std. Deviation
Product	407	3.69	.57
Price	407	3.12	.56
Promotion	407	2.72	.77
Place	407	3.33	.59
Purchase Decision	407	3.53	.52
Brand Loyalty	407	3.70	.60
Product Selection	407	3.59	.61

To analyze the effect of the marketing mix (product, price, promotion, and place) on purchase decisions, not-purchase decisions, and brand loyalty, IBM SPSS-AMOS (version 26) is used. Structural equation modeling expresses the relationships between observed and latent variables. 4Ps are observed variables, and customers' purchase decisions, not-purchase decisions, and brand loyalty are latent variables.

SEM analysis presents the relationship between product, price, promotion, place, and purchase decision. Distribution place has a positive significant relationship with customers' purchase decisions (estimate value = 0.347), followed by product (estimate value = 0.261) and price of coffee (estimate value = 0.137). The promotion has the least relationship with purchase decisions (estimate value = 0.058). Critical value (C.R.) approved that there is a significant direct relationship between the marketing mix and customers' purchase decisions.

The interpretation of the path coefficients for the relationships between various factors (product, price, promotion, place) and brand loyalty describes that there is a significant positive relationship between product, price, place, and brand loyalty (estimate value: 0.228, 0.123 and 0.182 respectively, at $p < 0.05$). The direct effect of product to brand loyalty is 0.133, and indirect effect is 0.095. The direct effect of price to brand loyalty is 0.073, and indirect effect is 0.05. The direct effect of place to brand

loyalty is 0.056, and indirect effect is 0.126. However, the promotion significantly negatively impacts brand loyalty (estimate = -0.147, p-value <0.001). The direct effect of promotion to brand loyalty is -0.169, and indirect effect is 0.021. Product, price and place have significant positive impact brand loyalty, indicating that good product quality, reasonable price, and effective distribution channels are significant factors for building brand loyalty. Purchase decision has direct significant impact on brand loyalty (estimate = 0.364, p-value < 0.001).

Table 3: Regression Weights between Marketing mix and Purchase Decision

	Direct effect	Indirect effect	Total effect (Estimate)	S.E.	C.R.	P
Product → Purchase Decision	0.261	-	0.261	0.036	7.253	***
Price → Purchase Decision	0.137	-	0.137	0.037	3.66	***
Promotion → Purchase Decision	0.058	-	0.058	0.027	2.12	0.034
Place → Purchase Decision	0.347	-	0.347	0.036	9.62	***
Product → Brand loyalty	0.133	0.095	0.228	.053	4.289	***
Price → Brand loyalty	0.073	0.05	0.123	.055	2.225	.026
Promotion → Brand loyalty	-0.169	0.021	-0.147	.041	-3.634	***
Place → Brand loyalty	0.056	0.126	0.182	.053	3.419	***
Purchase Decision → Brand loyalty	0.364	-	0.364	0.071	5.126	***

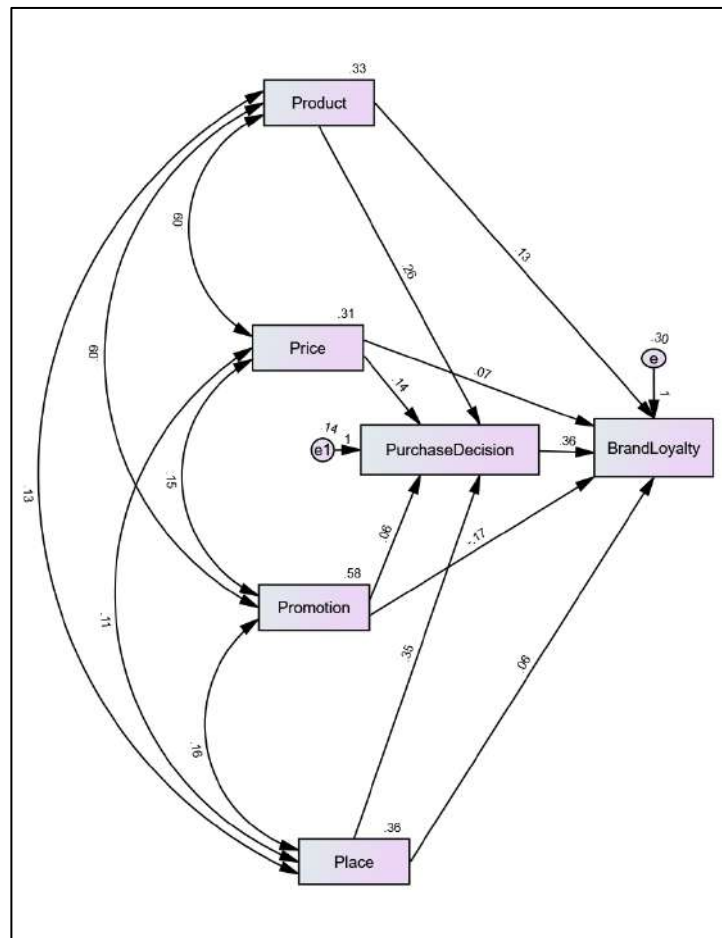


Figure 2: SEM between Marketing Mix and Purcahse Decision

5. Conclusion and Recommendation

These research findings agreed with the previous literature regarding the significant influence of product quality, price, and place on consumer purchase decisions and brand loyalty. Previous studies underscored the importance of product quality and packaging on consumer buying behavior [12]. These findings align with Kotler’s work, showing a significant positive correlation between product quality, purchase decisions, and brand loyalty (Estimate = 0.1261, 0.228, respectively). Moreover, the result from this study aligns with the research on price sensitivity [13], where the price was identified as an essential factor for both purchasing decisions (Estimate = 0.137) and brand loyalty (Estimate = 0.123).

However, the results from this study contrast with some earlier studies on the impact of promotion on consumer behavior. Promotion is crucial for attracting customers, the current study indicates a need for improvement. There was a negative relationship between promotion and consumer decisions in some cases. This is particularly evident in brand loyalty, where the relationship is significantly negative (Estimate = -0.147). This discrepancy may be due to Myanmar's cultural and economic environment, where promotion activities may negatively impact consumers as in other regions.

Coffee producers in Myanmar should emphasize product quality as high-quality products are vital to influence customers purchasing decisions and brand loyalty. Coffee sellers should develop pricing strategies that reflect the perceived value of their products. Further investigations should explore the following areas to enhance the effectiveness of promotional strategies in Myanmar’s coffee market. Further studies should emphasize how cultural influences impact the success of promotional strategies in Myanmar, ensuring the development of more culturally relevant marketing approaches.

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We would like to thank Dr. Soe Myint Than, the principal of BBA College, who organized the research study trip to make this paper possible. Special thanks to Ma Sunandar Lin and Shwe Ywa Ngan Company for showing and explaining everything from planting coffee trees to harvesting and producing coffee powder during the excursion.

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A COMPOSITION “ALWAYS IN YOUR HEART” FOR ELDERLY CHOIR

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ABSTRACT

“Always in Your Heart” (ประดับใจเธอ) a composition specifically crafted for an elderly choir, was composed with the intention of being performed by the “Let’s Be Young” choir in the “Thailand International Choral Festival.” The researcher assessed the choir’s singing abilities based on factors such as vocal range, technique, and sight-singing proficiency. The musical form employed is binary, a relatively simple structure that facilitates memorization for elderly singers. The vocal range of the composition is lower than conventional choral works, as determined by the researchers’ consideration of the potential of elderly vocal cords. The highest note is D5, appearing in the soprano part, while the lowest note is E2, appearing in the bass part. The lyrics were written from an imaginary perspective, envisioning the encouragement and support that elderly individuals might offer to younger ones. The central theme of the lyrics conveys the message that whenever someone feels distressed or encounters challenges, they will be there to provide assistance. This composition was officially published on September 4, 2024, at the Thailand Cultural Center. Notably, the choir received a silver medal in the senior category.

Keywords: Always in Your Heart; composition; elderly choir

1. Introduction

Choral music is a genre of music specifically composed for a choir. To compose choral music, composers have the freedom to utilize any instrument, including piano, string quartet, brass quintet, and orchestra. Additionally, a cappella compositions are also permitted. A choir is a group of singers who perform together in musical arrangements. The standard choir comprises a group of singers divided into four parts: soprano, alto, tenor, and bass. However, choruses can be categorized in various ways and divided into distinct sections. A chant music from the Middle Ages was sung unison only without instrument accompaniment. The choral works “Spem in alium” composed by Thomas Tallis is an example of a choral work that includes a 40 section of singers.

Let’s Be Young Choir is a choir group established by the Sugree Charoensuk Foundation. Let’s Be Young Choir is the foundation’s project aimed at enhancing the quality of life of the elderly by establishing choirs in various regions of Thailand. The foundation’s goal is to ensure that these choirs bring joy to the elderly and provide them with a sense of purpose and mission. They have also proposed organizing concerts for the choir.

Since the foundation decided to participate in the competition, they conducted auditions to gather the finest Let’s Be Young singers from across the country. It is worth noting that the foundation recognizes its mission to improve the quality of life. Therefore, they ensure that the compositions they select are not overly challenging, allowing the choir to sing effectively while still being suitable for competition.

A composition titled “Always in Your Heart” presents a challenge to the composer. The composition must be carefully crafted with extreme precision. It must be understandable to the elderly, with vocal lines that are easy to sing for each section. The musical form must be memorable, and the vocal range must be suitable for the elderly singers. Additionally, the composition must be filled with musical expression and challenging enough to be used in the competition.

2. Literature Reviews

An elderly choir is a category of choirs that includes singers over the age of 50. The definition of an elderly choir is typically limited to singers who have reached the age of 50 or older. Sectionalization of elderly choirs can vary, with different sections based on vocal ranges, such as full sections (soprano, alto, tenor, and bass), two sopranos and two altos, two tenors and two basses, or soprano, alto, and bass or tenor.

The defining characteristic of an elderly choir is its vocal tone. The vocal tone of elderly singers is typically richer and more robust, particularly in the bass section, compared to younger singers who have a lighter vocal tone. However, the vocal range of elderly singers is generally lower than that of younger singers due to the natural deterioration of their bodies, including the organs responsible for singing. This deterioration can significantly limit their singing potential, affecting their vocal range, stamina, and stability. Despite these limitations, the vocal tone of elderly singers possesses a unique and irreplaceable quality.

Musical form refers to the structure of music composition. It is typically organized into sections, each with distinct characteristics such as melody, chord progression, and rhythm. Throughout history, various musical forms have emerged, with the sonata form being particularly favored and considered a complex structure for many symphony orchestra composers. The sonata form consists of three main sections: exposition, development, and recapitulation. The simplest musical form is binary form, which consists of only two structures and repeats them until the music reaches its conclusion. Binary form is popular in the Renaissance period until nowadays in children’s songs and popular music. Musical forms can be arranged in two ways:

1. Repeating the first structure followed by the second structure (AABB).
2. Repeating both structures and then repeating the entire piece once more (ABABAB).

There are numerous captivating Thai classic songs that remain popular among the elderly, while not all have garnered the same level of appreciation from the younger generation. Some songs by Soontraporn have gained popularity among teenagers. Notably, Suchart Chawangkul’s “Jairak” (ใจรัก) has inspired a cover version by teenagers, which has garnered significant attention on social media platforms. For instance, a cover version created by the “ZaadOat Studio” channel has garnered fifteen

million views on YouTube. Another intriguing example is “Chun Ja Fun Thueng Ther” (ฉันจะฝันถึงเธอ), composed by Danu Huntrakul, a song that has maintained its popularity across generations until Thai diva Davika Hoorne performed her own rendition, and Thai renowned singer Pongkul Suebsung also created his own version. These two songs exemplify the traditional compositional techniques employed in Thai popular music during the older generation. The songwriters predominantly utilized the pentatonic scale as the primary scale for melody composition. This scale not only embodies the fundamental elements of Thai classical music but also aligns seamlessly with the intonation patterns of the Thai language.

3. Methodology

“Always in Your Heart” is a composition for an elderly choir, piano, and percussion ensemble. The choir is divided into four sections: soprano, alto, tenor, and bass. The performance was performed by the Let’s Be Young Choir. The study involved the following aspects:

1. Concept of harmonization
2. Concept of melodic development
3. Concept of songwriting
4. Musical form

3.1 Concept of harmonization

This musical composition was crafted in the key of D Major, employing a homophonic texture that aligns with the conventions of folk and popular music. The researcher opted for a diatonic chord progression as the basis for composition, recognizing its simplicity and ability to evoke a sense of comfort for vocalists. The chord progression in section A follows a pattern of tonic, subdominant, supertonic, dominant, tonic, and dominant (I-IV-ii-V-I-V). In contrast, section B employs a chord progression that alternates between submediant, mediant, subdominant, dominant, and tonic (vi-iii-IV-V-I). Notably, each chord in this composition is presented in root position.

The image shows a musical score for the piece "ประคองไว้ในใจเธอ" (Prakong Wai Nai Jai Tho) by Pongkul Suebsung. The score is in D Major and 4/4 time, with a tempo of 108. It features four vocal parts: Soprano, Alto, Tenor, and Bass, and a piano accompaniment. The piano part includes a timbournie. A red box highlights the chord progression in the piano part for measures 1-4, which follows the sequence I-IV-ii-V-I-V. The chords are: I (D major), IV (G major), ii (E minor), V (A major), I (D major), and V (A major).

Figure 1 The example of chord progression on section A, measure 1-4



Figure 2 The example of chord progression on section B, measure 33-36

This musical composition comprises four distinct sections. The initial three sections are written in a tempo of 108 beats per minute, gradually slowing down to 72 beats per minute in the fourth section.

Each section's rhythmic structure is characterized by a different pattern. The first section employs eighth notes as the primary rhythmic unit. The second section utilizes triplets as the primary rhythmic unit, followed by sixteenth notes in the third section. The fourth section, the slowest part of the composition, begins with half notes as the primary rhythmic unit. It then repeats the rhythmic structure in the order of eighth notes, triplets, sixteenth notes, and back to eighth notes, culminating in a coda section.



Figure 3 Example of rhythmic structure in the first section, measure 8-13

Figure 4 shows a musical score for measures 32-37. It includes vocal staves for Soprano (S.), Alto (A.), Tenor (T.), and Bass (B.), and a piano (Piano) accompaniment. The piano part is highlighted with a red box. The score is in 4/4 time and features Thai lyrics. The piano accompaniment consists of a complex rhythmic pattern with many sixteenth notes.

Figure 4 Example of rhythmic structure in the second section, measure 32-37

Figure 5 shows a musical score for measures 48-52. It includes vocal staves for Soprano (S.), Alto (A.), Tenor (T.), and Bass (B.), and a piano (Piano) accompaniment. The piano part is highlighted with a red box. The score is in 4/4 time and features Thai lyrics. The piano accompaniment consists of a complex rhythmic pattern with many sixteenth notes.

Figure 5 Example of rhythmic structure in the third section, measure 48-52

Figure 6 shows a musical score for measures 58-63. It includes vocal staves for Soprano (S.), Alto (A.), Tenor (T.), and Bass (B.), and a piano (Piano) accompaniment. The piano part is highlighted with a red box. The score is in 4/4 time and features Thai lyrics. The piano accompaniment consists of a complex rhythmic pattern with many sixteenth notes.

Figure 6 Example of rhythmic structure in the fourth section, measure 58-63



Figure 7 Example of rhythmic structure in the fourth section, measure 64-68

3.2 Concept of melodic development

In this composition, the D Major Pentatonic scale serves as the primary melodic development. Pentatonic scale, characterized by its five-note structure, is particularly advantageous due to its simplicity in singing and comprehension for vocalists. Two melodies were composed by the researcher: one for the section A and another for the section B. The melody for section A is composed entirely within the D Major Pentatonic scale, devoid of any additional notes. Conversely, the melody for section B retains the D Major Pentatonic scale but incorporates a C# note as a passing note. While this section may be analyzed as a D Major scale, its overall pattern remains rooted in the pentatonic scale throughout the section B.



Figure 8 The C# note as a passing note on section B, measure 17

3.3 Concept of songwriting

This composition was inspired by the researcher's contemplation of aging. The song explores the question of what older researchers might impart to younger generations. The lyrics convey a message of love, care, prayer, and encouragement. The central concept is that all love from the sky, the earth, and oneself should be poured into the heart, ensuring that love will always be present.

The song is structured into three distinct parts. The first part expresses the desire to send a bright sky into the heart, symbolizing guidance and protection during challenging times. The second part conveys the wish to send the earth into the heart, offering stability and support in moments

of loss or uncertainty. The final part expresses the deepest desire to send all one's love into the heart, assuring that even if no one else is present, love will always be there.

Table 1 Lyrics and translation

Thai	English
<p>ส่งท้องฟ้าครามดงาม ส่งแสงเรืองรองผ่องใส อุ่นไอรักจะประคองกอดไว้ ให้แสงเรืองรองทอดยาว ส่งเห็นทางที่ก้าวไป ส่งไปให้เธอประทับในใจ</p>	<p><i>Sending bright, shiny sky, Their love will hold and warm you, Let the sky brighten up your way, I'll send it into your heart,</i></p>
<p>เมื่อวันไหนที่เธอหมองมัว ทุกข์ทำเธอเกรงกลัว ท้องฟ้ายังคงสวยสว่างในใจเธอ เมื่อวันไหนที่เธอท้อใจ ไร้หนทางเดินไป หัวใจเธอยังเข้มแข็งยังสดใส</p>	<p><i>When you're feeling blue, sadness scolding you, The sky still shining you bright, When you're feeling blue, no other way to do, Your heart still big and shine,</i></p>
<p>ส่งคืนแผ่นดินกว้างใหญ่ หมู่มากไม้พันธุ์นานา สกุณาร้องรำทำเพลงก้องไพร และสายธาราทอดยาว สายน้ำเย็นล้ำชื่นใจ ส่งไปให้เธอประทับในใจ</p>	<p><i>Sending all the earth, forest, Also cantabile birds, Sending all the long and fresh rivers, I'll send it into your heart,</i></p>
<p>เมื่อวันไหนที่เธอพลั้งไป แม้ผิดพลาดเพียงไร ขอสายธารและแผ่นดินคอยประคองไว้ เมื่อวันไหนที่ล้มลงไป เธอมีฉันในใจ หัวใจเธอยังเข้มแข็งยังสดใส</p>	<p><i>When you did a mistake, no matter how bad, You'll have a place to rest, When you're falling down, you had me around, Your heart still big and shine,</i></p>
<p>ส่งหัวใจฉันที่มี ส่งทั้งรักและหวังดี ฝากฝากฟ้าแผ่นดินและเพลงนี้ ส่งรักฉันอันมั่นคง ตราบนิจนสิ้นชีวิต ส่งไปให้เธอประทับในใจ</p>	<p><i>Sending all my heart, my love, my hope, Via the earth, the rivers, and this song, I'll keep sending this until the end, I'll send it into your heart,</i></p>
<p>เมื่อวันไหนที่เธอเดียวดาย ไม่เหลือใครข้างกาย รักฉันกอดเธอไว้ให้เธอได้ผ่อนคลาย เมื่อวันไหนเธอไม่เหลือใคร เธอมีฉันในใจ หัวใจเธอยังเข้มแข็งยังสดใส</p>	<p><i>When you're alone, no one is around, My love would be holding you, You had me, never alone, Your heart still big and shine,</i></p>
<p>ส่งหัวใจฉันที่มี ส่งทั้งรักและหวังดี ฝากฝากฟ้าแผ่นดินและเพลงนี้ ส่งรักฉันอันมั่นคง ตราบนิจนสิ้นชีวิต ส่งไปให้เธอประทับในใจ</p>	<p><i>Sending all my heart, my love, my hope, Via the earth, the rivers, and this song, I'll keep sending this until the end, I'll send it into your heart,</i></p>
<p>เมื่อยามที่ต้องนิทรา โปรดจำไว้นะคนดี ความรักของฉันประทับในใจ</p>	<p><i>When is my time to sleep, don't forget, My love would always be in your heart,</i></p>

เธอมีฉันคอยเคียงข้างตลอดไป	<i>Forever.</i>
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3.4 Musical form

Researchers employing binary form as the structural framework of the composition commence the introduction of the composition at the first measure, spanning from measure 1 to measure 8. Section A commences at measure 9 and concludes at measure 16, followed by Section B from measure 17 to measure 24. Both sections repeat alternately from measure 25 to measure 40 and measure 41 to measure 56. Section B repeats once more as the concluding section, spanning from measure 57 to measure 70, and concludes with a *capo* section from measure 71 to measure 75.

Table 2 Musical form

Section	Introduction	A	B	A	B	A	B	B'	capo
Measure	1-8	9-16	17-24	25-32	33-40	41-48	49-56	57-70	71-75

4. Results

“Always in Your Heart,” a choral work featuring an elderly choir, piano, and percussion ensemble, employs a binary form and is composed in the key of D Major. The song’s Thai folk-pop melody conveys a narrative of elderly individuals expressing their love and care for younger generations through this musical composition. To illustrate the depth of their affection, researchers employ the metaphor of the sky and earth to symbolize their unwavering love and support, promising to be there for their young counterparts whenever they require assistance.

ประดับไว้ในใจเธอ

เก๋กูด เกษมณี

Allegro

Soprano
Alto
Tenor
Bass

Piano

Tambourine

Allegro

S.
A.
T.
B.

Pno.

Tamb.

D G/D Em⁷ A D A⁷ D G/D Em⁷ A

D A⁷ D G/D Em⁷ A

ส่ง ท้อง หิว ความ งด งาม ส่ง แสง เรือง ของ มอญ ไต่... หุ่น โถ รัก จะ ประ คอง กอด ไต่... ให้ แสง สีทอง ทอด ฮาว ส่ง เห็น

D A⁷ D G/D Em⁷ A D A⁷ D

2

Musical score for measures 14-19. The score includes vocal parts (Soprano, Alto, Tenor, Bass), Piano accompaniment (Pno.), and Tambourine (Tamb.). The key signature is one sharp (F#) and the time signature is 4/4. The lyrics are in Thai. The piano part includes chord symbols: G/D, Em7, A, D, A7/C#, Bm, F#m, Gmaj7, and A7. The tempo marking is *mp*.

Soprano (S):
เมื่อ วัน โทษ ที่สอง หมอง ลม ทุกลมทำ แสง เกรง กลัว ปล่อยให้ วัน โทษ สอง สว่าง สว่าง โลก

Alto (A):
ทาง ที่เรา ไป... ส่ง ไป ให้สอง ประเด็น ใน ใจ

Tenor (T):
เมื่อ วัน โทษ ที่สอง หมอง ลม ทุกลมทำ แสง เกรง กลัว ปล่อยให้ วัน โทษ สอง สว่าง สว่าง โลก

Bass (B):
ทาง ที่เรา ไป... ส่ง ไป ให้สอง ประเด็น ใน ใจ

Piano (Pno.):
G/D Em7 A D A7/C# Bm F#m Gmaj7 A7

Tambourine (Tamb.):
[Tambourine accompaniment]

Musical score for measures 20-25. The score includes vocal parts (Soprano, Alto, Tenor, Bass), Piano accompaniment (Pno.), and Tambourine (Tamb.). The key signature is one sharp (F#) and the time signature is 4/4. The lyrics are in Thai. The piano part includes chord symbols: D, F#m/C#, Bm, F#m, Gmaj7, Em7, A7, and D. The tempo marking is *mp*.

Soprano (S):
ใจ แสง... เมื่อ วัน โทษ ที่สอง ใจ ไร้หน ทาง เดิน ไป หัว ใจ แสง ชิ่ง เข้ม แข็ง ชิ่ง สด ใจ... ส่ง สิ้น แค้น ดิน ทวีต โทษ ทุกลม

Alto (A):
ใจ แสง... เมื่อ วัน โทษ ที่สอง ใจ ไร้หน ทาง เดิน ไป หัว ใจ แสง ชิ่ง เข้ม แข็ง ชิ่ง สด ใจ... ส่ง สิ้น แค้น ดิน ทวีต โทษ ทุกลม

Tenor (T):
ใจ แสง... เมื่อ วัน โทษ ที่สอง ใจ ไร้หน ทาง เดิน ไป หัว ใจ แสง ชิ่ง เข้ม แข็ง ชิ่ง สด ใจ... ส่ง สิ้น แค้น ดิน ทวีต โทษ ทุกลม

Bass (B):
ใจ แสง... เมื่อ วัน โทษ ที่สอง ใจ ไร้หน ทาง เดิน ไป หัว ใจ แสง ชิ่ง เข้ม แข็ง ชิ่ง สด ใจ... ส่ง สิ้น แค้น ดิน ทวีต โทษ ทุกลม

Piano (Pno.):
D F#m/C# Bm F#m Gmaj7 Em7 A7 D

Tambourine (Tamb.):
[Tambourine accompaniment]

Musical score for measures 26-31. The score includes vocal parts (Soprano, Alto, Tenor, Bass), Piano accompaniment, and Tambourine. The lyrics are in Thai. The piano part includes chord markings: G/D, Em7, A9, D9, A7, D, G/D, Em7, A.

Soprano: ไม่ พันธุ์นา... ส-ฤ-ดา ร้อง จำ ทำ เพลง ที่อง ไพร และ สาย ธาธา ทอด ธาร สาย น้ำ เป็น จำ ขึ้น ใจ... ส่ง ไป ให้เธอ ประทับ ใน ใจ

Alto: ไม่ พันธุ์นา... ส-ฤ-ดา ร้อง จำ ทำ เพลง ที่อง ไพร และ สาย ธาธา ทอด ธาร สาย น้ำ เป็น จำ ขึ้น ใจ... ส่ง ไป ให้เธอ ประทับ ใน ใจ

Tenor: ฤ... ฤ... ธา... ฤ... ฤ... ฤ...

Bass: ฤ... ฤ... ธา... ฤ... ฤ... ฤ...

Piano: G/D Em7 A9 D9 A7 D G/D Em7 A

Tambourine: [Rhythmic accompaniment]

Musical score for measures 32-37. The score includes vocal parts (Soprano, Alto, Tenor, Bass), Piano accompaniment, and Tambourine. The lyrics are in Thai. The piano part includes chord markings: D, A7/C#, Bm, F#m, Gmaj7, A7, D, F#m/C#, Bm.

Soprano: *mf* เมื่อ วัน โทษ ที่เธอ พังไป... แม้ลึก ทลาค เพ็ชระ ไร ขอ สาย ธาธา และ สิ้น สิ้น คอย ประ คอง ไว้... เมื่อ วัน โทษ ที่สิ้น ลง ไป

Alto: *mf* เมื่อ วัน โทษ ที่เธอ พังไป... แม้ลึก ทลาค เพ็ชระ ไร ขอ สาย ธาธา และ สิ้น สิ้น คอย ประ คอง ไว้... เมื่อ วัน โทษ ที่สิ้น ลง ไป

Tenor: *mf* โอ... โอ... ธา... ธา...

Bass: *mf* โอ... โอ... ธา... ธา...

Piano: D A7/C# Bm F#m Gmaj7 A7 D F#m/C# Bm

Tambourine: [Rhythmic accompaniment]

4

38

S.
ขอ ขอ อุดหนุน ไฉน หัวใจ ขอ มั่ง เหม่ มั่ง มี สด ไฉน ฤ ฤ

A.
ขอ ขอ อุดหนุน ไฉน หัวใจ ขอ มั่ง เหม่ มั่ง มี สด ไฉน ฤ ฤ

T.
ธา ไฉน ส่อง หัวใจ ชื่น ที่ มี ส่อง หัวใจ รัก และ หัวใจ ที่ ผา

B.
ธา ไฉน ส่อง หัวใจ ชื่น ที่ มี ส่อง หัวใจ รัก และ หัวใจ ที่ ผา

Pno.
F#m Gmaj7 Em7 A7 D G/D

Tamb.

43

S.
ฤ ส่อง ไป ให้ ขอ ประทับ ในใจ

A.
ฤ ส่อง ไป ให้ ขอ ประทับ ในใจ

T.
พาท หวัง สิ้น สิ้น และ แพร่ นี้ ส่อง หัวใจ ชื่น มั่น คง จาก นี้ ชื่น สิ้น สิ้น ฤ ส่อง ไป ให้ ขอ ประทับ ในใจ

B.
พาท หวัง สิ้น สิ้น และ แพร่ นี้ ส่อง หัวใจ ชื่น มั่น คง จาก นี้ ชื่น สิ้น สิ้น ฤ ส่อง ไป ให้ ขอ ประทับ ในใจ

Pno.
Em7 A D A7 D G/D Em7 A

Tamb.

Musical score for measures 48-52. The score includes vocal parts for Soprano (S), Alto (A), Tenor (T), and Bass (B), Piano (Pno), and Tambourine (Tamb.). The lyrics are: "เมื่อ วัน โทน ที่เธอ เฝ้ารอ คาย ไม่เหลือ ใคร ช่าง คาย รัก ฉัน กอด เธอ ไว้ ให้เธอ ได้ สอน คาย เมื่อ วัน". The piano accompaniment features a complex rhythmic pattern with chords: D, A7/C#, Bm, F#m, Gmaj7, A7, D, and F#m/C#. The tambourine part has a steady eighth-note rhythm.

Musical score for measures 53-57. The score includes vocal parts for Soprano (S), Alto (A), Tenor (T), and Bass (B), Piano (Pno), and Tambourine (Tamb.). The lyrics are: "ไหน เธอ ไม่เหลือ ใคร เธอ มี ฉัน ในใจ หัวใจ เธอ ยัง เข้มแข็ง ยัง สดใส ส่ง หัวใจ ฉัน ที่ มี ส่ง หัวใจ". The tempo is marked "Andante" and the dynamics are "p". The piano accompaniment features chords: Bm, F#m, Gmaj7, Em7, A7, and D. The tambourine part has a steady eighth-note rhythm.

6

58

S. *mp*
 รัก และหวัง ดี... ฝ่าย ฟาก ฟาก สิ้น และ เพลง นี้... ส่ง รัก อัน อ่อน คง จาก นี้ จน สิ้น ธิ ฐ... ส่ง ไป ให้เธอ ประทับ ใน ใจ

A. *mp*
 รัก และหวัง ดี... ฝ่าย ฟาก ฟาก สิ้น และ เพลง นี้... ส่ง รัก อัน อ่อน คง จาก นี้ จน สิ้น ธิ ฐ... ส่ง ไป ให้เธอ ประทับ ใน ใจ

T. *mp*
 รัก และหวัง ดี... ฝ่าย ฟาก ฟาก สิ้น และ เพลง นี้... ส่ง รัก อัน อ่อน คง จาก นี้ จน สิ้น ธิ ฐ... ส่ง ไป ให้เธอ ประทับ ใน ใจ

B. *mp*
 รัก และหวัง ดี... ฝ่าย ฟาก ฟาก สิ้น และ เพลง นี้... ส่ง รัก อัน อ่อน คง จาก นี้ จน สิ้น ธิ ฐ... ส่ง ไป ให้เธอ ประทับ ใน ใจ

Pno.
 Gmaj7 Em9 A7 Dmaj7/Dmaj7/A F#m/A Bm F#m Em A7

Tri.

64

S.
 ... เมื่อ ยาม ที่ ค้อง ณี ทรา ไป รวด จำ ไร นะ คน ดี... ความ รัก ของ ฉัน ประทับ ใน ใจ... เธอ

A.
 ... เมื่อ ยาม ที่ ค้อง ณี ทรา ไป รวด จำ ไร นะ คน ดี... ความ รัก ของ ฉัน ประทับ ใน ใจ... เธอ

T.
 ... เมื่อ ยาม ที่ ค้อง ณี ทรา ไป รวด จำ ไร นะ คน ดี... ความ รัก ของ ฉัน ประทับ ใน ใจ... เธอ

B.
 ... เมื่อ ยาม ที่ ค้อง ณี ทรา ไป รวด จำ ไร นะ คน ดี... ความ รัก ของ ฉัน ประทับ ใน ใจ... เธอ

Pno.
 D F#m/C# Bm F#m Em F#m G A Dmaj7 Dmaj7/E A7/C# A7

Tri.
 To W.Ch.
 To Tri. Wind Chimes

69

S.
มี ฉัน คอย เฝ้า ระวัง คอย ใจ

A.
มี ฉัน คอย เฝ้า ระวัง คอย ใจ

T.
มี ฉัน คอย เฝ้า ระวัง คอย ใจ

B.
มี ฉัน คอย เฝ้า ระวัง คอย ใจ

Pno.
G/maj7 G/A D G/D Em7 A D A7 D

W.Ch.
p

5. Conclusion and Recommendation

The composition was successfully completed and achieved its intended objectives for the researchers. The elderly choir was able to perform the composition, demonstrating their proficiency in singing. The Let's Be Young Choir comprehended the music, lyrics, and the harmonization provided by the researchers. The choir utilized this composition to perform at the "Thailand International Choral Festival" on September 4, 2024, where they were awarded the Silver Medal Prize in the senior category. Additionally, the choir was invited to perform on the television show "See Sun Variety" (สีสันวาไรตี้) on TPBS Channel on September 6, 2024.

Acknowledgement

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To all the individuals and organizations who have played a role in the success of this project, we extend our sincerest thanks. Your support and collaboration have been essential to the completion of this work.

6. References

All references should be in IEEE citation style as link below and present inside the main body of article. Don't put extra references which are not cited.

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THE PARTICIPATION OF PUBLIC TOWARDS THE PROBLEMS SOLVING OPERATION ON SUSTAINABLE POVERTY OF BAN TALAT NONG PHLING, MUEANG NAKHON SAWAN DISTRICT, NAKHON SAWAN PROVINCE.

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Abstract

The study on public participation in the sustainable poverty alleviation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, aimed to study and compare the level of public participation in the sustainable poverty alleviation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province. The population used in this study was the people in the area of Ban Talat Nong Phling, aged 18 years and over, totaling 5,724 people. The researcher calculated the sample size using Taro Yamane's formula, resulting in a sample of 374 people. Data were collected using a questionnaire as the study tool. The data were analyzed using statistics using percentage, mean, and standard deviation. The hypothesis was tested using t-test and F-test and analyzed the differences in paired means using the Least Significant Difference Analysis (LSD Analysis) method. The results of the study found that the majority of the respondents were female, totaling 170 people, or 45.45 percent. 132 people, or 35.29 percent, were aged 36-45 years old. 248 people, or 66.31 percent, had an education level lower than a bachelor's degree. 157 people, or 41.98 percent, had an average monthly income lower than 10,000 baht. 176 people, or 47.06 percent, had resided in the area for 5-10 years.

The level of public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, was overall at a high level. When considering each aspect, it was found that there was a high level of participation in all aspects. The average values, from highest to lowest, were in the areas of receiving benefits, operations, thinking and planning, and monitoring of operations, respectively.

A comparative study of the level of public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, classified by personal characteristics, found that gender, age, education level, average monthly income, and length of stay in the area had no statistically significant effect on the level of public opinion.

Keywords: Participation, People, Sustainable poverty alleviation

1. Introduction

The world community attaches importance to the problem of poverty and has set a goal to eliminate poverty by 2030 because poverty affects all aspects of human development, both in terms of security and quality of life. It causes people to lack basic necessities and opportunities in various aspects, resulting in a living standard that is lower than the standard. Although poverty appears in the form of individuals, when poverty occurs widely, it affects economic and social development as a whole. The guidelines for eliminating poverty are: Eliminate extreme poverty for all people in all areas; Reduce the proportion of men, women and children of all ages living in poverty in all dimensions, as defined by each country, by at least half; Provide everyone with appropriate social protection systems and measures at the national level, including basic social welfare protection covering the poor and vulnerable; Ensure that all men and women, especially the poor and vulnerable population, have equal rights to access economic resources, ownership and rights to land and other forms of property, such as inheritance, natural

resources, appropriate modern technology and financial services at the grassroots level, which will create resilience for the poor and people in vulnerable situations; Prevent and reduce exposure to and risks from severe events/disasters caused by climate, economy, society and the environment by ensuring that there is significant resource mobilization from various sources, including enhancing cooperation for development. In particular, the least developed countries, in implementing plans and policies to end poverty in all dimensions and creating appropriate policy frameworks at the national, regional and international levels based on a development strategy that is pro-poor and gender-sensitive to support investment and poverty eradication. For the poverty situation in Thailand in 2023, according to the National Economic and Social Development Board, Thailand has a total of 4.7 million poor people, accounting for 5.1 percent of the poor, with a per capita income of 263,332.9 baht per year, down from 2021, when the poor were 6.32 percent. At the household level, poverty was found to be 1.12 million poor households, accounting for 4.14 percent of all households, down from 1.24 million households in 2021, which was a result of the ability to cope with the spread of the COVID-19 pandemic, resulting in the majority of people's lives tending to return to normal. Household consumption has expanded again, employment has increased, especially in the industrial sector, wholesale, retail and hotel and restaurant sectors, which have helped increase household income. Coupled with the continuity of measures to help low-income people and the development of people's quality of life, the poverty situation in Thailand has improved. Meanwhile, the Thai People Map and Analytics Platform (TPMAP), developed from the Thai Poverty Map and Analytics Platform, has analyzed data from state welfare card registrations for inspection and field visits by officials to survey the severity of the problem according to the basic needs data criteria of the Ministry of Interior (Chanthamon Sihabunla, 2023: 2).

The government's policy to solve poverty problems The past government focused on reducing expenses, increasing income, expanding opportunities and developing the potential of the poor, and strengthening all local communities and civil society to be able to manage themselves in terms of economics, society, culture, governance, and natural resource management. This is laying the foundation for development for self-reliance in line with the Sufficiency Economy Philosophy and solving poverty problems, which will lead to sustainable development and has been transformed into practice under the "Provincial Well-Being Strategy" project. In addition, important projects have been implemented, such as the Village and Urban Community Fund Project, the SML Project, the People's Bank Project, the Baan Ua-Athorn Project, the Secure Home Project, and scholarships for poor and disadvantaged children. In the participatory development planning of the Subdistrict Administrative Organization, it is an attempt to encourage villagers, local leaders, groups, and community organizations to use the Subdistrict Administrative Organization as the center for determining directions, jointly deciding, and jointly implementing development activities at the subdistrict level. The true participation of villagers, local leaders, groups, and community organizations should be the foundation for developing the potential of the Subdistrict Administrative Organization to be strong and able to be an agency for systematic management, coordination, planning, budget management, and information (National Economic and Social Development Board, 2011:1).

Local government is an opportunity for people to govern themselves or determine the way of life and future of the community by the people in the community. Since Thailand announced the Constitution of the Kingdom of Thailand B.E. 2540 onwards, it resulted in the enactment of the Act on the Decentralization Plan and Procedures for Local Government Organizations B.E. 2542. It can be said that it is the beginning of a new era of decentralization of local government in Thailand, resulting in more administrative units at the local level, in addition to municipalities, there are provincial administrative organizations and sub-district administrative organizations totaling more than ten thousand nationwide to provide public services to the people. Later, the Constitution of the Kingdom of Thailand B.E. 2550 was announced, which gradually increased the power of local government organizations (Apichat Sathitniram, 2012:2). Therefore, public participation is necessary. It can be seen that it is specified that local administrators and local council members must be representatives of the people who come from public participation through the election process. In addition, it is specified to promote public participation in the administration and inspection of the work of local government organizations, with the goal of the work of local government organizations responding to the needs of the people directly, solving problems quickly, creating transparency, and being a method to help strengthen the community. Community ownership and strengthening local democracy Therefore, local government must focus on strengthening public participation in order to achieve the objectives of the establishment of local

government organizations, which is the foundation of democratic development (Oratai Kokphon, 2009:4).

Ban Talat Nong Phling is a village under the jurisdiction of the Nong Phling Subdistrict Administrative Organization, located in the west of Tambon Nong Phling. People work in agriculture, animal husbandry, and commerce. In addition to increasing the index of average income per person per year, the problem of poverty must also be managed by creating community participation in order to develop the potential for self-reliance to be strong, resulting in the power of the community to be aware of the problems that have occurred, to participate in finding solutions to poverty together, and to participate in solving poverty problems sustainably in the future. From the above conditions and problems, the researcher is interested in studying public participation in implementing sustainable poverty solutions in order to use as a guideline for developing the implementation of solving poverty problems for people in Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province to be successful in the future.

Objectives of the study

1. To study the level of public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province
2. To compare the level of public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, classified by personal factors

Hypothesis

1. People with different genders have different participation in sustainable poverty alleviation operations.
2. People with different ages have different participation in sustainable poverty alleviation operations.
3. People with different education levels have different participation in sustainable poverty alleviation operations.
4. People with different average monthly incomes have different participation in sustainable poverty alleviation operations.
5. People with different length of stay in the area have different participation in sustainable poverty alleviation operations.

Scope of the Study

This study is a study of public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province. The scope of the study is as follows:

1. Population and sample scope
 - 1.1 The population used in this research was the people in the Nong Pling Market Village area, Mueang Nakhon Sawan District, Nakhon Sawan Province, aged 18 years and over, totaling 5,724 people (data as of January 30, 2024).
 - 1.2 The sample group used in the study was the people in Nong Pling Market Village, Mueang Nakhon Sawan District, Nakhon Sawan Province. The researcher calculated the sample size using Taro Yamane's formula (Taro Yamane, cited in Thirawut Ekakun, 2000). The sample group was 374 people.
2. The variables used in this study consisted of:
 - 2.1 Independent variables include personal factors of the people, including gender, age, education level, average monthly income, and length of stay in the area.
 - 2.2 Dependent variables include public participation in the sustainable poverty alleviation operations of the Nong Phai Kaew Subdistrict Administrative Organization, Ban Bueng

District, Chonburi Province, in 4 areas: thinking and planning, operations, benefits, and monitoring of operations.

2. Literature Reviews

Participation means the participation of the people, both directly and indirectly, in the implementation of sustainable poverty alleviation (Kiatthakhon Wajanasawat, 2007:1). It is divided into 4 aspects as follows:

1.1 Thinking and planning means participation in community meetings for village development planning to prioritize problems and determine guidelines for solving various problems, such as sustainable poverty alleviation.

1.2 Implementation of sustainable poverty alleviation means participation in activities organized by Nong Mai Kaen Subdistrict Administrative Organization, such as poverty alleviation, participation in important day activities, participation in project training, and participation in activities to solve poverty alleviation sustainably.

1.3 Benefits means benefits in return for people’s participation in activities organized by Nong Mai Kaen Subdistrict Administrative Organization, with an emphasis on equal benefits.

1.4 Monitoring of performance means participation in monitoring and evaluation of the implementation of various projects, such as participation in monitoring of the implementation of sustainable poverty alleviation (Chankiat Charoenthanasathap, 2011).

Poverty means the situation of people whose income is insufficient for living and survival. For survival and lack of other opportunities (Somsak Sukwong, 2001: 1) is a result of economic and social inequality that causes poverty (Narong Petchprasit et al., 2002: 15 – 21).

Conceptual framework of the study

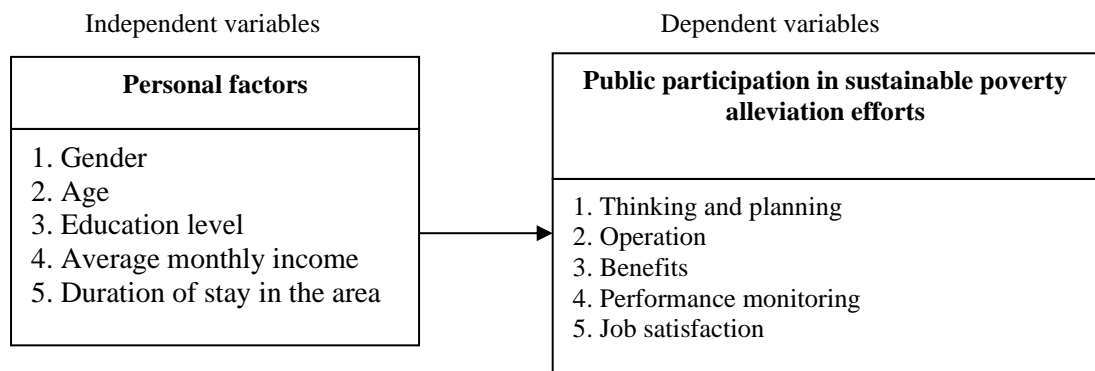


Figure 1 :Conceptual framework of the study.

3. Methodology

This study is a survey research study. The objective is to study and compare the level of public participation in the sustainable poverty alleviation of Nong Phai Kaew Subdistrict Administrative Organization, Ban Bueng District, Chonburi Province. The researcher has specified the details of the study methodology as follows:

Population and sample

The population used in the study was 5,724 people aged 18 years and over in the area of Nong Phling Market Village, Mueang Nakhon Sawan District, Nakhon Sawan Province (data as of January 30, 2024).

The sample used in the study was 5,724 people in the area of Nong Phling Market Village, Mueang Nakhon Sawan District, Nakhon Sawan Province. The researcher calculated the sample size using the principle of finding values according to the formula of Taro Yamane (Taro Yamane, cited in Thirawut Ekakun, 2000). The sample group was 374 people. The researcher selected the sample group by simple random sampling according to the sample size and proceeded to distribute the questionnaires.

Instruments used in the study

The questionnaire was divided into 2 parts as follows:

Part 1 is a questionnaire on the personal factors of the respondents, including gender, age, education level, average monthly income, and length of stay in the area.

Part 2 is a questionnaire on the level of public participation and public participation in sustainable poverty alleviation. It is a 5-level rating scale based on the Likert scale.

Instrument Development and Testing

In order to develop the instruments used to collect data in this study, the researcher proceeded to develop and determine the quality of the instruments according to the following steps:

1. Study, analyze, and synthesize documents and studies from both Thailand and abroad to study the ideas of educators. That provides ideas about public participation in sustainable poverty alleviation

2. Study the method of creating a rating scale tool using the Likert method and creating an open-ended questionnaire from Boonchum Srisat's (2002: 72) textbook by creating a questionnaire that covers the conceptual framework and objectives of the study

3. Present the questionnaire to the thesis advisor for checking its accuracy and providing suggestions

4. Improve the questionnaire according to the thesis advisor's suggestions and present it to 3 experts to examine the content validity of each question by finding the index of congruence between the questions and the operational definition (IOC: Index of item objective congruence) which found that the IOC was 0.92

5. Improve the questionnaire that has been reviewed by experts according to the suggestions. Then present to the thesis advisor for consideration and suggestions again.

6. Take the revised questionnaire to try it out with a non-sample population of 30 people.

7. Analyze each questionnaire with the required discriminating power to find the reliability of the entire questionnaire by using the alpha coefficient method according to Cronbach's method. The reliability of the entire questionnaire was found to be .9225.

8. Print out the complete questionnaire to collect data with the sample group to be studied.

Data Analysis

The researcher analyzed the data using a ready-made statistical program, with the following details:

1. Analyze the personal data of the respondents using frequency and percentage.

2. Analyze the level of public participation in the implementation of sustainable poverty alleviation using the mean (\bar{X}) and standard deviation (S.D.)

3. Compare the level of public participation in the implementation of sustainable poverty alleviation according to the gender variable using the t-test (Independent samples).

4. Compare the level of public participation in the implementation of sustainable poverty alleviation according to the variables of age, education level, average monthly income, and length of stay in the community using the F-test and analyze the differences in paired means using the Least Significant Difference Analysis method.

Statistics used to analyze data

The researcher used statistics to analyze the data as follows.

1. Descriptive statistics include frequency (Frequency), percentage (Percentage), mean (Mean : \bar{x}) and standard deviation (Standard deviation : SD).

2. Inferential statistics: use t-test to test the comparison of differences in 2 groups and use F-test to test the comparison of differences of 3 or more groups.

Summary of the study results

1. General information of the majority of the respondents were female, 170 people, or 45.45 percent, aged 36-45 years, 132 people, or 35.29 percent, had an education level lower than a bachelor's degree, 248 people, or 66.31 percent, had an average monthly income lower than 10,000 baht, 157 people, or 41.98 percent, and had resided in the area for 5-10 years, 176 people, or 47.06 percent.

2. The level of public opinion on public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, was at a high level overall. When considering each aspect, it was found that there was a high level of participation in all aspects, ranked from highest to lowest in terms of receiving benefits, operations, thinking and planning, and monitoring of results of operations, respectively. The details of each aspect are as follows:

2.1 Public participation in the sustainable poverty alleviation operation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province The overall thinking and planning aspect was at a high level, with the item with the highest average value being: You participated in proposing community problems and needs, followed by attending meetings to prioritize community problems, and the lowest mean score was You participated in determining poverty alleviation projects.

2.2 Public participation in sustainable poverty alleviation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, in terms of overall operations, was at a high level. The highest mean score was You participated in various projects/activities organized by the Subdistrict Administrative Organization to promote and support the community's poverty alleviation, followed by You accepted the sustainable poverty alleviation project, and the lowest mean score was You joined the committee for poverty alleviation.

2.3 Public participation in sustainable poverty alleviation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, in terms of receiving benefits, was at a high level overall. The highest mean score was You benefited from training under the vocational training project to generate income, followed by Your community being promoted to form occupational groups that are consistent with the potential, wisdom, and local culture, and the lowest mean score was Your community receiving budget support to solve poverty alleviation sustainably.

2.4 Public participation in sustainable poverty alleviation of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, in terms of monitoring of results, was at a high level overall. The highest mean score was Members of your community have participated in the committee to monitor and evaluate the poverty alleviation project of your sub-district, followed by you participating in monitoring the implementation of poverty alleviation of your sub-district, and the item with the lowest average value is you participating in monitoring the budget of the poverty alleviation project.

3. Hypothesis testing results

3.1 Hypothesis 1 The results of the hypothesis analysis found that people with different genders had different participation in the implementation of sustainable poverty alleviation operations, but it was not statistically significant, which was not in accordance with the specified hypothesis.

3.2 Hypothesis 2 The results of the hypothesis analysis found that people with different ages had different participation in the implementation of sustainable poverty alleviation operations, but it was not statistically significant, which was not in accordance with the specified hypothesis.

3.3 Hypothesis 3 The results of the hypothesis analysis found that people with different levels of education had different participation in the implementation of sustainable poverty alleviation operations, but it was not statistically significant, which was not in accordance with the specified hypothesis.

3.4 Hypothesis 4 The results of the hypothesis analysis found that people with different average monthly incomes had different participation in the implementation of sustainable poverty alleviation operations, but it was not statistically significant, which was not in accordance with the specified hypothesis.

3.5 Hypothesis 5 The results of the hypothesis analysis found that people with different lengths of stay in the area had different participation in the implementation of sustainable poverty alleviation operations, but it was not statistically significant, which was not in accordance with the specified hypothesis.

4. Results

From the results of the study, it can be seen that the level of public participation in the sustainable poverty alleviation operations of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, is at a high level overall. When considering each aspect, it was found that there was a high level of participation in all aspects. The researcher discussed the results in each aspect as follows:

In terms of thinking and planning, it was at a high level overall. The item with the highest average value was that you participate in proposing problems and needs of the community. This may be because the Subdistrict Administrative Organization opens opportunities for community leaders and people to attend meetings to express their opinions on various projects regularly. They provide information and publicize news to the people clearly. The Mayor of Nong Phling Subdistrict Administrative Organization, Mueang Nakhon Sawan District, Nakhon Sawan Province, has a policy on developing management efficiency by promoting public participation in working with the Subdistrict Administrative Organization. They organize community meetings to allow people to express their opinions or report problems that are causing suffering in the community. Therefore, the people participate in thinking and planning at a high level.

In terms of overall operations, it was at a high level. The item with the highest average value was that you participate in various projects/activities organized by the Subdistrict Administrative Organization to promote and support the resolution of poverty problems in the community. This may be because the Subdistrict Administrative Organization organizes activities or projects to encourage public participation continuously and consistently. They are diverse according to the context of the community and are activities that can increase income or improve people's lives. They can solve problems close to the people. Therefore, it creates cooperation by having the people involved or participate in the practice. Which leads to learning, seeing the importance of participation that can solve community problems, which is consistent with the research results of Somjintana Khumpai (2016) who studied the factors affecting the participation of community members in the prototype sub-district administrative organization that integrated the community plan into the local development plan, Nakhon Ratchasima Province, found that the strategy for creating participation of the prototype sub-district administrative organization that affects the participation of community members includes organizing activities to create participation for community members. If the sub-district administrative organization organizes activities to promote participation frequently, community members will participate more.

In terms of receiving benefits, the overall level is at a high level, with the item with the highest mean value being that you have benefited from participating in the vocational training program to generate income. This may be because receiving benefits from participating in various activities is an opportunity or channel to receive education, learn how to work, have a marketing opportunity to sell your products to generate income, reduce family expenses, and the fact that the community receives budget support from the government, therefore creating an attraction that makes people think about the benefits they will receive. Therefore, people participate more in receiving benefits than other aspects.

In terms of monitoring the results of operations, the overall level is at a high level, with the item with the highest mean value being that members of your community have joined the committee to monitor and evaluate the project to solve poverty problems in the sub-district. This may be because the sub-district administrative organization adheres to the principles of management and development that adhere to the principles of good governance. and the principles of democracy and emphasize on working with public participation, which is transparent and can be verified. Therefore, the public is invited to join the committee to monitor and evaluate the various projects organized by the Subdistrict Administrative Organization in every project. A comparative study of the level of public participation in the sustainable poverty alleviation operations of the people of Ban Talat Nong Phling, Mueang Nakhon Sawan District, Nakhon Sawan Province, classified by personal characteristics found that gender, age, education level, average monthly income, and length of stay in the area had no statistically significant effect on the level of public opinion.

5. Conclusion and Recommendation

1. Suggestions from the study results

In terms of thinking and planning, the item with the lowest average value is that you participate in determining the poverty alleviation project. Therefore, the SAO should provide people with knowledge about poverty alleviation problems and ask them what kind of projects they want. Local leaders or

members of the SAO may be responsible for this and closely interact with the people to obtain community information and use the problems for research to seriously solve poverty problems.

In terms of operations, the item with the lowest average value is that you participate in the poverty alleviation operation committee. Therefore, the SAO should have members of the SAO in each village join the committee to implement various projects organized by the SAO so that people will feel proud of being selected as representatives and will cooperate more in organizing various project activities.

In terms of receiving benefits, the item with the lowest average value is that your community receives budget support to solve poverty problems sustainably. Therefore, the SAO should increase projects/activities so that every household can benefit from them by making people understand how to spend money appropriately according to their income, occupations that are appropriate for their living conditions and the environment in the village. This is because the poverty alleviation project, if it focuses on the sufficiency economy, will be successful.

In terms of monitoring the results of operations, the item with the lowest average value is You are involved in monitoring the budget of the poverty alleviation project. Therefore, the SAO should publicize the results of the various projects organized, both projects related to poverty alleviation and other projects, so that the public is informed and can monitor the budget usage of the SAO. The SAO may increase the channels of public relations so that the public is more widely informed.

2. Suggestions for future studies

1.) Research on the problem of sustainable poverty alleviation management should be conducted.

2.) The effectiveness of sustainable poverty alleviation projects of local administrative organizations should be studied.

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FORECAST HYPERTENSION AND DIABETES INCIDENTS IN BANG TOEI, SAM KHOK, PATHUM THANI

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ABSTRACT

This quantitative forecasting research aimed to forecast of hypertension and diabetes incidents in Bang Toei sub-district, Sam Khok district, Pathum Thani province in the fiscal year 2025. The time series data collected from the standard reporting group Illnesses with important non-communicable diseases, Health Region 4, data from fiscal years 2014 to 2024, Ministry of Public Health, and analyzed annually data with Gray System Theory. The results showed that hypertension and diabetes incidents forecasted with the GM(1,1) Error Periodic Correction model and GM(1,1), respectively, had a mean absolute error for the period from fiscal year 2014 to fiscal year 2024 in percent of 16.43, and 20.70, respectively, which were within the criteria for good prediction, and reasonable to forecast, respectively. In fiscal year 2025, there will be the incidents with high blood pressure, and diabetes 143, and 60 cases, respectively, decreased from fiscal year 2024 of 10.30, and 4.93 percent, respectively.

Keywords: Forecast; Incident; Hypertension; Diabetes; Grey System Theory

1. Introduction

Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province has a population of 11,452 people, 5,528 men and 5,924 women as of September 2024, aged 60 years and over, 2,183 people, accounting for 19.06 percent [1]. The area of Bang Toei Subdistrict Municipality has 8 villages (Moo 2-8 are within the municipal area and Moo 1 and 10 are in Khlong Khwai Subdistrict Administrative Organization), area 5,668 sq.km [2]. Faculty of Nursing, Shinawatra University (SIU) has the cooperation agreement with Bang Toei Subdistrict Administrative Organization in implementing the health education project to reduce the number of new patients with chronic non-communicable diseases. and monitor the health of former patients in collaboration with sub-district health promotion hospitals in the area.

The number of new patients in Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province from fiscal year 2017 to fiscal year 2024 were reported online for public [3]. The time series data appropriate for estimating the number of new cases that will occur in fiscal year 2025 using time series forecasting. The results will benefit to operations planning in the area.

This research aimed to forecast the number of new patients with high blood pressure and diabetes in Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province, fiscal year 2025.

2. Literature Reviews

The number of new patients in Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province from fiscal year 2017 to fiscal year 2024 were only 8 fiscal years short data periods. The grey systems theory was developed by Julong Deng [4,5] to analyze contemporary systems based on scarce, incomplete and uncertain data seemed to match with this data set.

The Grey Systems Theory

The equation of the basic model according to Grey Systems Theory is the GM(1,1) model [6]. The calculation formula is shown in Equations 1 to 17 as follows.

The actual n values from 1,2,3,...,n,

$$X^{(0)} = (x^{(0)}(1), x^{(0)}(2), \dots, x^{(0)}(n)) \quad (1)$$

The accumulated n values from 1,2,3,...,n,

$$X^{(1)} = (x^{(1)}(1), x^{(1)}(2), \dots, x^{(1)}(n)) \quad (2)$$

The k^{th} accumulated value,

$$x^{(1)}(k) = \sum_{i=1}^k x^{(0)}(i), k=1, 2, \dots, n \quad (3)$$

The average with previous accumulated values,

$$Z^{(1)} = (z^{(1)}(2), z^{(1)}(3), \dots, z^{(1)}(n)) \quad (4)$$

The k^{th} average accumulated value,

$$z^{(1)}(k) = \frac{1}{2}(x^{(1)}(k) + x^{(1)}(k-1)), k=2, 3, \dots, n \quad (5)$$

M^T transpose matrix of M

M^{-1} inverse matrix of M

$$x^{(0)}(k) + az^{(1)}(k) = b \quad (6)$$

$$Y = \begin{bmatrix} x^{(0)}(2) \\ x^{(0)}(3) \\ \vdots \\ x^{(0)}(n) \end{bmatrix}, B = \begin{bmatrix} -z^{(1)}(2) & 1 \\ -z^{(1)}(3) & 1 \\ \vdots & 1 \\ -z^{(1)}(n) & 1 \end{bmatrix} \quad (7)$$

$$a = (B^T B)^{-1} B^T Y = [a \quad b]^T \quad (8)$$

a The development coefficient) and

b The grey action quantity

The GM(1,1) model,

$$\frac{dX^{(1)}}{dt} + ax^{(1)} = b \quad (9)$$

The $k+1^{\text{th}}$ accumulated forecast,

$$x^{(1)}(k+1) = \left(x^{(0)}(1) - \frac{b}{a} \right) e^{ak} + \frac{b}{a} \quad (10)$$

The $k+1^{\text{th}}$ forecast value,

$$x^{(0)}(k+1) = (1 - e^{-a}) \left(x^{(0)}(1) - \frac{b}{a} \right) e^{-ak}, k = 1, 2, \dots, n \quad (11)$$

GM(1,1) expanded with periodic correction model (GM(1,1)EPC) is the GM(1,1) model adjust the error using a Fourier series (the Fourier series) [7], which is a trigonometric function cosine and sine that adjusts the predicted value closer to the actual value than the linear regression equation of the GM(1,1) model.

The k^{th} error term,

$$\varepsilon^{(0)}(k) = x^{(0)}(k) - x^{(1)}(k) \quad (12)$$

$$\varepsilon^{(0)}(k) \cong \frac{1}{2} a_0 + \sum_{i=1}^Z \left[a_i \cos\left(\frac{2\pi i}{T}\right) + b_i \sin\left(\frac{2\pi i}{T}\right) \right], k = 2, 3, \dots, n \quad (13)$$

$$T = n - 1, Z = \frac{(n-1)}{2} - 1$$

The Fourier series errors adjustment,

$$P = \begin{bmatrix} 1/2 & \cos\left(2\frac{2\pi}{T}1\right) & \sin\left(2\frac{2\pi}{T}1\right) & \cos\left(2\frac{2\pi}{T}2\right) & \sin\left(2\frac{2\pi}{T}2\right) & \dots & \cos\left(2\frac{2\pi}{T}Z\right) & \sin\left(2\frac{2\pi}{T}Z\right) \\ 1/2 & \cos\left(3\frac{2\pi}{T}1\right) & \sin\left(3\frac{2\pi}{T}1\right) & \cos\left(3\frac{2\pi}{T}2\right) & \sin\left(3\frac{2\pi}{T}2\right) & \dots & \cos\left(3\frac{2\pi}{T}Z\right) & \sin\left(3\frac{2\pi}{T}Z\right) \\ \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots \\ 1/2 & \cos\left(n\frac{2\pi}{T}1\right) & \sin\left(n\frac{2\pi}{T}1\right) & \cos\left(n\frac{2\pi}{T}2\right) & \sin\left(n\frac{2\pi}{T}2\right) & \dots & \cos\left(n\frac{2\pi}{T}Z\right) & \sin\left(n\frac{2\pi}{T}Z\right) \end{bmatrix} \quad (14)$$

The members of vector C ,

$$C = [a_0 \quad a_1 \quad b_1 \quad a_2 \quad b_2 \quad \dots \quad a_n \quad b_n] \quad (15)$$

$$C \cong (P^T P)^{-1} P^T \varepsilon^{(0)} \quad (16)$$

The k^{th} value forecasted,

$$x^{(0)}(k) = x^{(1)}(k) - \varepsilon^{(0)}(k) \quad (17)$$

The model accuracy criteria

The Mean Absolute Percentage Error - MAPE

For the real value y_i , n values, $i = 1, 2, \dots, n$.

y_i the forecasted values, for the in sample values (the training data set), and the out of sample values $i = n + 1, n + 2, \dots$

$$MAPE = \left(\frac{1}{n} \sum_{i=1}^n \left| \frac{y_i - \hat{y}_i}{y_i} \right| \right) \times 100\% \quad (18)$$

MAPE is the average of Proportion of difference between forecast value and actual value. Divide by the actual value and multiply by a hundred in the data range used to develop the model. It has percentage units that make it easy for users to understand [8]. The accuracy criteria are as follows: if MAPE is less than 10, between 10 and 20, between 20 and 50, greater than 50 means the model has high accuracy, can be used to forecast well, is reasonable enough to use in forecasting, and the model is not accurate, respectively [9].

The GM(1,1) model has been applied to forecast the number of people infected with monkeypox using data on the number of daily infections between May and July 2022 for both the world and the country. The top 5 countries with the most infected people are the United States, Spain, Germany, the United Kingdom, and France, with MAPE values between 0.039 and 0.437 only [10].

3. Methodology

This study was the univariate time series forecasting research design.

Population and sample

The study population was new incidents with high blood pressure and diabetes in Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province. The sample was the total number of new incidents in fiscal years 2017 to 2024.

Research Instruments

The spreadsheet software, the table format used to record the total number of annually incidents in a sheet.

Data Collection

The number of incidents for the fiscal years 2017 to 2024 was collected from the Ministry of Public Health website [3] that is published to the public and can be accessed by the general public by selecting Standard Report Group >> Illnesses with important non-communicable diseases >> Rate of new illnesses of high blood pressure per 100,000 population in the fiscal year in fiscal years 2017 to 2024. Select Health Zone 4, Pathum Thani Province, Sam Khok District, Bang Toei Subdistrict, the system will display the total number of new high blood pressure patients per year (from a patient with the first 3 digits of ICD10 code being I10-I15). Total number of new diabetes patients per year came from a patient with the first 3 digits of ICD10 code being E10-E14. Data for fiscal year 2024 was processed by the system on October 17, 2024, which was past September 30, 2024 the end of fiscal year 2024 already.

Data Analysis

Data analysis used a spreadsheet program that can analyze trends using regression equations. It has processing capabilities according to Grey Systems Theory, which is able to perform transpose matrix, matrix multiplication, and inverse matrix, create a forecasting model based on gray system theory, and calculate the accuracy of the model

Research ethics

Evaluating with the form to evaluate whether your research project was considered human research or not from the Center for the Promotion of Human Research Ethics. Mahidol University [11]. It was found that this research project used data on the total number of new patients per year. There is no information that can be linked to any individual, no interactions with new patients. Therefore, it was not a research study on people. According to the Mahidol University announcement regarding guidelines for research projects that do not qualify as human research, 2022 [12]. This does not require any approval for human research. Even applying for exemption certification (Exemption review) [13].

4. Results

The number of new patients with high blood pressure

The number of new patients with high blood pressure based on the data between fiscal years 2017 and 2024, the data fluctuates, increasing, decreasing, and uncertain, as shown in Table 1. Overall, there is a linear regression equation. $Y = -12.393x + 234.64$. Where y is the number of new patients with high blood pressure and x is the fiscal year 0, 1, 2, ..., the coefficient of x is negative, meaning there is a trend of decreasing by 12.39 cases per year, as shown in Figure 1.

Forecasting using the Gray Systems Theory found that the GM(1,1)GPC model had the lowest MAPE value of 16.43 percent and the highest coefficient of determination (R^2) of 0.89. It predicted that there will be a number of new patients in fiscal year 2025, 143 cases, a decrease of 10.30 percent from fiscal year 2024, as shown in Table 1 and Figure 2.

Table 1 The real values and the forecasted values the number of new patients with Hypertension from the fiscal years 2017 to 2025, Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province.

Fiscal Year	Real values (cases)	Year-on-year increased /- Decreased	Forecasted values (cases)	
			GM(1,1)	GM(1,1)EPC
2017	123		123	123
2018	399	224.39	295	357
2019	127	-68.17	247	171
2020	186	46.46	207	148
2021	158	-15.05	173	182
2022	142	-10.13	145	137
2023	137	-3.52	121	123
2024	159	16.06	101	190
	R^2		0.50	0.89
	MAPE		27.29	16.43
2025	Forecasted Value		85	143
	Year-on-year increased /- Decreased from 2024		-46.76	-10.30

Source: [3]

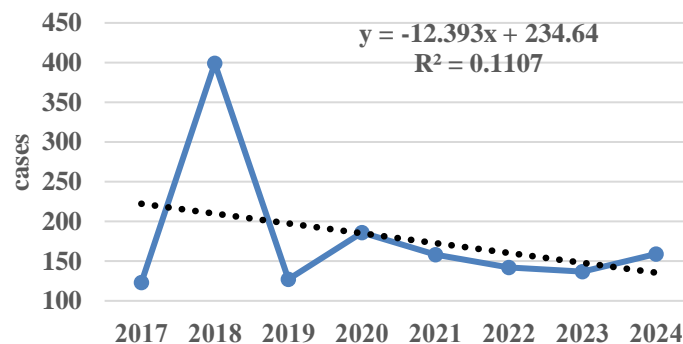


Figure 1 The number of new patients with Hypertension (cases) from the fiscal year 2017 to 2024.

Source: [3]

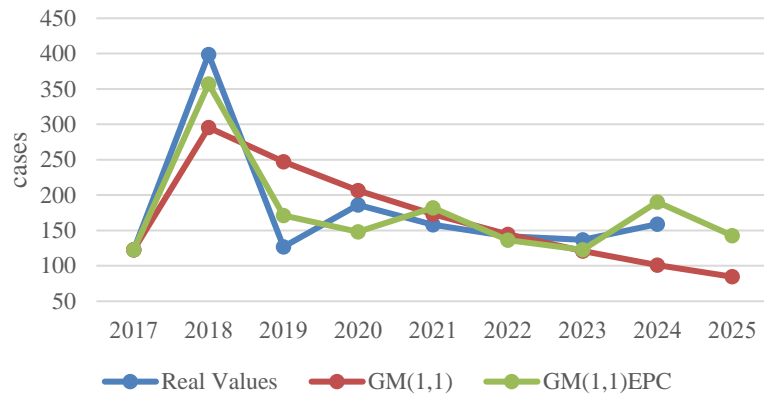


Figure 2 The forecasted number of new patients with Hypertension (cases) from the fiscal year 2017 to 2025.

Source: [3]

Table 2 The real values and the forecasted values the number of new patients with Diabetes from the fiscal years 2017 to 2025, Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province.

Fiscal Year	Real values (cases)	Year-on-year increased /- Decreased	Forecasted values (cases)	
			GM(1,1)	GM(1,1)EPC
2017	75		75	75
2018	133	77.33	122	108
2019	71	-46.62	110	100
2020	148	108.45	100	120
2021	70	-52.70	90	92
2022	77	10.00	81	66
2023	81	5.19	73	79
2024	63	-22.22	66	78
	R ²		0.35	0.60
	MAPE		20.70	21.53
2025	Forecasted Value		60	46
	Year-on-year increased /- Decreased from 2024		-4.93	-26.60

Source: [3]

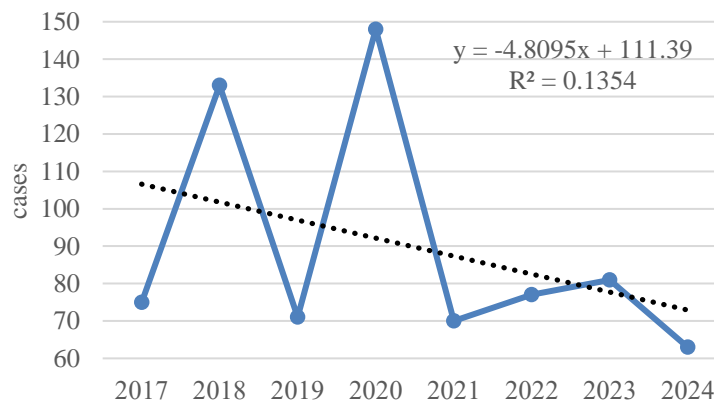


Figure 3 The number of new patients with Diabetes (cases) from the fiscal year 2017 to 2024.

Source: [3]

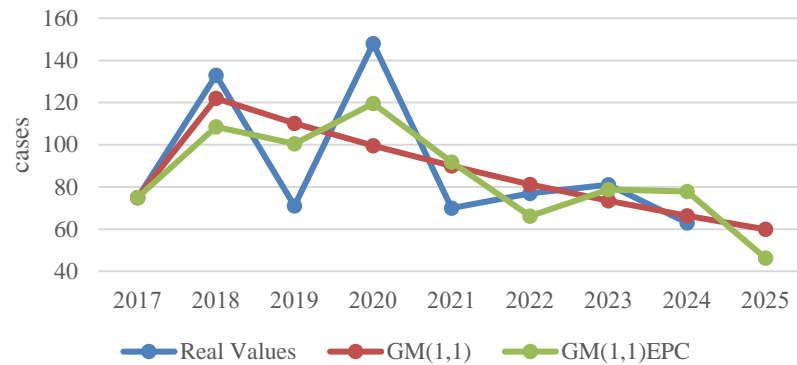


Figure 4 The forecasted number of new patients with Diabetes (cases) from the fiscal year 2017 to 2024.
 Source: [3]

The number of new patients with Diabetes

The number of new patients with diabetes based on the data between fiscal years 2017 and 2024, the data fluctuates, increasing, decreasing, and uncertain, as shown in Table 2. Overall, there is a linear regression equation. $Y = -4.809x + 111.39$. Where y is the number of new patients with high blood pressure and x is the fiscal year 0, 1, 2, ..., the coefficient of x is negative, meaning there is a trend of decreasing by 4.81 cases per year, as shown in Figure 3.

Forecasting using the Gray Systems Theory, the GM(1,1) model had the lowest MAPE value of 20.70 percent, while the GM(1,1)EPC model has a coefficient of determination (R^2) of 0.60 higher than the GM(1,1) model. Model selection GM(1,1) forecasts that there will be 60 new cases in fiscal year 2025, at a level similar to fiscal year 2024, which is a decrease from fiscal year 2024 by only 4.93 percent, as shown in Table 2 and Figure 4.

5. Conclusion and Recommendation

Results of forecasting the number of new patients with high blood pressure and diabetes in Bang Toei Subdistrict, Sam Khok District, Pathum Thani Province. It was found that there was a tendency to decrease by 10.30 percent and 4.93 percent, respectively, which was in line with what had been.

Using the results of the forecast in conjunction with implementing various measures to set the goals for the fiscal year 2025 plan, and when there is a report for the fiscal year 2025, comparisons are made with the goals set. To improve the forecasting model and plan for the next fiscal year.

The future research will study of factors affecting the number of new patients in the area concerning knowledge and understanding of how to behave in order to prevent and promote health of the population in the area.

Acknowledgement

Thank you to the Dean of the Faculty of Nursing, Shinawatra University, both pushed and supported for this research.

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SENSOR ALERT SYSTEM A CASE STUDY OF WORKERS TRAPPED IN CONFINED SPACES

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ABSTRACT

This research involves designing and building a sensor alert system to help monitor confined spaces for trapped workers. The researcher recognized that worker fatalities in confined spaces occur every year across various locations such as basements, silo tanks, water wells, pipes, cold rooms, and school buses. Therefore, the researcher designed a system incorporating motion sensors, carbon dioxide sensors, and sound sensors, programming them to work together and send alert messages via the LINE application to detect if there are living beings inside the confined space.

If the system detects life within the space, it will trigger a siren alarm and send alert messages to a LINE group. If no life is detected within the confined space, the program will command the sensor system to loop again according to the conditions set in the program's instructions. The experimental results showed that the sensor alert system can function and be practically applied with 100% accuracy.

Keywords: Alarm Sensor System Line Application

1. Research Problem

Safety incidents involving employee deaths in confined spaces have been occurring continuously. According to statistics compiled by the Division of Epidemiology, Department of Disease Control, between 2003-2018, there were 62 incidents with a total of 130 fatalities, averaging 2 deaths per incident. In the past 5 years (2015-2019) until 2020, there were 19 fatal incidents in confined spaces, with a total of 60 injuries and deaths. Each incident involved 2-5 people, with 43 fatalities, representing 72% of all victims. The main causes of death stem from errors in managing confined space work permits, inadequate preparation of equipment and workers for routine operations, and lack of strict supervision of workers. Currently, sensor technology plays a crucial role in collecting data for analysis and directing actions as needed. Sensors may be designed for specific purposes, such as motion detection, carbon dioxide detection, and sound detection. Sensors are designed with wireless transmission capabilities and data analysis features. For example, sound sensors use Piezoelectric sensor principles to convert sound energy into electrical energy, sending signals to a controller (Arduino) for analysis and processing, then notifying through Line messaging when worker sounds are detected in confined spaces.

Based on the above information, the researcher recognizes the significance of confined space entrapment issues for employees, which can be life-threatening. Therefore, a sensor system has been applied for alerting, motion detection, carbon dioxide detection, and sound detection to ensure confidence in the facility's safety system that no employees will be trapped in confined spaces.

2. Research Objectives

1. To design and build a sensor alert system for cases of workers trapped in confined spaces
2. To study the efficiency of the sensor alert system for cases of workers trapped in confined spaces

Scope of research

Research Hypothesis

The sensor alert system will send emergency alert signals to both a siren and the LINE application when it detects workers trapped in confined spaces

Research Scope

1. The study area is the Physics Laboratory at Shinawatra University
2. Testing was conducted in a factory storage room with confined space characteristics, measuring 3 x 8 meters
3. The alert sensor system includes: Infrared photoelectric switch sensor, MQ-135 Air Quality Sensor, Carbon dioxide sensor, Sound sensor module hub 360

3. Method

Research Tools

1.1 Arduino Integrated Development Environment (Arduino Software IDE) is software used for programming Arduino boards using the C language. The program is open-source, making it freely available for use.

1.2 Blynk Application is a smartphone application suite that makes IoT project creation comprehensively simple. It connects to remote devices through the internet network, using smartphones as the main interface between users and endpoint control devices.

1.3 LINE Application is a communication application used for messaging and talking with others. It uses the internet for communication, allowing users to chat or make calls to others without any charges and with unlimited duration.

1.4 Equipment

- 1) MQ-135 Air Quality Sensor
- 2) Infrared photoelectric switch sensor E18-D80NK
- 3) Sound sensor module hub 360
- 4) relay 2 channel
- 5) Mini strobe siren sound-light alarm wired sound-light alarm 103 speaker 12v Anti-theft alarm
- 6) LCD I2C 16X2
- 7) Jumper
- 8) Node MCU ESP8266
- 9) Lithium-ion JHZS 18650-2600 mAh (4C 10.4A)
- 10) Lithium-ion battery pack 14.8 V
- 11) Protection PCB Board 18650 For Li-ion Lithium Battery 6A-8A Prevent Overcharge & Discharge
w/Balance 3S (3cell 1.1v/12.6V)
- 12) DC-022B DC power outlet DC Block 5.5x2.1MM power female socket

Steps for preparing materials

2.1 Study information, devices, Arduino boards, Module boards, study C language writing from Internet sources, related research results from various websites as a prototype.

2.2 Study information on the Blynk application, which is a set of applications on smartphones that make IoT work connected to distant devices via the Internet, using smartphones as the main device to contact users and end control devices.

2.3 Select the Arduino board device as a wireless transmitter and receiver, controlled by writing a program with C language before connecting to the sensor and siren.

2.4 Write a C language program into the Arduino board to command the board to display the results as we want the board to work and connect the delay to the Arduino board.

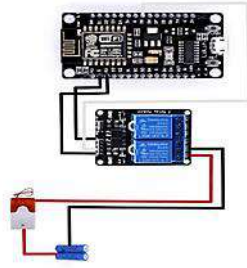


Fig1 Connecting the siren delay circuit to the Arduino board

2.5 Connecting the motion detection sensor to the Arduino board



Fig 2 Connecting the motion detection sensor to the Arduino board

2.6 Connecting the display circuit to the Arduino board

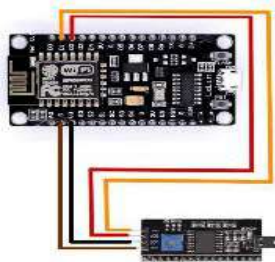


Fig 3 Connecting the display circuit to the Arduino board

2.7 Connecting the sound level sensor to the Arduino board

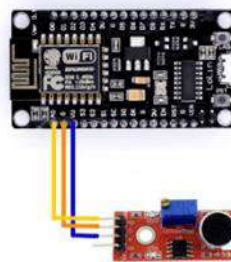


Fig 4 Connecting the sound sensor to the Arduino board

2.8 Connecting the carbon dioxide level sensor to the Arduino board

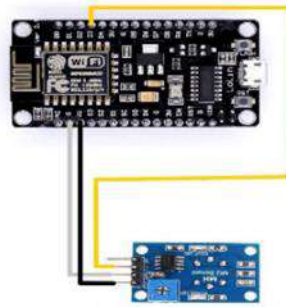


Fig 5 Connecting the carbon level sensor to the Arduino board

Data Analysis

3.1 Testing program delay before sensor operation: When switched on, the program will have a 30-second delay to allow sensors to set values before starting operation, which follows the conditions specified in the program commands.

3.2 Testing the operation of Infrared photoelectric switch sensor: When switched on, the program will have a 30-second delay to allow the sensor to set values before starting operation. After that, the Motion sensor will begin working to detect movement in confined spaces.

3.3 Testing the operation of MQ-135 Air Quality Sensor: It will begin operation by detecting Carbon dioxide levels in confined spaces. If Carbon dioxide is detected, the Siren will send an alert signal.

3.4 Testing the operation of Sound sensor module hub 360: It will begin operation by detecting sounds in confined spaces. If sound is detected in confined spaces, the Siren will send an alert signal.

4. Results

Research Results Sensor Testing in Case of Employee Trapped in Confined Space

Table 1 Results of sensor testing in case of employee trapped in confined space

Test No.	Program Delay Before Sensor Operation	Infrared photoelectric switch sensor	MQ-135 Air Quality Sensor	Sound sensor module hub 360
1	Normal	Alert	Alert	Alert
2	Normal	Alert	Alert	Alert
3	Normal	Alert	Alert	Alert
4	Normal	Alert	Alert	Alert
5	Normal	Alert	Alert	Alert
6	Normal	Alert	Alert	Alert
7	Normal	Alert	Alert	Alert
8	Normal	Alert	Alert	Alert
9	Normal	Alert	Alert	Alert
10	Normal	Alert	Alert	Alert

From Table 1 It was found that in testing the sensor system when someone is present in a confined space, the following results were observed:

1. The Infrared photoelectric switch sensor successfully detected movement in all 10 trials
2. The MQ-135 Air Quality Sensor successfully detected CO₂ in all 10 trials
3. The Sound sensor module hub successfully detected sound within the confined space in all 10 trials

All sensors achieved 100% detection rate.

Testing results for cases when no one is trapped in confined spaces

Table 2 Results of sensor testing in case of no employee trapped in confined space

Test No.	Program Delay Before Sensor Operation	Infrared photoelectric switch sensor	MQ-135 Air Quality Sensor	Sound sensor module hub 360
1	Normal	No Alert	No Alert	No Alert
2	Normal	No Alert	No Alert	No Alert
3	Normal	No Alert	No Alert	No Alert
4	Normal	No Alert	No Alert	No Alert
5	Normal	No Alert	No Alert	No Alert
6	Normal	No Alert	No Alert	No Alert
7	Normal	No Alert	No Alert	No Alert
8	Normal	No Alert	No Alert	No Alert
9	Normal	No Alert	No Alert	No Alert
10	Normal	No Alert	No Alert	No Alert

The results show:

1. The Infrared photoelectric switch sensor detected 0 instances of movement in all trials
 2. The MQ-135 Air Quality Sensor detected 0 instances of CO₂ in all trials
 3. The Sound sensor module hub detected 0 instances of sound within the confined space in all trials
- All sensors achieved 100% accuracy in detect

5. Summary

The performance testing of the device shows that the motion detection sensor, carbon dioxide sensor, and sound measurement sensor can operate according to the created command set. When powered on, the system begins operation with a 30-second delay to allow sensors to set their initial values before starting operation. After this:

1. The Infrared photoelectric switch sensor begins searching for movement in the confined space
2. The MQ-135 Air Quality Sensor works by detecting Carbon dioxide
3. The Sound sensor module hub 360 works by detecting sound

If any sensor detects its target parameter, it will:

- Trigger an alert signal
- Activate a siren
- Send an alert message via Line application

In cases where:

- No movement is detected
- No Carbon dioxide is detected
- No sound is detected in the confined space

The programmed system will loop back and command all three sensors to restart their operation in a continuous loop according to the conditions specified in the program commands. The experimental results showed 100% accuracy.

Recommendations

1. The casing design should be compact and use durable materials.
2. Enhance device functionality by adding more features, such as installing cameras to allow facility owners to conduct self-monitoring, thereby increasing the device's capabilities.
3. Each step of device installation should be carried out with caution.
4. For future development of the sensor alert system, a detailed study of circuit connections and sensor operations should be conducted.
5. For future development of the sensor alert system, the power supply should be improved. Since lithium-ion batteries have a short lifespan and require sensor charging, it is recommended to use power supply equipment with longer operational life, such as connecting to the factory's emergency power system battery.

These recommendations focus on physical improvements, functionality enhancements, installation procedures, technical development, and power supply optimization to make the system more reliable and practical for industrial use.

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THE RELATIONSHIP BETWEEN INDUSTRY 4.0 AND CIRCULAR ECONOMY: A SUSTAINABLE HEALTHCARE SECTOR PERSPECTIVE

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ABSTRACT

This article explores the relationship between Industry 4.0 and the Circular Economy, with a focus on the sustainable healthcare sector. Industry 4.0, which encompasses advanced digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), robotics, and big data analytics, has opened new opportunities for enhancing the efficiency of healthcare systems. It allows for the reduction of resource consumption and costs in both production and service delivery. Meanwhile, the Circular Economy focuses on minimizing waste, reusing resources, and creating added value from used materials. Applying Circular Economy principles to the healthcare sector can help establish a more sustainable system of production and consumption, both environmentally and socially. By leveraging Industry 4.0 technologies, the healthcare sector can support efficient resource management and the development of sustainable solutions, such as recycling medical materials and creating new business models that emphasize the use of circular resources. This article presents an integrated approach between Industry 4.0 and the Circular Economy to support the future sustainable development of the healthcare sector.

Keywords: Industry 4.0; Circular Economy; Healthcare; Sustainability; Digital Technologies

1. Introduction

The rapid increase in population and economic growth has led to a higher demand for resources, while resources are nearing depletion. This has given rise to the concept of the Circular Economy as a new alternative to develop the country's economy toward sustainability. At the same time, the Circular Economy focuses on maximizing the use of resources through recycling, reusing, and reducing waste, which helps minimize environmental impacts and ensures sustainable resource use in the healthcare sector. For example, developing medical equipment that can be reused, reducing the use of environmentally harmful materials, and efficiently managing medical waste will help reduce waste volume and enhance sustainability in healthcare operations.

2. Literature Reviews

Circular Economy is a concept of management under the principle of sustainable development, emphasizing the management of waste from production and consumption. It involves reintroducing raw materials that have already been produced and consumed back into the production process, or reusing them, while maintaining a balance between economic growth, resource use, and environmental preservation [1]. With the rapid advancement of technology and innovation, Industry 4.0 and the concept of Circular Economy have become crucial tools for developing and improving various sectors of society and the economy. This is particularly important in the healthcare sector, which faces challenges such as an aging population, scarcity of medical resources, and environmental issues that impact healthcare operations. The relationship between technology from Industry 4.0 and the principles of Circular Economy is key to strengthening a sustainable healthcare system that meets the needs of future populations.[2]

Many countries around the world are transitioning to a Circular Economy system to address the resource crisis. Looking back to 2015, the European Commission recognized the importance of addressing the problems of excessive consumption and resource use by proposing the "Industry 2020 in

the Circular Economy" initiative. This concept covers aspects of production in a new industrial model, changes in consumer behavior, and more efficient waste management.[3]

Industry 4.0, which includes the use of advanced technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), robotics, Big Data analytics, and 3D printing, has brought about significant changes in processes and workflows across various industries, including the healthcare sector. These technologies have been applied in areas such as accurate disease diagnosis, the development of high-performance medical devices, telemedicine services, and the creation of interconnected health data systems. These advancements help healthcare providers respond more quickly and efficiently to patient needs.

3. Methodology

Currently, the concepts of Industry 4.0 and Circular Economy are gaining widespread attention across various sectors, especially in industries and businesses seeking to leverage technology and innovation to improve efficiency and reduce environmental impact. Industry 4.0 refers to the use of digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), robotics, and automation in manufacturing processes to make them smarter and more interconnected. On the other hand, Circular Economy focuses on creating value from existing resources by reusing waste and used materials through recycling and designing products that can be reused.

However, despite both concepts being applied in many sectors, there is still limited research on the link between Industry 4.0 and Circular Economy from the perspective of sustainability, particularly in healthcare. Studying this relationship is crucial to enhancing our understanding of how these two concepts can work together to improve the effectiveness and sustainability of healthcare services.[3]

1. Circular Economy

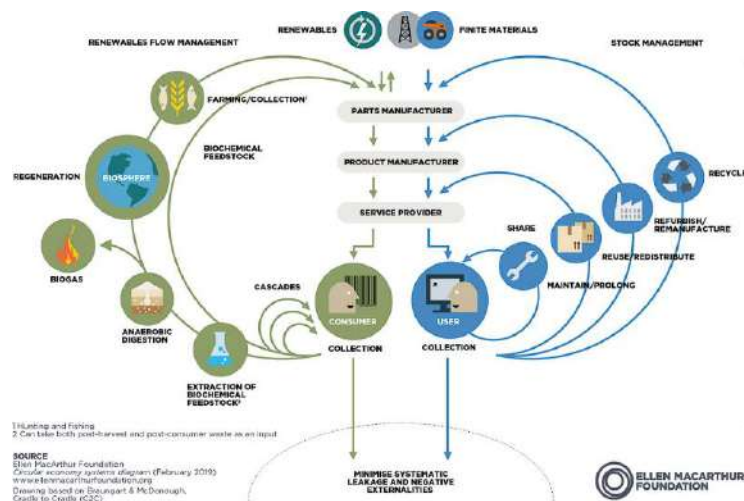


Figure 1: Butterfly Diagram (Source: Ellen MacArthur Foundation [4])

Figure 1: The relationship between the flow of materials in a circular economy consists of two main cycles: (1) the technical cycle, which involves the circulation of products and materials through processes such as reuse, repair, remanufacturing, and recycling, and (2) the biological cycle, which involves the circulation of minerals and nutrients from biodegradable materials that are returned to nature. Implementing circular economy principles thus enhances the efficiency of production and consumption while reducing environmental impacts in both industrial and agricultural sectors. [3]

2. Industry 4.0

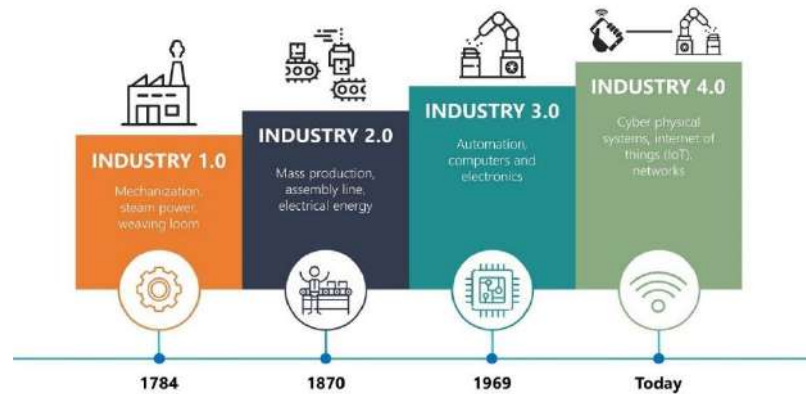


Figure 2: The Industrial Revolution (Source: Enerco Energy Solutions LLP [5])

Industry 4.0 is a concept that has emerged in the present era to describe a new industrial revolution, which utilizes digital technologies as key tools to improve manufacturing processes and operations across various industries. This concept is inspired by the approaches to industrial development that have evolved over different historical periods.

3. Circular Healthcare

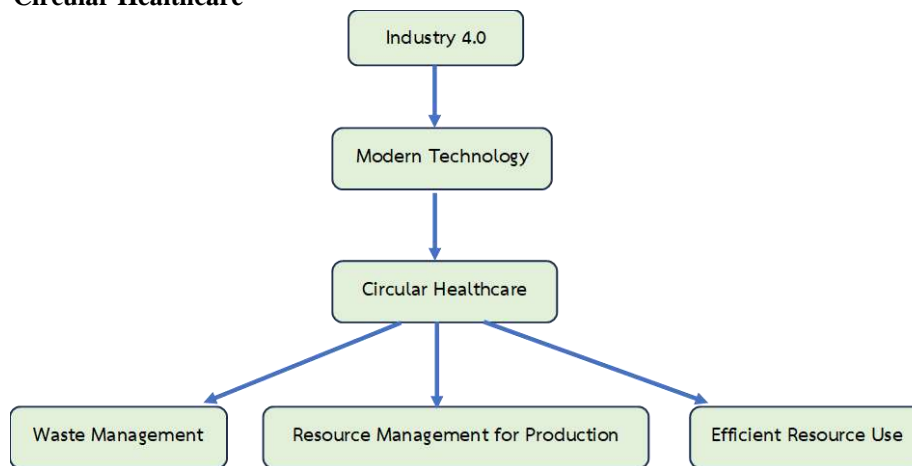


Figure 3: Circular Healthcare (from: M. Javaid, A. Haleem, I. Haleem Khan et al) [6]

Figure 3: The relationship between Industry 4.0 and waste management, raw material management in production, and the efficient use of resources not only provides a way to reduce costs and improve efficiency in the healthcare sector but also plays a crucial role in protecting public health by reducing the risks of pollution and exposure to harmful substances. Furthermore, it helps promote cleaner and safer environments in hospitals and healthcare facilities, which are key factors in patient recovery and care.

4. Results

Circular Economy in the Healthcare Sector In the healthcare sector, the circular economy can be applied in several areas, such as

1. **Medical Waste Management:** Medical waste generated from the use of medical materials, such as used syringes or disposable equipment, can be recycled or reused to avoid disposing of waste that may harm the environment.
2. **Efficient Use of Materials and Resources:** Reusable medical devices or equipment made

from eco-friendly materials help reduce the use of resources required for new production and minimize waste.

3. Sustainable Patient Care: The development and use of medications or vaccines that can be produced and distributed without harming the environment help reduce dependency on limited natural resources.

Integrating the circular economy with Industry 4.0 enhances the development of the healthcare sector by reducing costs and promoting efficient resource use in production, consumption, and waste management.

Building a Sustainable Healthcare Sector through the Integration of Industry 4.0 and the Circular Economy in Various Aspects:

1. Increasing Efficiency and Reducing Costs: The use of digital technologies improves the efficiency of production and resource management in the healthcare system. Meanwhile, adopting the circular economy can help reduce the costs of waste management and materials used in hospitals or healthcare facilities.

2. Environmental Protection: Reducing waste and increasing recycling will help minimize pollution caused by medical activities and contribute to the conservation of natural resources.

3. Sustainable Development: The integration of technology and sustainable resource management will create opportunities for the development of the healthcare sector that not only meets the current needs of patients but also remains flexible and capable of long-term growth.

5. Conclusion and Recommendation

This article focuses on studying academic papers regarding the relationship between Industry 4.0 and the circular economy in creating a sustainable healthcare sector. The integration of digital technologies with the principles of the circular economy can enhance resource management efficiency, reduce waste, and improve medical services, making them more sustainable and cost-effective in the long term. Furthermore, the use of advanced technologies and recycling in the healthcare industry will be key tools in creating a sustainable future. Industry 4.0 and the circular economy will play an important role in improving the healthcare sector by making it more efficient, environmentally friendly, and better able to meet the needs of patients in a more targeted and sustainable manner.

Recommendations

There should be further studies on the limitations of applying Industry 4.0 and the circular economy to the healthcare sector, in order to gain insights for developing and adapting these approaches to unlock their full potential, and to enhance the sustainability and efficiency of the healthcare system in the future.

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