FRONTIERS IN MANAGEMENT SCIENCE

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Investigating the Strategic Behavior of Competitive Intelligence on Green Marketing Performance in a Strategic Industry

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Abstract

Iran, as the world's second largest producer of natural gas and a key player in the Middle East energy sector, has a prominent role in the development of the oil and gas industry. However, the environmental challenges arising from the activities of this industry highlight the need for an innovative and sustainable approach. This study examines the role of Competitive Intelligence (CI) in enhancing Green Marketing (GM) in a gas refinery in Iran. This study, using a descriptive-survey method and using a questionnaire as a data collection tool, attempts to examine the importance of CI in realizing green marketing. Non-probability sampling is used, and 73 refinery experts were selected as the sample. Data analysis is conducted using SPSS and PLS software. The results show that CI has a positive and significant effect on GM and in the areas of marketing strategy, internal marketing, green products, and communications. These findings identify CI as a key tool for enhancing sustainable performance in the oil and gas industry, and refineries should implement the GM approach at strategic, semi-strategic, and tactical levels to succeed in greening. This study also faced limitations such as limited access to accurate data and sampling adjustment to a specific refinery. Finally, it is suggested that refinery managers, in addition to paying attention to CI, fully believe in the importance of GM in resource management and pollution reduction. This study, by providing new findings, contributes to a deeper understanding of how CI and GM interact in the oil and gas industry and can be used as a foundation for future studies in this area.

Keywords: marketing communication, strategy, green marketing, internal marketing, product, competitive intelligence

1. Introduction

Refinery pollution, releasing millions of tons of pollutants, poses a significant threat to health and the environment. The reliance on fossil fuels contributes to severe pollution and climate change, recognized as major global challenges (Wang et al., 2023). These activities have led to harmful changes in soil and water and unpredictable climate shifts. If global warming continues, temperatures might rise by 1.5 degrees Celsius between 2030 and 2052, resulting in extreme weather events that threaten ecosystems and human livelihoods (Majeed et al., 2022).

The growth of the oil industry and its effects on Iran's development is a critical issue that needs attention (Farzanegan et al., 2021). In a globalized economy, industries face uncertain markets driven by economic security principles. Achieving long-term equilibrium is challenging, yet this instability can foster competition and innovation. Managers must adapt to rapid market changes, as competitors may offer better products at lower prices, while regulatory shifts and currency fluctuations can impact trade and consumer preferences (LUȚAI & MIHĂIESCU, 2022). Thus, early identification of these threats and the implementation of swift countermeasures are vital (Ahmed et al., 2023). Despite the focus on Competitive Intelligence (CI) and its advantages, challenges remain in marketing non-renewable energy sectors.

CI analysts develop CI through data collection, processing, and transfer. The rise of digital markets has transitioned businesses online, generating vast amounts of data on products, customers, and competitors, which is crucial for informed decision-making. Given the abundance and diversity of this data, it's essential to create tools that assist analysts in collecting and analyzing CI. This initiative aims to enhance analysts' tasks by providing tools to explore, organize, and visualize environmental data (Silva & Bação, 2022). Organizations must adapt to these environmental changes and produce safer products using methods like Green Marketing (GM) (Bhargavi Mahadevappa, 2022).

But in a situation where pollution and environmental damage caused by people and organizations is a very worrying problem, it attracts the attention of a wide society. Therefore, it makes the organization prioritize GM in order to protect the environment. However, when the organization does not do GM properly, GM can be considered by consumers as green washing against environmental pollution (Santos et al., 2024). This shows that the influence of CI by analysts on the determination of strategies, especially the GM of industries, is ambiguous.

The Ministry of Petroleum and the management groups active in it, considering the age of the oil and gas industry and the vital position of this industry in the Iranian economy, should replace the ineffective strategies of selling more and lower prices with management approaches based on intangible capital such as human, communication and structural capital (David & Gupta, 2024). To respond to the continuous growth and developments in the business world. If the result of this process leads to the maintenance, continuation and development of the activities of the oil and gas industries and realizes the field of innovation management growth in the industry.

On the other hand, evidence shows that despite digital transformations and increased environmental problems in recent years, many gas refinery sectors still use the same market analysis and marketing strategies as they did two decades ago (Muazu, 2019; Wang et al., 2022). This issue has led to challenges such as the lack of attracting private capital for sustainable exports, transferring energy from sources to distribution centers, and developing international business relations, and as a result, facing conflicting information in the market and different views of employees. This indicates insufficient attention to moving towards progress by applying current knowledge, which will lead to a decrease in performance and productivity.

In this regard, energy, as a necessary material input base, plays a decisive role in all aspects of economic and social development (Tudor et al., 2023). But global climate changes require a rapid energy transition for less carbon emissions, from traditional fossil fuels to clean, renewable and sustainable energies. Made necessary. However, in reality, the majority of the world's energy cannot immediately switch to renewable or clean energy due to immature technological readiness, unavailability of sufficient resources, and unstable energy supply (Constante & Erazo, 2024).

In the next few decades, fossil fuels, especially oil and gas, will continue to operate as the primary energy sector (Wang et al., 2023). And the use of resources in countries with high population growth continues to increase (Majeed et al., 2022). But today, in order to provide a suitable answer to management issues, especially in the field of industrial research and development, special attention should be paid to the combination of approaches and its consequences with regard to the work field and the market. For this purpose, a number of industries have used CI and strategies such as GM in order to create a competitive advantage (de Oliveira Lima et al., 2024; Pillai, 2024).

CI has become a crucial technique for competitor analysis, aiding companies in decision-making (Kazemi & Soltani, 2024). It serves as a strategic management tool that fosters rapid growth and improvement by enhancing the quality and speed of strategic decisions, ultimately boosting organizational competitiveness (Markovich et al., 2019). Recently, CI has gained importance in management, adapting to the culture of leading firms. It enables organizations to analyze data swiftly and accurately, providing valuable insights for decision-makers. This enhances information exchange and collective decision-making effectiveness (Yin, 2018). The marketing landscape is constantly evolving due to rising competition. Until the 1970s, marketing was product-centric, but it shifted to a customer-oriented approach with the emergence of new products and a growing population. Today, organizations are increasingly aware of and value their environmental impact (Daud et al., 2019).

On the other hand, GM tries to reduce its final effects on the environment by applying the role of social-environmental responsibility in companies in order to achieve sustainable development. Therefore, in such a situation where "green" issues have become increasingly important for corporate decision-makers, companies are also facing increased public sensitivity, stricter regulations, and increasing pressure from stakeholders focused on preserving the natural environment (Nguyen-Viet, 2023). This requires analysis of consistent results as well as ongoing research. With this approach, the concept of GM has found an important place on a global scale and the recent increase of green customers has created a new market opportunity for the global economy (Majeed et al., 2022). Although some researchers believe that GM for organizations may seem expensive at first, but it will undoubtedly give results over time and will gain double importance in the organization (Ahmed et al.,

2023).

Iran has historically been a strategic region for non-renewable energy, with gas refineries playing a vital role, especially in the Middle East (Mostaghimi & Rasoulinezhad, 2022). The eastern gas refineries, among the first in the country, are crucial for supplying gas to northern provinces and have a significant global standing. However, there is a lack of strategies to attract competitor information and insufficient social activity in environmental matters within the gas industry. Given the importance of current knowledge for enhancing organizational performance, CI and GM are critical for the long-term success of energy organizations (Vilkaite-Vaitone et al., 2022; Widyastuti et al., 2024). These concepts facilitate the absorption of market information and the adoption of environmentally compatible marketing methods. Unfortunately, over the past two decades, these issues have been overlooked in refinery operations, resulting in poor performance and negative financial impacts. Thus, studying the effect of CI on GM in gas refineries is essential (Kazemi & Soltani, 2024). Based on these challenges, we formulate the research questions and hypotheses accordingly.

1.1 Research Questions and Hypotheses

RQ1: Does CI have a positive and significant effect on GM?

H 1) CI has a positive and significant effect on strategy in GM.

H 2) CI has a positive and significant effect on internal marketing in GM.

H 3) CI has a positive and significant effect on the product in GM.

H 4) CI has a positive and significant effect on marketing communication in GM.

2. Theoretical Framework

2.1 CI

The literature has not reached a precise definition of CI and different interpretations have been provided by different authors and methodologies. CI is a proactive process of gathering information about the competition in order to improve organizational performance. Companies with CI programs have a deeper understanding of markets and can formulate more proactive strategies (Tahmasebifard, 2018; Yin, 2018). CI is vital for maintaining competitiveness and influencing decision-making in various fields, leading to improvements such as increased revenue, new products, cost savings, and increased profits (Silva & Bação, 2022). Afanasyeva et al. (2024), Cekuls (2022) have defined CI as a tool for predicting the future and making strategic decisions. From the perspective of De las Heras-Rosas & Herrera (2021), CI is dynamic business knowledge to collect and analyze information in order to gain a competitive advantage. CI makes a deep distinction between information and intelligence, and managers need intelligence to make decisions. One of the key goals of CI is timely warning that helps decision makers take action to maintain their competitive advantage (Tredinnick, 2022).

2.1.1 CI and Ethics

Economic espionage has created a moral question and ambiguity in CI, and this issue itself is a failure for it and sometimes causes neglect of CI (this issue should not question the importance and effect of CI on success in business). Importantly, the principles of the Professional Association of CI are derived based on a rigid ethical framework. The purpose of CI is not to steal competitors' trade secrets or other personal assets. Rather, it collects information in a systematic, public, (legal) manner that, when arranged and analyzed, will give us a better understanding of the structure, culture, strengths and weaknesses of competitors' companies (Ojinaga, 2018).

2.1.2 CI and Strategy

Of course, small and large companies have always maintained the use of some methods in front of their competitors without knowing that this method and style is the same as CI. That's not to say that they can't do much better, and this (identifying optimal methods) is the driving force behind the CI professional association. The perception of the members of the association about CI is to make its methods professional, unlike in the past. This not only includes identifying basic information sources, collecting and analyzing information, but also includes tools and techniques to make it practical (Semerkova et al., 2017).

2.1.3 Objectives of CI System

The primary foundation of intelligence is information; but every type of information is not considered intelligence. Many researchers have emphasized the need to differentiate between information and intelligence and state that information includes numbers, statistics and isolated but real data about people, organizations and competitors. While intelligence will include filtered and analyzed information. To achieve a competitive advantage from the point of view of CI, it is considered very important to identify and define sources of CI. The field that CI is focused on to produce intelligence in its context shows the types of intelligence (Bagnoli & Watts, 2015).

2.2 GM

The American Marketing Association in 1975 referred to green or environmental marketing as "the study of the positive and negative aspects of marketing activities related to pollution, energy reduction, and non-energy resources." However, due to its focus on a limited range of environmental issues, this definition is not compatible with today's human needs and needs to be redefined and studied more comprehensively (Shamsi et al., 2022). GM is not limited to promoting products with environmental attributes. At a 1975 workshop by the American Marketing Association on environmental marketing, it was categorized into three main areas:

1) Retail definition: marketing of products deemed environmentally safe. 2) Social marketing definition: development and marketing of products aimed at reducing negative environmental impacts. 3) Environmental definition: organizations' efforts to produce, promote, package, and recycle products in an environmentally conscious manner (Garg & Sharma, 2017).

2.2.1 Wilkite-Whitten, Seskaskin and Dies-Menesses Theory

GM refers to the organization's involvement in strategic, tactical and operational marketing activities to produce, communicate and offer products with minimal environmental impact (Vilkaite-Vaitone et al., 2022). Researchers divide GM into four criteria: strategy, internal marketing, product, and marketing communications. Strategy includes stakeholder dialogue, policy statements, organizational culture, and core goals. Internal marketing addresses employee environmental initiatives and awareness of GM practices. The product focuses on innovation, recyclability and material safety. Marketing communication highlights the importance of marketing research in effectively communicating environmental issues.

3. Research Background

These studies examine the relationship between different theories and practices of GM and CI in different industries. The study (Eyadat et al., 2024) focuses on the Jordanian pharmaceutical industry and shows that GM strategies have a positive and significant relationship with competitive performance. Pacevičiūtė & Razbadauskaitė-Venskė (2023) reviewed the existing literature on GM and proposed a conceptual framework that explains the relationship between relationship marketing and sustainable competitive advantages. Research (Bahrami Gahrui & Omidi, 2023) identified the impact of CI dimensions on marketing strategies in the Sari food industry and emphasized that quality differences and price competition have a greater impact on the effectiveness of strategies. LUȚAI & MIHĂIESCU (2022) examines the importance of open-source information in achieving strategic advantages in unstable economic conditions. Also, Lai et al. (2021) emphasizes the need to integrate sustainability and risk management in the oil and gas industry to attract environmentally conscious consumers and proposes a conceptual framework to promote green growth. The study (Cavallo et al., 2021) examines the use of CI methods in different stages of the strategy formulation process, and Karimi & Eshaghi (2018) examines the relationship between cultural intelligence and CI in Iranian knowledge-based organizations and emphasizes the importance of increasing intelligence. Culture refers to strengthening competitive abilities. Together, these researches point to the importance of integrating different approaches in green management and CI in improving the performance of organizations and competition in different markets.

4. Conceptual Model

The authors have developed a conceptual model based on research objectives, questions, and gaps in previous studies. This model outlines key research components and maps the relationships within the study. It integrates essential elements such as problem statements, literature review, goal setting, and question formulation. According to standard definitions, the model should be clear and detailed, describing the necessary steps, variables, and tools to meet research objectives. It presents the relationships coherently, helping to provide clear answers to research questions. Ultimately, this model defines the research structure and rationalizes the approach to the research issues.

Figure 1. Conceptual model

5. Methodology

In terms of the type of research, this research is applied research, since it intends to investigate the effect of CI on GM among the employees of the Gas Refinery. The research discussed employs descriptive and correlational methods, primarily focusing on descriptive research, which aims to objectively and systematically describe conditions or phenomena without manipulating variables. This type of research is prevalent in behavioral sciences and serves to enhance understanding and aid decision-making by accurately portraying the characteristics of the subject under investigation. The researcher's goal is to present the objective results of the situation, emphasizing a clear depiction of what exists rather than exploring cause-and-effect relationships.

5.1 Society and Research Statistical Sample

5.1.1 Statistical Society

A statistical population refers to a set of elements and people that have one or more common characteristics in a specific geographic scale (whether global or regional) (Spina, 2011). In this research, the statistical population includes a group of people or objects that share the characteristics or characteristics of the study and are related to the research objectives. In this research, the studied community includes all the experts of the Gas Refinery in the number of 90 people.

5.1.2 Statistical Sample

A sample is a subset of the population (Andrade, 2020), and selecting an appropriate sample size is crucial for a study. The minimum sample size should meet the required amount without exceeding conventional limits. Sampling methods are categorized into probability and non-probability methods. This research, focused on the impact of CI on GM in the refinery, will utilize non-probability accessible sampling, where members are chosen based on availability and researcher judgment (Etikan & Bala, 2017). For structural equation modeling, which resembles multivariable regression, the sample size is determined by the formula $q \leq n \leq 15q$, with q representing the number of questionnaire items. The minimum sample size is 26 cases (Adam, 2021), and with a 26-item questionnaire, the sample size should range from 26 to 390. For a population of 90, Morgan's table suggests a sample size of 73. Thus, the researcher has set the sample size at 73.

5.2 Data Collection Tool

The methods of collecting information can be divided into two categories: library and field. In this research, field methods were used to collect information in general, and library methods such as books, treatises, and research articles were used to compile the theoretical foundations of the research. There are many tools and methods for data collection, in this research, a 26-question questionnaire was used to collect information. This questionnaire consists of two parts, the first part includes questions related to the personal information of the respondents and the second part includes questions related to the investigation of the effect of CI on GM.

5.3 Likert Scale

This scale includes a set of questions who's attitudinal or value load is considered almost equal. The respondent chooses a scale that is between two extremes, such as agree-disagree and accept-reject, according to the intensity or weakness of his attitude. To determine the attitude score of each person, the scores of each of his selected positions in all scales are added together, and then averaged, and thus the score of the individual's attitude about each concept or expression is obtained (Leonor et al., 2022). The scoring in this questionnaire was based on a 5-point Likert scale (strongly disagree = 1 to strongly agree = 5).

5.4 Questionnaire Components

1) CI: 1 to 12 of the questionnaires.

2) GM: 1 to 14 of the questionnaires.

3) Strategy: 1 to 4 of the questionnaires.

4) Internal Marketing 5 to 7 of the questionnaire.

5) Product: 8 to 11 of the questionnaires.

6) Marketing communication: 12 to 14 of the questionnaires.

Table 1. Questionnaire questions

Main component		Number of items	Number of questions
	CI	12	12-11-10-9-8-7-6-5-4-3-2-1
GM	Strategy	4	16-15-14-13

Internal marketing	3	19-18-17
product	4	23-22-21-20
Marketing communications	3	26-25-24
Total		26

5.5 Determining the Reliability — Validity of the Questionnaire

Reliability is one of the technical characteristics of measuring instruments and indicates the consistency of results in similar conditions. The reliability coefficient is variable between zero and one; The closer it is to one, the more efficient it is. To measure complex concepts with a Likert scale, Cronbach's alpha can be used to check internal consistency. Alpha above 0.7 indicates good reliability and between 0.5 and 0.7 indicates moderate reliability (Trizano-Hermosilla & Alvarado, 2016). In this research, Cronbach's alpha was calculated with SPSS software and the results are shown in the table below. The obtained values are higher than 0.7, which indicates high reliability. Validity refers to the accuracy of the measurement tool in evaluating the desired characteristic. In this study, "content validity" and "construct validity" were used to evaluate the questionnaire. Content validity verifies that all relevant dimensions and components have been considered. This research reviewed the initial framework with the feedback of professors and management experts to ensure that the questionnaire correctly measures the desired characteristic.

Table 2. Calculate the reliability of the questionnaire

Variables	Number of items	Cronbach's alpha coefficient
CI	12	0/805
Strategy	14	0/765
Internal marketing	4	0/871
product	3	0/861
Marketing communications	4	0/803
CI	3	0/856

6. Findings

6.1 Descriptive Statistics

In this section, a descriptive review of the information related to the personal characteristics of the respondents, i.e., gender, level of education, job position, age, service history, as well as the descriptive information of the variables of the CI questionnaire, including GM (strategy, product, internal marketing, and marketing communications) is discussed.

Table 3. Information about the personal characteristics of the respondents

Demographic variable		Abundance	Abundance percentage
Gender	man	45	61/6
	woman	28	38/4
Age group	20 to 30 years	12	16/4
	30 to 40 years	38	52/1
	40 to 50 years	16	21/9
	50 to 60 years	7	9/6
Education level	Bachelor's degree	20	27/4
	Master's degree	38	52/1
	Ph.D.	15	20/5
Work position	the expert	9	12/3
	In charge of affairs	25	34/2

	Head of Department	35	47/9
	general manager	4	5/5
Work history	Less than 10 years	51	69/9
	Between 10 and 20 years	14	19/2
	Between 20 and 30 years	8	11

6.2 Average Distribution of Selected Options in the Questionnaire

In this section, the average selection of the options chosen by the respondents in the questionnaire questions is discussed, these averages are presented in the following table.

Table 4. Frequency distribution of the options chosen by the respondents

Questions	Number	Minimum	Maximum	Mean	Standard Deviation
CIQ1	73	1.00	5.00	3.7123	.92014
CIQ2	73	1.00	5.00	3.3836	.84377
CIQ3	73	1.00	5.00	3.9041	.91537
CIQ4	73	1.00	5.00	3.5753	1.16569
CIQ5	73	1.00	5.00	3.6575	.91620
CIQ6	73	1.00	5.00	3.6301	.90534
CIQ7	73	1.00	5.00	3.7397	.95782
CIQ8	73	1.00	5.00	3.6712	.92878
CIQ9	73	1.00	5.00	3.3973	.99638
CIQ10	73	1.00	5.00	3.4521	1.13089
CIQ11	73	1.00	5.00	3.1644	1.14278
CIQ12	73	1.00	5.00	3.4110	1.05192
GMQ1	73	1.00	5.00	3.0822	1.10244
GMQ2	73	1.00	5.00	3.3699	1.16078
GMQ3	73	1.00	5.00	3.2466	1.06433
GMQ4	73	1.00	5.00	3.3014	1.27677
GMQ5	73	1.00	5.00	3.7671	.96495
GMQ6	73	1.00	5.00	3.3836	1.23187
GMQ7	73	1.00	5.00	3.3014	1.22117
GMQ8	73	1.00	5.00	3.5616	.92776
GMQ9	73	1.00	5.00	4.1096	.71805
GMQ10	73	1.00	5.00	3.8630	.82184
GMQ11	73	1.00	5.00	3.7808	.88579
GMQ12	73	1.00	5.00	3.6438	.94824
GMQ13	73	1.00	5.00	3.5753	1.03974
GMQ14	73	1.00	5.00	3.3973	1.17544

6.3 Descriptive Study of Variables

In the following table, the descriptive indices including the minimum, maximum, average and standard deviation for each of the research variables are specified. Based on this table, average CI, GM including (strategy, product, internal marketing, marketing communications) are mentioned in order.

Table 5. Data description indicators for research variables (number of respondents = 73)

Variables	Minimum	Maximum	Average standard	Deviation
CI	1.20	5.00	3.7068	.69768
GM	1.00	5.00	3.6192	.77184
Strategy	1.00	5.00	3.2959	.96097
Internal marketing	1.00	5.00	3.4000	1.01871
product	1.60	5.00	3.7918	.65865
Marketing communications	1.00	5.00	3.4301	.91206

6.4 Inferential Statistics and Hypothesis Testing

This research examines one main hypothesis and four sub-hypotheses. In this section, the analysis method intended in this research is first explained, namely structural equation modeling, and then the research hypotheses are tested using this method.

6.4.1 Structural Equation Modeling Based on Partial Least Squares — Composite Reliability

The PLS method, or partial least squares, is a modern approach for developing regression equations applicable to both univariate and multivariate analyses (Esposito Vinzi & Russolillo, 2013). It establishes relationships between dependent and independent variables by generating new explanatory variables, focusing on maximizing variance rather than reproducing the empirical covariance matrix. Like other structural equation models, it includes a structural component for latent variables and a measurement component for their indicators. To assess reliability, both Cronbach's alpha and composite reliability are used, with the latter accounting for the correlations among constructs. A composite reliability above 0.7 indicates good internal stability, while below 0.6 suggests a lack of reliability. This method has been used in a mixed-method study (Kazemi et al., 2024) in its entirety and in a two-structure method.

Table 6. Measurement model reliability test values, Cronbach's alpha and composite reliability

Composite reliability	Cronbach's alpha	Variables
CI (CI)	0/948	0/939
GM (GM)	0/840	0/901
Strategy (S)	0/906	0/862
Internal Marketing (IM)	0/942	0/908
Product (P)	0/867	0/798
Marketing Communications (MC)	0/859	0/897

6.4.2 Convergent Validity- Confirmatory Factor Analysis (Checking the Validity of Questionnaire Questions)

Confirmatory factor analysis is the best method to assess construct validity, examining if selected questions yield appropriate factor structures for the research dimensions. Higher factor loadings indicate stronger relationships with latent variables, while a zero loading signifies no relationship, and a negative loading indicates a reversed effect. This study uses a 26-question questionnaire to measure CI as the independent variable and GM (including strategy, internal marketing, and product marketing communications) as the dependent variable, identified through factor analysis. Factor loads with t-statistics below -1.96 or above 1.96 are considered small and should be eliminated from the model (Cudeck & O'dell, 1994).

Table 7. The results of confirmatory factor analysis of the variables related to the hypotheses

Variables	Questionnaire questions	Factor loading	T- value
	CIQ1	0/830	19/89
CI	CIQ2	0/589	5/20
	CIQ3	0/819	16/49

	CIQ4	0/666	6/26
	CIQ5	0/843	20/11
	CIQ6	0/784	12/76
	CIQ7	0/763	13/23
	CIQ8	0/766	11/76
	CIQ9	0/681	7/54
	CIQ10	0/825	22/55
	CIQ11	0/854	25/97
	CIQ12	0/862	33/26
Strategy	GMQ1	0/797	17/21
	GMQ2	0/839	16/83
	GMQ3	0/862	22/41
	GMQ4	0/866	25/94
Internal marketing	GMQ5	0/893	29/40
	GMQ6	0/930	45/67
	GMQ7	0/934	59/64
product	GMQ8	0/883	24/71
	GMQ9	0/806	14/52
	GMQ10	0/782	16/009
	GMQ11	0/669	6/81
Marketing communications	GMQ12	0/720	7/63
	GMQ13	0/859	20/50
	GMQ14	0/871	45/55

If it can be seen from the above table that the amount of factor loading is close to one in most cases and the t statistic for all factor loadings is greater than 1.96, so it can be concluded that the selected questions have appropriate factor structures to measure the variables and dimensions of the case. They provide study in research model.

6.4.3 Average Variance Extracted Index (AVE)

The average variance extracted for convergent validity examines the correlation of each construct with its questions (indices). The AVE criterion indicates the average variance shared between each construct with its indicators, and a value of 0.4 or higher is considered sufficient.

Table 8. Average Variance Extracted (AVE) values

Variables	AVE
CI (CI)	0/605
Strategy (S)	0/708
Internal Marketing (IM)	0/845
Product (P)	0/623
Marketing Communications (MC)	0/672

6.4.4 Divergent Validity — Transverse Load Test (Reciprocal)

In the transverse load test, the degree of correlation between the indicators of one structure with that structure and the degree of correlation between the indicators of one structure with other structures are compared. If it is determined that the correlation between an index and another structure other than its own structure is higher than

the correlation of that index with its own structure, the validity is questioned. The rows of the mutual factor load matrix belong to the indexes and its columns belong to the constructs of the research model. The values that are in the houses of this matrix indicate the degree of correlation of indicators with structures.

Table 9. Divergent validity cross-loading test

Overt	CI	Strategy	Internal marketing	Product	Marketing communications
CIQ1	0/56	0/31	0/18	0/831	0/12
CIQ2	0/42	0/53	0/50	0/645	0/007
CIQ3	0/38	0/47	0/17	0/786	0/19
CIQ4	0/62	0/21	0/23	0/677	0/04
CIQ5	0/39	0/72	0/73	0/804	0/35
CIQ6	0/556	0/54	0/50	0/41	0/35
CIQ7	0/678	0/39	0/22	0/26	0/24
CIQ8	0/809	0/79	0/66	0/32	0/34
CIQ9	0/741	0/66	0/63	0/37	0/22
CIQ10	0/787	0/50	0/63	0/32	0/35
CIQ11	0/79	0/17	0/852	0/07	0/33
CIQ12	0/66	0/53	0/855	0/53	0/28
GMQ1	0/28	0/57	0/776	0/57	0/38
GMQ2	0/16	0/776	0/795	0/37	0/35
GMQ3	0/03	0/795	0/783	0/51	0/11
GMQ4	0/059	0/783	0/17	0/86	0/44
GMQ5	0/17	0/14	0/776	0/59	0/32
GMQ6	0/033	0/33	0/795	0/62	0/42
GMQ7	0/18	0/26	0/783	0/59	0/12
GMQ8	0/18	0/41	0/51	0/63	0/81
GMQ9	0/16	0/22	0/22	0/63	0/69
GMQ10	-0/10	0/37	0/39	0/852	0/75
GMQ11	-0/04	-0/15	-0/009	0/855	0/78
GMQ12	0/22	-0/25	-0/18	0/26	0/776
GMQ13	0/04	0/04	0/17	0/195	0/795
GMQ14	-0/32	-0/50	-0/45	0/383	0/783

6.4.5 Fornell Larcker Test

The relationship of a construct with its indicators should exceed its relationships with other constructs to ensure acceptable divergent validity. This is assessed using a matrix containing correlation coefficients and the square root of the AVE values for each construct. A latent variable must exhibit more variance among its observables than with other latent variables, with the average square root of the extracted variance being greater than its maximum correlation with other variables in the model.

Table 10. Divergent Validity Assessment Matrix with Fornell-Larker Method

Variables	CI	Internal Marketing	Marketing Communications	Product	Strategy
CI	0/778				
Internal Marketing	0/814	0/919			
Marketing	0/833	0/806	0/820		

Communications					
Product	0/803	0/702	0/726	0/789	
Strategy	0/825	0/845	0/818	0/647	0/841

According to the above matrix, since the root value of AVE related to each structure (substantive variables) in the present study, which are located in the houses in the main diameter of the matrix, is higher than the correlation value between them, which are located in the lower and right houses of the main diameter; Therefore, it can be said that in the current research, the model structures interact more with their indicators than with other structures. In other words, the divergent validity of the model is adequate.

6.4.6 Examining the Fit of the Research Model — Significant Values of T — Coefficient of Determination — Effect Size Criterion ($f2$)

In the PLS method, after fitting measurement models, the structural model's fit is assessed by analyzing relationships between latent variables. Key criteria include significant t-values, R2, effect size ($f2$), Stone-Geary criterion (Q2), redundancy, and overall GOF. Significant t-values exceeding ±1.96 indicate valid relationships and confirm hypotheses at a 95% confidence level. R2 measures the explained variance in dependent variables influenced by independent ones, with values for endogenous constructs only. Higher R2 indicates a better model fit, categorized as weak (0.19), medium (0.33), and strong (0.67). The effect size ($f2$) assesses relationship intensity with values of 0.02, 0.15, and 0.35 indicating small, medium, and large effects, respectively. To compute $f2$, run the model, note R2, remove the independent variable of interest, and rerun the model for new calculations.

Table 11. Effect Size in the Main Paths of the Model

The effect of variable A on B	Effect size
CI--> Internal Marketing	1/95
CI--> Marketing Communications	2/27
CI--> Product	1/81
CI--> Strategy	2/12

6.4.7 Stone-Geisser Criterion (Q^2) — Redundancy Index

This criterion assesses the model's predictive power, where models with acceptable structural fit should predict indicators related to endogenous structures. Accurate definitions of relationships allow structures to influence each other's indicators, thus verifying hypotheses (Henseler et al., 2015). They identified predictive power levels at 0.02 (weak), 0.15 (medium), and 0.35 (strong). A Q2 value of zero or less indicates poor explanation of relationships for that construct. In this research, Q2 values of 0.53, 0.43, 0.37, and 0.47 show average predictive power. The redundancy index, the fifth structural model fit index, reflects the variability of an endogenous structure's indices affected by exogenous structures, calculated from the product of common R2 values. This index serves as a general measure of structural model quality for all endogenous structures.

Table 12. The values of determination and sharing coefficient and the redundancy index of the research variables

Current variables	R^2 values	Common values	Index Q^2	redundancy index
CI	-	0/25	-	-
Internal Marketing	0/657	0/63	0/53	0/409
Marketing Communications	0/690	0/72	0/43	0/496
Product	0/640	0/42	0/37	0/268
Strategy	0/676	0/39	0/47	0/263
Average	0/665	0/482	-	-

6.4.8 GOF Index

The primary fit index in partial least squares (PLS) is the GOF index, introduced by Tenenhaus (2004) and

calculated by equation 2. Wetzels et al. (2009) defined GOF values of 0.01, 0.25, and 0.36 as weak, medium, and strong, respectively. This index is derived from the geometric mean of R2 and the average redundancy indices, serving a similar purpose to fit indices in covariance-based methods and assessing PLS model quality. The GOF ranges from 0 to 1, with values close to 1 indicating good model quality. For this research, the average shared values of the latent variables are 0.25, 0.63, 0.72, 0.42, 0.39, and 0.45, resulting in an average of 0.482. The average R2 for the four endogenous variables with values of 0.657, 0.690, 0.640, and 0.676 is 0.665.

Table 13. Appropriateness indicators of the research model

Indicators	R^2	Common values	GOF
Values	0/665	0/482	0/566
Acceptable amount	Above 0.1	positive	Above 0.3

As can be seen in the above tables, the fit indices have reported excellent fit of the model. As a result, the structural equation model in PLS can be confidently used to confirm and reject the research hypotheses.
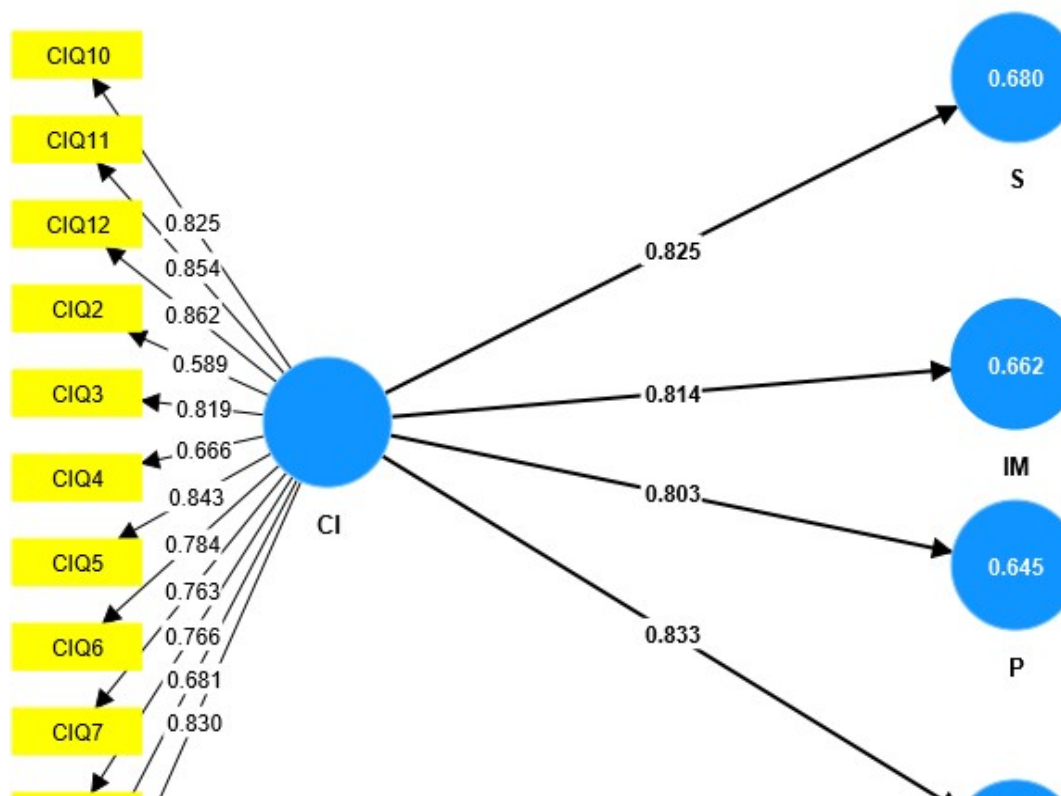
6.5 Examining Research Hypotheses

Figure 2. Graph of path coefficients between competitive intelligence and green marketing components

The current research includes one main hypothesis and four sub-hypotheses, which were used to test the hypotheses, path analysis. In this section, using path analysis in structural equation modeling, the research parameters will be analyzed and estimated, and the research hypotheses will be tested.

6.5.1 The Visual Representation of Path Coefficient Plots that Illustrates the Relationship Between CI and GM Strategies
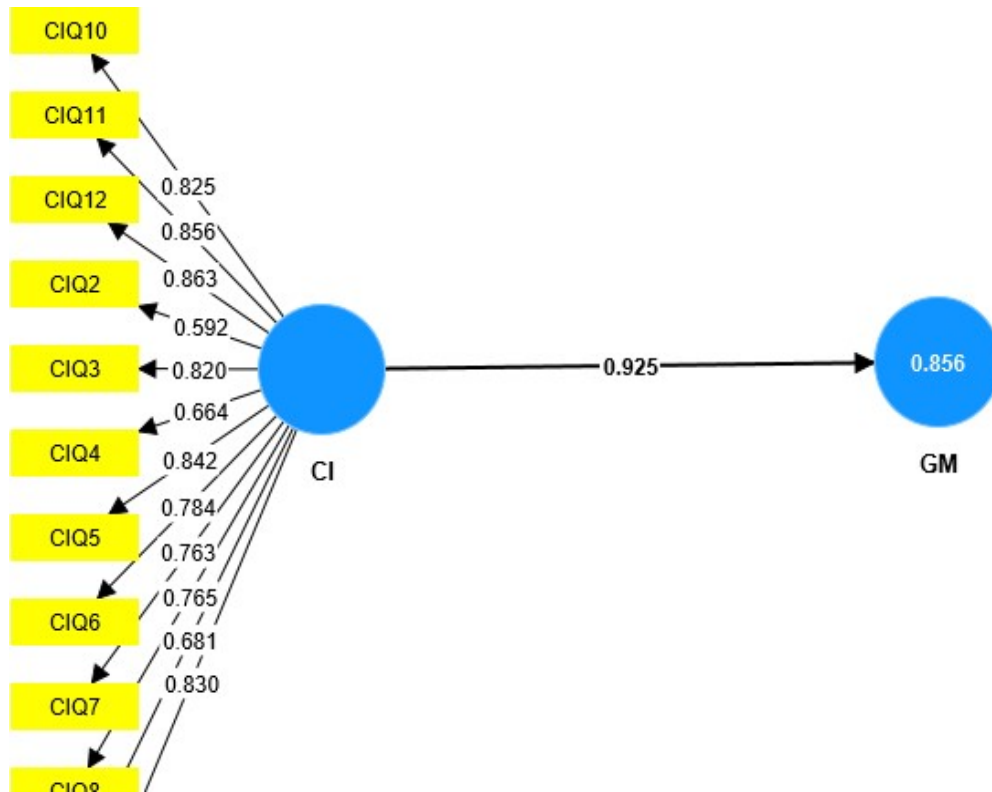
Figure 3. Path coefficient plots between CI and GM

6.5.2 The Statistical Values That Pertain to the Various Components of CI as Well as Those Related to the Elements of GM
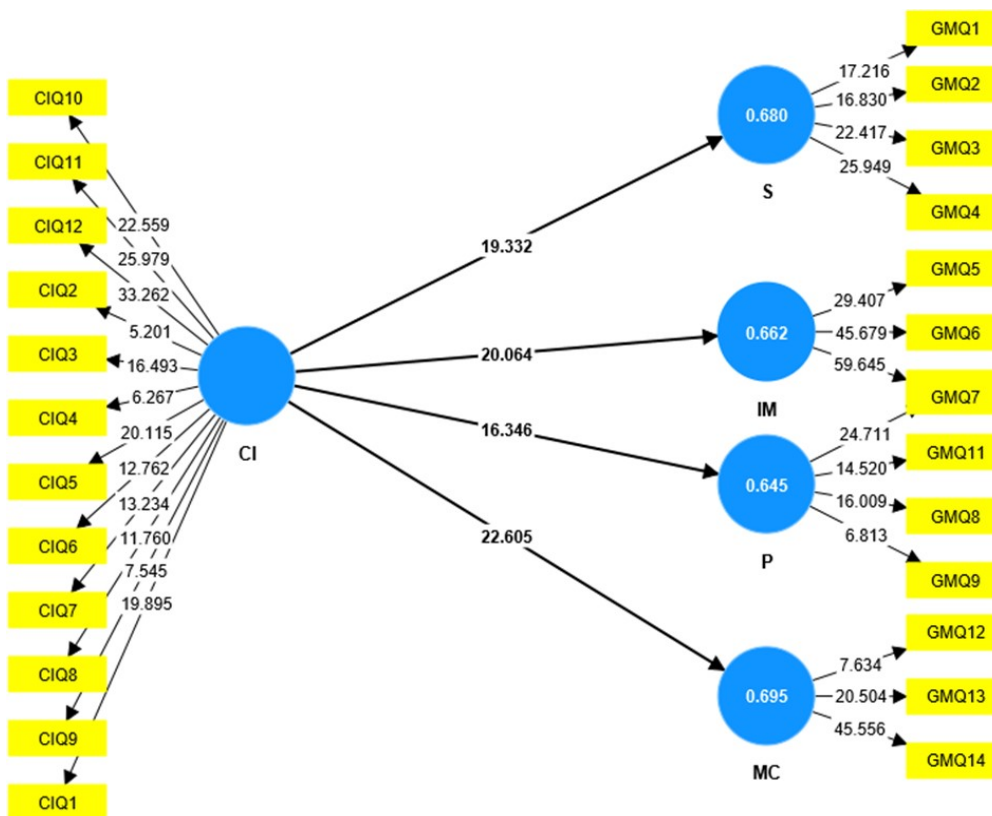

Figure 4. Statistical values of CI and GM components

6.5.3 The Statistical Values That Are Associated with CI and the Principles of GM in Their Various Forms
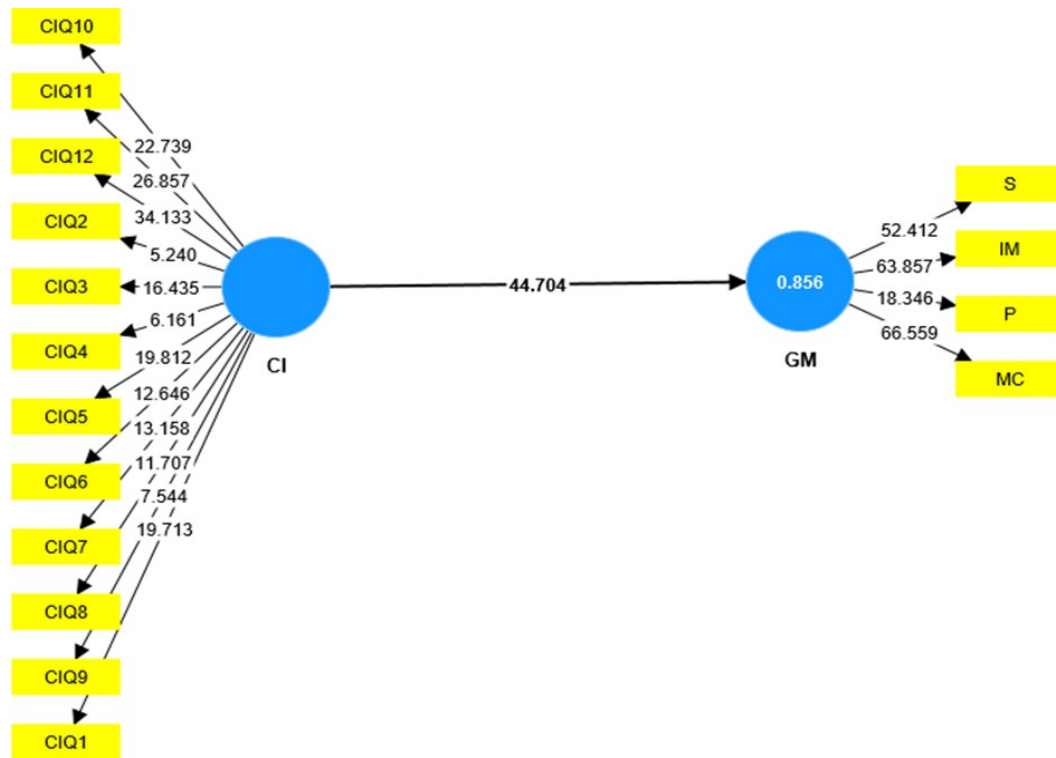

Figure 5. Statistical values of CI and GM

6.5.4 Examining the Main Question: CI Has a Positive and Significant Effect on GM

In this hypothesis, according to the path coefficient between CI and GM is equal to 0.925, which is a positive value, and the t-statistic is equal to 44.70, which is more than 1.96, so with 95% confidence, we can conclude found that this path coefficient is significant at the error level of 0.05 and the presence of a significant and positive relationship between CI on GM is confirmed and it can be said that CI has a significant effect on GM.

Table 14. Regression coefficient and significance of the effect of CI on GM

RQ1	Straight Path	P-Value	T-Value	Result
	0/925	0/000	44/70	Accept

6.5.5 Examining the First Hypothesis: CI Has a Positive and Significant Effect on Strategy in GM

In this hypothesis, according to the path coefficient between CI and strategy in GM is equal to 0.825, which is a positive value, and the t-statistic is equal to 19.33, which is more than 1.96, so it can be concluded with 95% confidence that this path coefficient is significant at the error level of 0.05 and the existence of a significant and positive relationship between CI over strategy in GM is confirmed and it can be said that CI over strategy in GM has a positive and significant effect.

Table 15. Regression coefficient and significance of the effect of CI on strategy in GM

H 1	Straight Path	P-Value	T-Value	Result
	0/825	0/000	19/33	Accept

6.5.6 Examination of the Second Hypothesis: CI Has a Positive and Significant Effect on Internal Marketing in GM

In this hypothesis, according to the path coefficient between CI and internal marketing in GM is equal to 0.814, which is a positive value, and the t-statistic is equal to 20.064. Which is more than 1.96, so it can be concluded with 95% confidence that this path coefficient is significant at the error level of 0.05 and the existence of a significant and positive relationship between CI and internal marketing in GM is confirmed. And it can be said that CI has a positive and significant effect on internal marketing in GM.

Table 16. Regression coefficient and significance of the effect of CI on internal marketing in GM

H 2	Straight Path	P-Value	T-Value	Result
	0/814	0/000	20/064	Accept

6.5.7 Examination of the Third Sub-Hypothesis: CI Has a Positive and Significant Effect on the Product in GM

In this hypothesis, according to the path coefficient between CI and product in GM is equal to 0.803, which is a positive value, and the t-statistic is equal to 16.346, which is more than 1.96. Therefore, with 95% confidence, we can conclude that this path coefficient is significant at the error level of 0.05, and the presence of a significant and positive relationship between CI on the product in GM is confirmed, and it can be said that CI has a significant effect on the product in GM.

Table 17. Regression coefficient and significance of the effect of CI on the product in GM

H 3	Straight Path	P-Value	T-Value	Result
	0/803	0/000	16/346	Accept

6.5.8 Examining the Fourth Hypothesis: CI Has a Positive and Significant Effect on Marketing Communications in GM

In this hypothesis, according to the coefficient of the path between CI on marketing communications in GM is equal to 0.020, which is a positive value, and the t-statistic is equal to 0.364, which is more than 1.96. Therefore, with 95% confidence, we can conclude that this path coefficient is significant at the error level of 0.05. And the presence of a significant and positive relationship between CI on marketing communication in GM is confirmed. And it can be said that CI has a significant impact on marketing communication in GM.

Table 18. Regression coefficient and significance of the effect of CI on marketing communications in GM

H 4	Straight Path	P-Value	T-Value	Result
	0/833	0/000	22/60	Accept

7. Discussion and Conclusion

7.1 RQ 1: CI Has a Positive and Significant Effect on GM

The findings of the research clearly show a significant path coefficient of 0.925 that exists between CI and GM strategies. This path coefficient is accompanied by a notably high t-statistic of 44.70, which greatly surpasses the critical threshold value of 1.96. As a result, we can confidently assert, with a robust 95% level of confidence, that this path coefficient is indeed significant at the 0.05 error level. This statistical evidence confirms that there is a substantial positive relationship between CI and GM initiatives. Furthermore, the influence coefficient indicates that CI exerts a strong impact on GM efforts, thus affirming the principal hypothesis of this study at the 0.05 error level.

It is also noteworthy that these results align well with the findings put forth by several researchers, including Bahrami Gahrui & Omidi (2023), Ncube & Ndlovu (2022), Hanif et al. (2022), Al-dmour et al. (2023). Additionally, the support from studies conducted by Buswari et al. (2021), Silva (2021), Giantari & Sukaatmadja (2021), Tahmasebifard (2018) reinforces the conclusions drawn in this research. Importantly, an extensive review of the literature revealed no research contradicting the hypothesis posited in this study, further solidifying the credibility of these findings. Overall, the results present compelling evidence for the positive influence CI has on the advancement of GM practices.

7.2 H1: CI Has a Positive and Significant Effect on Strategy in GM

The research findings indicated that the path coefficient established between CI and the strategy utilized in GM is equivalent to 0.825. This value is clearly positive, which reflects an important and beneficial role in delineating the relationship between CI and the strategic approaches taken in GM. Furthermore, the T-statistic has been calculated to be 19.33, a figure that clearly exceeds the critical threshold of 1.96. Therefore, it can be confidently confirmed that, with a 95% level of confidence, there is a significant and positive relationship in place between CI and the strategy adopted in GM initiatives. This is encouraging and highlights the relevance of CI in formulating effective GM strategies. Based on this evidence, we can assert that the first sub-hypothesis of the research is confirmed at the 0.05 error level, signifying that the results obtained are not only valid but also possess a high degree of accuracy. These findings reinforce the notion that leveraging CI is crucial for the development and implementation of successful GM strategies. Overall, the evidence strongly supports the idea that CI plays a vital role in enhancing strategic decision-making within the context of GM, contributing to the overall effectiveness of marketing efforts aimed at sustainability.

The current conclusion drawn regarding this particular hypothesis is clearly understandable and well-supported based on the findings from the research conducted by various scholars in the field. These findings show a strong consistency with the research outputs from notable researchers, including Wu et al. (2023), Ncube & Ndlovu (2022), as well as Hanif et al. (2022). Additionally, the work of Al-dmour et al. (2023), Silva (2021), Giantari & Sukaatmadja (2021), and also the studies conducted by Kazemi & Soltani (2024) further align with these findings. Furthermore, the research contributions of Solanki & Lakhera (2023), along with those of Papadas et al. (2019) demonstrate a notable coherence and consonance with the hypothesis in question. For this reason, it can confidently be said that, to date, there has been no research that outright rejects or contradicts this hypothesis. Instead, the available body of evidence overwhelmingly supports the confirmation and reconfirmation of the significant relationship between CI and strategic approaches within GM. The positive influence highlighted in these findings underscores the critical importance of giving attention to CI during the process of formulating effective GM strategies. Such focus can lead to enhanced success and greater efficiency of these strategies, ultimately assisting organizations in advancing their strategic goals and objectives. This proactive consideration of CI can be a determining factor in achieving a sustainable competitive advantage in the marketplace.

7.3 H2 CI Has a Positive and Significant Effect on Internal Marketing in GM

The research findings have clearly demonstrated that the path coefficient linking CI and internal marketing within the context of GM is quantified at 0.814. This value is, notably, a positive one, indicating a relationship that is both significant and beneficial. In addition to this, the calculated t-statistic stands at 20.064, a figure which exceeds the critical threshold of 1.96. As a result of these statistical outcomes, we can confidently conclude, with a solid 95% level of confidence, that there exists a significant and positively correlated relationship between CI and internal marketing practices in the realm of GM. Thus, we can assert that the second sub-hypothesis of this research has been confirmed at the traditional error level of 0.05, which further emphasizes the reliability of the findings. Additionally, the results of this hypothesis are consistent with the research outcomes presented by Hanif et al. (2022), as well as Silva (2021), and the study conducted by Baah et al. (2024). Furthermore, it is essential to note that a thorough review of the relevant literature has not uncovered any research that contradicts or rejects this particular hypothesis. This points to a growing consensus within the academic community regarding the critical role CI plays in enhancing internal marketing strategies related to GM initiatives. The corroboration of these findings further underscores the import of integrating CI into marketing strategies aimed at promoting sustainability.

7.4 H3 CI Has a Positive and Significant Effect on the Product in GM

The research findings showed that the path coefficient between CI and product in GM is equal to 0.803, which is a positive value, and the t-statistic is equal to 16.346, which is more than 1.96, so it can be concluded with 95% confidence that the existence of a relationship between significant and positive relationship between CI and product in GM is confirmed. Therefore, the third sub-hypothesis of the research is confirmed at the error level of 0.05. The result of the present hypothesis with the findings of the researches of Al-dmour et al. (2023), Buswari et al. (2021), Kazemi & Soltani (2024), Tahmasebifard (2018) are in line and no research was found to reject this hypothesis.

7.5 H4 CI Has a Positive and Significant Effect on Marketing Communication in GM

The research findings showed that the path coefficient between CI and marketing communication in GM is equal to 0.020, which is a positive value, and the t-statistic is equal to 0.364, which is more than 1.96. Therefore, it can be concluded with 95% certainty that the existence of a significant and positive relationship between CI and marketing communication in GM is confirmed. Therefore, the fourth sub-hypothesis of the research is confirmed at the error level of 0.05 with 95% confidence. Now that we know that CI has an effect on GM in Khangiran Refinery, it is concluded that gathering information about competitors, market trends and customer preferences,

the gas refinery can increase its understanding of environmental concerns. In addition, the development of environmentally friendly products or services and the discovery of green initiatives in the refinery can be effectively communicated to customers. In other words, implementing a strategic CI process can act as a catalyst for the gas refinery's success in GM. In general, the result of the present research is in line with the findings of Wu et al. (2023), Al-dmour et al. (2023), Giantari & Sukaatmadja (2021) are in line and no research was found that rejects this hypothesis.

Therefore, it can be boldly stated that although the managers of this complex invest in their CI, strategy, internal marketing, product and marketing communications have an effective role in the performance of the refinery market and should be paid attention to. Without having and dealing with strategy, internal marketing, product and marketing communications, it cannot remain in the field of tight competition in this industry or gain a competitive advantage.

Refinery officials who have a long history of trying to become an attractive destination for knowledge-based companies and academic centers should carefully study the science of GM and have a proper understanding of their situation regarding environmental issues as well as GM. This can also help to reduce the destruction of the environment and reduce the excessive exploitation of resources in our country.

8. Research Limitations and Outlook

The study of CI's impact on GM in gas plants has several limitations. A significant issue is the lack of prior research, particularly in the oil industry, leading to insufficient information and a clear framework. Consequently, the researcher relied on related studies and the consultant's opinion. Data collection faced challenges; the intention was to include all employees, but refinery managers' authority restricted access, necessitating a specific sampling method. Additionally, focusing on CI and GM limited the study to one refinery to control for external factors. While CI influences GM, it cannot be assumed that CI weaknesses directly cause GM issues. Geographical constraints also limit the applicability of findings to other refineries. Finally, due to the inability to conduct qualitative research, a quantitative approach using questionnaires was employed.

Based on Menon & Menon (1997) point of view, it is suggested that GM actions be carried out at three strategic levels, quasi-strategic level and tactical level in the company. These measures show the level of commitment to various environmental activities. According to Polonsky & Rosenberger III (2001), GM measures can be implemented at a strategic level by making fundamental changes in the company's philosophy. This often requires a change in the company's mentality and behavior and tactics. Also, by making changes in the company's procedures, being green can be achieved at a quasi-strategic level. In addition to that, according to Comino et al. (2007), tactical greenness can be experienced by applying changes in operational activities such as changes in promotions and advertisements.

To achieve these essential goals, forming a dedicated team to collect and analyze data on green strategies is crucial. This team would monitor competitors' approaches and assess best practices while remaining informed about legal changes. Collaboration with other refineries and research organizations can facilitate the exchange of innovative ideas, fostering further advancements in the industry. Sustained investment in green technologies and regular communication of green strategies to stakeholders are vital. These efforts not only reinforce the refinery's commitment to sustainability but also enhance its reputation and competitive advantage, ultimately benefiting all stakeholders.

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Influence of Human Resource Practices on Employee Behaviour in Federal Tertiary Institutions in Nigeria — Multivariate Approach

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Abstract

Knowledge sharing has become a panacea for organizations to gain and to sustain a competitive advantage in this fast-growing technological era in education sector. Learning institutions are faced with how to manage their employees; motivating people to share knowledge, identifying the key people to share their knowledge, organizing existing knowledge and making knowledge easily accessible. Evidence from literatures review has shown that negligence and inadequate implementation of human resource management variables are responsible for poor employee knowledge sharing behaviour in federal universities. This study was carried out, using Multiple Regression Analysis, to examine the effect of human resource management variables and employee knowledge sharing behaviour in University of Uyo in Akwa Ibom and University of Calabar in Cross River States, Nigeria and to identify gaps relating to compensation practices, performance appraisal, and supervision and employee knowledge sharing behaviour. Survey research design was used in the study. A sample size of 364 was selected for the study using Taro Yamane formula while Bowler's Proportionate Allocation Formula was used to determine each sample size of 139 and 225 for UNIUYO and UNICAL respectively. The data collected were analysed using SPSS version 28. Results from the test of hypotheses showed that compensation practices had a significant positive effect on employee knowledge sharing behaviour in UNIUYO and UNICAL in Nigeria. Also, it was found that supervision had a significant positive effect on employee knowledge sharing behaviour UNIUYO and UNICAL in Nigeria. Whereas performance appraisal has a positive coefficient but no significant positive effect on employee knowledge sharing behaviour. Based on the results, it was recommended that management of the universities should provide adequate compensation in order to complement workers efforts, boost performance and inspire positive knowledge sharing behaviour. It also suggested that management should ensure suitable and appropriate staff supervision to enhance and strengthen the knowledge capacity of the employees.

Keywords: compensation practices, supervision, performance appraisal, human resource, employee's behaviour

1. Introduction

Knowledge empowers individuals and organizations to stay competitive in the borderless world of business. Organizational dependence on resources to obtain greater output has moved from physical resources to knowledge and skills resources. Knowledge is not only information but a source of resource with asset value that can support organizations to function efficiently. Knowledge residing within individual employees plays critical role in improvement of structural capability in form of organizational performance. Human resource management practices are a set of the major tools for knowledge creativity through knowledge sharing by influencing human capital and improved organizational performance (Salma et al., 2012).

Human resource management discipline extracted its roots from organizational psychology and has proven to be

an important practice for managing organizations and institutions' learning. The role of human resource management has become indispensable in gaining competitive gain especially in this era of globalization and advanced technological progress. Human resource management practice is a process that utilises the skills and knowledge of employees in order to achieve organizational goals (Hassan, 2013). The practice of human resource management is concerned with all aspects of how people are employed and lead in organizations. It covers among others, activities such as compensation, performance appraisal and supervision.

Universities, like every other organization, strive to survive in today's dynamic and complex business environment. Universities aim to develop and survive in the challenging market environment, and as such, make efforts to develop their strategic resources so that their goals can be achieved. Meanwhile, the idea of human resource management in universities is to render support services in achieving the goals of the universities. This could be because university employees are considered to be knowledgeable in teaching and research. Knowledge sharing entails communicating knowledge within a group of people with the aim of employing available knowledge to advance group performance. Effective knowledge management procedures sustained by effective knowledge sharing can improve the quality of work, productivity and competency that can profit the individual and the institution. Knowledge sharing is a voluntary action of an individual to participate in knowledge exchange; it is a relationship between two parties, one that possesses the knowledge and the other that acquires the knowledge. Individuals in organizations have always created and shared knowledge and therefore, knowledge sharing is considered to be an activity that takes place automatically. The sharing of knowledge is recognised as a main component of knowledge management which requires employee willingness and ability to exchange and disseminate knowledge.

Organizations are faced with how to manage their employees, and the problems are related to motivating people to share knowledge, identifying the key people to share and making knowledge accessible for the achievement of the overall goals (Logan, 2006). Academic institutions are confronted with a number of challenges (appropriate compensation practices, supervision and training programmes) that can be alleviated through sound knowledge management and sharing practices. The quality of higher education mainly depends on the quality and competence of the lecturers working in the institution. The academic staff is considered as key element for the success of any education system (Yin, 1996). There are variety of factors which facilitate and interfere with the knowledge sharing practices of lecturers working in higher institutions. The practices of human resource management in the university can either hamper or encourage the willingness of the lecturer to share their knowledge for the success of the institution.

Human resource management practices are gradually being recognized as essential organizational factors for promoting knowledge sharing behaviour of academic staff (Jyoti et al., 2015). It is imperative that lecturers in tertiary institutions share knowledge with others at individual, team, organization, national and/or international levels. Existing literatures focused on recruitment and selection, employee participation, job security as well as promotion opportunity (Ananthalakshmi & Fadumo, 2014; Razak et al., 2015; Agarwala, 2003), while others focused on knowledge sharing altruism, reciprocal and subjective norms (Shamsudin et al., 2016). These authors apparently overlooked the aspects of compensation, performance appraisal and supervision as it relates to employee knowledge sharing behaviour. The paper examined the influence of human resource management practices on employee knowledge sharing behaviour using human resource management variables as independent variable in term of compensation, performance appraisal and supervision whereas employee knowledge sharing behaviour is the dependent variable considered as employee knowledge sharing trust, employee knowledge sharing turnover, and employee knowledge sharing intention (Esu & Inyang, 2009). Specific objectives were to:

1) establish how compensation practices affect employee knowledge sharing trust in university of Uyo and university of Calabar.

2) determine the effect of performance appraisal on employee knowledge sharing turnover in university of Uyo and university of Calabar.

3) ascertain the effect of supervision on employee knowledge sharing intention in university of Uyo and university of Calabar.

2. Theoretical Framework

Social exchange theory (SET) Social exchange theory was postulated in 1958 by George Homans (Homans, 1958). He argued that exchange of knowledge between people is a fundamental form of behaviour and is always based on principles of cost and benefit, have a reciprocal effect. Pfeffer (2007) incorporated expectation and reward into the theory from psychology. Social exchange theory is among the most influential conceptual paradigms for understanding and explaining knowledge sharing behaviour. Knowledge sharing is regarded as a kind of social exchange with people sharing their knowledge and skills with their colleagues and expecting,

reciprocally, to receive others' knowledge in return regulated by trust. Lin (2012) has analysed knowledge sharing by outlining some factors like future supervision and performance prospects to regulate employee knowledge sharing behaviour.

Social exchange theory assumes that activities undertaken between an organization and its employees can generate organizational commitment (Aldhuwaihi, 2013). Based on the assumption of social exchange theory, the employees believe that the organization should provide a better working environment, where they utilise their skills and knowledge to achieve their goals as well as organizational goal (Ahmed et al., 2018). From the assertion, favourable exchange understanding between employees and the organization will result in increased organizational knowledge sharing behaviour. The postulate of this theory is applicable to the relationship between human resource practices and employee knowledge sharing behaviour in federal universities in Nigeria.

Wilson et al. (2015) opined that satisfying human resource management practices will stimulate employee commitment within the organization as reciprocal. Social exchange theory emphasises that interactions between parties who are in a state of reciprocal interdependence relationships evolve over time into trust, loyalty, and mutual commitments as long as the parties abide by certain rules of exchange. In conclusion, social exchange theory indicates that appropriate implementation of human resource practices can lead to effectiveness and efficiency in employee commitment, trust, turnover, intention and willingness in knowledge sharing behaviour which is profitable in overhauling institutional sustainable advantage.

The value of this theory in this study is the preposition that academic staff are main sources of knowledge sharing in the educational institutions which need to be appreciated through proper compensation, appraised, and supervised for maximum commitment to knowledge sharing.

2.1 Ability Motivation Opportunity Theory

Ability motivation opportunity theory was developed by Appelbaum et al. (2000). The theory had been widely used in human resource management practices research as an added value to resource-based view of Penrose, 1959 (Ahmad, 2020). The ability motivation opportunity components are described as the resources needed by the employees to perform efficiently and effectively at workplace. Moreover, these elements are interrelated, suggesting the necessity for all components to exist at the workplace (Haque et al., 2021).

Ability is an essential factor influencing employee behaviour and task performance. It encompasses the employees' necessary knowledge, skills, and aptitudes to perform their job (Boxall & Purcell, 2011). Organizations can implement human resource management practices to guide employee behaviour towards specific organizational goals. It can be done through compensation practice that rewards the employees when they successfully achieve the desired goals. Mat et al. (2020) pointed out that skilled employees will not perform effectively if they are not motivated. Therefore, proper implementation of human resource management practices in an organization will impact employee motivational level in terms of knowledge sharing behaviour. The theory suggests that employees who are given the opportunity to contribute and perform their job will produce more positive organizational outcomes (Ujma & Ingram, 2019). Opportunity is described as the engagement in job-related behaviour, which can be achieved through job design and involvement (Szule et al., 2021). This is apparently true with developing innovative workplace behaviour in the universities where employees are required to perform their job accordingly.

The theory encourages employees' desired behavioural outcomes at work such as their knowledge sharing behaviour (Nor & Abdullah, 2020). The study was underpinned by the Ability motivation opportunity theory which contributes to employee behaviour in the shape of developing and enhancing the ability and capability of employees, motivate them and improve opportunities for them to foster their knowledge sharing behaviour. Workers tend to perform better when they have the opportunity to apply their skills and motivation to a given work situation. Thus, working arrangements can provide employees with the opportunity to influence the decision-making process of an institution and motivates them to share their task-specific knowledge through an environment such as that of trust.

The relevance of this theory to the study is based on the assumption that, academic staff in federal universities in Nigeria are the main contributors of knowledge sharing. The academic workforce needs to be equipped through, suitable job design, compensation packages and constant training. With the application of appropriate human resource management practices, the academic staff knowledge sharing capacity will be broadened and renewed to enhance the universities' ability to achieve sustained competitive advantage.

3. Literature Review

3.1 Human Resource Management

It is the responsibility of every manager to managed their staff in order to achieve the goals of the organization, this is because human resource plays a vital role in the management of other resources, such as materials, money,

time, machine, information entrusted in their care. Uche (2011) maintained that human resource refers to an organization's employees, who are described with reference to their training, experience, intelligence and relationship. Human resource co-ordinates the operational activities as well as decides how much an organization can achieve with other resources (Adetoro, 2009). Human resource management is that function of an organizations which makes for effective utilisation of people to achieve not only the objectives of the organization but also the satisfaction and development of employees. Human resource management in the context of the university is the harnessing of the totality of workers' skills, knowledge, energies, talent, capabilities, and social characteristics such as belief, to achieve the objectives of learning and research and at the same time make the workers to be part and parcel of the system in fulfilling their life goals (Etor, 2014). It is, therefore, necessary to manage the human factor in an organization to be useful and resourceful in order to gain and sustain a competitive advantage.

3.2 Human Resource Management Variables

Human resource management practices are required to perform the routine of human resource in an organization. The term human resource management practices are a collective word used to describe the various activities carried out in an organization, be it private or public, to manage the human factor in order to have them exhibit their potential and for the wellbeing of the organization. The universities must attract, develop and maintain an energetic workforce to support their goals and strategies (Adeyeye, 2009). Maintaining and improving educational standards is only possible through the effective utilisation of the human resources in the institutions. Human resources of a university system are the greatest aid to learning, and they should be thoroughly empowered and supported. It is very important in the operation of the university system as required number of staff and the staff mix are important for accreditation exercise (Opeke & Adenekan, 2019).

Universities as knowledge-based institutions are expected to manage knowledge for sustainable competitive advantage, growth and innovation in Nigeria. Implementation of knowledge sharing practices by the University requires the engagement of the right competence of human resources, this is because it is the human resources that will do all that are required for the successful implementation of knowledge dissemination in organization. Advancing knowledge sharing can be accomplished through human management practices by influencing employees' knowledge sharing behaviour within organizations. The success of any knowledge initiative like knowledge sharing requires employees' willingness to share their knowledge. However, employees have instinct to hoard their knowledge, due to fear of losing power, authority and control (Iqbal, 2010).

Similarly, employees' knowledge sharing is also restricted by limitations imposed by human resource functions, like job descriptions and reward systems according to Iqbal (2016). Organizations need to pay attention to human resource management practices to facilitate positive knowledge sharing behaviour.

3.3 Measures of Human Resource Management Practices

3.3.1 Compensation Practices

Compensation is very important for employee productivity. It is a process of providing intrinsic or extrinsic (financial and non-financial) motivation for employees to improve their performance. Compensating particular behaviour gives employees understanding of what is valuable for the organization. Enhancing employees to share knowledge, organizations should recognize knowledge-sharing behaviour through direct evaluation and compensation since the employee see knowledge sharing as an integral part of their job responsibilities (Cabrera & Cabrera, 2005). A compensation practice should provide employees with appropriate incentives and employees' commitment to share knowledge, encourage/promote teamwork, and recognize individual and group performance. Offering incentive based on group performance enhances co-operation and leads to increased trust that is crucial for the development of knowledge sharing friendly environment (Shamsudin et al., 2016).

Another issue on employee's compensation is the problem of the Integrated Payroll and Personnel Information System introduced in 2006 and implemented by federal government of Nigeria in 2019, to pay federal government employees on time and accurately. The centralised payroll system is meant to meet the needs of federal government employee and helps government to plan and manage payroll budget by ensuring proper control of personnel cost, has been riddled with lots of inconsistencies (Chima et al., 2019; Iloanya et al., 2020). Folorunso and Simeon (2021) noted the gains and pains of integrated payroll and personnel information systems policy implementation in Nigeria which revealed weak positive relationship with employee welfare.

According to Silva (2009) and Jamilu et al. (2015) employee compensation includes all forms of pay (financial and non-financial motivation) giving to employees arising from their employment. Doyle (2010) on the contrary, proposed that there are types of employee benefits offered at the discretion of the employer and covered in labour agreement, these include hazard pay, health care, maternity, paternity and adoption leave, paid holidays, pay raise, sick leave, vacation leave, work breaks and meal breaks. Notwithstanding, Dialoke and Paschal (2017) suggested that extrinsically motivated individuals seek to be compensated for doing what is expected of them.

On the contrary, intrinsically motivated employees get pleasure out of completing a task, recognition or the job itself.

Ndungu (2017) stated that compensation mechanism of an organization can enhance employee motivation that can improve their willingness to share knowledge within organization. Employees who are willing to share and create knowledge could be encouraged by the incentive support within the organization. Employees recognise that open and transparent compensation should be given to those employees who spend their time supporting other members by adding value to the organization (Iqbal, 2015). Sharing expertise and knowledge is a behavioural outcome therefore; the purpose of rewards could be to change the individuals' behaviour to improve knowledge sharing activities (Iqbal, 2016). If a university wants to stimulate desired behaviours from employees, it must provide incentives that reinforce the desired behaviours according to the submission of Pastor et al. (2010). Therefore, the extent to which employees share their knowledge with others should be reflected by the compensations received (Foss et al., 2015).

Additionally, an organization could stimulate members to reuse knowledge using financial and non-financial rewards. Gagne (2009) postulated that financial rewards like increased pay, bonuses in the forms of cash are insufficient and could even be detrimental to the motivation to share. He advocated non-financial compensation like professional development, career advancement, opportunity to work together with an important person, opportunity to travel abroad, job security and recognition of one's contribution to enhanced knowledge sharing behaviour of employee. However, Foss et al. (2015) claimed that it is not the compensation itself, but rather its value to the receiver which determines the compensation's effects and the likelihood to create knowledge sharing. Generally, people who perceive that their co-workers and supervisors value knowledge sharing are more inclined to engage in such behaviour themselves (Ming-Chang et al., 2013).

Contrary, Matoskova and Smesna (2017) advocated that individual compensation might lead to excessive competition amongst employees and reduce knowledge sharing in the organization. Incentive factor has a way of inducing employee attitude or behaviour toward performing certain task which ordinary could not have. From the findings of different scholars as stated above incentive mechanism is crucial for knowledge sharing behaviour of employee any given organization.

3.4 Performance Appraisal

Performance appraisal is a process of evaluating employee performance and potential for development during a period of time by supervisors. It is a vital tool for organization because it provides useful information in decision making regarding issues affecting employee job performance and necessary reinforcement in an organization. According to Quansah (2013) performance appraisal increases employee commitment and satisfaction.

Ezeuwa (2009) and Gagne (2009) also submitted that increased competitive nature of the economy and rapid changes in the external environment have forced many organizations to shift from reactive performance appraisals to proactive performance management to boost productivity and improve organizational performance. Gagne (2009) and Yousif and Ahmed (2020) considered proactive or preventative performance appraisal as form of human resources practice that evaluates employees' performance to know those who are the best fit for the organization whereas reactive performance appraisal is a corrective approach of employee behaviour to meet expected organizational performance. Iwuoha (2009) and Armstrong (2009) agreed that performance appraisal is systematic process for improving organizational performance by developing the performance of individual and teams.

Organizations can monitor the development of desired employee attitudes and behaviours through the use of the appraisal tool. This appraisal-based information could be used for changing the selection and training practices to select and develop employees with the desired behaviours and attitudes. However, the effectiveness of skilled employees will be limited unless they are motivated to perform their jobs (Ogedegbe, 2014). Performance appraisal, compensation and rewards are interrelated and complementary practices designed to encourage employees' performance and desired behaviour (Fajana et al., 2011). Performance appraisal can be a useful tool for institutions to direct employee knowledge sharing behaviour drive to goal achievement. Ebiasuode et al. (2017) advised that, performance appraisal should be systematic, long-term and group-performance oriented in order to be a knowledge-driven institution. Ananthalakshmi and Fadumo (2014) also recognised knowledge-sharing behaviour as an important part of performance appraisal. From the above findings, performance appraisal is a very important practice of human resource management which encourages employee knowledge sharing behaviour.

3.5 Supervision

Supervision is a human resource practice where a superior oversees the activities of a junior employee in order to correct or advise where necessary for effective and efficient job performance. It is a provision of technical support and guidance to workers in discharging their duties and responsibility. A number of researched have

suggested that supervision encourages friendship, mutual trust, respect and increase employee satisfaction (Jamilu et al., 2015; Masui et al., 2019). The relationship with an immediate supervisor is a step towards employee trust and commitment. When employees observed fair treatment, they engage in workplace social exchange as assumed by the social exchange theory. If the employees are keen on such treatment by their supervisor, then they will reciprocate the favourable treatment through their behaviour and attitude in sharing of their skill, knowledge, ideas, etc.

Supervision has become a strategy for human resource management nevertheless, little is recorded on how it improves the employees' behaviour in federal universities in Nigeria. Supervision is instrument needed for preparing future skilled employees and also to strengthen learning capabilities, intelligence, shape organization knowledge, and sustain the organization competitive advantage according Ofobruku and Nwakoby (2015). Supervision is a relationship between a more experienced employee and a less experienced employee for purposes of sharing knowledge and insight with respect to a specific task or duties. In academic settings, supervision is used in both teaching and non-teaching staff (Ilevbare, 2016).

Masui et al. (2019) who stated that organizations are social systems where human resources are the most important factors for effectiveness and efficiency utilisation of other resources, also considered a supervisor as a person who facilitates personal and professional growth of an employee by sharing the knowledge and insight that have been learned through the years. Knowledge sharing is a key mechanism for organizations success according to Masui et al. (2019). Therefore, workplace relationships such as supervision, compensation, job design should be encouraged to promote knowledge sharing. Beer (2018) established influence of supervision on employee knowledge sharing as well as related activities in universities. Akosile and Olutokun (2019) also agreed with the findings of Beer (2018) that, supervision has influence on knowledge sharing among academics. It is imperative that supervision as a human resource management tool can foster and encourage employee knowledge sharing behaviour among their colleague which can produce highly competitive advantage for the universities.

3.6 Employees' Behaviour Dimensions

3.6.1 Employee Knowledge Sharing Trust

Employee knowledge sharing trust is the feeling of confident an employee has on the management of the universities to share their potentials and intellect without fear of prejudice of losing power or position. As a multidimensional construct, trust is a belief, assessment or assumption about an exchange partner that results from the partner's expertise, reliability, benevolence, and deliberateness. Trust assumes basic part in encouraging more profound exchange relationship such as knowledge sharing (Nur et al., 2018). Without trust during collective process knowledge sharing between individuals may be low regarding accuracy. Swift and Hwang (2013) argued that trust is characterised as the readiness of the individual to place oneself in position of possible vulnerability to another individual. Therefore, trust is subjected to a person's view towards others whether it will improve or risk them in the workplace.

Eugene and Khalil (2011) submitted that knowledge resource increases in value, so is the effort in advancing new and evolving knowledge activities to meet the global trend. Knowledge management has changed the paradigm of most organizations by turning the organizational climate to be a learning block where knowledge is discovered, captured, shared and applied to maximise and actualise their purpose. Knowledge sharing has given many organizations a sustained competitive advantage, setting them at the high ranks in their respective areas. Organizational environment ought to be a learning platform or knowledge society where individuals share and capture knowledge, especially tacit knowledge which is inaccessible for employees within the organization (Al Hazaizi & Muthuraman, 2020).

Trust is defined as the act of becoming open to people based on the good recognition of the result of their action (Gambetta, 2000). Trust is proven to be the costliest efficient tool that enhances knowledge sharing within organization. Trust improves act of knowledge sharing within members of an organization. Whenever there is trust within staff in organization, there is possibility for higher collaboration and commitment. Interpersonal trust contributes to improvement in knowledge sharing behaviour among employees. Cope and Kalantzis (2020) opined that inter-personal trust is directly proportional to knowledge sharing. People will be motivated to share their knowledge when they perceive the recipients to be honest, trustworthy, and reliable. Higher trust will make individuals not think of any future negative occurrence on the activities and will share their knowledge freely (Eugene & Khalil, 2011). Trust in workplace is encouragement and freedom that employees can put to their creativity and passion to work.

In this fast-growing university environment, where flow of information resources or knowledge exchange processes are considered as competitive advantage, trust plays an important role mostly in the share of knowledge (Pervaiz et al., 2016). Trust would restrain the relationship between human resource management

practices and employees' knowledge sharing. In particular, it provides evidence that employee commitment regulates the relationship between human resource management practices and knowledge sharing. This new proposed relationship could enhance employees' abilities and motivation to learn and create a knowledge culture that will foster the concept of sharing. Chiang et al. (2011) stated that trust builds a healthy atmosphere for knowledge sharing and acts as a moderator. Human resource practices related to career development and the compensation system are considered more important for knowledge sharing. If the human resource practitioners pay attention on knowledge management processes specifically in knowledge creation and sharing in an organization, they can promote trust worthy environment in which the knowledge can be shared effectively.

Trust plays a vital role in knowledge sharing process among employees when effective human resource practices are implemented in organization. Trust is therefore a key dimension in strengthening the power of an ideal human resource system to share knowledge. The study views employee trusts in university of Uyo and university of Calabar as the confident, hope and faith an employee establishes with the university environment in support for the achievement of the overall organizational goal and objectives.

3.7 Employee Knowledge Sharing Turnover

Employee knowledge sharing turnover refers to the rate an employee shares his experience, intellect and skills with other employees within an institution for accurate and timely performance. How often is the employee ready to share their knowledge for the growth and betterment of the organization depend on employee satisfaction. Employee reluctant to share knowledge can lead to loss of knowledge which is crucial for organizational growth and achievement of goal and objective. An effective human resource practice enhances, simulates and provides avenue for frequent employee knowledge sharing. Tangthong (2014) and Foong-ming (2008) stated that employee knowledge sharing turnover is the number of times an employee is ready to socialise and interact with colleagues for the purpose of sharing ideas and skills. It is, therefore, advisable for employer to create and foster environment that encourages current employee knowledge sharing their skills, by having practices in place that address their diverse needs. The activities of human resource in an organization can either decrease or increase employee knowledge sharing turnover (Sharratt et al., 2007).

Employee can decide to hoard his/her skill or knowledge intention if organization does not offer good prospects, in term of organizational practice like job design, appraisal, compensation, supervision and training. These reviews have not drawn attention to the frequency of employee knowledge sharing behaviour. The study therefore seeks to fill this gap by investigating the relationship between the frequencies of employee knowledge sharing with the human resource management practices in university of Uyo in Akwa Ibom and university of Calabar Cross River States, Nigeria.

3.8 Employee Knowledge Sharing Intention

Employee knowledge sharing intention refers to the desire of an employee who is knowledgeable and skilled and intents to share his potential with other individual or groups in organization for attainment of overall objective. Intention is also considered as purpose, intent, objectives, aim and goals that influence employee behaviour to share their knowledge. Ajzen and Manstead (2007) pointed out that human action is influenced by a favourable or unfavourable evaluation of behaviour, perceived social pressure to perform or not perform the behaviour, and perceived capability to perform the behaviour. Also, intention is an indication of how hard an individual is willing to try, how much of an effort an individual is ready to put in (Ru-chu & Shii-jer, 2011). Intention is the probability that an employee will perform a stated action. Social theory assumes that the most main direct determinant of behaviour is behavioural intention. Employee knowledge sharing intention is the effort or ability of an employee to create, initiate and innovate intellectual ideas within the organization which can gain competitive advantage for the organization through interaction.

Wang and Noe (2010) defined employee intention as a concept that addresses the application of a new idea and process. It is a fundamental ability to maintain a competitive advantage. Innovative behaviour is a major factor in the success of the organization in this era of knowledge-based economy and globalization. Ariawan et al. (2020) stated that, the rapid change and high level of environmental uncertainty, requires ability and skills of intention behaviour in knowledge sharing to be able to achieve growth and sustainability of an institution. Organization that has the resources that are able to behave innovatively will be able to improve the performance and achievement of organizational goals (Ariawan et al., 2020). The nature of academic institutes makes it imperative for the academicians to impart knowledge either through research, teaching or its dissemination at both individual and collective level. The knowledge sharing practices in tertiary institution comes in various forms like; research, presentation, teaching, meeting etc., which promote institutional success.

Rorbertson and Hammersley (2004) pointed out that although knowledge sharing is a desirable goal, for many organizations, in practice it is difficult to achieve. They explained that employees are reluctant to share knowledge but are willing to do work activities that are required in their jobs. They further stated that most

people who hoard their knowledge are almost fearful of losing their job or feel insecure. Many purposefully refuse to document procedures and information about certain tasks because they do not want to lose their knowledge power to others. They want to remain as the ones who 'know how' to do something when others do not. The knowledge sharing practices in the educational institutions also improve educational quality, institutional performance, as well as contributed to the success of the nation (Akosile & Olatokun, 2019).

Omar and Ahmad (2019) stated that employees show different organizational work behaviour depending on their satisfaction and work environment. In addition, some individuals may share their experience and knowledge with others without thinking of the benefit they may gain from it (Eugene & Khalil, 2011). Conclusively, individuals within an organization may share their knowledge freely without thinking of any strings attached if they are satisfied with organizational human resource practices. Employee knowledge sharing intention is a rarely studied area, therefore, this study will contribute to knowledge by investigating the influence of human resource practices on employee knowledge sharing intention in universities of Uyo in Akwa Ibom and university of Calabar Cross River States, Nigeria.

3.9 Employee Knowledge Sharing Behaviour

Knowledge sharing is a communal process of knowledge and knowledge generation. Knowledge sharing helps the collaboration of people who work toward common aims. This practice changes individual knowledge to organizational knowledge since knowledge is only in the minds of people according to Usoro et al. (2007). It is a kind of communication practice by which two or more parties are involved in knowledge exchange and its output is new knowledge generation (Usoro et al., 2007). If knowledge is shared and exchanged in right time among right people and it is used in right time, it increases organization chance of improved performance through positive behavioural outcome. Duke et al. (2022) also acknowledged that knowledge is an inimitable organizational strength and can be harnessed from different sources employees inclusive, to again a competitive advantage when it is effectively shared.

Public servants believe that knowledge sharing is an additional job, and they may resist against knowledge sharing (Sekaran & Bougie, 2008). Employees like to keep their knowledge ownership in order to acquire credit among their colleagues. Many employees do not share their knowledge due to fear of reducing their job security (Mehdi et al., 2014). Knowledge sharing involves a main part of creating competitive advantage based on knowledge management. Trust is seen as the most radical indicator of knowledge sharing. One can expect that knowledge owners would not share their knowledge until they receive potential advantages.

Knowledge is a source of developing sustained long-term competitive advantage for an organization. In this current global advancement, organization becomes knowledge-based for the purpose of sustainable development. Knowledge sharing is a vital instrument that turns individual knowledge into organizational knowledge. The knowledge sharing practice plays a remarkable role in the development and innovation in many areas of organizations. The importance of knowledge sharing for sustainability of organizations globally cannot be overemphasised. Mohajan (2019) stated the purpose of universities establishment to include: teaching, research and community service, and in achieving these goal, integration of knowledge sharing among employee is important.

Knowledge as advanced by the knowledge-based view is the most important strategic resource among all the possible resources organization may possess (Agarwal & Marouf, 2014). Due to the importance of knowledge in the organizations, the concept 'knowledge management' emerged in the mid-1980s and gained much interest in managerial and academic fields since 1990s (Olivia, 2014). Knowledge management refers to the process of capturing, sharing, developing, and using the knowledge efficiently. However, among all the activities of knowledge management, knowledge sharing is acknowledged as the central and most vital part (Chen et al., 2016). This study on human resource management practices and employee knowledge behaviour is generally concerned with promotion of employee's knowledge sharing behaviour in organizations. Employee knowledge sharing behaviour is the attitude or behaviour displaced by an employee toward sharing ideals, views, experience or skills in an organization. It facilitates the exchange and application of scattered information, practices, uncommon understandings, insights, and experiences of individual employees in organization.

Dewan and Abdul-Halim (2017) defined knowledge sharing behaviour as an individual behaviour in circulating one's job-related knowledge willingly, being tacit or explicit to other employees in the organization. It is also a degree to which an individual actually shares knowledge with other persons, groups or organization as well as sharing task relevant ideas, information and suggestion (Funmilaya, 2019). Wang and Noe (2010) asserted that knowledge is information processed by individuals appropriate for individual, team and organizational efficiency and effectiveness. It is, therefore, necessary for the organization to effectively exploit such processed information or knowledge for its benefit. Hence, employers need to encourage employees particularly the experts to share their knowledge with others in the organization. Wang et al. (2016) categories employee knowledge sharing behaviour into two: knowledge donating and knowledge collecting. Knowledge donating encompasses

transferring one's personal intellectual experience to others, whereas knowledge collecting refers to consulting others to get them to share their intellectual capital.

An organization that takes its responsibility for its employees will provide necessary support and resources to enable them grow and develop their career, as such employees are likely to develop a sense of commitment and be motivated in their job. Engaging in achievable human resource management practices will enhance individual knowledge-sharing behaviour (Shamsudin et al., 2016). The theory of social exchange assumes that organizational support for advancement of employee can facilitate knowledge sharing behaviour among employees. This research views employee knowledge sharing behaviour as a potential of an employee to share ideas, views, knowledge and information in respect to acquire skills, experience and knowledge with other employees for effective and efficient performance of duties and responsibilities for the good and attainment of overall organizational objectives.

3.10 Human Resource Management and Knowledge Sharing

Human resource management and knowledge sharing are likely organization tools for productivity, competitive advantage and innovation. Knowledge sharing in organization helps enhance employee's effectiveness and efficiency in discharging organizational responsibilities. Employees are expected to partake in knowledge sharing activities for the purpose of organizational benefits, but often time individuals do not share knowledge base on personal justifications (Rehman et al., 2020; Ugo-Agharanya et al., 2021). These reasons range from a fear of losing power to lack of trust in their co-worker. Individuals feel ownership of their knowledge, as they have constant control over it. They are not willing to share the ownership of knowledge with others because they think that they will lose control of their knowledge if they share it with others (Agarwala, 2003).

Human resource management research is expanding in diverse dimensions (employee sourcing, employee utilisation, performance and reward management, etc.): Managing employee's interpersonal relationships is one of the aspects of human resource management research (Rehman et al., 2020). Human resource management practices can influence relationship with knowledge sharing process such as knowledge sharing initiative, effectiveness, commitment, trust, turnover and employee willingness. Human resource practice has a way of affecting the behavioural practice of an employee which can positively or negatively affect the level of output in the organization. The knowledge governance approach highlights that human resource management practices are a primary means through which organizations can influence employees' behaviours, attitudes, and perceptions towards successful knowledge sharing (Foong-ming, 2008; Minbaeva, 2008). Theoretical support for human resource management and employee knowledge sharing as organizational strength, comes from the resource-based view of human resource management (Penrose, 1959), where value in an organization is employees' knowledge and experiences that are unique to organization and can gain its competitive advantage. Employee knowledge sharing ability together with their understanding of the particular context and environment, makes imitation by competing organizations very difficult, thus sustaining competitive advantage.

4. Empirical Review

Abbas (2017) examined knowledge sharing and dissemination among academics in federal universities in Nigeria. The aim was to investigate the phenomenon of knowledge sharing among academic staff in four federal Nigerian universities, namely Bayero University, Kano; University of Maiduguri; University of Ibadan; and University of Porthacourt. The research was a quantitative approach and 364 academic staff were sampled using administrator questionnaire. The study found proof of knowledge sharing among academics in the four universities through workshops, seminars and conferences, affiliation of professional associations/societies and readiness to share knowledge and other resources with colleagues. The study recommended more intense modern technologies to increase awareness, improve knowledge sharing through research and teaching activities, since knowledge sharing is a critical factor in the survival of educational institutions across the globe.

Oladele et al. (2015) examined the relationship between human resource management practices and Nigeria universities administration. The objective was to investigate the usefulness of human resource management practices in Nigeria universities administration. A survey design was used for data collection while regression analysis was conducted to test the relationship. A total of 180 sample was selected from the population from six universities. The findings revealed that there was a significant difference between the performances in human resource management practices in public and private universities. It was also revealed that effective human resource management leads to improvement in staff and student performance. It was recommended that universities administration should invest more in human resources in order to improve the quality of their workforce. It was opined that university personnel should undergo higher academic training in their area of specialities and attend regular workshops, conferences and seminars locally and internationally and also utilise the benefits of mentoring.

Kenndy and Victor (2020) researched on knowledge sharing practices among lecturers in Nigeria universities.

The objectives of the study were to examine the perceptions of lecturers about knowledge sharing, identify the benefits of knowledge sharing among lecturers, identify ways used in sharing knowledge by lecturers, and investigate the barriers militating against knowledge sharing. The study adopted the descriptive survey design. A sample of 217 lecturers was collected across seven faculties in the university in Kwara. Data were analysed using descriptive statistics of frequency counts and percentage. Findings of the study revealed that lecturers have positive perceptions toward knowledge sharing. It was recommended that university management should create massive campaigns on the need for lecturers to embrace knowledge sharing among peers. This can be achieved through training, conferences attendance, and seminars etc on the need for knowledge sharing among them.

Thomas and Sunday (2019) investigated knowledge sharing behaviour of librarians in federal universities in Nigeria. 518 sample was selected using survey and descriptive statistics. The results revealed that the level of knowledge sharing by librarians is high. The study concluded that librarians are not only knowledge managers but also knowledge disseminators. It was recommended among others that recognition and incentives be given to librarians who share knowledge so that they can share more knowledge.

Masui et al. (2019) studied academic staff behavioural intention to create knowledge by using policies in the universities of Tanzania. The objective of the study was to investigate the association between policy aspects and the intention to engage in the knowledge creation behaviour by academic staff in the universities. The study adopted theory of planned behaviour. Structured questionnaire was used to collect data from 202 respondents. Logit regressed and maximum likelihood estimation was used to analyse data. It was revealed that there was significant association between availability of time, provision of space, rights and values and the intention to engage in knowledge creation behaviour. The relationship between reward and mentoring and intention to engage in the behaviour was negative. The study recommended among others that training and mentoring should be properly instituted in the universities.

Ru-chu and Shii-jer (2011) investigated the knowledge sharing behaviour of teachers in Taiwanese high schools, with the aim of observing factors responsible for knowledge sharing. A total of 210 questionnaires was distributed and analysis of variance and partial least square was used for analysis. The results showed among others, that attitude, subjective norm, behavioural control and intention influenced knowledge sharing behaviour of the Taiwanese teachers. Recognition and trust were emphasized to encourage effective knowledge sharing.

Areekkuzhiyil (2016) researched on the impact of organizational factors on knowledge sharing practice of teachers in higher schools. The study conducted in Kerala, administered 250 questionnaires using partial least square structural equation model for data treatment and analysis. The study revealed among others that, support and mutual trust significantly affect employee knowledge sharing and therefore, recommended organizational support and trust for effective knowledge sharing practice.

Fahad (2018) studied knowledge sharing among academics in higher education institution in Saudi Arabia. The objective was to observed individual and organizational factors affecting employee willingness to share knowledge. The study used survey technique to administer 140 questionnaire and multivariate regression was used to analyse data. The result showed that, trust, leadership and attitude affected a person's willingness to share knowledge. It was recommended that trust, time and support through open communication and collaboration can enhance employee willingness of knowledge sharing.

Daniel (2017) researched on the effect of reward and recognition on employee performance in public education institutions in Kenya. The objective was to determine the effect of reward and recognition on employee job performance. It was a descriptive research and purposive sampling was adopted, 332 questionnaire was distributed and person correlation and multiple regression was used for analysis. The result showed that, reward and recognition have effect on employee initiative, productivity and teamwork. It, therefore, suggested the need for effective compensation, collaboration and participation of employee to enhance organizational achievement.

Amini and Nwanosike (2018) studied knowledge synergy among lecturers in public universities in River State, Nigeria. Decriptive research design and stratified random sampling were adopted. A total of 764 lecturers was sampled and Z-test statistics was used to test the hypotheses. It was revealed out among others, that lecturers practiced knowledge synergy to a very great extent in the three public universities through academic conferences, workshops, seminars, joint authorship, general staff meetings and one-on-one discussions. It was recommended among others that; heads of department should always pair senior and junior lecturers in the discharge of teaching responsibilities to enrich their knowledge level.

Rehman et al. (2020) studied the role of trust and organizational commitment on human resource management and knowledge sharing behaviour of employees in Pakistan. The aim was to investigate the impact of human resource management practice on knowledge sharing behaviour among university faculty members. Questionnaire were distributed to 700 faculties members and structural equation model was also used to analyse the data. The study revealed a positive impact of human resource practices on knowledge sharing behaviour of

faculty members. It therefore recommended that more socio-emotional relationship be developed to build trust and commitment in other to spur knowledge sharing among the employees in the faculties.

Bamigboye et al. (2018) investigated knowledge sharing and research output among academic staff in Federal University of Agriculture, Abeokuta Nigeria. 127 academic staff were used for the study while questionnaires were used as instrument for data collection. Data was analysed using descriptive statistics such as frequencies, percentages, mean and standard deviation. Findings of the study revealed that the channels through which academic staff shared knowledge was high. It also showed that the level of research output among academic staff was also high and that there is significant relationship between knowledge sharing and research output among academic staff. The study recommended among others, that the university management should provide avenue for academic staff to embrace knowledge sharing among the academic staff through training and conferences.

Salleh et al. (2017) researched on employee readiness, training transfer and work environment among academic staff in Malaysia. The objective of the study was to investigate the influence of training design on the readiness of academic staff to transfer knowledge. It was a cross section research and questionnaire was administer to 238 while partial least square and structured equation model was used to analyse the data. The research findings revealed among others that ability, supervisor role training played significant roles in transferring training knowledge. The study recommended extensive training and motivation practices to be implemented.

Khalid (2017) studied knowledge sharing behaviour intentions of academics and their determinants among lecturers in Baghdad. The objective was to assessed the attitudes, perceptions and behaviours of academics and the identification of factors that support or hinder knowledge sharing behaviour of academics within Baghdad University. A survey design was used to administered 326 questionnaires. AMOS Version 23 software and the structural equation modelling (SEM) software of IBM (Version 23) was used to examine the relationship. The study recommended that educational institutions seeking to entrench knowledge sharing strategies should encourage communication, training and the exchange of knowledge skills.

Emeribe (2020) studied human resource management variables and academic staff job effectiveness in the university of Calabar, Nigeria. The aim of the study was to examine the effect of some human resource variables on academic staff job effectiveness. A correlational research design was adopted for the study. The study comprises all the academic staff in the University of Calabar. A stratified random sampling technique was used to select total numbers of one hundred (100) respondents from the University of Calabar. The result revealed that the management of lecturers' appraisal/promotion and management of lecturers' in-service training significantly relate to their' job effectiveness in the university. It was recommended that the university management should ensure that lecturers are appraised and promoted appropriately to enhance their lecturer job performance. Also, that the university management should make provision for lecturer in-service training to enhance learning and improving lecturers' job effectiveness.

5. Materials and Methods

The study employed survey research design to guideline collection, analysis, discussion of findings and interpretation of the data which was collected from the field. It gives opportunity to study more variables at the same time, it is convenient, inexpensive, efficient and scientifically acceptable method of collecting data in social and behavioural science. The researcher used descriptive statistics to rank the respondent socio-demographic status and perception of human resource management practices and employee knowledge sharing behaviour in federal university in Nigeria. The population of the study consists of 3,995 academic staff from the two federal universities in Akwa Ibom and Cross River States. This statistic comprises (UNICAL 2474 and UNIUYO 1521) academic staff. This population was further sub divided into strata; Graduate assistant — lecturer 1 and Senior lecturer — Professor) from the two universities. The choice of population for this study was justified by the views of Adeyemi and Ademilua (2012) and Udoh-Uwah and Etim (2018) stated that teaching staff are ardent researchers with experiences and skills in knowledge activities. Sample size was drawn using Taro Yamane statistics formula while The Bowler's (1996) proportionate allocation formula was used to determine the sample for each institution. The total sample size of the study drawn among teaching staff of the Universities was three hundred and sixty-four staff (364) and was proportionally shared based on their population size (225 and 139) respectively. The questionnaire was designed in 5- point Likert scales of strongly agreed (SA) = 5, Agreed (A) =4, undecided (U) =3, disagreed (D) 2 and strongly disagreed (SD) = 1. Exploratory factor analysis was used to examine the construct validity. Exploratory factor analysis was conducted to determine the validity of the construct. The result of the analysis revealed that constructs in the instruments were valid as the p-value of the study constructs were less than 0.05. Furthermore, the Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity (KMO and Bartlett's Test) range from (0.854-0.966) revealed the sampling adequacy of the constructs as well as the closeness of fit between the construct measures and actual observations made with the instrument. Hence the constructs in the instrument were considered valid for the analysis. The reliability of the instrument was established based on a pilot study. In measuring the

reliability of the research instrument, the questionnaire was subjected to a pilot test. Thirty-six (36) copies of the questionnaire containing 30 questions was administered to thirty-six lecturers in University of Cross River State (UNICROSS), which represent 10 per cent of the sampled size. The Cronbach Alpha for internal consistency of the items of the questionnaire was conducted using the reliability procedure in Statistical Package for Social Sciences (SPSS) version 28. A high Cronbach alpha index indicates high reliability. A Cronbach alpha coefficient of at least 0.70 was acceptable, and the instrument was considered to have high reliability and therefore fit for the purpose of collecting data for the study.

6. Analysis of the Results

The hypotheses were re-stated in the null and alternate forms using multiple regression analysis at 0.05 level of significance. The Statistical Package for Social Science (SPSS) version 28 was used to analyse data.

Hypothesis 1

H_0: Compensation practices do not have a significant effect on employee knowledge sharing trust.

H_A: Compensation practices have a significant effect on employee knowledge sharing trust.

The test of hypothesis one for the significance of compensation practices (Comp) on employee knowledge sharing trust revealed that the coefficient of this construct was 1.5762 with a z-stat of 2.7466 and probability of 0.0001. The p-value was significant at less than 1 per cent, indicating that the coefficient passes the significance test at 1 per cent level. Therefore, the study rejects the null hypothesis, meaning that there is a significant positive relationship between compensation practices and employee knowledge sharing trust in university of Uyo in Akwa Ibom and university of Calabar in Cross River States, Nigeria.

Table 1. Multiple regression analysis results for the constructs of human resource management practices and employee knowledge sharing behaviour

Variable	Probit			Logit			Extreme value		
	Coef.	z-stat.	Prob.	Coef.	z-stat.	Prob.	Coef.	z-stat.	Prob.
Comp	1.3584	1.6945	0.0002	1.5762	2.7466	0.0001	1.3547	1.5452	0.0002
PA	0.1346	0.7443	0.3114	0.3754	1.0343	0.2021	0.1273	0.1164	0.4213
Sup	1.5642	1.6782	0.0003	1.8432	2.2453	0.0002	1.1794	1.8552	0.0001
Pseudo R^2		0.7823			0.7495			0.7534	
LR statistic		54.443	0.0000		57.532	0.0000		52.893	0.0000
Akaike info criterion (AIC)		3.9764			3.9153			3.9537	

Source: SPSS Version, 28.

Hypothesis 2

H_0: Performance appraisal does not have a significant effect on employee knowledge sharing turnover.

H_A: Performance appraisals have a significant effect on employee knowledge sharing turnover.

The coefficient of performance appraisal (PA) was positive but not significant 0.3754 with the z-stat and p-value of 1.0343 and 0.2021 respectively. The coefficient failed the significance test at the 5 per cent level; therefore, the null hypothesis is retained. This implies that performance appraisal does not have a significant effect on employee knowledge sharing turnover in university of Uyo in Akwa Ibom and university of Calabar in Cross River States, Nigeria. River States Nigeria.

Hypothesis 3

H_0: Supervision does not have a significant effect on employee knowledge sharing intention.

H_A: Supervision has a significant effect on employee knowledge sharing intention.

The test of hypothesis of the relationship between supervision (Sup) and employee knowledge sharing behaviour outcomes shows that the coefficient of the constructs was 1.8432 with z-stat of 2.2453 and a probability of 0.0002 respectively. The coefficient passed the significance test at the 5 percent level; therefore, the null hypothesis was rejected. This implies that supervision have a significant positive effect on employee knowledge sharing behaviour in Federal Universities in Akwa Ibom and Cross River States Nigeria.

6.1 Discussion of Findings

The test of hypothesis one revealed that the coefficient of compensation practices was positive (c = 1.5762; z-stat = 2.7466) and significant at 5 per cent (0.0001). This result implies that there is a significant positive relationship between compensation practices and employee knowledge sharing trust in university of Uyo in Akwa Ibom and university of Calabar in Cross River States, Nigeria. However, the result of this study agreed with the conclusions of Dialoke and Paschal (2017) who found that compensation has significant positive effect on workers performance and enhanced positive knowledge sharing behaviour.

Ndungu (2017) stated that compensation mechanism of an organization can enhance employee motivation that can improve their willingness to share knowledge within organization. Employees who are willing to share and create knowledge could be encouraged by incentive support within the organization. The result of the study was corroborated by Matoskova and Smesna (2017) who stated that using bonus package to reward employees for improve performance will motivate them to put in more effort in future task and will also motivate the under-performing employees to improve on their performance in order to be rewarded by their organization thereby enhancing knowledge sharing among employees.

In hypothesis two, the coefficient of performance appraisal was positive but not significant 0.3754 with the z-stat and p-value of 1.0343 and 0.2021 respectively. The coefficient failed the significance test at the 5 per cent level; therefore, the null hypothesis was retained. This implies that performance appraisal does not have a significant effect on employee knowledge sharing turnover in university of Uyo in Akwa Ibom and university of Calabar in Cross River States, Nigeria. This result was in line with the findings of Fajana et al. (2011) who found that performance appraisal had significant positive effect on workers performance but negative impact on workers knowledge sharing behaviour.

The test of hypothesis three shows that the coefficient of supervisor was positive with (c = 1.8432, z-stat = 2.2453) and a p-value of 0.0002, respectively. Thus, the coefficient passed the significance test at the 0.05 percent level. This result implies that supervision have a significant positive effect on employee knowledge sharing behaviour in Federal Universities in Akwa Ibom and Cross River States Nigeria. This study's finding agrees with the study of Masui et al. (2019) that supervision play a vital role in enhancing workers performance and knowledge sharing behaviour by providing technical support and guidance to workers in discharging their duties and responsibility. The study was also supported by the finding of Ofobruku and Nwakoby (2015) who stated that supervision is a relationship between a more experienced employee and a less experienced employee for purposes of sharing knowledge and insight with respect to a specific task or duties for improve performance.

7. Conclusion and Recommendations

Human resource management practices have continued to play a vital role in institutions globally. However, this study explored the relationship between human resource management practices and employee knowledge sharing behaviour in Federal Universities in Akwa Ibom and Cross River States Nigeria. Some selected human resource management practice constructs were chosen for the study (compensation, performance appraisal and supervision) on employee knowledge sharing behaviour. The result showed that human resource management practices have a significant positive effect on employee knowledge sharing behaviour in Federal Universities in Akwa Ibom and Cross River States Nigeria. Specifically, the study concluded that compensation and supervision have a significant positive effect on employee knowledge sharing behaviour in Federal Universities in Akwa Ibom and Cross River States Nigeria. However, performance appraisal has no significant relationship on employee's knowledge sharing behaviour in Federal Universities in Akwa Ibom and Cross River States Nigeria.

The universities must attract, develop and maintain an energetic workforce to support their goals and strategies. Maintaining and improving educational standards is only possible through the effective utilisation of the human resources in the institutions. Human resources of a university system are the greatest aid to learning, and they should be thoroughly empowered and supported.

It is pertinent to conclude that organizations, particularly institutions need to pay more attention to human resources management practices, and ensure it effectiveness in order to enhance workers performance and improve workers knowledge sharing behaviour in organization. The following recommendations were made:

1) Management of universities should provide adequate compensation practice in order to complement workers efforts, boost performance and encourage positive knowledge sharing behaviour among the employees.

2) Adequate supervision should be enhanced in the institutions to improve employee attitude toward knowledge sharing by providing support and guidance to workers in discharging their duties and responsibility.

3) Effective information sharing in institutions should be actively encouraged to improve employee's performance.

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Empowering Healthcare Leadership Through Facilitators of Evidence-Based Management: A Narrative Review and Proposed Conceptual Framework

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Abstract

Decision-making in healthcare leadership often relies on subjective experiences rather than structured, evidence-based approaches, leading to inefficiency, missed opportunities for improvement and ineffective control over rising healthcare costs. This narrative review examined key facilitators that enhance the adoption of Evidence-Based Management (EBMgt) in healthcare, focusing on leadership effectiveness, operational efficiency, and strategic decision-making. A comprehensive literature search was conducted across PubMed, ABI/INFORM, Google Scholar, Emerald, ResearchGate, Harvard Business Review, ProQuest, and Health Business Elite, covering studies from 2015 to 2025. After applying inclusion criteria, 37 studies were analyzed to identify enablers supporting EBMgt implementation. The most common study designs were quantitative cross-sectional studies (n=11), systematic literature reviews (n=6), and qualitative studies with semi-structured interviews (n=5), with most studies conducted in the United States (n=9), Iran (n=6), and Australia (n=4). The findings showed that leadership commitment, organizational culture, access to high-quality evidence,

professional development, stakeholder engagement, and digital solutions are crucial in fostering an EBMgt culture. Healthcare organizations that effectively leverage these facilitators demonstrate improved adaptability, better resource utilization, and more informed leadership decisions. This review introduced the EBMgt Implementation Pentagon Model, a new conceptual framework encompassing five key constructs — Implementation Intentions (II), Knowledge Management (KM), Implementation Science (IS), Organizational Culture (OC), and Stakeholder Engagement (SE) to evaluate EBMgt adoption and increase awareness of its importance. Assessment included four statements per construct, evaluated using a five-point Likert scale. EBMgt adoption was weighed through a structured scoring system, with higher percentages (≥80%) signifying stronger integration, leadership commitment, and organizational alignment, while lower percentages (<40%) indicate minimal or no adoption.

Strengthening EBMgt through research-based evidence-informed decision-making (EIDM), data transparency, managerial training, economic evaluation, cost management, and digital transformation is essential for sustaining evidence-based decision-making. Future research should focus on refining measurement tools, addressing implementation barriers, and assessing long-term outcomes of EBMgt adoption while leveraging health systems science to promote sustainable healthcare systems.

Keywords: Evidence-Based Management, EBMgt, healthcare leadership, decision-making, enablers, operational efficiency implementation strategies, healthcare organizations, research utilization, EBMgt Implementation Pentagon Model

1. Introduction

Every day, individuals rely on various forms of evidence to guide their choices, often without pausing to think about what "evidence" truly means. Managers exist in every nation, business, and organization, and they operate within the confines of the specific cultures, regulations, and practices pertinent to their environments. Consequently, a manager may oversee a singular project, a small enterprise, or a substantial organization.

In recent decades, there has been a strong focus on conducting scientific research on management practices and developing innovative organizational and administrative models, including Evidence-Based Management (EBMgt) as a strategic approach to improving healthcare leadership and decision-making. (Briner et al., 2009; Greene, 2020) The term "evidence-based" first emerged in the medical field during the 1990s, but its principles have since been adopted in various disciplines, including education, public policy, social work, and, more recently, healthcare management (Rousseau, 2013).

Evidence-Based Management (EBMgt) involves making informed decisions by relying on data and research findings as the basis for decision-making (The Center for Evidence-Based Management (CEBMa), 2025). According to Barends & Rousseau (2018), "Evidence-Based Management is about making decisions through the conscientious, explicit and judicious use of the best available evidence from multiple sources." Evidence-Based Management aims to enhance decision-making (Briner et al., 2009). This approach to decision-making and daily operational practices enables management practitioners to rigorously assess the reliability of the evidence they possess (Cruz & Blaney, 2021).

Additionally, it assists them in identifying, locating, and evaluating further evidence pertinent to their decisions. Figure 1 illustrates the key components influencing decision-making in an Evidence-Based Management framework, emphasizing four essential factors: research and evaluation, practitioner experience and judgments, stakeholder preferences and values, and organizational context (Barends & Rousseau, 2018). These elements collectively shape decisions by integrating empirical evidence, professional expertise, stakeholder input, and situational factors, ensuring a comprehensive and informed approach to management.

Figure 1. The Four Elements of Evidence-Based Decision

Source: Adapted from Barends and Rousseau (2018) and modified by the author.

Integrating Evidence-Based Management (EBMgt) into healthcare has been inconsistent for over a decade and many healthcare organizations rely solely on experience-based decision-making, overlooking available data sources and sometimes disregarding evidence (Hedayatipour et al., 2024). For instance, Lugo-Gil et al. (2019) found that many government healthcare leaders lacked a clear understanding of evidence-based decision-making (EBDM), often relying on subjective data rather than rigorous, objective research when shaping policies and programs. This approach highlights a gap between the rapidly evolving business landscape and healthcare managers' practices that struggle to adapt to a data-driven world (Alavi et al., 2015; Daouk-Öyry et al., 2021; Orlu et al., 2023). In effect, it is asserted that "billions of dollars are 'left on the table' or even squandered when managers" disregard evidence-based business practices and instead rely on less reliable sources of information (Olivas-Luján, 2008). This gap arises from an organizational lack of interest, low awareness, and insufficient frameworks for effective implementation (Speicher-Bocija & Adams, 2012). Understanding the reasons for the slow adoption of EBMgt is essential to identifying obstacles and developing strategies for its practical use.

The increasing complexity and competitiveness characterizing the modern healthcare arena require practitioners and managers to adopt robust and efficient strategies for evidence-based decision-making (Guo et al., 2017). EBMgt is one such model, and its implementation substantially impacts healthcare facilities' performance, as it bridges gaps between theory and practice, leading to better organizational and managerial decisions (Azar et al., 2024; Jaana et al., 2013; Janati et al., 2018b; Janati et al., 2018a).

This review contributes to the field of Evidence-Based Management (EBMgt) by critically evaluating relevant literature, identifying key facilitators that enhance EBMgt adoption, and outlining a structured theoretical framework (Baba & HakemZadeh, 2012; Bastani et al., 2019; Humphries et al., 2014). Additionally, it proposes a model for assessing the readiness to adopt evidence-informed decision-making in healthcare leadership, offering insights into optimizing managerial practices through validated EBMgt principles (Eapen et al., 2023; Shafaghat et al., 2022a). Understanding the reasons for the slow adoption of EBMgt is essential to identifying obstacles and developing strategies for its practical use.

2. Background and Overview

The diverse specialties, distinct professional cultures, and extensive range of services contribute to the complexities of managing healthcare (Walston, 2017). Contemporary healthcare systems face numerous challenges and escalating costs (Al Harshan et al., 2024; HealthManagement.org (HM), 2024). These issues necessitate innovative solutions from healthcare leaders equipped with the requisite skills and knowledge to execute new strategies grounded in the most reliable research evidence-based practices (Gifford et al., 2018; Kakemam et al., 2020; Saberi, 2018).

The evolution of Evidence-Based Practice (EBP) has significantly influenced decision-making in healthcare by promoting critical appraisal and the application of research (Barends & Briner, 2014). Motivated by the Evidence-Based Practice (EBP) movement, the Evidence-Based Management (EBMgt) approach started to be considered slowly but surely for managers to actively seek and critically evaluate evidence from management research to inform their professional practices (Guo et al., 2017). Due to the extensive nature of EBMgt as a management philosophy, there is currently no universally recognized or universally accepted EBMgt process (Briner et al., 2009). While EBMgt involves managers making decisions based on the best available evidence (Guo et al., 2018), healthcare executive leaders are crucial in effectively implementing evidence-based practices within their organizations (Reichenpfader et al., 2015).

2.1 Evidence

Decision-making improves based on valid research and reliable data evidence (Ellen et al., 2014). The proficient use of evidence is crucial in enabling the smooth operation of establishments in present society, including governmental bodies, healthcare institutions, commercial enterprises, and various other groups (Ellen et al., 2013; Martelli & Hayirli, 2018).

Evidence can come from various sources, including scientific research that provides generalizable insights into the world, people, or organizational practices (Baba & HakemZadeh, 2012; Rynes et al., 2018). It may also stem from operational data, local business indicators such as company metrics, key performance indicators (KPIs), or observed workplace conditions. Kilgus et al. (2024) advocated that utilization of health data is frequently linked to enhanced efficiency and considerable financial savings. Additionally, professional experience is valuable evidence, as seen when entrepreneurs refine their strategies through multiple ventures. Stakeholders also contribute essential information by highlighting potential consequences and interests related to a decision. Figure 2 illustrates the progression from raw data to benchmarks in evidence-based decision-making, emphasizing the role of monitoring (descriptive) and statistical analyses (inferential).
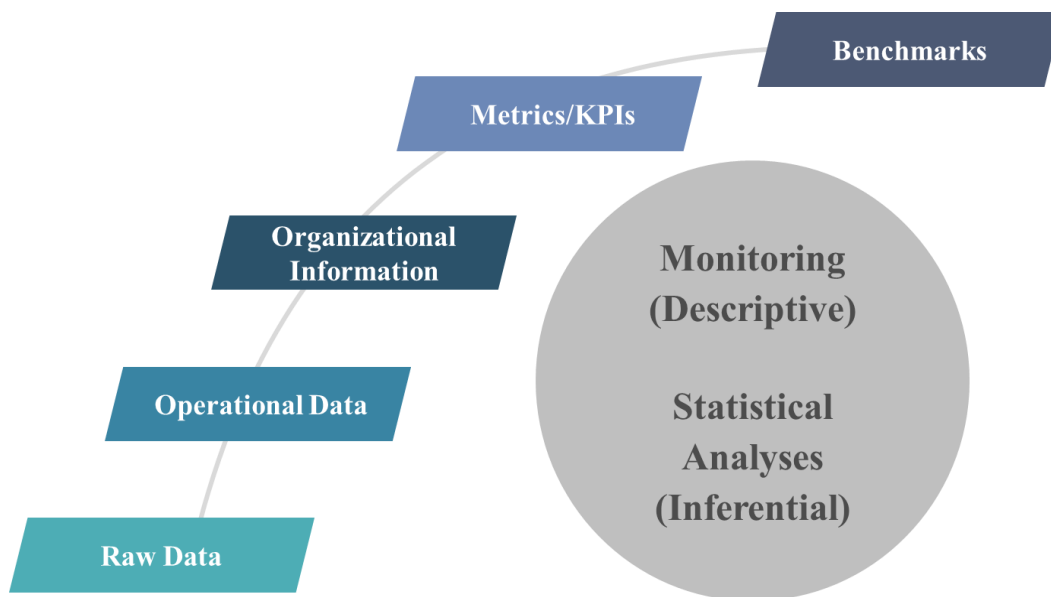

Figure 2. Organizational Data Transformation Pathway for Evidence-Based Decision-Making

Source: Adapted from Barends and Rousseau (2018) and modified by the Author.

2.2 Historical Development of Evidence-Based Management in Healthcare Administration

Evidence-based practice emerged in medicine during the 1990s, prioritizing scientific research over clinical tradition (Claridge & Fabian, 2005). Discussions soon explored its application in healthcare administration (Kovner & Rundall, 2006; Rousseau, 2006). By the early 2000s, healthcare institutions integrated research into policy, operations, and leadership, supported by electronic health records (EHRs) to enhance decision-making (Rousseau & McCarthy, 2007).

In the 2010s, healthcare organizations standardized Evidence-Based Management (EBMgt) practices, emphasizing quality improvement and interdisciplinary collaboration (Ledger, 2010). By 2015, hospitals widely adopted EBMgt, using performance metrics and patient outcomes for decision-making (Guo et al., 2015). Policy

integration and specialized training programs further strengthened implementation (Rousseau & Gunia, 2016). By 2018, big data and analytics improved managerial decisions, while patient-centered care models emphasized EBMgt's role in enhancing outcomes (Barends & Rousseau, 2018).

In 2020, the COVID-19 pandemic highlighted the importance of rapid decision-making processes in crisis response, reinforcing data-driven strategies (Bastani et al., 2022; Sallam & Snygg, 2022; Yang, 2020; Yu et al., 2021). AI, big data, and predictive analytics enhanced efficiency and resource allocation (Sallam et al., 2024b). Digital health and machine learning will continue to shape managerial decision-making, fostering global standards (Brommeyer et al., 2023; Sturm et al., 2023). Figure 3 presents the progression of Evidence-Based Management (EBMgt) in healthcare administration.
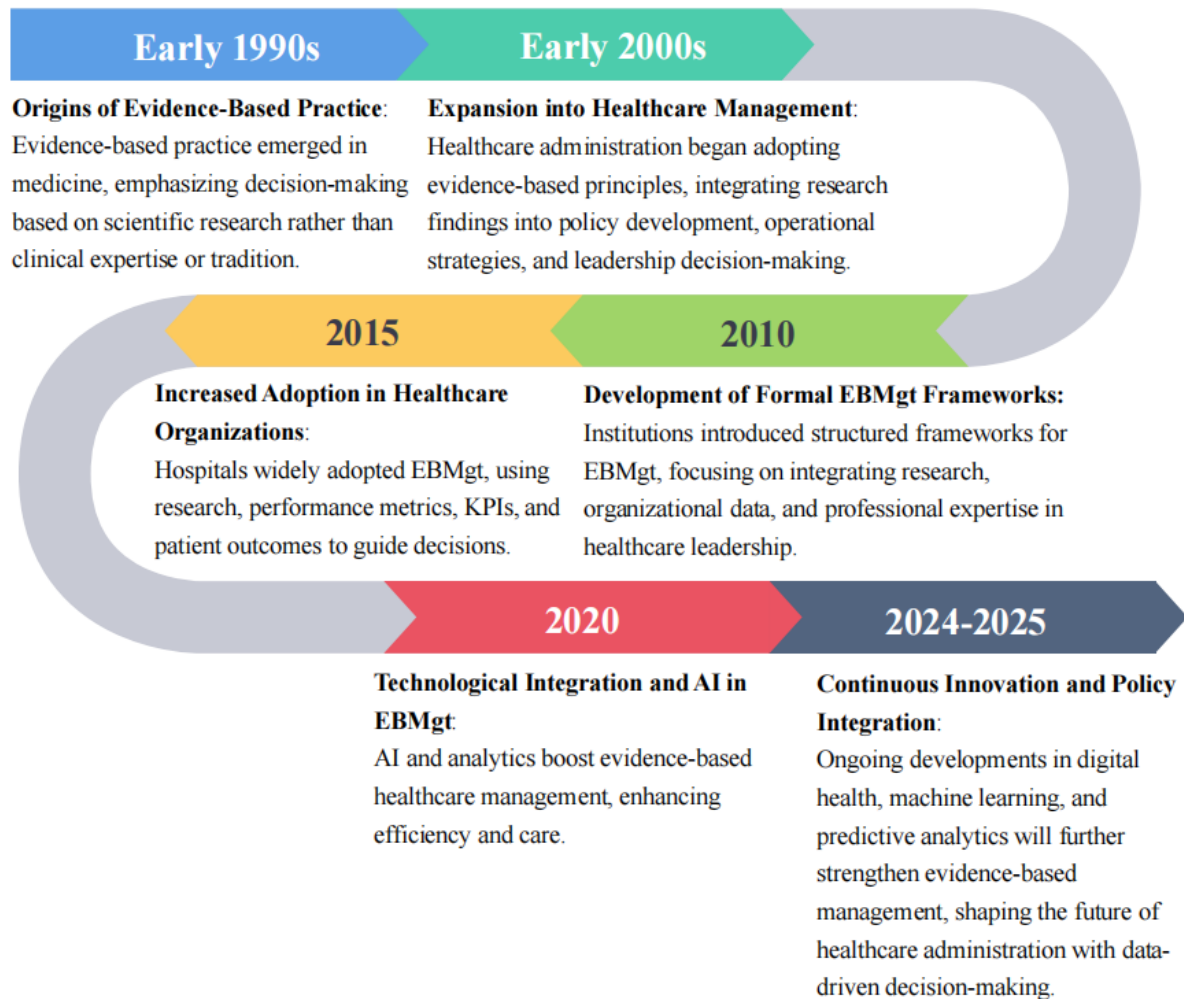
Figure 3. Timeline of Evidence-Based Management Development in Healthcare Administration

Source: Author.

2.3 Evidence-Based Management (EBMgt) Theoretical Framework

The Evidence-Based Management (EBMgt) theoretical framework (Figure 4) emphasizes the role of improved information quality and use in enhancing learning and decision-making quality (Rousseau, 2013). It integrates human experience and judgment with the best available scientific knowledge and systematic attention to organizational facts to ensure informed decisions. Evidence-based decisions and ethical considerations refine information use, enabling managers to apply high-quality evidence in organizational settings (Hasan et al., 2024).

The case for EBMgt suggests that managers can navigate challenges more effectively, ensuring that decision-making is based on reliable evidence rather than tradition, trends, self-promotion, or unquestioningly replicating high-performing organizations (Pfeffer & Sutton, 2006).

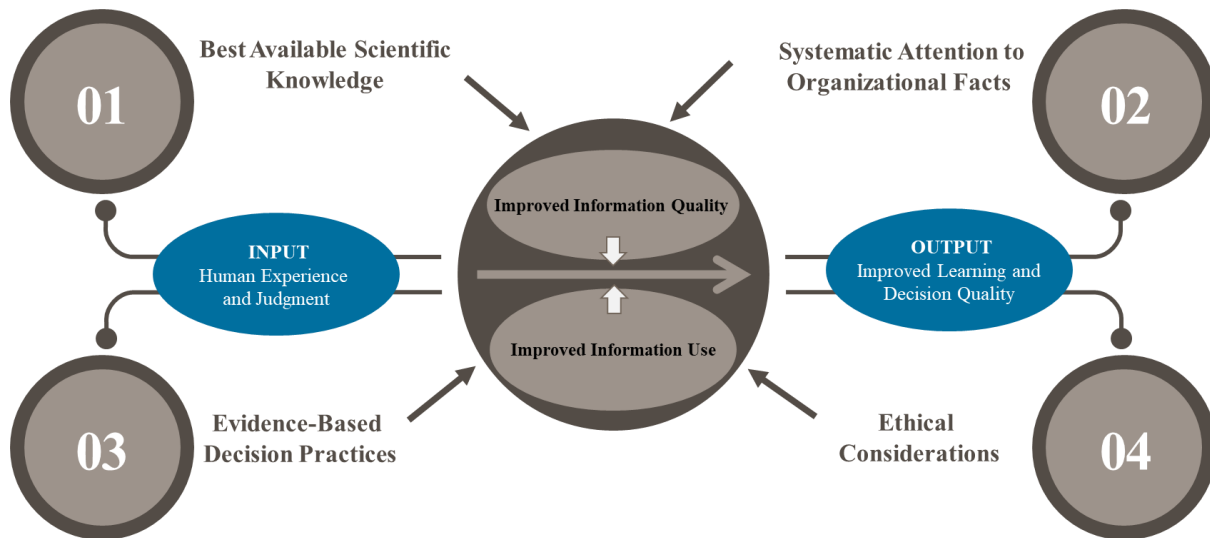Figure 4. Key Dimensions of Evidence-Based Management (EBMgt)

Source: Adapted from Rousseau (2013) and modified by the author.

Tools for healthcare executives and managers to practice Evidence-Based Management (EBMgt) are available (Shafaghat et al., 2022b). For example, the Agency for Healthcare Research and Quality (AHRQ) provides the Informed Decisions Toolbox as a structured six-step approach that guides decision-makers in gathering, evaluating, and applying evidence effectively. The six steps (Table 1) include framing the decision question, identifying information sources, evaluating accuracy, assessing applicability, determining actionability, and ensuring sufficiency of information, ensuring that healthcare leaders make informed, transparent, and accountable decisions that improve organizational efficiency and patient outcomes (Agency for Healthcare Research and Quality (AHRQ), 2019).

Table 1. Informed Decisions Toolbox: Six-Step Approach

Step	Description	Key Questions
1. Framing the Question	Define the decision and identify key information needs.	What is the decision, and what do I need to know to make a well-informed choice?
2. Finding Sources	Ensure all relevant evidence sources are explored.	Have I (or my team) looked in all the right places for evidence?
3. Evaluating Accuracy	Assess the validity, reliability, and comprehensiveness of the information.	How accurate, valid, and comprehensive is this information? Am I missing critical perspectives?
4. Assessing Applicability	Determine if the information is relevant to the specific decision and organization.	Is this information applicable to my organization and the decision I need to make?
5. Assessing actionability	Identify which recommendations can be implemented and their potential effects.	Can I translate this information into a concrete plan? What are the expected and unintended effects of my decision?
6. Determining sufficiency	Ensure enough evidence is available to make a well-informed decision.	Do I have enough information to proceed? Is there a single best option, or are multiple reasonable options available? What if the information I need does not exist yet?

Source: Adapted from the Agency for Healthcare Research and Quality (AHRQ) (2019).

2.4 Evidence-Based Management and Leadership in Healthcare Settings

In the current climate of heightened accountability in the 21st century, executive leaders in the healthcare sector across numerous organizations seek to adopt robust management methodologies, such as Lean management

(Sallam et al., 2024a), Six Sigma (Alkeelani et al., 2025; Sallam, 2024a), and similar frameworks, in order to enhance operational performance (Sallam, 2024b).

Reichenpfader et al. (2015) emphasized the critical role of leadership within healthcare organizations in successfully implementing Evidence-Based Management (EBMgt) in health environments. Their analysis of 17 studies indicated that leadership was predominantly viewed as a key facilitator for successful implementation, mainly through supportive leadership. Considering that many researchers regard leadership as a crucial contextual factor in the implementation of EBMgt, it is essential to investigate how leadership, in conjunction with organizational culture, can cultivate the advancement of such a philosophy within hospitals. (Hargett et al., 2017)

To foster a sustainable EBMgt culture, healthcare organizations must prioritize leadership development, structured decision-making frameworks, and performance-driven strategies (Olariu, 2019). Recent studies highlight the role of Lean Leadership in optimizing hospital pharmacy operations, reducing waiting times, and enhancing patient satisfaction through evidence-based methodologies (Sallam et al., 2025). The integration of Lean Six Sigma principles supports operational efficiency, strengthens employee engagement, and aligns management practices with data-driven improvements, reinforcing the importance of EBMgt in achieving superior healthcare outcomes (Sood & Teherani, 2022).

Integrating Evidence-Based Management (EBMgt) into healthcare leadership enhances decision-making and operational efficiency by aligning managerial practices with validated evidence (Figure 5). This process involves four key components. First, sources of evidence serve as the foundation, incorporating scientific research, organizational data, expert insights, and stakeholder input to support informed leadership. Second, leadership integration ensures the application of this evidence in strategic decision-making, policy document formulation (Solberg et al., 2024), and operational enhancements, fostering best practices and managerial effectiveness (Abelsson et al., 2021; Jackson & Leung, 2018). Third, implementation factors determine the success of EBMgt adoption, influenced by leadership commitment, organizational culture (El Leithy, 2017), training (Ayeleke et al., 2016), and technology integration, which facilitate the seamless embedding of evidence-based strategies in healthcare operations (Speicher-Bocija & Adams, 2012). Finally, the outcomes of this integration are reflected in stronger leadership, improved decision-making, enhanced efficiency, and better patient outcomes. Aligning these elements reinforces the role of evidence-driven approaches in optimizing healthcare leadership and performance.
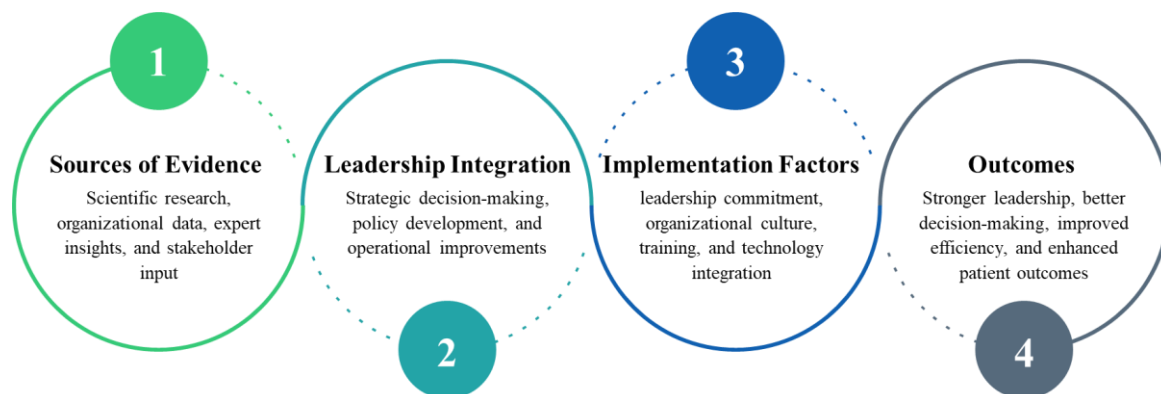
Figure 5. Integration of Evidence-Based Management in Healthcare Leadership

Source: Author.

2.5 Balancing Cost and Quality for Sustainable Healthcare

Implementing evidence-based management (EBMgt) principles through data-driven methodologies and fostering stakeholder collaboration optimizes resource allocation, reduces financial pressures, and maintains high-quality care. The global long-term sustainability of healthcare systems depends on integrating cost-conscious decision-making with innovative, patient-centered strategies that enhance efficiency and accessibility. These strategies, which put the patient at the heart of decision-making, are crucial in our efforts to improve service delivery and achieve better health outcomes (HealthManagement.org (HM), 2024).

3. Materials and Methods

3.1 Study Design

The study systematically conducted a narrative literature review (Ferrari, 2015; Green et al., 2006; Williams,

2018) to identify key facilitators of Evidence-Based Management (EBMgt) adoption in healthcare leadership. Based on the findings, the study introduces the Pentagon Model, a conceptual framework designed to assess and enhance EBMgt implementation through five key constructs: Implementation Intentions (II), Knowledge Management (KM), Implementation Science (IS), Organizational Culture (OC), and Stakeholder Engagement (SE).

3.2 Statement of the Problem

Despite the increasing recognition of Evidence-Based Management (EBMgt) in healthcare leadership, its implementation in decision-making and operational efficiency remains inconsistent (Ledger, 2010; Rynes & Bartunek, 2017). Key facilitators that support its adoption are not always well-defined or effectively leveraged, underscoring the need for a structured approach to enhance and sustain its application in healthcare settings (Kazman Kohn et al., 2011).

3.3 Theoretical Framework

This study is grounded in the Evidence-Based Management (EBMgt) Model, which emphasizes decision-making based on integrating scientific research, organizational data, professional expertise, and stakeholder input (Briner et al., 2009; Pfeffer & Sutton, 2006; Rousseau, 2006). The model provides a structured approach to improving leadership effectiveness and operational efficiency in healthcare by ensuring that managerial decisions are supported by credible evidence rather than intuition or tradition (Jepsen & Rousseau, 2022).

3.4 Research Question (RQ)

What are the key facilitators of Evidence-Based Management (EBMgt) in enhancing decision-making and leadership effectiveness in healthcare?

3.5 Literature Search Strategy

Relevant literature was identified through systematic searches (Figure 6) in PubMed, ABI/INFORM, Google Scholar, Emerald, ResearchGate, Harvard Business Review, ProQuest, and Health Business Elite.

Figure 6. Sources for Literature Search

Source: Author.

The search terms included combinations of "Evidence-Based Management enablers," "healthcare leadership," "decision-making," "operational efficiency," "management frameworks," "health systems science," and "healthcare administration." Boolean operators were applied to refine the search, using and to combine key concepts ("Evidence-Based Management" or "EBMgt") and ("facilitators" or "enablers" or "supporting factors") and ("decision-making" or "leadership effectiveness" or "managerial decision-making") and ("implementation"

or "adoption" or "policy integration") and ("healthcare" or "hospital management" or "healthcare organizations") not ("clinical management") not ("clinical trials") not ("evidence-based clinical practice" and "patient treatment decisions").

3.6 Inclusion Criteria

Studies were included if they were peer-reviewed articles, systematic reviews, or empirical studies published in English, focusing on applying Evidence-Based Management (EBMgt) in the healthcare sector. Research examining facilitators of decision-making processes, operational efficiency, and leadership EBMgt frameworks in healthcare settings was prioritized. Only studies published within the last decade were included from 2015 to early 2025 to ensure relevance to current practices.

3.7 Exclusion Criteria

Studies were excluded if they did not focus on healthcare leadership or EBMgt frameworks, as well as those concentrating solely on clinical decision-making rather than managerial applications. Non-English publications and studies with insufficient data were also excluded.

3.8 Data Collection and Analysis

The screening process began with a review of article titles and abstracts, followed by a full-text assessment to confirm eligibility. Relevant data extracted included study characteristics, research methodology, key findings, and the influence on leadership decision-making and operational efficiency.

4. Results

The initial search using combinations of the terms "Evidence-Based Management enablers," "healthcare leadership," "decision-making," "operational efficiency," "management frameworks," and "healthcare administration" focused on titles and abstracts of articles published in English, available in full text, from Jan 1, 2015, to Feb 14, 2025. This search yielded 6,747 records across the eight databases: PubMed (n=1,200), ABI/INFORM (n=258), Google Scholar (n=2,500), Emerald (n=150), ResearchGate (n=300), Harvard Business Review (n=50), ProQuest (n=2,089), and Health Business Elite (n=200).

After removing 1,970 duplicate records, 4,777 unique records remained for screening. 3,802 records were excluded based on title and abstract review due to irrelevance to Evidence-Based Management (EBMgt) in healthcare leadership. 975 articles underwent full-text assessment, resulting in 37 articles meeting the inclusion criteria. These articles encompassed elements revolving around five key thematic areas related to EBMgt enablers, including 1) Research, 2) Organizational culture and leadership support, 3) Capacity building and training strategies, 4) Technology and digital solutions strategies, and 5) Collaboration, knowledge sharing, and benchmarking strategies. Most studies included in this review were conducted in the United States (n=9), followed by Iran (n=6) and Australia (n=4), with additional studies originating from diverse regions, including Palestine, Sweden (n=2 each), and various other countries (n=1 each). The most common study design was quantitative cross-sectional studies (n=11), followed by systematic literature reviews (n=6) and qualitative studies with semi-structured interviews (n=5). Conceptual framework development, mixed-methods studies, and scoping reviews were each used in three studies, while integrative literature reviews and case study approaches were each employed in two studies. An empirical study on Polish public hospitals (n=1) and a quasi-experimental design (n=1) were identified less frequently. The final selection of studies (Table 2) provided comprehensive insights into the facilitators driving EBMgt adoption in healthcare settings.

Table 2. Overview of included studies

Author/Year	Journal	Study Design	Country	Key EBMgt Facilitators
(Sanaeifar et al., 2025)	Frontiers in Public Health	Scoping Review	Iran	Identified key competencies for Evidence-Based Management in healthcare, including leadership, communication, technical knowledge, critical thinking, research skills, information management, and stakeholder engagement.
(Azar et al., 2024)	International Journal of Healthcare Management	Quantitative, Cross-Sectional Study	Jordan	All three theory of planned behavior (TPB) constructs (attitude, subjective norm, perceived behavioral control) significantly influenced EBMgt adoption. Subjective norm was the strongest predictor.
(Diane et al.,	Journal of	Integrative	South	Executive support, continuous education,

Author/Year	Journal	Study Design	Country	Key EBMgt Facilitators
2024)	Nursing Management	Literature Review	Africa	structured incentives, effective communication, and stakeholder engagement.
(Välimäki et al., 2024)	BMC Nursing	Mixed-Methods Study	Finland	Leadership support, training programs, access to EBMgt resources, stakeholder engagement.
(Alboliteeh et al., 2023)	Sustainability	Quantitative, Cross-Sectional Study	Saudi Arabia	Knowledge management strategies, leadership support, organizational learning, and sustainability-focused decision-making frameworks.
(Alsaqqa, 2023)	F1000Research	Perspective Framework Analysis	Palestine	Leadership engagement, structured EBMgt guidelines, organizational culture, evidence integration into decision-making, and systematic monitoring for EBMgt adoption.
(Abelsson et al., 2022)	Journal of Healthcare Leadership	Qualitative Content Analysis of Individual Interviews	Sweden	Leadership influence, organizational support, and structured EBMgt frameworks were key facilitators of effective decision-making.
(Elkhyer et al., 2022)	International Journal of Health Sciences	Quasi-Experimental Design	Egypt	Evidence-Based Decision-Making (EBDM) knowledge scores improved immediately and at 3 months post-training with a statistically significant increase in EBDM application.
(Sahakian et al., 2022)	Journal of Health Organization and Management	Scoping Review	Global	Leadership commitment, organizational culture, access to high-quality evidence, integration of evidence into decision-making, and stakeholder involvement.
(Shafaghat et al., 2022a)	Archives of Public Health	Quantitative, Cross-Sectional Study	Iran	Leadership commitment, training programs, supportive organizational policies, and access to evidence-based resources.
(Young, 2022)	Journal of Applied Leadership and Management	Design-Based Case Study	United States	Leadership readiness, structured interventions, strategic decision-making frameworks, training, and development for EBMgt adoption.
(Daouk-Öyry et al., 2021)	British Journal of Management	Qualitative Study with Semi-Structured Interviews	Lebanon	Thirteen competencies were identified and grouped into four dimensions: technical, cognitive, interpersonal, and intrapersonal. Key facilitators include open-mindedness, research knowledge, ethicality, resourcefulness, and relationship management.
(Shafaghat et al., 2021a)	Systematic Reviews	Scoping Review	Iran	Positive attitudes towards EBMgt, strong leadership, organizational support, teamwork and collaboration, sufficient infrastructure, workforce development, and access to research and data.
(Shafaghat et al., 2021b)	Journal of Education and Health Promotion	Mixed-Methods Study	Iran	Relevant and reliable evidence, researcher-decision-maker collaboration, strong supervision and control, reforming planning and decision-making systems.
(Cruz &	Muma	Systematic	United	Leadership advocacy, fostering an

Author/Year	Journal	Study Design	Country	Key EBMgt Facilitators
Blaney, 2021)	Business Review	Literature Review	States	organizational culture that values research evidence, strategic partnerships with scholars, structured decision-support tools, and integrating innovation diffusion strategies to enhance EBMgt adoption.
(Frączkiewicz-Wronka et al., 2021)	Risks	Empirical Study On 103 Polish Public Hospitals	Poland	Stakeholder engagement, structured risk management practices, financial stability frameworks, leadership involvement in decision-making, and integration of financial sustainability strategies.
(Criado-Perez et al., 2020)	Australian Journal of Management	Literature Review and Meta-Analysis	Australia	Information system capabilities, transformational leadership, employee collaboration, knowledge sharing, resource availability, external knowledge inflows, and inter-organizational collaboration.
(Sevy Majers & Warshawsky, 2020)	Nurse Leader	Case Study Approach	United States	Leadership support, structured decision-making framework, access to multiple evidence sources, stakeholder involvement, and competency development for EBMgt adoption.
(Alsaqqa, 2020)	International Journal of Health Services Research and Policy	Conceptual Framework Development	Palestine	Organizational culture, leadership engagement, structured decision-making frameworks, access to high-quality evidence, and stakeholder collaboration.
(Hasanpoor et al., 2019)	Worldviews on Evidence-Based Nursing	Quantitative, Cross-Sectional Study	Iran	Leadership commitment, fostering an organizational culture that values research, continuous learning in management principles, stakeholder engagement, and social support for EBMgt adoption.
(Guo et al., 2019)	International Journal of Healthcare Management	Quantitative, Cross-Sectional Study	United States	Positive attitudes towards EBMgt perceived behavioral control education level as a moderator for EBMgt adoption.
(Christensen V, 2019)	Medical Care	Qualitative Study with Semi-Structured Interviews	United States	Timeliness of evidence, unbiased methodology, relevant scoping for decision-making, concise evidence summaries, stakeholder partnerships, and practical application guidance.
(Tate et al., 2019)	Journal of Health Services Research & Policy	Systematic Review and Meta-Synthesis of Qualitative Case Studies	Canada	Strong leadership support, integration of research evidence, stakeholder collaboration, and structured decision-making frameworks.
(Liang et al., 2018)	BMC Health Services Research	Quantitative, Cross-Sectional Study 360° Assessment Study	Australia	Leadership commitment, competency-based training, structured professional development programs, stakeholder engagement, and data-driven decision-making frameworks.
(Bianchi et al., 2018)	Journal of Nursing Management	Integrative Literature Review (N = 28)	Global	Twenty-eight studies were reviewed (2006–2016), all highlighting leadership as key to adopting evidence-based practice (EBP). Nurse managers shape EBP culture,

Author/Year	Journal	Study Design	Country	Key EBMgt Facilitators
				requiring training and resources.
(Afsaneh et al., 2018)	Management Decision	Systematic Literature Review	Italy	Integration of multiple evidence sources (published studies, real-world data, expert opinions), structured analysis of empirical evidence, and development of process-oriented frameworks for decision-making.
(Guo et al., 2018)	American Journal of Management	Quantitative, Cross-Sectional Study	United States	EBMgt culture, organizational support, access to EBMgt resources, and training programs.
(Greaves, 2017)	International Journal of Health Governance	Qualitative Study with Semi-Structured Interviews	Caribbean (Small Island Developing States - SIDSs)	Leadership advocacy, fostering a research-oriented culture, integration of data-driven decision-making, cross-sector collaboration, and regional policy support for EBMgt adoption.
(Guo et al., 2017)	Leadership in Health Services	Quantitative, Cross-Sectional Study	United States	Leadership attitude toward EBMgt, organizational size, professional experience, access to organizational data, and stakeholder engagement.
(Janati et al., 2017)	Ethiopian Journal of Health Sciences	Qualitative Study with Semi-Structured Interviews and Focus Group Discussions (N=48)	Iran	Scientific and research evidence, hospital data and information systems, political-social development plans, professional expertise of managers, ethical-moral evidence, and stakeholder values and expectations.
(Liang et al., 2017)	Asia Pacific Journal of Health Management	Quantitative, Cross-Sectional Study 360° Assessment Study	Australia	Leadership commitment, competency-based training, stakeholder engagement, access to organizational data, structured decision-making frameworks, and continuous professional development.
(Sarkies et al., 2017)	Implementation Science	Systematic Literature Review	Global	Establishing an imperative for practice change, building stakeholder trust, developing a shared vision, employing effective communication strategies, providing resources to support change, knowledge brokering, targeted messaging, workshops, policy briefs, and research implementation strategies.
(Guo et al., 2016)	Hospital Topics	Quantitative, Cross-Sectional Study	United States	Leadership support, organizational culture fostering evidence use, access to high-quality data, structured decision-making frameworks, and training programs for EBMgt adoption.
(Wright et al., 2016)	British Journal of Management	Mixed-Methods Study	United Kingdom	Leadership commitment, structured decision-making frameworks, and access to reliable data sources.
(Guo et al., 2015)	Journal of Hospital Librarianship	Quantitative, Cross-Sectional Study	United States	Access to organizational data, reliance on professional networks and expert consultations, availability of decision-support resources, and enhanced information literacy skills among hospital administrators.

Author/Year	Journal	Study Design	Country	Key EBMgt Facilitators
(Martins & Isouard, 2015)	Asia Pacific Journal of Health Management	Framework Development & Systematic Analysis	Australia	Competency-based education, leadership development, strategic management training, and continuous professional education.
(Reichenpfader et al., 2015)	Leadership in Health Services	Systematic Literature Review	Sweden	Leadership commitment, organizational support, transformational leadership, role clarity, and structured decision-making frameworks.

5. Discussion

5.1 Core Determinants from the Narrative Review

This narrative review was motivated by the necessity to ascertain essential determinants that promote the adoption of Evidence-Based Management (EBMgt) among leaders in the healthcare sector (Kovner & Rundall, 2006). The body of literature surrounding Evidence-Based Management facilitators exhibited a diverse range of focus and breadth (Rynes & Bartunek, 2017). This examination concludes by identifying key facilitators that can be strategically deployed to support the successful application of Evidence-Based Management in healthcare administration contexts (Ellen et al., 2014).

While authors such as Janati et al. (2018b), Alboliteeh et al. (2023), Azar et al. (2024) considered all healthcare managers, others were more specific to nursing management (Bianchi et al., 2018; Diane et al., 2024; Elkhyer et al., 2022; Hasanpoor et al., 2019; Sevy Majers & Warshawsky, 2020; Välimäki et al., 2024). Sanaeifar et al. (2025) conveyed that Evidence-Based Management was a self-directed process that enabled healthcare managers to refine and enhance their management approaches.

Some studies critiqued and observed that healthcare managers frequently relied on personal experience to make their judgments prone to bias, systematic errors, and reduced decision quality (Daouk-Öyry et al., 2021; Wright et al., 2016).

5.2 Facilitators of Evidence-Based Management (EBMgt)

Within a rapidly evolving and complex healthcare landscape, the importance of effective decision-making processes and leadership practices among healthcare administrators has become more pronounced than ever (Guo et al., 2018). Xuan Tho (2024) conveyed that formal incentive programs have the potential to facilitate the adoption of Evidence-Based Management.

This part travels through the inquiry of the key facilitators of Evidence-Based Management (EBMgt). It synthesizes insights into important enablers that can assist healthcare teams in successfully adopting Evidence-Based Management in their practice settings and managerial roles, an effort vital to improving health system outcomes (Spiri & MacPhee, 2013).

Research and Education Strategies: Strategies that involve collaboration with individuals, organizations, or policymakers facilitate the process of knowledge translation, ensuring that research findings are effectively integrated into healthcare management practices (Guo et al., 2019; Laustsen et al., 2021; Sarkies et al., 2017). Leveraging systematic reviews, real-world data analysis, and evidence synthesis enables healthcare managers to make informed decisions grounded in high-quality research (Afsaneh et al., 2018; Guo, 2020; Sahakian et al., 2022; Shafaghat et al., 2022a; Välimäki et al., 2024). Librarians can effectively contribute as collaborative team members by leveraging their skills and knowledge to aid hospital administrators in decision-making (Guo et al., 2015). Additionally, fostering partnerships with academic institutions, research bodies, and professional networks enhances access to relevant evidence, promotes innovation, and strengthens the adoption of Evidence-Based Management (EBMgt) across healthcare organizations (Preez et al., 2024).

Organizational Culture and Leadership Support Strategies: Hospital administrators hold both the responsibility and the authority to reshape their organization's structures and culture to foster research evidence that advances effective management decisions (Alsaqqa, 2020; Criado-Perez et al., 2020; Cruz & Blaney, 2021; Diane et al., 2024; Guo et al., 2017; Reichenpfader et al., 2015). As a result, the organizational board and executive leadership play a crucial role in ensuring that their institution's managerial culture is conducive to Evidence-Based Management (EBMgt) (Alsaqqa, 2023; Azar et al., 2024; Sanaeifar et al., 2025; Shafaghat et al., 2021a; Tate et al., 2019). To achieve this objective, leadership must familiarize themselves with the principles of EBMgt to identify areas where the integration of EBMgt practices and processes is necessary for optimizing patient healthcare outcomes (Abelsson et al., 2022; Bianchi et al., 2018; Christensen V, 2019; Rousseau, 2013; Shafaghat et al., 2021b; Young, 2022).

Capacity Building and Training Strategies: Successful EBMgt adoption depends on equipping healthcare managers with the necessary competencies to apply research-based decision-making in their leadership roles (Daouk-Öyry et al., 2021; Kakemam et al., 2020; Liang et al., 2018) Training programs, workshops, and continuous professional development initiatives play a crucial role in bridging the knowledge gap and ensuring that managers can interpret, critically appraise, and apply research findings effectively (Elkhyer et al., 2022; Guo et al., 2016; Sevy Majers & Warshawsky, 2020). Leadership development programs emphasizing analytical skills, research utilization, and problem-solving techniques further support EBMgt integration (Guo et al., 2018; Janati et al., 2017; Sanaeifar et al., 2025). Moreover, mentorship initiatives and experiential learning opportunities allow managers to practice evidence-informed strategies in real-world settings, reinforcing their ability to make data-driven decisions (Elkhyer et al., 2022). Health systems must prioritize structured competency and capacity-building efforts to ensure long-term sustainability and consistent application of EBMgt practices across managerial levels (Liang et al., 2018; Liang et al., 2017).

Technology and Digital Solutions Strategies: Technological advancements have significantly influenced the ability of healthcare leaders to implement and sustain EBMgt practices (Eapen et al., 2023). Digital solutions, including artificial intelligence (AI)-driven analytics, electronic health records (EHRs), and decision-support systems, enhance access to evidence and improve the efficiency of managerial decision-making (Greaves, 2017). Automated data analytics tools enable real-time performance monitoring, allowing leaders to identify trends, measure key performance indicators, and implement timely interventions based on empirical insights (Bates et al., 2014). To maximize the impact of technology in EBMgt adoption, healthcare organizations must invest in digital literacy training, ensure interoperability of information systems, and address data privacy concerns to build trust in digital decision-support mechanisms.

Collaboration, Knowledge Sharing, and Benchmarking Strategies: Collaborative networks, knowledge-sharing platforms, and benchmarking frameworks are essential enablers of Evidence-Based Management (EBMgt) in healthcare (Alboliteeh et al., 2023; Frączkiewicz-Wronka et al., 2021; Hasanpoor et al., 2019; Martins & Isouard, 2015). Onofre & Teixeira (2022) highlighted that open communication and shared learning enhance evidence-based decision-making, while Kulikowski (2021) emphasized the role of structured benchmarking in improving leadership effectiveness. Regular forums, peer-review panels, and leadership summits facilitate dialogue among managers, researchers, and policymakers, ensuring that decisions are informed by diverse expertise. Additionally, integrating institutional sources, expert advisory panels, and benchmarking models strengthens knowledge accessibility, reinforces credibility, and fosters continuous improvement in data-driven healthcare management (Sanaeifar et al., 2025).

5.3 Developing a New EBMgt Implementation Pentagon Model

Classifying studies into five key thematic enablers provided a structured foundation for developing a comprehensive measurement model. The literature consistently identified these enablers as critical factors influencing EBMgt adoption in healthcare settings.

The Pentagon Model for EBMgt implementation was developed to assess and facilitate the adoption, adaptation, and application of Evidence-Based Management in healthcare. By integrating five conceptual theories: Implementation Intentions (II), Organizational Culture (OC), Knowledge Management (KM), Implementation Science (IS), and Stakeholder Engagement (SE), this model evaluates the system's capacity to implement and sustain EBMgt practices, supporting their effective dissemination in healthcare management (Figure 7).
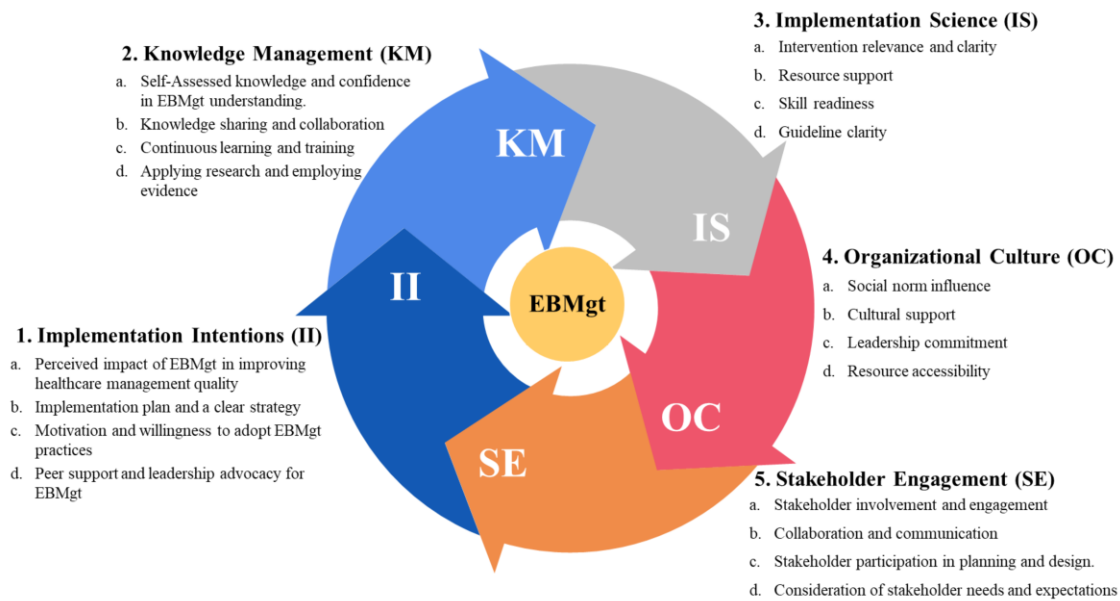
Figure 7. The EBMgt Implementation Pentagon Model

Source: Author.

Implementation Intentions (II): These are purposeful strategies used when people may be motivated to act but cannot translate that motivation into action (Wijetunge et al., 2023). Implementation intentions are distinct from behavioral intentions because they specify the conditions under which a particular target behavior will be performed. The intention of healthcare managers to implement Evidence-Based Management principles in their practice is influenced by their attitudes, subjective norms, and perceived behavioral control.

Leadership is essential in translating motivation into action by fostering a culture of implementation and reinforcing commitment to Evidence-Based Management (Walston, 2017). It pairs with peer support to align individual intentions with organizational goals, enhancing the successful adoption of these principles (Reichenpfader et al., 2015).

Knowledge Management (KM): Knowledge is an essential resource for organizations. In line with this principle, many organizations are implementing knowledge management (KM) initiatives, recognizing that their competitive advantage lies in effectively capturing, retaining, storing, and sharing knowledge (Alboliteeh et al., 2023). The adoption of Evidence-Based Management principles by healthcare managers can increase significantly when they have access to and effectively utilize relevant knowledge, skills, and the latest research information, thereby facilitating institutional evidence-based decision-making (Mutua et al., 2024; Uneke et al., 2023). Dobbins et al. (2018) highlighted that effective knowledge brokering strengthens EBMgt adoption by enhancing decision-making skills. Additionally, providing evidence summaries in a clear and comprehensible language format facilitates the adoption of Evidence-Based Management by enhancing usability, bolstering credibility, and improving decision-making efficiency for healthcare leaders (Busert et al., 2018). Moreover, various training modalities, such as blended learning and distance education, significantly contribute to capacity building for evidence-based management in healthcare by effectively bridging skill gaps and enhancing decision-making abilities among healthcare managers (Jacob et al., 2018).

Implementation Science (IS): The scientific study of techniques and approaches that aid in accomplishing the uptake of evidence-based practice and research into regular use by managers and policy-makers (Eccles & Mittman, 2006).

The practical implementation of healthcare managers in Evidence-Based Management principles can increase with adequate support and scientific resources.

Organizational Culture (OC): The organizational culture refers to the core values and practices established by an organization to manage its internal challenges and adapt to changes in its external environment. It is crucial to evaluate the organizational culture accurately, considering the impact of leaders and management on shaping and preserving the culture (Zareivenovel et al., 2024). Adopting healthcare managers to use Evidence-Based Management principles can increase when the organizational culture is supported (Rousseau, 2013).

Stakeholder Engagement (SE): The involvement of stakeholders has become a common practice in various

industries, including healthcare (Frączkiewicz-Wronka et al., 2021). The successful implementation of Evidence-Based Management principles by practicing healthcare managers depends on their ability to engage effectively and involve different stakeholders (Damba et al., 2022; Petkovic et al., 2023). These stakeholders include internal and external groups, such as healthcare leadership, clinical and non-clinical staff, organizational decision-makers, and external entities like health regulatory agencies, insurance providers, other healthcare organizations, patients, and professional associations. Each plays a crucial role in policy development, financial sustainability, service delivery, and decision-making processes, making their engagement essential for aligning Evidence-Based Management practices with organizational and systemic goals.

5.4 Evaluating and Scoring Healthcare Managers' EBMgt Adoption

Healthcare managers' EBMgt adoption can be assessed using a structured scoring system based on five key constructs of the EBMgt Implementation Pentagon Model: (1) Implementation Intentions (II), (2) Knowledge Management (KM), (3) Implementation Science (IS), (4) Organizational Culture (OC), and (5) Stakeholder Engagement (SE). A five-point Likert scale-based survey shall measure responses, with scores aggregated to determine overall adoption levels (Table 3). Each statement is rated on a five-point Likert scale (Bhandari & Nikolopoulou, 2023), with response options defined as follows: for agreement-based statements, responses range from 1 = strongly disagree (completely disagree), 2 = disagree (somewhat disagree), 3 = neither agree nor disagree (neutral), 4 = agree (somewhat agree), and 5 = strongly agree (completely agree). for frequency-based statements, responses range from 1 = never (does not happen at all), 2 = rarely (occurs occasionally but infrequently), 3 = sometimes (intermittently but not consistently), 4 = often (regularly but not always), and 5 = always (occurs all the time without exception).

Table 3. EBMgt Implementation Pentagon Model Constructs and a Five- Points Likert Scale

Pentagon Construct	Statement	Likert Scale Option
Implementation Intentions (II)	1) Applying Evidence-Based Management (EBMgt) principles enhances the quality of healthcare decision-making and management.	Agreement
	2) A structured and actionable plan for implementing EBMgt is established within my organization.	Agreement
	3) I am highly motivated to integrate EBMgt principles into my managerial decision-making processes.	Agreement
	4) My colleagues, peers, and leadership actively support the implementation of EBMgt in our organization.	Agreement
Knowledge Management (KM)	5) My organization provides sufficient knowledge and training on EBMgt to support informed decision-making.	Frequency
	6) Exchanging knowledge and best practices is a fundamental component of effective EBMgt adoption.	Agreement
	7) EBMgt-focused training and professional development programs are regularly conducted in my organization.	Frequency
	8) Integrating research findings into managerial decision-making is essential for optimizing healthcare outcomes.	Agreement
Implementation Science (IS)	9) The EBMgt framework is relevant, comprehensible, and applicable to daily management tasks.	Agreement
	10) My workplace provides adequate support and resources to facilitate EBMgt implementation.	Frequency
	11) I have the necessary skills to evaluate and apply research findings in my managerial decisions critically.	Agreement
	12) My organization has well-defined guidelines for systematically implementing EBMgt strategies.	Frequency
Organizational Culture (OC)	13) Social norms and professional expectations influence how EBMgt is adopted in my organization.	Frequency
	14) The organizational culture within my workplace	Agreement

Pentagon Construct	Statement	Likert Scale Option
	actively promotes and facilitates EBMgt adoption.	
	15) Leadership within my organization is visibly committed to the successful implementation of EBMgt.	Agreement
	16) Access to EBMgt-related resources, such as research databases and decision-support tools, is seamless and efficient.	Agreement
Stakeholder Engagement (SE)	17) Engaging stakeholders, "including healthcare providers, policymakers, and administrators," in the decision-making process is crucial for the effective implementation of EBMgt.	Agreement
	18) Key stakeholders are actively and consistently engaged in EBMgt planning.	Frequency
	19) Clear and structured communication channels enhance collaboration and contribute to the success of EBMgt.	Agreement
	20) The implementation of EBMgt practices effectively meets stakeholders' priorities and expectations.	Agreement

Scores are categorized into high, moderate, limited, or minimal adoption (Table 4), allowing for targeted analysis and improvement strategies. Statistical methods, including descriptive and inferential analyses, can be used to identify the distribution of responses and key enablers or predictors influencing EBMgt adoption, respectively. It also guides interventions to enhance evidence-based decision-making in healthcare management.

Table 4. EBMgt Adoption Levels and Evaluation Criteria

Score Range (%)	Adoption Level	Interpretation
80 — 100%	High Adoption	Strong integration of EBMgt principles, well-supported by organizational culture and leadership.
60 — 79%	Moderate Adoption	Partial implementation with room for improvement in specific areas.
40 — 59%	Limited Adoption	Basic application, but significant knowledge, support, or stakeholder engagement gaps exist.
< 40%	Minimal Adoption	Low or no integration, requiring targeted interventions to initiate and enhance EBMgt application.

5.5 Implications for Practice and Future Research Directions

The outcomes of this investigation yielded significant insights that possess numerous practical implications for the adoption and integration of Evidence-Based Management (EBMgt) within hospitals and healthcare systems. Initially, healthcare executives must evaluate the current level of EBMgt practices across all leadership tiers and the institution as a unified entity, thereby establishing a foundational benchmark for evidence-based leadership methodologies. Health Systems Science (HSS) could provide a complementary approach by integrating system-wide thinking, interdisciplinary collaboration, and sustainable healthcare strategies to enhance EBMgt adoption (Sood & Teherani, 2022). The EBMgt Implementation Pentagon Model presents a structured framework to aid in this evaluation, offering a systematic means to measure the incorporation of EBMgt through its five principal constructs. This model enables healthcare organizations to identify gaps, reinforce supportive factors, and monitor their progress toward evidence-based decision-making (EBDM). To ensure the validity of the Pentagon Model, future research should assess its content validity index (CVI) through expert evaluations, measuring relevance, clarity, and applicability across healthcare settings.

Healthcare systems aspiring to integrate EBMgt must appreciate the facilitators involved in its implementation and acknowledge the necessary shifts in leadership style and organizational culture to realize this objective successfully.

Furthermore, health scholars and executives may engage in action research projects to assist health systems in

implementing Evidence-Based Management practices. Establishing partnerships with academic institutions and leveraging external expertise can enhance evidence accessibility (Preez et al., 2024).

Consequently, future research initiatives may encompass the execution of both cross-sectional and longitudinal studies within healthcare organizations.

Bridging the gap between research and decision-making requires targeted research, clear messaging, and capacity building to enhance evidence-based public health policies (Orton et al., 2011).

5.6 Study Limitations

Despite the comprehensive approach taken in this review, several limitations must be acknowledged. The reliance on secondary data from existing literature may have introduced selection bias, as only published studies meeting predefined inclusion criteria were considered, potentially overlooking unpublished or grey literature. The heterogeneity of methodologies across the included studies limits direct comparisons and generalizability, as healthcare leadership and decision-making structures vary across regions and institutions. While the review focused on facilitators, systemic barriers such as resistance to change, resource constraints, and regulatory challenges were not deeply analyzed, which may impact the practical application of the study. Additionally, the Pentagon proposed model has not undergone empirical validation, requiring future research to conduct pilot studies and Content Validity Index (CVI) assessments to refine its applicability in different healthcare settings. Furthermore, the rapid evolution of digital health, AI, and big data in EBMgt was not fully captured, necessitating continuous updates to integrate emerging technological advancements. Addressing these limitations through further research will enhance the robustness of EBMgt frameworks and support the effective implementation of the Pentagon Model in diverse healthcare environments.

6. Conclusion

Evidence-Based Management (EBMgt) offers a structured, research-driven approach to decision-making, enabling healthcare administrators to identify opportunity gaps and implement effective, organization-specific solutions. In shared leadership settings, decision-making involves diverse perspectives, requiring a coordinated effort among healthcare managers. Integrating EBMgt principles enhances leadership effectiveness, optimizes resource allocation, and reduces costly errors. Outcome measures should focus on improved decision accuracy, leadership cohesion, and organizational efficiency, reinforcing the need for structured implementation strategies.

Further research remains essential to refine EBMgt applications and support its successful adoption in healthcare organizations. Leaders must utilize high-quality evidence while actively generating it through experimentation and continuous evaluation. The evolving nature of healthcare management calls for a flexible yet systematic decision-making approach, emphasizing evidence credibility and organizational adaptability. Future studies should explore methods to improve knowledge accessibility, enhance training programs, and develop standardized frameworks for EBMgt integration, ensuring sustained improvements in healthcare leadership and operational efficiency.

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Does Control of Corruption Sand or Grease the Wheel of Human Development? Evidence from Panel Threshold Analysis

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Abstract

This paper applies the panel threshold regression analysis to investigate the potential non-linear relationship between control of corruption and human development. Pass studies fail to investigate the dynamics in the corruption-human development relationship. Using a sample of 163 countries from 2000 to 2017, the results indicate that a decline in corruption initially improves human development but after a threshold level of human development, control of corruption reduces human development. Explicitly, the results suggest that control of corruption might grease the wheel of human development in countries with low HDI and sand the wheel in countries with high HDI. We also find that political stability, government effectiveness role of law, regulatory quality, research and development and urbanisation improve human development whereas an increase in the prevalence of anaemia and smoking reduces human development.

Keywords: human development, control of corruption

1. Introduction

The past years have witnessed growing attention in economic research and policy circles regarding the issue of human development. Researchers are intrigued by the stunning paradox posed by the fact that most developing countries are very rich in natural resources but unable to convert these rich resources to sustainable human development (Deaton, 2019; Piketty, 2020). While most of these countries are rich in natural resources, they also face the problem of high levels of corruption (Khan et al., 2020; Nginyu, 2023). The evidence in the literature indicates that the problem of corruption is not unique to developing countries; it exists throughout the world, in developed and developing countries, though it is more prevalent in less developed countries (Mauro, 2020; Transparency International, 2022; Fonchamnyo & Nginyu, 2023; Nginyu et al., 2023). Though the problem of corruption is not new, it still deserves serious attention since the debate about the effect of corruption has not yet been settled (Rothstein & Teorell, 2019; Gupta & Tiwari, 2021).

An ample literature has studied the relationship between corruption and economic growth as well as human development. There are two divergent approaches in the theoretical literature concerning the effect of corruption on economic growth: the efficiency-enhancing approach and the efficiency-reducing approach. Authors of the efficiency-enhancing approach such as Leff (1964) and Nye (1967)[1], argued that corruption improves efficiency in an economy while advocates of the efficiency-reducing approach such as McMullan (1961), Shleifer and Vishny (1993), Krueger (1974), Tanzi and Davoodi (1998), Mauro (1995), Akcay (2006), Mauro (1996) Fonchamnyo and

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[1] Nye (1967) examine corruption by applying a cost-benefit analysis. The effect of corruption can either be negative or positive depending on the probability of its cost to be more than its benefit or vice versa.

Nginyu (2023), Nginyu et al. (2024) and Fonchamnyo et al. (2023) claim that corruption hampers economic growth and distorts resource allocation thereby reducing efficiency.

Over the past years, there have been numerous empirical studies about the impact of corruption. Many authors have empirically shown that corruption harms economic growth as well as human development. For instance, Mauro (1995), Ades and Di Tella (1997), Mauro (1996), and Tanzi and Davoodi (1998) found a negative relationship between investments and corruption. Mauro (1996), Tanzi and Davoodi (2000), Leite and Weidmann (1999), Abed and Davoodi (2000) and Mo (2001) found that corruption hurts economic growth. Wei (2000), Habib and Zurawicki (2001) and Drabek and Payne (2002), found that corruption is a hindering factor for foreign investors. Al-Marhubi (2000) found a positive relationship between inflation and corruption. Bahmani-Oskooee and Nasir (2002) showed that countries with high levels of corruption tend to have a real depreciation in their currency. Gupta (1998) found that corruption increases income inequality as well as poverty by reducing economic growth. Tiongson et al. (2000) found that corruption increases infant and child mortality rates as well as increases dropout rates in primary school. Akhter (2004), Akcay (2006) and Ortega et al. (2016) found that corruption harms human development. In a nutshell, the foregoing literature suggests that the costs of corruption are immense.

Furthermore, the existing studies also established that this relationship is very likely to be nonlinear such that the effect of corruption on economic growth may vary based on the level of economic development. For example, Saha and Gounder (2013) showed a pattern of non-linear relationship between economic growth and corruption across different income levels[1]. Huang (2016) showed that corruption has a significantly negative effect on economic growth in all the 13 Asian-Pacific countries on the other hand corruption has a positive effect on growth for South Korea. Shumetie and Watabaji (2019) confirmed that corruption has a positive effect on Ethiopian enterprises. Mudassaar et al. (2019) found that corruption enhances growth in East Asia and South Asia and in the West Asian region corruption is found to be a hindrance to growth.

We, therefore, notice that there is yet a conclusion in the literature to that which concerns the effect of corruption on human development. The best way to understand this relationship is to verify the effect of corruption on human development by employing the threshold regression technique of Hansen (1999)[2]. The question to be answered here is, is it always beneficial (at all levels) to control corruption or is there a level at which it is no more important to control corruption? In other words, is there any level at which the effect of corruption changes?

Although "less corruption, more human development" is a reasonable conjecture, however, the opposing views about the effects of corruption on human development in the literature suggest that this relationship is more probable to be nonlinear such that, the effect of corruption on human development may differ by levels of economic development. Nevertheless, there has been limited evidence to confirm that the development level of a country makes a difference in the way corruption affects human development. This conjecture therefore requires a flexible modelling approach that can be able to accommodate a nonlinear corruption-human development interaction therefore, there is a need for a threshold regression approach.

This study extends the literature in three aspects. Firstly, we employ a regression approach based on the idea of the threshold effect of Hansen (2000). This approach permits us to allow the relationship between corruption and human development to be piecewise on the level of development of a country acting as a regime-switching determinant (variable). Secondly, we use a sufficiently large data set to enable robust conclusions to be drawn. Specifically, the data set employed in this study consists of annual data from 163 countries from 2000 to 2017. Thirdly, the study fills the gap between the empirical and theoretical literature by verifying the non-linear relationship between corruption and human development.

2. The Between Human Development and Corruption

Theoretically, the is no consensus in the literature regarding the effect of corruption on human development. The theoretical argument about the effect of corruption have divided researchers into two groups as early announced above. Two theories explain how corruption influences human development; the "grease the wheels" hypothesis which explains the ways through corruption can benefit the economy (Leff, 1964; Nye, 1967; Lui, 1985; Mauro, 1995; Mo, 2001; Dridi, 2013; Gründler & Potrafke, 2019; Fonchamnyo & Nginyu, 2023). On the other hand, the "sand the wheels" hypothesis which on the other hand explain the ways through which corruption can harm the economy (Nye, 1967; Mauro, 1995; Mo, 2001; Saha & Gounder, 2013; Gründler & Potrafke, 2019).

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[1] Saha and Gounder (2013) showed that high-income countries are less corrupt compared to low-income countries but the middle income countries are perceived to be more corrupt than the low-income countries. The non-linear results show that corruption increases at low economic development stage and decreases as nations' achieve higher levels of economic development.

[2] The threshold regressions of Hansen (1999) is an estimation technique capable for non-linear and non dynamic panel based on the intuition that individual observations can be divided into two classes based on the value of an observed variable.

Firstly, to that which concerns the "grease the wheels" hypothesis, according to Grundler and Potrafke (2019) when procedures (bureaucracy) for starting businesses are long, bribing will probably give rise to vibrant economic activities. Therefore, corruption may help to facilitate economic exchange, helping to overcome cumbersome regulations. Mo (2001) claimed that Corruption is like a piece-rate wage to bureaucrats, which encourages an efficient provision of government services, and therefore provides a breathing space for entrepreneurs to bypass long cumbersome and inefficient regulations. From this perspective, corruption acts as a lubricant that smooths operations and, hence, raises the efficiency of an economy. Corruption can therefore be a good source to increase efficiency by removing the rigidities imposed by the government which delays investment and disturbs economic decisions that are unfavourable to economic growth Dridi (2013). In addition, employees who charge bribes can also work harder since bribes act as a piece rate (Mauro, 1995). This is why Lui (1985) argued with his queue model that corruption may be desirable in an economy since it minimizes the average queueing (waiting line) time spent for bureaucracy. Corruption can, therefore, drive corrupt officials to be more efficient and to make decisions faster.

Secondly, the "sand the wheels" hypothesis explains on the contrary that, corruption decreases human development through several channels. Corruption prevents the efficient allocation of resource (financial as well as human resources) for production the production of goods and services (Murphy et al., 1991) and Mauro (1995). Mauro (1995) argued that public officials do not like to spend more on health and education since those spending programs give them fewer opportunities for rent-seeking activities. Corruption hinders the state's legitimacy and gives some people advantages that others do not have as it dismisses the rule of fairness. Murphy et al. (1991) showed that in countries where talented people or intellectuals are allocated to rent-seeking activities economic growth tends to be very slow. In this type of country, a greater share of the country's wealth (resources) is distributed to corrupt bidders, creating to inequalities in wealth (Akcay, 2006). According to Rose-Ackerman (1997), corruption also alters the allocation of resources favouring the "haves" against the "have-nots" leading to income inequality which can also lead to political instability as the less privileged will revolt for change. Corruption makes the business environment fragile and therefore discourages investment. In addition, corruption affects human development by causing political instability which weakens administrative capacity and hinders democracy as well as economic activities.

From both theoretical and empirical literature, we can therefore understand that corruption has both negative and positive effects on human development. From the cost-benefit analysis of Nye (1967) which analyses the compensation of the negative effect and the positive effects of corruption on human development, we can therefore think that there exists a level at which the effect of corruption on human development is no more negative. We therefore retain from (Nye, 1967) that the effect of corruption is negative if the costs of corruption are more than the benefits. What therefore happens if the cost is equal to the benefits or when the cost is less than the benefits? We therefore have the intuition that, there exists a level of development at which the cost of corruption is no greater than the benefits of corruption, and therefore at this level of development, it becomes disadvantageous to control corruption.

3. Empirical Model and the Data

3.1 Empirical Model

The empirical model is based on the model employed by Akcay (2006) where human development is a function of corruption as shown in equation (1) below.

$$HDI_{it} + \beta'C_{it} + \gamma X_{it} + \varepsilon_{it}\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

where HDI is the human development index, C is corruption, X is a vector of control variables, ξ is an error term and $_i$ and $_t$ are the individual and time specifications respectively.

To test attain the objective outlined in the first section, the threshold model is, therefore, appropriate to take care of the contingency effects on human development and therefore offer a better way of modelling the role of development level on the impact of corruption on human development as shown in equation (2) bellow. Therefore, we employ the threshold regression analysis suggested by Hansen (1999, 2000) to explore the nonlinear behaviour of corruption on human development. Based on the threshold regression approach, the model takes the following form;

$$HDI_{it} = \beta'_1(C_{it} + \gamma_1 X_{it})I(HDI \leq \lambda) + \beta'_2(C_{it} + \gamma_2 X_{it})I(HDI \geq \lambda) + \varepsilon_{it}\dots\dots\dots\dots\dots(1)$$

where HDI is the dependent variable as well as the threshold variable, which is used to split the sample into deferent groups or regimes λ is an unknown threshold parameter and I(.) is an indicator function, which takes the value 1 the argument in the indicator function is valid and 0 otherwise. This type of modelling approach allows the effect of corruption to differ depending on whether the HDI are above or below the unknown level of λ. The impact of corruption on human development will be β_1 and β_2 for countries with a low or high regime, respectively. Nevertheless, it is obvious that under the hypothesis $\gamma_1 = \gamma_2$ and $\beta_1 = \beta_2$ the model becomes linear and reduces to

equation (1). Models such as equation (2) have been used in the analysis of trade and growth (El Khoury & Savvides, 2006) and finance and growth (Law et al., 2013), foreign direct investment (FDI) and growth (Azman-Saini et al., 2010) among other topics. Equation (2) can also be written as;

$$HDI_{it} = \frac{\beta_1'(C_{it} + \gamma_1 X_{it})I(HDI \leq \lambda)}{\beta_2'(C_{it} + \gamma_2 X_{it})II(HDI \geq \lambda)} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(3)$$

The first step of our estimation will be to test the null hypothesis of linearity of the corruption-human development relationship $H0$: $\beta_1 = \beta_2$ and $\gamma_1 = \gamma_2$ in the threshold (non-linear relationship) model in equation (2) or (3).

3.2 Data

To investigate the effect of control of corruption on human development, this paper employed annual data from three sources; the Human Development Index (HDI) from the United Nations Development Program (UNDP), institutions dataset from World Governance Indicators (WGIs) and World Development indicators (WDI) which was compiled for 163 countries from 2000 through 2016[1]. HDI is a composite index that measures the extent to which human development has been improved. It is based on three vital aspects of socioeconomic development; education, health, and standard of living. The value of this index ranges from 0 to 1, where 0 means a low level of human development and 1 means a high level of human development.

The institutions' dataset from (WGIs) was assembled by Kaufmann et al. (2009). Several variables were used from this data source; Control of Corruption measures the extent to which public power is used for private gain, Political Stability and Absence of Violence measures perceptions of the likelihood of political instability, Rule of Law measures the extent to which agents have confidence in as well as abide by the rules of society, Regulatory Quality measures the ability of the government to frame and implement rigorous policies and regulations that permit and help private sector development, Government Effectiveness measures the quality of public services, the quality of the civil service and the degree of its independence from political pressures. All these variables from WGI range from approximately -2.5 (weak) to 2.5 (strong) governance performance and are there for expected to have a positive effect on human development.

We also used the following control variables; STJA (Scientific and technical journal articles) which refer to the number of scientific articles published in chemistry, physics, clinical medicine, biology, mathematics, engineering, biomedical research and technology and earth and space sciences, UP is Urban population (% of total population), POS is the prevalence of smoking POA is the prevalence of anaemia among children under the age 0f 5 year measured as a percentage of children under the age of 5 whose haemoglobin level is less than 110 grams per litter at sea level.

4. Empirical Results and Discussion

4.1 Results of the Baseline Model

Table 1 and 2 presents the descriptive statistics and correlation analysis of the variables employed in the analysis respectively. As demonstrated in Table 2, all the variables are highly correlated among themselves. As confirmed in Table 2, all the variables are highly correlated among themselves.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
HDI	2,934	.6791626	.1651193	.252	.953
RL	2,934	-.0341868	1.001409	-2.255175	2.100273
RQ	2,934	.0435902	.9662186	-2.25506	2.260543
GE	2,934	.0303919	.9893553	-2.270754	2.436975
PS	2,934	-.0748159	.9587841	-2.180798	1.760102
CC	2,934	-.0178597	1.023667	-1.82574	2.469991

Source: Computed by authors.

Table 3 reports the results of the estimation of equation 2 which investigates the effect of corruption on human development by applying Hansen (2000) threshold regression. The transitional variable is human development

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[1] The indicators from WGIs are constructed based on information gathered through a wide variety of cross-country surveys as well as polls of experts. Kaufmann et al. (1999) used a model of unobserved components, which enabled them to determine levels of coverage in approximately 212 countries for each of their indicators.

index (HDI). The statistical significance of the threshold estimate is evaluated based on the p-value calculated using the bootstrap method with 300 replications. As shown in Table 3, the bootstrap p-values shows that the hypothesis of no threshold effect is rejected for all models. Thus, the sample can be divided into two regimes thus we can therefore continue with the interpretation of the result in Table 4. The point estimate of the threshold value of HDI is 0.4980 with a corresponding 95% confidence interval [0.4970, 0.5010] for all the Models. This implies that countries bellow threshold value of 0.4980 are the low-HDI group (developing countries) while those with greater values are classified into the high-HDI group (developed countries). We also tested whether the high- HDI group could be further divided into sub-regimes and the bootstrap p-values were insignificant for the second sample split, which therefore suggest that only the single threshold in equation 2 is adequate for all models. Having established the existence of a human development threshold, the next thing is to show how control of corruption affect human development bellow and above the threshold level. Table 4 presents the empirical results of equation 2.

Table 2. Correlation

	HDI	CC	PS	RL	RQ	GE
HDI	1.0000					
CC	0.7327	1.0000				
PS	0.6154	0.7567	1.0000			
RL	0.7552	0.9537	0.7765	1.0000		
RQ	0.7520	0.8918	0.7106	0.9330	1.0000	
GE	0.8039	0.9421	0.7358	0.9569	0.9391	1.0000

Source: Computed by authors.

Table 3. Threshold estimates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Threshold estimate	0.4980	0.4980	0.4980	0.4980	0.4980	0.4980
Bootstrap p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-stat	561.86	555.71	524.72	545.06	580.41	542.89
95% Confidence interval	[0.4970, 0.4990]	[0.4970, 0.5010]	[0.4970, 0.5010]	[0.4970, 0.5010]	[0.4970, 0.5010]	[0.4970, 0.0.5010]

Source: Computed by authors.

Since the data favour a threshold model, we focused on the threshold model specifications as in equations 2 and 3 and adding a set of other institutional variables as control variables for robust tests and controlling for multicollinearity since the variables are highly correlated among themselves. Turning first to model 1 (without control variable), the coefficient estimate of control of corruption is positive and significant when the HDI is below the threshold level. On the contrary, above the threshold level of the HDI, the effect control of corruption on HDI becomes negative and insignificant.

Table 4. Regression results using Hansen (2000) threshold technique

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	1	2	3	4	5	6
CC (HDI $< \lambda(0.4980)$)	0.061***	0.059***	0.045***	0.052***	0.048***	0.040***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)
CC (HDI $> \lambda(0.4980)$)	-0.001	-0.003	-0.014***	-0.008**	-0.013***	-0.019***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
PS		0.003*				-0.002
		(0.002)				(0.002)

RL			0.027***			0.022***
			(0.004)			(0.004)
RQ				0.014***		0.000
				(0.003)		(0.004)
GE					0.023***	0.015***
					(0.004)	(0.004)
Constant	0.689***	0.689***	0.689***	0.688***	0.688***	0.688***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	2,934	2,934	2,934	2,934	2,934	2,934
R-squared	0.125	0.126	0.142	0.131	0.138	0.147
Number of Countries	163	163	163	163	163	163

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Source: computed by authors.

When we independently add political stability, the results remain unchanged though the effect of political stability is positively significant. Adding role of law, regulatory quality, government effectiveness and finally including all the control variables respectively as some control variables, the results remain unchanged when the HDI fall below the threshold level but when the HDI falls above the threshold level, control of corruption becomes negatively significant. The results also demonstrate the importance of other institutional variables.

The above findings demonstrate that HDI responds differently to control of corruption when considering the different levels of development and for corruption to have a positive effect in an economy, it must be accompanied by good performance in other institutional variables. It therefore means that there exists a level at which the marginal effect of control of corruption turns to diminish and therefore it is less important at this level to control corruption. Therefore, corruption has a U-shaped (control of corruption has an inverted U-shaped) relationship with human development. This finding is in line with the cost-benefit analysis of (Nye, 1967) where the effect of corruption is analysed concerning its cost and benefit. Here we see that below the threshold level of HD, the cost of corruption control is lower than the benefits and therefore controlling corruption increases human development. On the other hand, above the threshold, the benefits of corruption are lower than the costs of controlling corruption. Then, the effect of CC on HD becomes negative. Theoretically, this suggests that control of corruption greases the wheels of HD in countries above the threshold HDI whilst it sands the wheels of HDI when countries reach and pass a certain threshold of HD. These results are the main contribution of our paper. The results also explain the importance of other institutional variables in explaining human development. Our results therefore explain the importance of corruption in explaining the stagnation of human development in developing countries.

4.2 Robustness Check

It is difficult to gate data for a threshold regression since it needs a perfectly balanced panel without absent observations. It was therefore difficult to add all the control variables in the same sample as in the baseline model. We filtered the panel with respect to data availability in other to check for robustness in our result.

Table 5 presents the first robustness check with the following control variables; STJA, POS POA MS, Trade, CPI, PUALBDW and PUALBS. These results demonstrate the robustness of the existence of a threshold in the corruption human development relationship. It also shows the importance of STJA, UP, POS, POA, MS, Trade, CPI, PUALBDW and PUALBS in determining the level of human development in a country. The result remains the same though the threshold estimate and the confidence interval change from one estimation to the other. Our robust estimation is therefore in line with our baseline estimation.

Table 5. Regression results using Hansen (2000) threshold technique with control variables

	(1)	(2)	(3)	(4)
VARIABLES	HDI	HDI	HDI	HDI
CC (HDI $<\lambda$)	0.0238***	0.00943**	0.0199***	0.0150***
	(0.00541)	(0.00381)	(0.00461)	(0.00425)

CC (HDI $\geq \lambda$)	-0.0233***	-0.0213***	-0.0156***	-0.0115***
	(0.00445)	(0.00328)	(0.00372)	(0.00343)
PS	0.00218	0.00438***	-0.00298	-0.00477***
	(0.00195)	(0.00143)	(0.00185)	(0.00170)
RL	0.0213***	0.0154***	0.00532	0.00647
	(0.00512)	(0.00373)	(0.00430)	(0.00394)
RQ	0.00495	0.00433	0.00201	0.00484
	(0.00438)	(0.00319)	(0.00360)	(0.00331)
GE	0.0140***	0.0138***	0.0209***	0.0161***
	(0.00444)	(0.00324)	(0.00374)	(0.00346)
STJA	5.98e-07***	1.18e-07***	9.75e-08*	1.89e-07***
	(5.06e-08)	(3.90e-08)	(5.09e-08)	(4.73e-08)
UP		0.00841***	0.00730***	0.00648***
		(0.000220)	(0.000296)	(0.000280)
POS			-0.00247***	-0.00253***
			(0.000235)	(0.000216)
POA				-0.00277***
				(0.000232)
Constant	0.697***	0.187***	0.325***	0.463***
	(0.00120)	(0.0134)	(0.0207)	(0.0223)
Observations	1,778	1,778	872	872
R-squared	0.219	0.585	0.671	0.723
N^o of Countries	127	127	109	109

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Source: computed by author.

5. Conclusion

Using data from 163 countries over the period 2000 to 2017, this study investigates whether there is a development threshold in corruption-human development relationship. One main contribution of this paper was the adoption of a regression model which is based on the notion of threshold effect proposed by Hansen (1999) to take care of the dynamics in the relationship between control of corruption and human development. The empirical results showed that there is a significant developmental threshold in the corruption-human development relationship. By using the HDI to distinguish the different levels of development, when the HDI falls below the threshold, control of corruption has a positive effect on human development. However, the effect of control of corruption on human development turns out to be negative when the HDI is above the threshold level. More so, these findings suggest that the corruption human development relationship is contingent on the level of development of a country, where corruption promotes growth after HDI exceed a certain threshold level. Since the effect of corruption on human development kicks in after HDI reaches a certain threshold, policy makers should improve the level of human development (such as cracking down on corruption, improving the rule of law, improving government efficiency and transparency) to explore the benefits of corruption on human development. In addition, if a country tries to fight against corruption beyond a particular threshold, the country tends to benefit less from the decrease in corruption.

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Appendix

List of Countries in the Database

Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Democratic Republic of Congo, Republic of Congo, Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guyana, Haiti, Honduras, Hong Kong SAR, China, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Kyrgyz Republic, Lao, Latvia, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Norway, Oman, Pakistan, Panama, Papua New Guinea,

Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Samoa, Sao Tome, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Solomon Islands, South Africa, Spain, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Togo, Trinidad, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

Waste Management Strategy to Save Environment and Improve Safety of Humanity

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Abstract

Wastes are defined as the generation of valueless substances that are thrown away after their use that result negative impacts on human health as well as increased pollution of land, air, and water. Some major causes of increased wastes are local and global economic development, urbanization, and improving living standards in cities. Waste management (WM) is a comprehensive type of activities that encompass the collection, handling, transportation, treatment, storage, processing, recycling, and disposal of wastes efficiently. Ineffective and inefficient WM results in greenhouse gas (GHG) and toxic emissions, and the loss of precious materials and resources. It creates an unhealthy and unhygienic living environment, and it is responsible for the spread of diseases, and pollution of lakes and water bodies leading to loss biodiversity. An integrated WM approach is a crucial part for sustainable development strategies and for saving environment, and maintaining proper healthcare. This study takes an attempt to discuss WM policy to reduce the dangerous effects of wastes on the environment and human health.

Keywords: global waste, circular economy, waste management

1. Introduction

Waste is an essential product of human activities and is a part of our everyday life that is increasing dramatically in recently. The high living standards, urbanization, industrialization, increased population, economic development, quick advanced technologies, low cost and design items with a short lifespan, etc. are creating larger quantities of wastes worldwide (Zaman, 2016). On the other hand, waste is directly related to human development, both technologically and socially; some wastes have economic value that can be recycled (Alamgir & Ahsan, 2005).

Waste management (WM) is a lengthy and healthy process that needs collection, transport, treatment, and disposal of waste, together with monitoring and regulation processes through the waste-related laws, technologies, and economic mechanisms (Davidson, 2011). It is one of the major environmental concerns in the world. Proper WM includes waste minimization, waste processing, recycling, waste transformation, and efficient disposal on land. It is one of the hot topics of urban planning and development (Saxena & Joshi, 1996). It is a distinct practice from resource recovery which focuses on delaying the rate of consumption of natural resources. Effective WM policy is necessity to implement a circular economy (CE) through the 7R waste practices: refuse, reduce, reuse, repair, repurpose, recover, and recycle (Mohajan, 2020, 2021b).

WM practices are different in developed and developing nations; urban, hilly and rural areas; and residential and industrial producers (Mohajan, 2018). Metropolitan domestic waste is usually managed by the local government authorities; and commercial and industrial wastes are usually managed by the local, national, and international experts (Kaza et al., 2018). Usually there are four possible ways of managing waste, such as open dumping

ground, sanitary landfills, composting, incineration, and plasma technology. Biodegradability in the waste allows it to get absorbed into the soil without affecting the environment that is also suitable for biogas generation through disposal in properly designed sanitary landfills (Eriksen & Astrup, 2019). At present the WM cost is about $325.5 billion and it is estimated that the cost will increase to about $640.3 billion by 2050. At present about half of the world populations are without access to WM services, and most of them live lower- and middle-income countries (Mavropoulos et al., 2012).

2. Literature Review

A literature review is an overview of previously published works, such as scholarly paper, books or articles on a particular topic (Torraco, 2016). It provides the researcher about the general information of an existing knowledge of a research area (Adams et al., 2007). It is a part of a graduate and post-graduate requirement for the preparation of a thesis, dissertation, or a journal article (Bolderston, 2008). Reddy Dhana Raju has stressed on the WM policy to establish a zero-waste based, healthy, hygienic, and sustainable society (Raju, 2021). Constantino Fernandez-Pereira and his coauthors have tried to develop a more sustainable management alternative for an industrial waste produced in increased amounts and provide the basis for a symbiotic coupling relationship among various industrial sectors (Fernandez-Pereira et al., 2024). Chanchai Phonthanukitithaworn and his coworkers have investigated how citizens with characteristics aligned with the CE utilize internal and external knowledge networks to enhance their practices in the 5Rs: repair, reduce, recycle, reuse, and rot within emerging markets (Phonthanukitithaworn et al., 2023).

Phyo Zaw Oo and his coworkers have aimed to assess life cycle GHG emissions from the global municipal solid waste (MSW) management sector for the years 2023, 2030, and 2050; and then analyses the global and regional WM goals set by the UNEP and the EU to identify hotspots in the MSW management systems and critical factors that influence GHG emissions from the waste sector (Oo et al., 2024). Pratap Kumar Swain and his coauthors have presented the status on generation and utilization of both hazardous and non-hazardous solid wastes in India, and their recycling potential and environmental effects are reported and discussed (Swain et al., 2018). Hafez Salleh and his coauthors have proposed a strategy on the adoption of the circular economy principle in the construction and demolition waste sector to improve the performance of the current construction and demolition WM system (Salleh et al., 2022). Mojgan Alighardashi and her coauthors have tried to examine the current healthcare waste (HCW), and consider the local challenges associated with establishing a circular economy (CE) to improve hospital WM (Alighardashi et al., 2024).

Md. Anwarul Abedin and M. Jahiruddin have focused on the status of solid waste generation, WM system, and WM problems in Bangladesh. They have observed that lack of regulations for waste disposal, landfill and use, lack of awareness, improper choice of technology and inadequate financial support are the major constraints for WM in the country. They are hopeful that efforts are underway to improve the system of waste collection, transportation, recycling, incineration and land filling (Abedin & Jahiruddin, 2015). Abdulkadir Kan has presented a detailed review on waste and WM options, and research published on the effect of waste materials on environment (Kan, 2009). Ebikapade Amasuomo and Jim Baird have shown that the effectively planning ahead will prevent indiscriminate disposal and other harmful practices so as to prevent the build-up of open dumps and breeding ground for rats and other vermin which poses health risk (Amasuomo & Baird, 2016). Samuel Fosso Wamba and his coauthors have stated that plastic WM represents a fundamental challenge in terms of environmental pollution and health in many emerging countries. Their findings suggest that plastic WM for value creation is still embryonic in Cameroon (Wamba et al., 2023).

3. Research Methodology of the Study

Research is a systematic gathering of data and information, and it is an analysis for the advancement of knowledge in any subject that attempts to find answer intellectual and practical questions through application of systematic methods (Kara, 2015). It is an original contribution to the existing stock of knowledge making for its advancement. Methodology is the study of research methods that is traditionally divided into quantitative and qualitative research. Therefore, research methodology is a way of explaining how a researcher intends to carry out research (Bryman, 2008).

4. Objective of the Study

Waste is defined as discarded materials that have no value in normal use. It may be organic and inorganic; hazardous and non-hazardous; and solid, liquid, and gaseous materials that are unwanted by its user and most of them are recyclable (Velenturf & Purnell, 2017). It is created in homes, hospitals, factories, farms, schools and colleges, mines, construction sites, and picnic spots. WM is the processes of dealing with waste at every stage from generation and collection through to final disposal (Mohajan, 2021a). Main objective of this article is to examine proper WM. Other subsidiary objectives of the study are as follows:

1) to specify waste and its types,

2) to stress on management of waste, and

3) to show the importance of waste management.

5. Waste

According to the Basel Convention, wastes are all useless items, such as household rubbish, sewage sludge, wastes from manufacturing activities, packaging items, discarded cars, old televisions, garden waste, old paint containers, etc. that people no longer have any use for, which they either intend to get rid of or have already discarded, and are disposed by the provisions of national laws because of their hazardous properties (UNEP, 2021). Waste can either be solid, liquid, and gasses; and each type has its own method of disposal and management. The solid waste is generated by domestic households, commercial land industrial enterprises, mining, municipality, agricultural operations, and healthcare and institutional activities, as well as on the streets and public places by the general population (Wilson et al., 2015).

Usually, the developed countries generate more wastes than developing countries (Mohajan, 2021c). For example, Asian and African countries produce waste in the range of 0.21-0.37 tons/capita/year, while European countries generate higher amount of waste with 0.38-0.64 tons/capita/year (IPCC, 2006). At present the world generates about 2.3 billion tons of waste annually, and this is expected to increase 70% to reach 3.5 billion tons annually by 2050 (Raju, 2021).

The increase of waste is due to overpopulation, affluence, and technological advancement. In 2019, about 96 billion tons of primary materials were extracted and consumed globally, but only 9% were recycled (UNEP, 2024). After the adoption of a circular economy the world has yield significant economic benefits, and it is estimated to reach a value of $4.5 trillion by the year 2030. Waste is usually managed in four stages, such as generation, collection, segregation, and treatment. In landfills, wastes remain for a longer time and degrade the environment with breeding of mosquito, rodents, fly, etc. which pollutes the land, water, and air (Sharholy et al., 2008).

6. Types of Waste

Wastes are of various types and differently classified, based on specific parameters and depending on the origin and type, such as physical states, physical properties, reusable potentials, biodegradable potentials, source of production, and the degree of environmental impact (Demirbas, 2011). These are seen in three forms, such as solid waste, liquid waste, and gaseous waste. These can be classified mainly in two types: hazardous waste and non-hazardous waste (Sandhu et al., 2017).

Hazardous waste has physical, chemical, or biological characteristics and requires special handling and disposal procedures to avoid negative health effects, adverse environmental effects or both. Characteristics of these wastes are toxic, oxidizing, explosive, flammable, irritant, corrosive, carcinogenic, infectious, and mutagenic (Wilson et al., 2015). Non-hazardous wastes do not have intrinsically dangerous or toxic properties. For example, paper, plastic, wood, lime sludge, metal scrap, glass, and organic wastes are non-hazardous wastes. These wastes can be is either recycled and reused, or treated and disposed (Hoornweg & Bhada-Tata, 2012). There are many types of wastes, such as household, industrial, biological, municipal, organic, biomedical, and radioactive (Giusti, 2009).

6.1 Industrial Waste

Industries wastes are different waste flows that are derived from a variety of industrial processes. Industries produce both hazardous and non-hazardous liquid and solid wastes that are generated during the manufacturing process which turns raw materials into consumer products (Hao, 2013). These are disposed of in an unscientific manner on open plots or on the roadside, and create environmental pollution. These wastes are chemical, petroleum, coal, metal gas, sanitary paper; paper and paper products; wood and wood products, etc. (Shafigh et al., 2014). But very few sites are authorized for the disposal of industrial waste in the country. Consequently, industrial solid wastes are disposed of in an unscientific manner, and create environmental pollution and subsoil contamination (Islam et al., 2013).

6.2 Construction Waste

Construction and demolition wastes are generated during the course of repair, remodeling, renovation, maintenance, and construction activities of various infrastructures, such as buildings, roads, bridges, dams, tunnels, railways, and airports (Hemalatha et al., 2008). Materials subject to this category are bricks and masonry, sand, gravel, bitumen, asbestos, stones, tiles, cement concrete, paint, timber, iron, steel, copper, wood, and so forth that are generally not stored by the waste generator within its premises until disposal (Akanbi et al., 2018). These wastes are deposited just outside the premises on the streets or in open spaces and may hinder traffic and adversely affect the aesthetics of the city. Construction provides job facilities and associated with economic development, but it is the major cause of environmental pollution (Menegaki & Damigos, 2018). The huge

volume of solid waste generated by the construction industry that results the limited availability of land in the country (Poon et al., 2001).

6.3 E-Waste

E-waste is any electrical or electronic equipment that has been discarded. It is also known as waste electrical and electronic equipment (WEEE) or end-of-life (EOL) electronics (Kahhat et al., 2008). It is being created by a variety of sources, such as government and non-government sectors, education and laboratory sectors, research and development sectors, medical and clinical sectors, household and manufacturing sectors, etc. (Tale, 2020). It consists of end of life discarded, surplus, obsolete, broken, electrical or electronic devices that comprises of a range of electrical and electronic items, such as computers and printers, electrical and electronic tools, washing machines, medical equipment, refrigerators, televisions, etc. (Agnihotri et al., 2011). Potentially various harmful materials in e-wastes are lead, cadmium, mercury, beryllium, brominated flame retardants, polychlorinated biphenyls (PCBs), arsenic, etc. (Osibanjo, 2007; Mohajan, 2024). E-waste that barely existed before was generated as much as 20-50 metric tons a year (UNEP, 2006).

6.4 Biomedical Waste

Biomedical wastes are generated in hospitals, research institutions, healthcare teaching institutes, clinics, laboratories, blood banks, animal houses, and veterinary institutes (Pasupathi et al., 2011). These are solids and liquids, such as discarded drugs, containers, waste sharps, microbiological and biotechnological waste, human anatomical waste, contaminated animal waste, pathological waste, etc. that are heavily infectious and toxic, and generated during the diagnosis, testing, treatment, and research (Brunner & Rechberger, 2014). About 85% of hospital waste is non-hazardous, 10% is infectious, and the rest 5% is non-infectious. Proper management of biomedical waste is highly essential, because it creates various risks to the human health and to the surrounding ecosystem due to the ecological hazard, professional hazard, and public hazard (Kalpana, 2016). Biomedical wastes must be disinfected before disposal, syringes to be cut with hub cutters and anatomical wastes must be disposed by deep burial (Yazie et al., 2019).

6.5 Radioactive Waste

Waste that contains a concentration of radio nuclides greater than those deemed safe by national authorities is considered as radioactive that takes million years to decay. Usually these are byproducts of nuclear processes and are generated from nuclear power plants, nuclear testing lab, and industrial establishment (Swain et al., 2018). Some of these wastes remain radioactive for hundreds or thousands of years, while others may require storage for only a short period, while they decay, prior to conventional disposal (Abdel-Karim et al., 2019). Sometimes industries that are not directly involved in nuclear activities may also produce some radioactive wastes, such as radio-isotopes, chemical sludge, etc. (Deng et al., 2020).

6.6 Mining Waste

Mine wastes are unwanted, currently uneconomic, solid and liquid materials found at or near mine sites. These are arising from prospecting, extraction, treatment and storage of minerals, processing of ore, waste rock, and overburden (Ochieng et al., 2010). The major sources of mining waste are tailings, dumping leaches mine water seepage, and other process wastes disposed of the mine (Ostrega et al., 2024).

6.7 Municipal Waste

Municipal wastes are household and commercial that are generally generated by households and commercial activities. These are generated by household garbage, rubbish, construction and demolition debris, sanitation residues, cardboard, metals, used paper and plastic, packaging materials, textiles, organic waste, trade refuges, etc. that are managed by the municipality (Mor et al., 2006). Of these wastes 54% is discarded, 35% is recycled, and the rest 11% is incinerated. Plastics, packaging materials, and other synthetic materials that last longer are increasing due to urbanization and industrialization (Idris et al., 2004).

7. Impact of Waste

Wastes adversely affect the air, water, and soil until their complete decomposition. Improper WM has negative effects on both the quality of environment and human health. All wastes are threats to the environment and human health if not handled appropriately (Bello et al., 2022). Proper management of wastes is necessary for the welfare of environment and human health. Different wastes and WM activities have varying impacts on energy consumption, methane emissions, carbon storage, ecological and human health (Wilson, 2007).

7.1 Impact on Health

Soil contamination with wastes can harm plants through their roots that can adversely impact the health of humans and animals. Improperly managed of landfills can spread insects that develop various diseases, such as dysentery, diarrhea etc., which affect the health of human beings. Emissions from incinerators and landfills can

cause air pollution that emit dioxins, furans and polychlorinated by-phenyls (PCB), which are deadly toxins and can cause cancer, lung cancer, heart disease, cholera, hepatitis, and endocrine system damage. Scientific evidences show that people who live near the landfills have a high risk of low birth weight, birth defect, symptoms of fatigue, headache, and some types of cancer (Giusti, 2009).

7.2 Impact on Environment

Animal wastes, farming wastes, horticulture wastes, and domestic waste degrades the environment that increases concentration of ammonia and methane in atmosphere, which causes acidification and global warming (Shafigh et al., 2014). Household hazardous wastes are old batteries, shoe polishes, paint tins, old medicines, and medicine bottles that carry contaminated chemical are toxic to humans, animals and plants (Vergara & Tchobanoglous, 2012). Contamination of water with wastes can affect all levels of an ecosystem. Wastes can emit greenhouse gases (GHGs) that can cause global warming. The waste sector is a major anthropogenic source of about 5% global GHG emissions (IPCC, 2006).

8. Management of Waste

Sustainable WM is an environmentally sound and socially satisfactory that is achieved through strategic planning, institutional capacity building, fiscal incentives, techno-economically viable technologies, public-private partnerships and community participation (TERI-BCSD, 2014). At present only 40% of EU household waste is recycled. Improper waste disposal may cause pollution that is a threat to human and other living organisms. It may damage the ecosystem and disrupt the natural cycle and climate on earth (Ebikapade & Baird, 2016). Waste management indicates the prevention, minimization, reuse, recycling, energy recovery, and efficient disposal of wastes. At present SWM becomes a great challenge in environmental issues where population is rapidly growing and amount of waste generated is increasing very rapidly (Mazzanti & Zoboli, 2008).

9. Importance of Waste Management

Proper WM practices, such as recycling, incineration, and controlled landfilling can help to mitigate environmental pollution and minimize health hazards. Effective and efficient WM is vital for preserving public health that prevents the spread of diseases, protects the environment, controls disease vectors, ensures occupational safety, and promotes the well-being of communities (Ragaert et al., 2017). Proper waste collection, storage, transportation, treatment, and disposal can prevent the spread of infectious diseases. For example, biomedical WM can protect bacteria, viruses, and parasites. Adequate WM can decrease disease-carrying vectors, such as flies, rodents, and mosquitoes that thrive in waste and spread various diseases, such as dengue fever, malaria, and cholera (Wilson et al., 2015).

When efficient WM practices are introduced into production and consumption, valuable materials are recovered, and people find jobs and economy will develop, consequently poverty and health problems will reduce (Abedin & Jahiruddin, 2015; Mohajan, 2015). To implement proper WM atmosphere we need adequate training, proper handling techniques and the use of PPE are crucial (Marchettini et al., 2007). Clean and hygienic surroundings promote a healthier living environment. By creating clean and hygienic surroundings through the proper WM we can create healthier and safer living environments for everyone through the proper WM. Moreover, the WM practices promote sustainability, reduce carbon footprint, and conserve natural resources through the recycling and resource conservation (Vergara & Tchobanoglous, 2012).

10. Conclusions

At present both hazardous and non-hazardous wastes are increasing due to globalization, unsustainable economic growth, unplanned urbanization and industrialization. These wastes pose potential impact on mixture of different kinds of dangerous constituents, such as toxic radioactive substances, methane gas, pathogens, industrial effluents, and medical, pathological and harmful chemicals that can pose a threat to human health, other living organisms, and environment. Waste recycling is an important factor that helps to reduce the demand on resources and the amount of waste requiring disposal by landfilling. WM as an industry that aims to present a zero-waste based healthy, hygienic and sustainable society; provides an employment opportunity of many workers, and provides an alternative source of natural resources for the prosperity and wellbeing of the global humanity. Public awareness and education on proper WM are necessary to establish a hygienic, and a sustainable healthy society.

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Leadership Styles and Performance of Service Industry

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Abstract

The study examined leadership styles and performance of service industry. A study of FCMB, Ecobank, Fidelity in Calabar. The study employed primary sources of data. The study was conducted using primary data which involves the use of questionnaire. The statistical method used for the validation of the research hypothesis formulated was Pearson product moment correlation. Based on the analysis of the results, the findings revealed that transformational leadership style, democratic leadership style, and laissez faire leadership style had a significant relationship with organizational performance. The study recommended that management should adopt the best leadership style to enhance effective performance. Finally, management of the organizations should be encouraged of their performance by given them the necessary incentives.

Keywords: leadership styles, transformational leadership style, democratic leadership style, laissez faire leadership style, organizational performance, service industry

1. Introduction

According to Acker (2020), leaders need a new mist of complicities to properly shape their board and develop their organization. According to Tolbert (2019), leaders need a new mix of competencies to properly shape their board and develop their subordinates to meet 21st century challenges. Shifting cultures, rapidly changing technology and other factors will require new patterns of leadership. The 21st century leader will need greater awareness of diverse factors and new sets of competencies — characteristics that lead to success on the job — to help them make relevant, correct and timely decisions in the leadership of change and leadership of people (Williams, 2020). Previous researches have shown that successful interaction between leaders and their followers is central to the overall functioning of a company (Eagly, 2019).

The interest in the influence of leadership styles on organization represent an alternative to the tradition of the leaders as the center of attention and power as with the sun in the "solar system". Although the qualities of leaders are obviously important, especially in team work in particular, leaders need the skill to engage followers in productive and satisfying mutual pursuits. However, this is a departure from personal way of seeing leader qualities as possession rather than interpersonal links to others involved in shared activities. Because not all leaders wish to be participative, understanding and overcoming such reluctance to involve followers become pivotal. Not least as a source of resistance is the problem of shared responsibility and who will be accountable, it is on this background that this research work aims to assess the extent to which leadership impact on organizational performance.

1.1 Objectives of the Study

The specific objectives of this study were stated as follows:

a. To investigate the impact of transformational leadership style on organizational performance in service Industry.

b. To examine the impact of democratic leadership style on organizational performance in service Industry.

c. To ascertain the impact of laissez faire leadership style on organizational performance in service Industry.

2. Literature Review

Karau (2022) explains that the excellent leader not only inspires subordinate's potential to enhance efficiency but also meets their requirements in the process of achieving organizational goals. Agars (2015) defines leadership as the individual behavior to guide a group to achieve the common target. Alison (2015) explains leadership as use of leading strategy to offer inspiring motive and to enhance the staff potential for growth and development. Several reasons indicate that there should be a relationship between leadership style and organizational performance (Schmit, 2019). Studies have suggested that effective leadership behaviors can facilitate the improvement of performance when organizations face these new challenges. Organizational performance refers to ability of an enterprise to achieve such objectives as high profit, quality products, large market share, good financial results, and survival at pre-determined time using relevant strategy for action (Sule, 2017). Organization performance can also be used to view how an enterprise is doing in terms of level of profit, market share, and product quality in relation to other enterprises in the same industry. Good governance, among other things, must be participatory, transparent, and accountable, effective and equitable as well as promotes the rule of law (Riman, Lebo, Obeten & Akpan, 2023).

2.1 Theoretical Framework

2.1.1 Empowerment Theory of Leadership

The empowerment theory of leadership simply is focused on a leadership style that inspires employees by empowering them to take decisions and actions that affect the existence of the organization. The theory suggests that leaders should aside other human approach seek to empower employees to take actions that will enhance their growth and that of the organization. Empowerment theories inspire individuals to reach and acknowledge their potential in life and society. The concept of leadership has been widely researched due to its relevance to organizational survival which is why viewed leadership as a social tool required for the attainment of organizational goals and objectives. This definition emphasized leadership to encompass the actions and attitude of the leader with respect to its subordinates. Leadership is about inspiration that drives positive outcome. The whole essence of leadership can be deduced to consist given others the opportunity to learn and grow and ensuring the right attitude and building commitment to organizational goals and objectives. Leadership should inspire creativity and development of inherent skills, thereby empowering employees towards future leadership positions (Koeing & Eagly, 2014; Morris, 2018).

2.2 Empirical Review

Jekelle (2021) studied leadership styles dimension and organizational commitment. The independent variables for the study were transformational, transactional, and laissez faire leadership style. Cross sectional survey research design was used and 151 employees of a public sector agency in Abuja were surveyed. A structured questionnaire with a five-point scale was used to elucidate the responses of the respondents while multiple regression technique was deployed to analyze the data. The study found out that transformational, transactional, and laissez faire leadership techniques were statistically significant on organizational commitment. The study therefore recommends that organization should use continuous transformational leadership style practices to sustain high employee commitment and organizational effectiveness. Also, organizations should apply a bit of both transactional and laissez faire leadership styles from time to time depending about things at the workplace as there is no leadership style that is one-size fit all but depends on situation at hand.

Choudhary et al. (2013) studied the impact of transformational and servant leadership on organizational performance. The purpose of this study is to examine the impact of two comparative leadership styles on organizational performance outcomes. The leadership styles undertaken is transformational and servant leadership. A sample of 155 participants is taken from profit-oriented service sector of Pakistan. Data through survey gathered on a five points Likert scale from organizations. AMOS and SPSS are used for statistical analysis. The result shows that transformational leadership has more impact on organizational learning than servant leadership. Furthermore, organizational learning enhances organizational performance. Managers and leaders of corporate sector can get benefited from this study. Their main objective is to maximize the profitability of organization thus, they can choose leadership style which polishes their abilities and helps them to achieve profit maximization.

McCann et al (2014) researched on servant leadership, employee satisfaction, and organizational performance in rural community hospitals. This study sought to determine the degree that leaders in community hospitals were perceived as servant leaders and the level of employee satisfaction at these rural community hospitals. Two hundred nineteen surveys were completed from 10 community hospitals. This research revealed that servant leadership and employee satisfaction are strongly correlated. In addition, servant leadership has a significant

correlation between intrinsic satisfaction and HCAHPS scores. Further research can be extended to additional categories and geographic areas of the United States to determine how servant leadership, employee satisfaction, and HCAHPS are related. Hospital administrators should examine the findings of this study for possible implications to their leadership style and practice in determining how it may impact the organization they lead.

3. Methodology

This study employed survey research design. It was used to answer questions that have been raised to solve problems posed or observed, to assess needs and set goals to determine whether or not specific objectives have been met. It was also used to find fact by collecting the data directly from population or sample. This study comprised of selected commercial banks (FCMB, Ecobank, Fidelity) in Calabar. The population of the staff is ninety-three (93) using census sampling. The study employed primary sources of data. The study was conducted using primary data which involves the use of questionnaire. The statistical method used for the validation of the research hypothesis formulated was Pearson product moment correlation. A total of ninety-three copies of questionnaire were distributed and a total of eighty-nine (89) was accurately filled and returned.

3.1 Test of Hypotheses

Hypothesis one:

H_{01}: There is no significant relationship between transformational leadership and organizational performance.

Independent variable: Transformational leadership

Dependent variable: Performance

Test statistic: Pearson product moment correlation coefficient

The analysis showed a correlation coefficient of 0.572 indicating the existence of strong positive correlation relationship between transformational leadership and organizational performance. The results are based on Pearson correlation coefficients, significance levels (2-tailed), sum of squares and cross-products, covariance, and the number of observations (N). The Pearson correlation coefficient between transformational leadership and organizational performance is .572, which indicates a strong positive correlation between the two variables. The sum of squares and cross-products and the covariance values provide additional information about the relationship between the variables. The test was significant at 0.01 significant level and led to the rejection of the null hypothesis which states that there is no significant relationship between transformational leadership and organizational performance. Consequently, the alternative hypothesis was accepted and concluded that there is a strong positive correlation relationship between transformational leadership and organizational performance.

Table 1. Correlation result of relationship between transformational leadership and organizational performance

		TL	Perf
TL	Pearson correlation	1	.572**
	Sig. (2-tailed)		.000
	Sum of squares and cross-products	138.58	171.21
	Covariance	.250	.236
	N	89	89
Perf	Pearson correlation	.572**	1
	Sig. (2-tailed)	.000	
	Sum of squares and cross-products	176.41	622.44
	Covariance	.336	1.51
	N	89	89

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

Source: SPSS analysis by Researcher, 2024

Summary of Pearson Product Moment Correlation Analysis of the relationship between transformational leadership and organizational performance. n= 89.

Variables		$\sum X$	$\sum X^2$	$\sum XY$	r-cal p-value
	N	$\sum Y$	$\sum Y^2$		

TL(X) 89		5656	119646		
				103027	.572**
	.000				
Perf (Y) 89		4890	89456		

*Significant at p<.05, df = 87.

Hypothesis two:

H_{02}: There is no significant relationship between democratic leadership style and organizational performance.

Independent variable: Democratic leadership style

Dependent variable: Performance

Test statistic: Pearson product moment correlation coefficient

1) The analysis showed a correlation coefficient of 0.545 indicating the existence of strong positive relationship between democratic leadership style and organizational performance. The results are based on Pearson correlation coefficients, significance levels (2-tailed), sum of squares and cross-products, covariance, and the number of observations (N). The Pearson correlation coefficient between democratic leadership style and organizational performance is .545, which indicates a strong positive correlation between the two variables. The sum of squares and cross-products and the covariance values provide additional information about the relationship between the variables. The test was significant at 0.01 significant level and led to the rejection of the null hypothesis which states that there is no significant relationship between democratic leadership style and organizational performance. The alternative hypothesis was consequently accepted and concluded that there is a strong positive correlation between democratic leadership style and organizational performance.

Table 2. Correlation result of relationship between democratic leadership style and organizational performance

		DL	Perf
	Pearson correlation	1	.545**
	Sig. (2-tailed)		.000
DL	Sum of squares and cross-products	301.74	116.94
	Covariance	.421	.305
	N	89	89
	Pearson correlation	.545**	1
	Sig. (2-tailed)	.000	
Perf	Sum of squares and cross-products	176.94	159.32
	Covariance	.305	.201
	N	89	89

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

Source: SPSS analysis by Researcher, 2024.

Summary of Pearson Product Moment Correlation Analysis of the relationship between Correlation result of relationship between democratic leadership style and organizational performance. n= 89.

Variables		$\sum X$	$\sum X^2$	$\sum XY$	r-cal	p-value
	N	$\sum Y$	$\sum Y^2$			
DL(X) 89		5452	111088			
				99361	.545**	
	.000					
Perf(Y) 89		4890	89456			

*Significant at p<.05, df = 87.

Hypothesis three

H$_{03}$: There is no significant relationship between laissez faire leadership style and organizational performance.

Independent variable: Laissez faire leadership

Dependent variable: Performance

Test statistic: Pearson product moment correlation coefficient

The analysis showed a correlation coefficient of 0.509 indicating the existence of strong positive relationship between poor physical working condition and employees' performance. The results are based on Pearson correlation coefficients, significance levels (2-tailed), sum of squares and cross-products, covariance, and the number of observations (N). The Pearson correlation coefficient between poor physical working condition and employees' performance is .509, which indicates a strong positive correlation between the two variables. The sum of squares and cross-products and the covariance values provide additional information about the relationship between the variables. The test was significant at 0.01 significant level and led to the rejection of the null hypothesis which states that there is no significant relationship between poor physical working condition and employees' performance. The alternative hypothesis was consequently accepted and concluded that there is a strong positive correlation between poor physical working condition and employees' performance.

Table 3. Correlation result of relationship between laissez faire leadership style and organizational performance

		LF	Perf
	Pearson correlation	1	.509**
	Sig. (2-tailed)		.000
LF	Sum of squares and cross-products	33.32	124.92
	Covariance	.517	.404
	N	89	89
	Pearson correlation	.509**	1
	Sig. (2-tailed)	.000	
Perf	Sum of squares and cross-products	127.92	318.28
	Covariance	.404	.649
	N	89	89

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

Source: SPSS analysis by Researcher, 2024

Summary of Pearson Product Moment Correlation Analysis of the relationship between laissez faire leadership style and organizational performance. n= 89.

Variables		$\sum X$	$\sum X^2$	$\sum XY$	r-cal	p-value
	N	$\sum Y$	$\sum Y^2$			
Ppwc(X) 89		5632	118694			
				102540	.509**	
	.000					
Perf (Y) 89		4890	89456			

*Significant at $p < .05$, df = 87.

4. Findings

The objectives of the study were to determine the impact of leadership style on organizational performance of service Industry. To determine the impact of leadership style on performance of organization, the following findings have been made which are summarized below;

1) Transformational leadership style has a significant effect on organizational performance.

2) Democratic leadership style has a significant effect on organizational performance.

3) Laissez faire leadership style has a significant effect on organizational performance

5. Conclusion

An important factor in the leadership process is the relationship that a leader has with individual followers. In the literature, leadership has been identified as an important subject in the field of organizational behavior. Leadership is one with the most dynamic effect during individual and organizational interaction. In other words, ability of management to execute "collaborated effort" depends on leadership capability. An excellent leader not only inspires subordinate's potential to enhance efficiency but also meets their requirements in the process of achieving organizational goals. Leadership is the individual behavior to guide a group to achieve the common target. It is used as a leading strategy to offer inspiring motive and to enhance the staff potential for growth and development. It is concluded that an effective leadership behavior can facilitate the improvement of performance when organizations face these new challenges.

6. Recommendations

Based on the findings of the research study, the following recommendations were made;

1) Management of organizations should adopt the best leadership style that will enhance effective performance.

2) Management of the organizations should be encouraged of their performance by given them the necessary incentives.

Management of the organization should study the organization to know the best leadership style to adopt.

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Competency Characteristics of Management Positions in Foreign Trade Under the Digital Economy: Based on a Survey of Manufacturing Enterprises in the Guangdong-Hong Kong-Macao Greater Bay Area

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Abstract

This research was to explore the digital literacy, leadership competence, and professional quality possessed and expected to be possessed by management personnel in the manufacturing enterprises carrying out foreign trade in the Greater Bay Area (GBA) of Guangdong province, China. A literature review was conducted to review the definition, concepts and related empirical research of digital literacy, leadership competence and professional quality. A set of interview questions were designed based on the literature review, and interviews were conducted involving 10 management personnel of the manufacturing enterprises in the GBA with foreign trade businesses. The findings showed that the interviewees held themselves possessed basically satisfying digital literacy, leadership competence, and professional quality. However, all of them held that they needed to further enhance their competence characteristics in these aspects. Two conceptual models were designed to illustrate interviewees' existing competence characteristics, as well as the gaps between existing and expected capabilities.

Keywords: digital economy, foreign trade management positions in the Greater Bay Area, competency characteristics, interview research

1. Introduction

In the first 11 months of 2024, the total import and export volume of foreign trade in the Greater Bay Area (GBA) of Guangdong province, China reached ¥8.27 trillion yuan, with a year-on-year increase of 10%, and Guangdong became the only province among the top ten foreign trade provinces in China to achieve double-digit growth. The contribution rate of Guangdong's foreign trade in the country reached 40.9%, demonstrating its important position in national foreign trade (Southern Metropolis Daily, 2024). The industry distribution of manufacturing enterprises engaging in foreign trade in the GBA is extensive, mainly concentrated in the fields of mechanical and electrical products, containers, ships, electric vehicles, etc. (Southern Daily Online Edition, 2024).

In recent years, digital technology has made rapid progress and profoundly changed the operational methods of various industries (Calderon-Monge & Ribeiro-Soriano, 2024), and manufacturing enterprises in the GBA are no exception. Digital transformation has put forward higher requirements for the managers of manufacturing enterprises with a foreign trade orientation in the GBA, requiring them to make a qualitative leap in leadership, professional quality, and digital capabilities compared to before, in order to adapt to the professional demands of the times and economic development. Therefore, it is particularly important to study the competence characteristics of Chinese manufacturing enterprise management positions/personnel against foreign trade and digital backgrounds.

2. Research Aim and Objectives

Aim: To explore the competency characteristics of manufacturing enterprise management positions of the GBA in China against digital and foreign trade backgrounds, in order to construct a corresponding competency characteristic model.

Objectives:

1) To explore digital literacy and green economy/sustainability competences for manufacturing enterprise management positions in the GBA under digital and foreign trade backgrounds;

2) To explore leadership competences for manufacturing enterprise management positions in the GBA under digital and foreign trade backgrounds;

3) To explore professional competences for manufacturing enterprise management positions in the GBA under digital and foreign trade backgrounds;

4) To explore the gap between the existing competences and expected competences of manufacturing enterprise managers conducting foreign trade in the GBA;

5) To construct a model for the competency characteristics of foreign trade management personnel in the manufacturing firms in the GBA.

3. Literature Review

The competency characteristics of foreign trade enterprise management positions can be derived from existing literature.

3.1 Digital Capabilities

In terms of digital capabilities, digital skills can assist managers in data analysis, budget control, and more. In the digital age, foreign trade managers need to have certain technical application abilities, including proficient use of office software, network tools, and trade platforms. They need to be able to use technological means to improve work efficiency and information processing capabilities (Oberlander et al., 2020). In addition, data analysis skills are particularly important in foreign trade management. Foreign trade managers need to be able to grasp market dynamics and develop effective market strategies and sales plans through data analysis. Mastering data analysis tools and techniques, such as Excel, SPSS, etc., can help them better understand market data and make accurate decisions (Rahman & Muktadir, 2021). Thirdly, foreign trade managers need to be familiar with the use of e-commerce platforms, including product listing, order processing, and customer management, etc. Mastering these platform operations proficiently can help foreign trade managers better carry out online business and expand their market (Dai et al., 2024). Finally, foreign trade managers need to have the awareness of network security, understand how to protect the data and transaction security of the enterprise, and prevent information leakage and fraudulent behavior. Understanding basic network security measures and prevention techniques is necessary (Gagliani, 2020).

The study by Qin et al. (2025) was from the perspective of emerging market economies, to explore the bi-lateral exchange with China based on digital development and trade relations within BRICS countries' framework. The findings showed that digital development significantly enhanced bi-lateral trade volumes, while institutional differences not only did not hinder bi-lateral trade with China, but also played the role of adjustment (Qin et al., 2025). This suggests that the managers of foreign trade firms in the GBA of China must lay emphasis on their digital management capabilities to promote the further development of bi-lateral trade with other emerging economies. Ahmedov (2020) pointed out that digital space had been becoming a key area of global trade, leading to the changes of patterns and structures in international trade. Global competition had been accelerated and transitioned to virtual/intangible departments. Through the expansion of digitization, intangible employment and cross-national businesses, international trade field ushered in new opportunities and models (Ahmedov, 2020). The foreign trade managers of the GBA of China have to strengthen their own digital capabilities to adapt to the demand of new and changed situations.

3.2 Leadership

In terms of leadership, managers of foreign trade enterprises need to possess foresight and charisma. They need to have the ability to foresee the future, gain insight into industry trends, and set clear goals for the organization. At the same time, they need to have the ability to attract and influence the team through personal charm and vision, stimulate the team's potential, and jointly pursue excellence (Sacavem et al., 2017). Moreover, they also need to possess decisiveness and control. In the face of challenges, managers need to make decisive decisions, control the situation, and ensure the achievement of goals. Meanwhile, they need to be capable of effectively controlling organizational development to ensure smooth implementation of strategies (Siyal, 2023).

According to Bird and Mendenhall (2016), global leadership of enterprises is featured by cross-cultural

management capabilities. International leadership includes international management, international human resources, and international strategies, while cross-cultural management refers to adapting to the differences of cultural practices in management abroad (Bird & Mendenhall, 2016). However, foreign direct investment (FDI) made by multinationals is not the same as the foreign trade situations of Chinese domestic enterprises. The latter may be regarded as the primary stage of the former. This indicates that the managers of foreign trade firms of China need to learn from the advanced and rich experiences of international managers in Western multinationals to enhance their leadership competences. It was found by Tsai (2022) that the adjustment of leadership behaviors had a mutual relationship with leadership efficacy. In the context of digital economy, the managers of foreign trade firms in China need to adjust their leadership behavior to adapt to new situations and new problems. It was pointed out by Siyal (2023) that irrespective of whether it is small-and-medium-sized firms or multinational corporations, engaged, well-trained and qualified managers and leaders who can effectively and efficiently lead market, resources and teams are needed by both (Siyal, 2023). Therefore, it is very important that the managers in foreign trade firms in the GBA of China grasp necessary leadership capabilities/competences to meet the requirement of continuously changing and evolving foreign trade conditions internally and externally.

3.3 Other Professional Competences

In terms of professional qualities and competences, foreign trade managers need to be familiar with the production process, product types, quality standards, etc. of the industry, master the basic rules, processes, documents, etc. of foreign trade, and be able to formulate reasonable strategic plans and goals (Virtanen et al., 2023). In addition, in the Chinese market, especially in the field of foreign trade, the environment is rapidly changing and complex. Managers need to have a high degree of flexibility and agile learning ability, be able to quickly adapt to market changes, absorb new knowledge, optimize market strategies, and maintain advantages in constantly changing situations (Desalegn et al., 2024).

It was argued by Szkudlarek et al. (2020) that communication is crucial to most international business operations, and enterprises are led, managed, built and dissolved through communication. Communication plays its important role in maintaining and establishing partnerships, transactional negotiation, maintenance and development of relationships, and knowledge exchange. Successful communication is more and more regarded as the critical factor in operations at organizational, team and interpersonal levels (Szkudlarek, 2020). To foreign trade managers in the firms of the GBA, one of the embodiment and reflections of their professional competences is communication skills. In the viewpoint of Kedia and Mukherji (1999), international business managers need to have global vision and global ways of thinking supported by proper knowledge and skills. Managers may have a number of mindsets, from defenders facing the home country internally, to continuous explorers, to controllers, and to integrators facing the world (Kedia & Mukherji, 1999). The foreign trade managers of enterprises in the GBA are basically at the stage of continuous explorers and controllers, which is determined by the fact that China has not yet completed industrial upgrading and crossed the middle-income trap (Zhao et al., 2019), and its foreign trade enterprises have not extensively formed their own internationally renowned brands (Polfub, 2021). The study by Tangkittipaporn & Songkroh (2008) targeting Chinese foreign trade enterprises showed that the most crucial capabilities of managers included accounting management, marketing, export businesses and human resource management (HRM) (Tangkittipaporn & Songkroh, 2008). Moreover, in today's business environment, green economy and sustainable development should be emphasized (Salifu & Salifu, 2024).

3.4 Conceptual Framework

According to the literature review, the conceptual framework of the research is designed as follows:
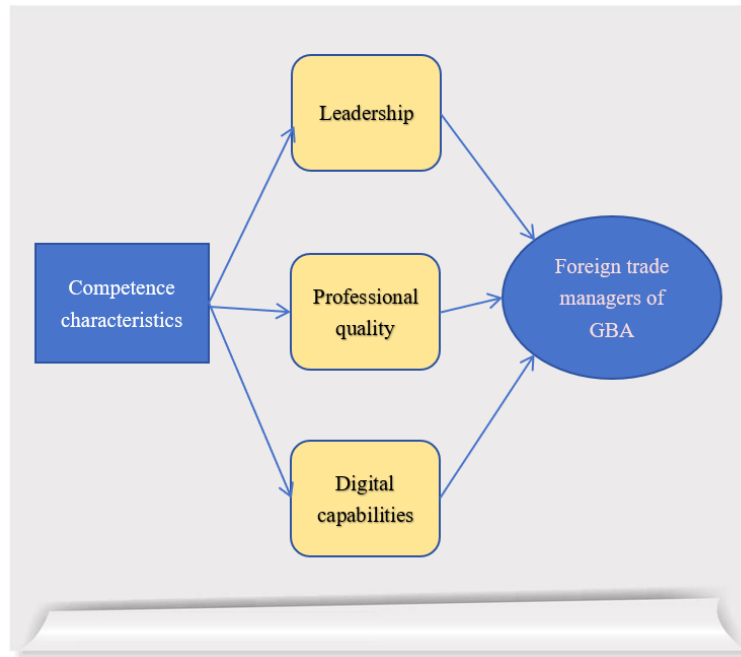
Figure 1. Conceptual framework

4. Methodology

4.1 Research Design

This research adopts interpretivism research philosophy (Pervin & Mokhtar, 2022) and inductive reasoning approach (Heit, 2000). One of the benefits of interpretivism lies in that it can incorporate the subjective meanings endowed by research subjects (Saunders et al., 2015) to the phenomenon and issues of foreign trade management competencies. The advantage to use inductive reasoning lies in that it meets the requirement of exploratory research studies (Jebb et al., 2017).

The researcher applied qualitative research method, based on primary data collection. Interpretivism-induction and qualitative research can form a continuum (Goldkuhl, 2012), and qualitative method can help collect rich data to enhance the in-depth nature of exploratory research (Palinkas et al., 2015). Moreover, primary data provides rich raw information, allowing the researcher to gain a deeper understanding of the research topic (Prada-Ramallal et al., 2018). Primary data reflects the current information and is the latest and most timely. It can directly target the research objectives, making it more reliable to answer specific research questions (Taherdoost, 2021).

4.2 Interview Questions

All interview questions were open-ended to meet the requirements of qualitative method, and interviews were semi-structured. Interview questions were designed according to the literature review, which are shown as follows:

1) Please say something about your use of digital technologies to carry out daily operational management (Source: Oberlander et al., 2020; Rahman & Muktadir, 2021)

2) How about your competences to carry out e-commerce? (Source: Dai et al., 2024)

3) Please say something about your competences for cybersecurity. (Source: Gagliani, 2020)

4) What is your leadership ability to foresee the future, gain insight into industry trends, and set clear goals for the organization? (Source: Sacavem et al., 2017)

5) What is your leadership ability to make decisive decisions, control the situation, and ensure the achievement of goals? (Source: Siyal, 2023)

6) What is your leadership competence to effectively and efficiently lead market, resources and teams? (Source: Siyal, 2023)

7) What is your professional quality to ensure that you have a high degree of flexibility and agile learning ability, and are able to quickly adapt to market changes? (Source: Desalegn et al., 2024)

8) How about your communication skills in foreign trade? (Source: Szkudlarek, 2020)

9) Please say something about your professional quality that can support you to achieve the goal of green economy and sustainable development in foreign trade if needed. (Source: Salifu & Salifu, 2024)

10) Do you think there is a gap between your current competencies and your expected competencies in leadership, professional qualities, and digital abilities? Can you talk about this aspect?

4.3 Sampling

The sampling method used was convenience sampling, with those managers who wanted to participate in the interviews being included as the sample. Although convenience sampling belongs to a kind of non-probability sampling method (Stratton, 2021), qualitative research does not require generalizability as quantitative studies, but rather emphasize case specificity. Therefore, it was considered convenience sampling would not affect the insights of qualitative research findings.

4.4 Participants

10 manufacturing foreign trade management personnel in the GBA were invited to participate in the interviews.

Table 1. Participants

No.	Gender	Age	Position	Industry	Years of service in foreign trade sector
1	Male	50	General manager	Electronic product	16
2	Male	46	Marketing manager	Mechanical equipment	10
3	Female	52	Office General Secretary	Textiles and clothing	16
4	Male	38	Workshop director	Toy	4
5	Male	40	Foreign trade administrator	New energy vehicles	4
6	Male	35	Department manager	Electromechanical	11
7	Female	43	Sales manager	Lithium battery	9
8	Male	49	Foreign trade manager	Solar cell	13
9	Female	44	Foreign trade administrator	Cool Home Appliances	8
10	Male	52	Foreign trade supervisor	LCDTV	16

4.5 Pilot Study

The researcher carried out a pilot study involving two friends who engage in foreign trade. The main purpose of pilot study is to identify and correct potential issues in interview questions to ensure the effectiveness and reliability of final ones (Majid et al., 2017). Based on pilot study results, the researcher modified items that might be misunderstood due to unclear wording or improper option settings. The two participants provided feedback, pointed out issues they did not understand or parts they considered inappropriate. The feedback was used to improve the design of interview questions, making them more comprehensive and user-friendly (Tate et al., 2023).

4.6 Data Collection

The data was collected in the form of face-to-face interviews, in the private teahouses in several major cities of the GBA, including Hong Kong, Macao, Guangzhou, Shenzhen, Dongguan, and Foshan. The interview contents were recorded in the form of mobile phone recording, and were sorted out by the researcher to get transcripts.

4.7 Data Analysis

The data was analyzed based on thematic analysis (Erlingsson & Brysiewicz, 2017). The process is divided into the following steps:

1) Firstly, the researcher got familiar with the data to gain a deep understanding of the data content to ensure a comprehensive understanding of the overall characteristics and key information of the data. This step laid the foundation for subsequent analysis (Castleberry & Nolen, 2018).

2) The researcher systematically browsed the data and performed initial encoding, tagged key information such as key words, phrases, or sentences, and assigned them codes. During the coding process, strive for comprehensiveness, add new code at any time, classify data according to the code, and grasp the key points and

common meanings (Braun & Clarke, 2022).

3) The researcher integrated coding and searched for potential thematic foundations by repeatedly examining the code, identifying underlying patterns, and integrating relevant code into themes. This process is similar to data compression, simplifying complex data into several core themes. The researcher explored the theme in this way (Jowsey et al., 2021).

4) The researcher reviewed the topic. Return to the dataset, compare the topic with the original data, consider whether there are any omissions, whether the topic really exists, and whether it can be optimized. Discovered issues were split, merged, discarded, or new themes were created (Castleberry & Nolen, 2018).

5) Define and name the theme. After determining the topic list, accurately define the connotation and extension of the topic, and clarify its significance and scope in the research. (Jowsey et al., 2021).

6) Tell data stories, provide thematic evidence, and embed typical excerpts to demonstrate the rationality of the analysis (Braun & Clarke, 2022).

4.8 Ethical Issues

The researcher ensured confidentiality and anonymity (Wiles et al., 2008) of interviews, and an informed consent was sent to each interviewee for their check and acceptance (Akhurst & Leach, 2023). Interview questions did not involve interviewees' privacy, and would not cause them discomfort. They were respected, and the raw data transcripts are protected with encryption and password in the personal computer of the researcher (Ducato, 2020).

5. Findings

5.1 Theme: Interviewees Use Various Digital Tools to Engage in Foreign Trade or Assist Their Operations Management

Interviewees use various digital tools for foreign trade and/or operations management, from basic office software to more complex digital management systems. For example, according to Interviewee I:

'*I have the most basic ability to operate office software, such as Word, Excel, PPT, PDF, etc.*'

According to Interviewee C:

'*As the cornerstone of secretarial work, word processing requires secretaries to be proficient in word processing software such as Microsoft Word and WPS, in order to efficiently complete tasks such as document editing, formatting, style application, and review.*'

Various digital management systems are applied by the interviewees, including '*online marketing system based on customer behavior*' (Interviewee B), Enterprise Resource Planning (ERP) systems (Interviewee D; Interviewee E; Interviewee G), Supply Chain Management (SCM) system (Interviewee D; Interviewee G), Customer Relationship Management Systems (CRM) (Interviewee F), Logistics Management Systems (LMS) (Interviewee G); Foreign Trade Management Software (FTMS) (Interviewee H). For example, according to Interviewee H:

'*Mastering the use of foreign trade management software can help me efficiently handle orders, customs clearance, logistics, and other affairs, improving work efficiency and accuracy. Through foreign trade management software, I can automate some repetitive tasks, saving time and energy.*'

According to Interviewee G:

'*My team and I use a CRM system to manage customer information, track sales opportunities, and improve customer satisfaction.*'

To sum up, through using digital technologies to assist operations management and foreign trade, the interviewees enhance their work efficiency and team performance.

5.2 Theme: Interviewees Hold They Are Skillful in E-Commerce Platform Operations, Digital Marketing, and Other E-Business Functions

The interviewees emphasize e-commerce, and are skillful and proficient in e-business operations and digital marketing, according to their self-evaluation. The major e-business platforms mentioned by them include Alibaba and Amazon (Interviewee B; Interviewee G). For example, according to Interviewee B:

'*In terms of e-commerce, I am proficient in the operational rules and skills of e-commerce platforms such as Amazon, Alibaba, etc.*'

Most of the interviewees are confident in their abilities of e-commerce, and consider e-business plays a crucial role in their companies' foreign trade. According to Interviewee E:

'*For foreign trade specialists, e-commerce is an inevitable aspect to be involved. In addition to conducting*

international marketing and trade through our official website, our company also expands sales channels through e-commerce platforms.'

There are the anomalies that two interviewees do not directly engage in e-commerce for foreign trade. Interviewee C as an Office General Secretary is responsible for online meetings and remote collaboration, while Interviewee D as a Workshop Director '*use(s) data analysis tools to conduct in-depth analysis of production data, identify potential problems, and optimize production processes*'.

To sum up, from the data analysis results, it can be seen that the companies of the interviewees emphasize e-commerce, and all the interviewees have their own skills in e-commerce or other e-business functions.

5.3 Theme: Companies Take Various Cybersecurity Measures, and Interviewees Are Mainly Responsible for Team Member Education and Assisting Specific Cybersecurity Technicians

The companies where the interviewees work take respective measures to protect cybersecurity. For example, according to Interviewee B:

'*Our company installs professional firewalls and security software to ensure the security of our website... we regularly backup website data in order to recover data in a timely manner in case of network attacks or failures, reducing economic and reputational losses.*'

As for the interviewees, because their job positions are not cybersecurity technicians, they are mainly responsible for improving the cybersecurity awareness of team members and related general-knowledge training. Moreover, they also assist professional cybersecurity technicians in regular checking and monitoring. For example, Interviewee F said:

'*I am mainly responsible for security awareness training, improving employees' awareness and prevention of network threats.*'

Interviewee D said:

'*I am responsible for cooperating with the security audit to ensure the continuous maintenance and improvement of the system's security.*'

There is only one interviewee — Interviewee C who works as Office General Secretary, acting as the main person accountable for conducting security reviews.

To sum up, all respondents have the awareness of network security, understand and support the company's network security measures. However, they are not professional network maintainers themselves, and network security mainly plays the auxiliary and supporting role in their conducting foreign trade e-commerce.

5.4 Theme: Strong Awareness of Green Economy and Sustainability, Recognition of Personal, Company and Industrial Limitations, and High Expectation for Green Future Both Personally and Organizationally

All the interviewees have their awareness of the importance of green economy and sustainability. For example, according to Interviewee F:

'*With the continuous deepening of the green development concept globally, it is imperative for enterprises in the electromechanical industry to practice sustainable development.*'

In the viewpoint of Interviewee D:

'*Traditional toy manufacturing materials contain a large amount of plastic and harmful substances, posing potential threats to the environment and children's health.*'

However, the interviewees recognize the limitations of themselves, the company and the industry in green economy and sustainability. For example, from a personal perspective, Interviewee A said:

'*I feel that I am still far from doing enough in this regard.*'

Interviewee G said:

'*However, industrial products cannot avoid generating negative environmental externalities.*'

Despite the recognition of limitations, some interviewees admit the current policies executed by their companies to make efforts in facilitating sustainability. According to Interviewee D:

'*In order to meet the green demands of the international market, we are constantly improving our production processes.*'

There are two interviewees paying attention to the risks posed to China in terms of international sustainability regulations. According to Interviewee F:

'*Currently, overseas green regulations and policies pose risks and challenges to China's exports of mechanical and electrical products as well as our industrial and supply chains.*'

Interviewee J said:

'*Some green thresholds internationally not only restrict the export of China's household appliances, but also intertwine with issues such as RMB exchange rate, market access, intellectual property rights, carbon tariffs, etc., weakening the international competitiveness of China's household appliance industry.*'

In view of such circumstances, the interviewees express their high expectations of future company commitment and their own efforts in sustainability. For example, Interviewee H said:

'*I think what we need to do now is to learn more about the relevant policies and regulations in Europe, America, and other market countries, design and manufacture products according to international standards, ensure product quality, and contribute to the development of green and low-carbon economy.*'

According to Interviewee B:

'*I will learn more relevant knowledge and peer experience in the future, in order to make the necessary contribution to the green economy and sustainable development when needed.*'

5.5 Theme: Emphasis on Leadership Competencies in Terms of Market and Competitor Analysis, Goal Setting and Management

Among the interviewees, there is emphasis on and engagement in international market and competitor analysis, and importance is attached to goal setting and management. According to Interviewee C:

'*In terms of insight, I require myself to understand the customer's needs in the first place. Customers' purchasing agents and project managers are usually very busy. If I can understand and grasp their meaning in the first place instead of repeatedly asking, customers will think that I am very clever and professional.*'

Interviewee E said:

'*I also need to analyze competitors' channel information, product information, and pricing to enhance the competitiveness of the product in the target market.*'

In terms of goal setting, some interviewees talked about their strategies for/ approaches to goal management. According to Interviewee F:

'*If I find that the goal is difficult to achieve or there are problems with the division of responsibilities, I will make timely adjustments and improvements to ensure that the team can achieve the goal smoothly. Only by achieving small stage goals can we be fully prepared to achieve long-term goals.*'

In terms of goal setting, some interviewees show high confidence in their own capabilities. According to Interviewee H:

'*I usually actively learn about industry trends and developments through various channels every day, in order to assist company executives in setting practical and feasible sales goals.*'

The interviewees also tend to have high confidence in their own market vision and insights. For example, Interviewee J said:

'*I believe I have a certain level of insight in analyzing and forecasting future industry trends. I actively understand market demand, competitive situation, and industry trends in order to develop product strategies that better meet market demands. Through market research, user feedback, and data analysis, I can identify opportunities and challenges in the market and adjust sales positioning direction accordingly.*'

The confidence and positive evaluations of the interviewees on their leadership competencies to foresee the future, gain insight into industry trends, and set clear goals for the organization may come from their years of work experiences in foreign trade.

5.6 Theme: Interviewees Use Different Decision Making, Risk/Crisis Control and Goal Achievement Strategies

The strategies used by the interviewees to make more effective decisions vary. Interviewee B said:

'*I use data to study industry and customer trends in a timely manner, analyze competitors' product characteristics, pricing strategies, and market share information, and develop effective plans or scientific decisions.*'

Interviewee I said:

'*In each decision-making process, record, review, and summarize lessons learned in order to make wiser decisions in similar situations.*'

With regard to control, according to different work characteristics, the aspects to control tend to be different for different interviewees. For example, Interviewee H said:

'*I assist the company's general manager in assessing market risks and competitive trends, developing*

corresponding response strategies, and ensuring the smooth progress of the company's overseas projects.'

Interviewee J said:

'*Professional managers need to possess abilities in crisis identification and judgment, response and handling, communication and coordination, as well as learning and summarization. I feel that I need to further strengthen my ability to control crisis situations.*'

Interviewee I take advantage of regular reflection to enhance control ability over team members:

'*I regularly reflect and summarize my work to ensure that team's systems and processes keep up with the times. Long term management work may make people feel exhausted, so regular reflection and adjustment of management strategies are necessary.*'

The decision making, situation control and goal achievement/implementation strategies used by the interviewees lay the foundation for the effectiveness of their leadership practices in foreign trade.

5.7 Theme: Communication and Humanized Management for Team Management; Allocation and Utilization of Various Resources to Lead in Foreign Trade Market

Among the interviewees, there is the utilization of communication strategies for team management. For example, according to Interviewee C:

'*Effective communication is required with personnel at different levels, including leaders, colleagues, and personnel from other departments. Good communication skills help coordinate work and convey information.*'

According to Interviewee H:

'*Maintain one-on-one communication, understand the difficulties and needs of team members, and provide timely help and support.*'

Interviewee J utilizes humanized management strategies for better team cohesion and motivation:

'*I focus on team building activities such as outdoor activities, meals, and travel to enhance understanding and trust among team members. I also pay attention to the work status and mental health of team members, and help them solve difficulties and problems in a timely manner.*'

With regard to leading the market, the interviewees take advantage of the utilization of various resources to support foreign trade sales and marketing. Interviewee I said:

'*I use customs data platforms such as Tendata to analyze the import and export data of the target market and find potential customers. The specific operation is to input the product name or HS code, obtain import and export data of the target market, analyze market demand and competition, and develop a market promotion plan.*'

In terms of resource allocation, Interviewee A talked about his personal experiences:

'*The Alibaba general account occasionally receives inquiries and is usually assigned to the salesperson with the highest inquiry volume for the month. At the same time, publicize the overall account inquiry allocation in the team and reward sub accounts with more inquiries, indicating that the salesperson has done the best in product updates, inquiry response rates, and Alibaba backend optimization, and is worthy of rewards.*'

The above strategies applied by the interviewees for team management and resource allocation/utilization enable them to better engage in foreign trade in international marketplaces.

5.8 Theme: Try to Be Flexible and Agile Through on-the-Job Practices, Learning, Reading and Training

The interviewees understand the necessity of flexibility and adaptability/agility to foreign trade work. For example, Interviewee A said:

'*In general, I think foreign trade managers should also possess self-management skills, flexibility, and adaptability to cope with the constantly changing market environment.*'

Interviewee B said:

'*The international market is full of changes and challenges. As a foreign trade personnel, I need to have the ability to flexibly respond to changes and adjust strategies in a timely manner according to market changes and customer needs.*'

In order to improve their own flexibility, agility and adaptability, the interviewees take various measures. The concrete strategies include lifelong learning, training, and reading. For example, Interviewee said:

'*So, I value lifelong learning and constantly updating knowledge, and believe this is the key to maintaining*

success in my future career.'

According to Interviewee D:

'The learning tasks and goals I have set for myself include studying relevant management courses, attending industry seminars and training courses, conducting case studies, learning quality management system standards, learning safety production laws, regulations, and standards, as well as learning team management theories and methods.'

However, due to their relatively busy work schedules, the interviewees learn to be flexible and agile mainly through on-the-job experience accumulation. For example, Interviewee D said:

'My spare time is very limited. So, most of my learning is actually accumulated through workplace experience.'

This can be seen from the answers given by other interviewees about on-the-job coping strategies to be flexible and agile. For example, according to Interviewee F:

'I also need to flexibly adjust marketing positioning and sales strategies according to market demand.'

5.9 Theme: Awareness of the Importance of Communication Skills; Internal and External Communication; Emphasis on Foreign Language Skills and Cross-Cultural Communication

The interviewees are aware of the importance of communication skills in foreign trade work. For instance, according to Interviewee B:

'I believe that customer managers need to establish a good professional image in front of clients, demonstrating integrity, efficiency, self-confidence, personal charm, and high-level professional abilities to win their trust and respect.'

The interviewees engage in both internal and external communications to carry out their work. In terms of internal communications, Interviewee D said:

'As the workshop director, I need to communicate effectively with employees, superiors, and other departments. I must listen to employees' opinions and suggestions, understand their needs and problems, promptly solve their troubles, and establish good employee relationships.'

In terms of external communication, in the opinion of Interviewee E:

'In fact, doing foreign trade is dealing with foreigners, which is to let them trust you. Once they trust you, the order will naturally come to you. Honesty, punctuality, and understanding are qualities that can earn the trust of customers.'

Interviewee H emphasizes communication with peers, while there is emphasis on foreign/English language skills by Interviewee J, Interviewee H, and Interviewee F. As far as cross-cultural communication is concerned, some interviewees talked about their perceptions. According to Interviewee J:

'... it is necessary to understand the cultural backgrounds and business etiquette of different countries to avoid misunderstandings caused by cultural differences.'

Some interviewees have their plan for further improvement in communication skills, including Interviewee H, Interviewee I, and Interviewee F.

Comprehensively, the interviewees have a relatively high awareness of the importance of various communication skills for their foreign trade work, and expect to make progress continuously in the future.

5.10 Theme: There Are Gaps for Improvement, and the Areas Needing Improvement Vary

Through coding and thematic analysis, it is found that all the 10 interviewees recognize that there are gaps between expectations and reality in terms of their leadership, professional, digital literacy and green economy/sustainability competences, despite of different expressions and narrations. For example, according to Interviewee D:

'I feel that I sometimes struggle to improve myself because of my busy work schedule and lack of time for self-learning and training.'

Interviewee F said:

'I feel that there are many aspects of management that need to be learned, and there will be some progress every year. New learning should never stop, and progress slows down with age.'

Interviewee J expressed:

'I strive to become a better foreign trade manager, but I don't have any illusions that I will become the best foreign trade manager.'

As for the areas that need to be improved in the viewpoints of interviewees, they can be summarized in the table below:

Table 2. Areas for improvement

Areas for improvement	Interviewees
Team management	Interviewee A, C, D, I
Market analysis	Interviewee A
Forecasting and planning	Interviewee A, J
Business skills	Interviewee B
Overall management level, skill & practices	Interviewee B, C, E, H
Leadership	Interviewee C, E, F, G, J
Cost management	Interviewee D
Languages	Interviewee E
Technical ability, cutting edge technologies, expertise	Interviewee E, F, G
Communication skills	Interviewee F, H, I
Digital capabilities, computer skills	Interviewee F, H
Data analysis & statistics	Interviewee G, I, J
Customer relationships	Interviewee H
Employee motivation	Interviewee I
Maintenance and repair knowledge	Interviewee I
Combination of people and task orientations	Interviewee J

Among the interviewees, the most emphasized skill gaps needing improvement are Leadership, Team Management, Overall Management Level, Skill & Practices. For example, according to Interviewee E:

'... *my future career development plan and promotion channels require me to further improve my management skills and leadership abilities.*'

There are also other gaps being paid special attention to by specific interviewees. For example, according to Interviewee D:

'*The areas where I need to improve the most at present are cost management and team building abilities.*'

To sum up, the interviewees have demonstrated their awareness of the gaps in their various management abilities and competencies, and have relatively considerate plans to continuously improve and engage in lifelong learning in their future career paths.

6. Discussion and Model Construction

6.1 Discussion

According to the literature review, foreign trade managers need to have competencies in digital technologies (Oberlander et al., 2020; Rahman & Muktadir, 2021), e-commerce/e-business platform operations (Dai et al., 2024), and cybersecurity (Gagliani, 2020). The empirical research findings of interviews show that the interviewees have a relatively high awareness of the importance of these aspects, and have grasped a certain level of corresponding skills and capabilities. However, they recognize that they need to further enhance their own competencies in technical ability, cutting-edge technologies, expertise digital capabilities and computer skills, as well as data analysis and statistics, reflecting the gap between personal expectations and reality.

In terms of green economy and sustainability, the interviewees understand the requirements of these aspects currently, which echoes the literature review (Salifu & Salifu, 2024). However, they refer to the limitations of their work contents, their companies and industries in more effectively facilitating green economy and sustainability. Despite limitations, they express their willingness to make more personal contributions to sustainability, and some of them have personal work plans to reinforce sustainability in their future work, which is a gratifying phenomenon.

With regard to leadership capabilities, interview questions designed in this research seem somewhat complex

because of many variables involved, including foresee the future, gain insight into industry trends, and set clear goals for the organization (Sacavem et al., 2017); make decisive decisions, control the situation, and ensure the achievement of goals (Siyal, 2023); effectively and efficiently lead market, resources and teams (Siyal, 2023). The complexity is because of the rich contents of leadership concept per se. The interviewees answered the complex questions in a relatively orderly way, and mostly made positive and confident evaluations on their competencies in these aspects. However, this does not mean that they are satisfied with their current capabilities. Rather, they admit that they still need to strengthen their abilities in team management, market analysis, forecasting and planning, business skills, overall management level, skill & practices, leadership as a whole, cost management, customer relationships, employee motivation, and combination of people and task orientations. The findings demonstrate that the interviewees have relatively high requirements for the improvement of their own capabilities in leadership.

Finally, as far as professional quality is concerned, the interview questions are designed according to the literature review, including a high degree of flexibility and agile learning ability to quickly adapt to market changes (Desalegn et al., 2024), and communication skills in foreign trade (Szkudlarek, 2020). In these aspects, the interviewees talked about their expectations and plans for further enhancing their life-long learning through reading and training. In addition, they showed their actions and behaviors in work to accumulate on-the-job experiences to make their flexibility/adaptability/agility improved further. As far as communication is concerned, interviewees mentioned language abilities and cross-cultural communications, reflecting their relatively high awareness of these aspects.

In view of the consistence of research findings with the literature review, a competence characteristic model is designed to show the capabilities that need to be possessed by the foreign trade managers in the GBA of China:
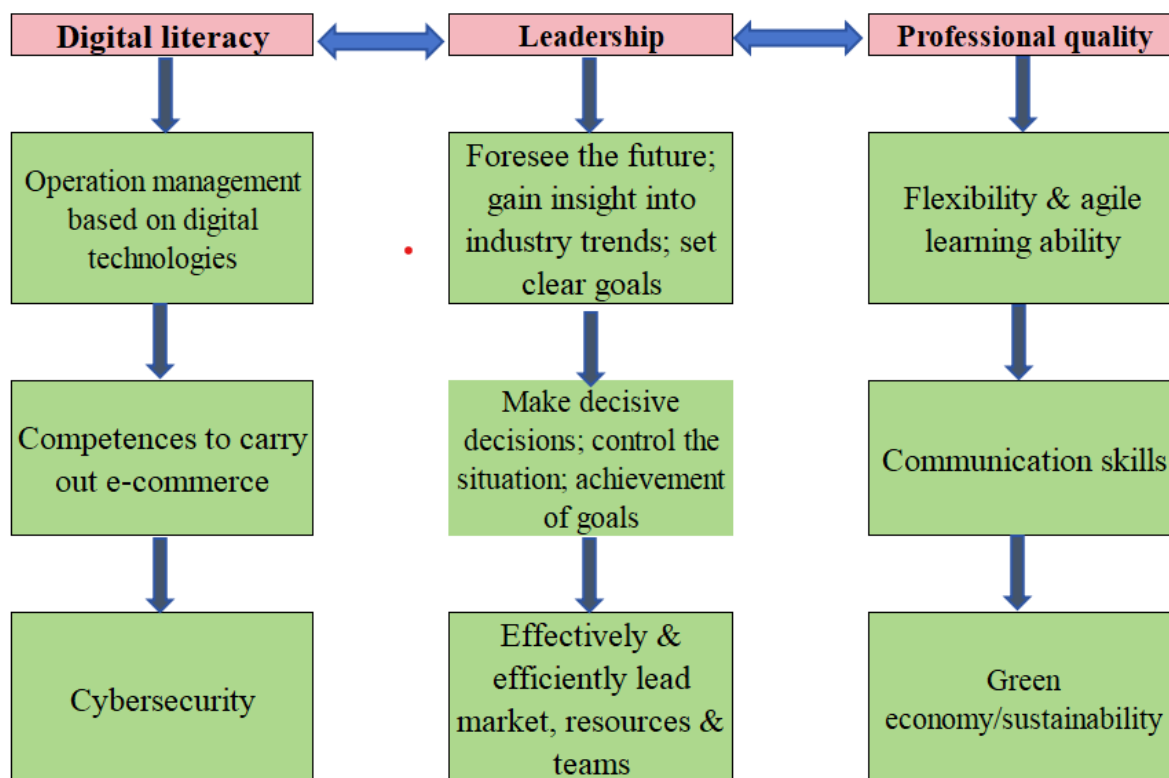

Figure 2. Competence characteristic model for foreign trade managers in the GBA

Source: Author.

According to the gap between expected and existing competences in the viewpoint of the interviewees, a gap model is constructed to illustrate the aspects needing further enhancement/improvement:
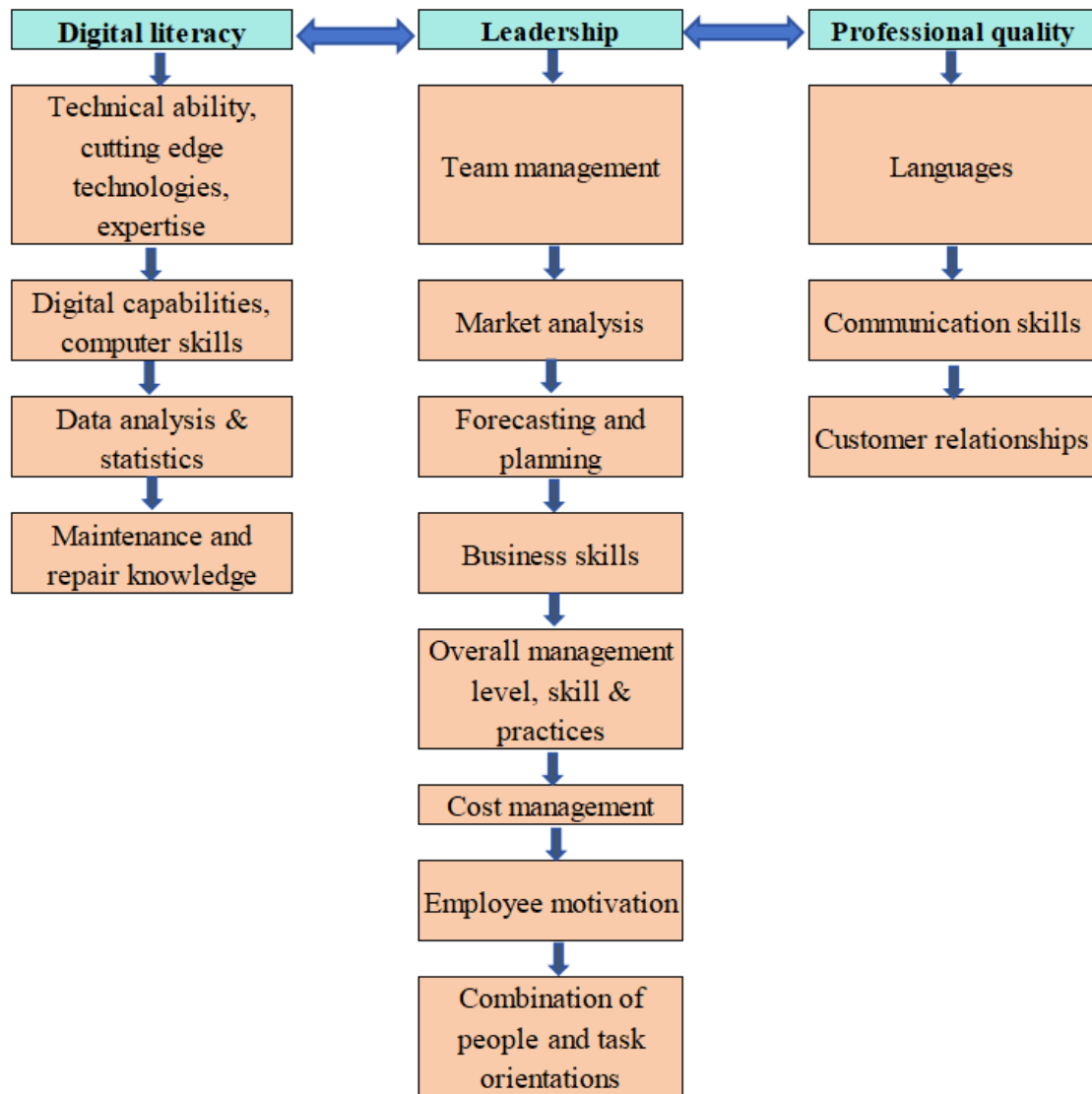
Figure 3. The gap model of competence characteristics for foreign trade managers in the GBA

Source: Author.

7. Conclusion, Limitation and Future Research Direction

7.1 Conclusion

In conclusion, through the literature review and empirical qualitative data collection and analysis of this research, it has been found that the interviewees possess some competence characteristics in digital literacy, leadership, and professional quality. However, all of them consider that there are gaps between their actual capabilities and their own personal expectations of the capabilities which should be further obtained by them. Therefore, they have their plans for future improvement in various aspects to better support their foreign trade work.

7.2 Limitations

The first limitation of the research lies in that the variables are not tested statistically, and there are no hypotheses to be confirmed or rejected whereby. Second, qualitative research method cannot achieve the effect of generalizability to the whole population.

7.3 Recommendations

In future research, statistical model can be constructed involving digital literacy, leadership and professional quality as independent variables, and work performance as dependent variable, to test the effect of the independent variables on the work performance of the foreign trade management personnel in the GBA of China. This needs to be based on relatively large-scale questionnaire surveys to quantify the data collected, with random sampling being applied. In this way, generalizability can be achieved to a large extent.

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Research on the Driving Factors and Pathways of Discontinuous Change in China's Emergency Management Policies: A Clear Set Qualitative Comparative Analysis Based on 20 Cases

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Abstract

The change in China's emergency management policies is largely influenced by emergencies, but not all emergencies drive policy changes. Based on the Punctuated Equilibrium Theory, this paper employs the Clear Set Qualitative Comparative Analysis (csQCA) method to study 20 cases of emergencies in China, categorized into natural disasters, accident disasters, public health incidents, and social security incidents. Combining the actual context of Chinese policy decision-making, the paper focuses on analyzing the driving elements and configuration pathways that lead to discontinuous changes in emergency management policies. The study finds that the shift in high-level attention is a necessary prerequisite for changes in emergency management policies. There are two configuration pathways for policy change, which can be classified into macro-political push type and focal event-induced type. By using the qualitative comparative analysis method to explore and reflect on the mechanisms of emergency management policy change, we can better grasp the inherent laws of policy change from the perspective of condition combinations, providing theoretical insights for the future optimization and adjustment of emergency management policies.

Keywords: emergency management policy, policy change, clear set qualitative comparative analysis

1. Introduction

In 2014, General Secretary Xi Jinping proposed the concept of a holistic approach to national security, integrating emergency management into the overall consideration of national security and innovating it as a comprehensive public safety governance model. Therefore, from a macro perspective, the emergency management system is generally subordinate to the national public safety system (Zhu Zhengwei & Wu Jia, 2019), and emergency management can essentially be defined as "public safety governance". The report of the 20th National Congress of the Communist Party of China in 2022 emphasized the need to resolutely safeguard national security and social stability, incorporating public safety and emergency management into the framework of national security. It also pointed out that improving the level of public safety governance requires adhering to the principle of safety first and prevention first, establishing a comprehensive safety and emergency framework, and improving the public safety system. This indicates that promoting the modernization of emergency management and enhancing the national security system and capabilities have become important levers for achieving the modernization of the national governance system and governance capabilities.

Historically, China has been a disaster-prone country, and the ideas and practices of crisis or emergency management have a long history, especially since the founding of the People's Republic of China. Various emergencies (natural disasters, accident disasters, public health incidents, social security incidents) have frequently occurred, causing significant economic losses and casualties, and posing enormous challenges to the

government's emergency management work. Reviewing the history of emergency management in China, it can be said that the development and changes in emergency management and its policies are invariably linked to emergencies, and they exhibit distinct stage characteristics. However, not all emergencies lead to policy changes; rather, they are the result of multiple factors working together. So, besides emergencies, what other necessary conditions are required for changes in emergency management policies? And what pathways exist? This paper attempts to answer these two questions by constructing an analytical framework for the change in China's emergency management policies based on the Punctuated Equilibrium Theory, and by focusing on the driving elements and configuration pathways that lead to discontinuous changes in emergency management policies, thereby better grasping the inherent laws of emergency management policy change.

2. Literature Review

2.1 Emergency Management Research

Reviewing relevant literature, it can be seen that research on emergency management in China started relatively late, truly taking off after the SARS incident in 2003. Existing research on emergency management mainly focuses on emergency capabilities, emergency systems, emergency institutions, and emergency mechanisms, with less attention paid to the driving forces and pathways of emergency management policy changes from a macro-dynamic perspective. For example, Zhong Kaibin (2009) believes that China's emergency management system is built around the "one plan, three systems" core, and that the emergency management system should be adjusted according to changes in social development to adapt to the development of society in different periods; Zhang Haibo (2019) emphasizes the whole-process management of emergency management, arguing that the key to innovative development of emergency management in the new era is process reengineering, comprehensively optimizing the operational mechanisms of emergency management from the five stages of preparation, prevention, mitigation, response, and recovery; Yu Jianxing and Chen Shaohui (2022) emphasize the introduction of digital technology to achieve crisis governance through platform embedding, thereby enhancing emergency management capabilities. In fact, after two decades of development, the evolution of emergency management policies in China is a specific reflection of the requirements of socio-economic development for emergency management systems or practices in different periods. From a practical development perspective, China's emergency management policies have experienced both gradual minor adjustments and discontinuous changes caused by focal events or leadership decisions. However, current research on emergency management in China tends to focus on static theoretical analysis, lacking dynamic research on the entire development trajectory of emergency management policies. Therefore, this study will draw on the Punctuated Equilibrium Theory and use the Clear Set Qualitative Comparative Analysis method to explore and analyze the influencing factors and condition combinations of discontinuous changes in emergency management policies.

2.2 Policy Change Research

Public policy change has always been a core area and research hotspot in both domestic and international academia. In the 1960s, Charles Lindblom defined policy change as "the science of muddling through" and proposed the incrementalism model of policy change; in 1984, John Kingdon proposed the Multiple Streams Theory, attributing policy agenda setting to the coupling of three streams: political, policy, and problem streams; subsequently, in 1993, Sabatier and Smith jointly proposed the Advocacy Coalition Framework, arguing that the process of policy change is a gradual evolution driven by the competition among advocacy coalitions and external shocks to the system; the Punctuated Equilibrium Theory was proposed by Baumgartner and Jones based on the process of policy issues appearing and disappearing from the public agenda in U.S. politics. They believe that the policy process is usually driven by a stable incremental logic, thus presenting a long-term stable state. However, during this process, due to internal and external factors, policy crises and changes occur from time to time, leading to policy collapse. This theory takes into account both the discontinuous and equilibrium states of policies, demonstrating strong explanatory power for actual policy analysis. The above theories and models have been extensively tested and revised through research and have been widely applied in the field of policy change research in China. Based on these theories, theoretical explanations have been made for the policy evolution in fields such as transportation, family planning, education, and public health, and adaptive revisions have been made according to the specific policy context in China. For example, Kuang Yanhua (2015) explored the driving factors of fluctuations in fiscal expenditures in the environmental protection field in China based on the Punctuated Equilibrium analysis framework and developed the "decision-maker attention — institutional friction" explanatory framework; Xie Ming (2018) added the "political pressure" factor to the study of China's poverty alleviation policy changes, arguing that the accumulation of political pressure has a destructive effect on the original policy monopoly, continuously enriching the connotation of the original Punctuated Equilibrium Theory.

3. Research Methods and Case Selection

3.1 Research Methods

The Qualitative Comparative Analysis (QCA) method was created by American scholar Charles C. Ragin in 1987. This is a research method that explores the causal relationship between conditions and results from a holistic perspective. Its basic assumption is that there are interdependent relationships among condition variables, and cases are "configurations" of condition variables. By comparing and analyzing cases, the configuration pathways that lead to the occurrence or non-occurrence of results can be derived (Du Yunzhou et al., 2017). The key questions it answers are: What are the antecedent conditions that lead to the occurrence of a certain result? What are the antecedent conditions that do not lead to the occurrence? Can the number of conditions leading to the occurrence of a result be reduced? What are the sufficient conditions that lead to the occurrence of a certain result? What are the necessary conditions? It is essentially a combination of quantitative and qualitative methods, aiming to explore the causal relationships among variables.

In terms of classification, the Qualitative Comparative Analysis method is mainly divided into three categories based on the types of variables it handles: Clear Set Qualitative Comparative Analysis (csQCA), Fuzzy Set Qualitative Comparative Analysis (fsQCA), and Multi-value Set Qualitative Comparative Analysis (mvQCA). The research method used in this paper is Clear Set Qualitative Comparative Analysis (csQCA), and the software used is fsQCA3.0. Clear Set Qualitative Comparative Analysis is typically used for the analysis of binary variables, where condition and result variables are assigned values of "0" or "1". By assigning binary values of 0 or 1 to antecedent conditions, the path relationships between result variables and antecedent conditions are identified. The Qualitative Comparative Analysis method mainly evaluates antecedent conditions and pathways through two indicators: Consistency and Coverage. The Consistency formula (1) is used to test sufficiency and necessity, while the Coverage formula (2) reflects the explanatory power of antecedent conditions or pathways. When Consistency is greater than 0.8, the antecedent condition or pathway can be considered a sufficient condition for the result; when Consistency is greater than 0.9, the antecedent condition or pathway can be considered a necessary condition for the result.

$$\text{Consistency } (Yi \leq Xi) = \sum [\min (Xi, Yi)] / \sum (Yi) \tag{1}$$

$$\text{Coverage } (Xi \leq Yi) = \sum [\min(Xi, Yi)] / \sum (Xi) \tag{2}$$

3.2 Case Selection

Influenced by factors such as climate and topography, China is a country prone to frequent disasters, and emergency response to sudden events has a long history in China. However, since the SARS incident, the cross-border nature and impact of sudden events in China have become increasingly evident. Therefore, this study selected twenty typical cases as research samples within the time frame from the SARS incident to the present, as shown in Table 1. To ensure the typicality and representativeness of the selected cases, this study chose cases that had a profound impact, received widespread public attention, and had complete event records available. Among the twenty cases selected for this study, each of the four types of sudden events (i.e., natural disasters, accident disasters, public health, and social security) accounted for five cases, aiming to exclude the potential influence of the type of sudden events on the research results. The specific case information is shown in the following table:

Table 1. Twenty Sudden Event Cases

Event Type	Case Name	Province(s)	Year
Natural Disasters	Southern Snowstorm	Guizhou, Hunan, Anhui, Sichuan, etc.	2008
	5.12 Wenchuan Earthquake	Sichuan	2008
	4.14 Yushu Earthquake	Qinghai	2010
	9.16 Typhoon Mangkhut	Guangdong, Guangxi, Hainan, Guizhou	2018
	7.20 Zhengzhou Heavy Rainstorm	Henan	2021
Accident Disasters	8.13 Hunan Tixi Bridge Collapse	Hunan	2007
	4.21 Shijiazhuang Liquefied Gas Leak	Hebei	2011
	8.12 Tianjin Binhai New Area Explosion	Tianjin	2015
	12.20 Shenzhen Guangming New Area Landslide	Guangdong	2016
	6.21 Yinchuan Barbecue Restaurant Explosion	Ningxia	2023

Public Health	SARS Incident	Guangdong	2003
	Melamine Milk Powder Incident	Anhui	2004
	H7N9 Avian Influenza	Shanghai, Anhui, Jiangsu, Zhejiang	2013
	Changchun Changsheng Vaccine Incident	Changchun	2018
	COVID-19	Wuhan	2019
Social Security	6.28 Weng'an Incident	Guizhou	2008
	9.20 Shenzhen Fire Accident	Guangdong	2008
	6.5 Chengdu Bus Burning Incident	Sichuan	2009
	7.5 Urumqi Severe Violent Crime Incident	Xinjiang	2009
	3.1 Kunming Railway Station Violent Terror Attack	Yunnan	2014

4. Theoretical Basis and Variable Setting

4.1 Theoretical Model

In the 1990s, based on the assumption of bounded rationality, Baumgartner and Jones proposed the "Punctuated Equilibrium" theory to explain the nonlinear and significant changes in U.S. public policy after long periods of stability and equilibrium. The logic of the Punctuated Equilibrium theory in explaining U.S. policy changes is as follows: the original members of the policy subsystem, in order to maintain the "policy monopoly" within the subsystem, would exclude "outsiders" by shaping a positive image of the policy or raising barriers to entry into the decision-making arena. At this time, "negative feedback" plays a major role, and the policy maintains monopoly and slow development within the subsystem. When policy issues are discussed within the subsystem, the existing institutional structure keeps the decision-makers' attention within a limited range and specific alternatives, making decisions exhibit "path dependence" characteristics to maintain policy monopoly. After a period of imbalance, the policy subsystem always returns to its original state. However, the policy subsystem often faces threats from external mobilization, so policy monopoly is not always successful. When new issues or new dimensions of issues arise and cannot be resolved within the subsystem, external pressures, policy entrepreneurs, and new participants will guide the transformation of the policy image and confront the existing policy image, further stimulating public discussion of policy issues to attract the attention of decision-makers in the macro system. Once the new definition and discussion of policy issues enter the macro political system through agenda setting for serial processing, the policy is likely to face punctuated change. This process is the "positive feedback" process.

In summary, policy monopoly and the continuous strengthening of negative feedback within the policy subsystem maintain the incremental change of policies, while the mobilization and impact of the external environment play a positive feedback role, continuously pushing the agenda setting into the macro political system and promoting punctuated policy changes. The state of policy alternates between punctuation and equilibrium in the transformation of the policy decision-making arena, as shown in the following diagram of the change process:

4.2 Variable Setting

The variable setting of this study includes two dimensions: outcome variables and condition variables. The outcome variable, i.e., the case outcome, refers to whether the national emergency management policy has changed, judged by whether laws, regulations, or institutional settings have been updated. The condition variables, i.e., the antecedent conditions, can be set as the impact scope of focal events, the degree of policy monopoly, the transformation of policy image, and the shift of attention based on the core elements of the Punctuated Equilibrium theory. Based on the Punctuated Equilibrium theory and related research on emergency management policy and its changes, this paper has determined the antecedent condition indicators affecting the change of national emergency management policy, as detailed in Table 2.

4.2.1 Focal Events

Focal events refer to social issues that easily attract public or decision-maker attention. Birkland (Birkland T A) summarized three types of focal events that easily attract social attention: first, events that involve a wide range of people and become focal events. For example, major natural disasters become focal events within a certain geographical area. Second, events that pose significant potential danger to society and thus become focal events. For example, major social projects such as nuclear power plant construction often become the focus of public

attention. Third, events that attract the attention of interest groups or political elites and thus become focal events. In this case, the event itself may not have a wide impact, but it reflects a complex social background, prompting public or decision-maker discussion of the social issues behind the event. Attention to the event itself shifts to social issues or a certain policy, forming a focus. The occurrence of focal events often provides an opportunity to solve related social problems or conditions for policy change and adjustment. In other words, when sudden events exceed the local scope and have a national impact, they easily attract the attention of the public and even decision-makers, promoting policy change.

4.2.2 Policy Arena

There are some institutions or groups in society that have the authority to make decisions on related issues, which we call the "policy decision-making arena" (or policy arena), including authoritative political institutions and interest groups. Baumgartner and Jones proposed that the "policy arena" includes the policy subsystem and the macro political system: the sub-political system is the arena for handling specialized policy issues, while the macro political system is a higher-level arena composed of national leaders and political parties with decision-making power over comprehensive policy issues. In reality, the addition of new actors and internal contradictions can cause changes in the policy arena. In the policy process, policy decision-makers are influenced by various factors, i.e., changes in the policy arena, which directly cause policy changes and accelerate the collapse of policy monopoly.

4.2.3 Policy Image

How policies are understood and discussed by the public and the media, including the description and evaluation of policy content. Based on the public's understanding and acceptance of policies, policy images can be divided into positive and negative policy images. When the public holds a positive attitude towards a policy, it is under the influence of a positive image, which is conducive to policy stability. When the public questions or even opposes a policy, a negative image comes into play, and the public harbors doubts and disapproval of the policy, which can easily lead to policy evolution.

4.2.4 Attention Shift

In reality, due to the specialization of the policy subsystem, its way of handling issues is parallel, and its policy issues are also realized through the policy subsystem. The attention of the macro political system and its leaders is limited and cannot simultaneously identify and handle a large number of policy issues, but can only handle them in order of importance. Its way of handling issues is a serial mode. In this context, how various issues attract the attention of policy makers is crucial. Therefore, when major changes occur in the external political, economic, and other environments, the work of the losers in the policy subsystem is to transfer the issues in the parallel processing field into the serial processing field through the redistribution of attention in the macro political system, making them re-recognize and evaluate certain policy areas and promoting policy development. Therefore, in the policy-making process, the allocation of decision-makers' attention will directly affect whether policy issues can enter the policy agenda and the order in which they enter, thereby affecting decision-making results and achieving policy change.

Table 2. Outcome Variables and Conditional Variables of Policy Change

Variable Category	Value Name	Discriminant Rule	Value
Outcome Variable	Emergency Management Policy Change	Laws and regulations or institutional settings have been updated	1
		Neither laws and regulations nor institutional settings have been updated	0
	Scope of Emergency Impact	The impact of the event involves multiple provinces or even the entire country	1
		The impact of the event does not exceed the local area	0
Conditional Variable	Attention Shift	The central government is responsible for emergency response	1
		Local governments are responsible for emergency response	0
	Degree of Policy Monopoly	The government responds to emergencies in an open policy environment	1
		The government responds to emergencies in a closed policy environment	0
	Policy Image	The public and media generally hold a positive evaluation of the	1

Transformation	government's image after the event	
	The public and media generally hold a negative evaluation of the government's image after the event	0
Attention Shift	The central government is responsible for emergency response	1
	Local governments are responsible for emergency response	0

4.3 Construction of the Truth Table

After completing the selection and assignment of outcome and conditional variables, the truth table was constructed using the fsQCA3.0 analysis software and Boolean algebra algorithms. This table shows all possible logical combinations of outcome and conditional variables for the 20 cases in this study, as listed in Table 3. For ease of expression, each variable code is represented by its English initials: FEC for Focus Event Coverage, DPM for Degree of Policy Monopoly, PIT for Policy Image Transformation, AD for Attention Shift, EMPC for Emergency Management Policy Change, and number for the number of cases.

Table 3. Truth Table

FEC	DPM	PIT	AD	EMPC	number
1	1	1	1	1	6
0	1	1	1	0	4
0	0	0	0	0	4
0	0	0	1	0	2
1	0	0	1	1	1
1	0	0	0	0	1
0	1	1	0	0	1
0	1	0	1	0	1

5. Research Results and Analysis

5.1 Analysis of Antecedent Conditions

As shown in Table 4, among the antecedent conditions, only Policy Image Transformation and Attention Shift have consistency greater than 0.8, but only Attention Shift has consistency greater than 0.9. This indicates that both Policy Image Transformation and Attention Shift can constitute sufficient conditions for the outcome variable, while only Attention Shift is a necessary condition. This means that Attention Shift is a necessary prerequisite for the change in the national emergency management system, and only Attention Shift can independently influence the occurrence of the outcome variable. Other factors must work through conditional combinations to drive changes in national emergency management policies.

Table 4. Necessity and Sufficiency of Conditional Variables

Antecedent Condition	Consistency (%)	Coverage (%)
Large Focus Event Coverage	75.00	50.00
Small Focus Event Coverage	25.00	25.00
Open Policy Field	75.00	42.86
Monopolized Policy Field	25.00	33.33
Negative Policy Image	87.50	53.84
Positive Policy Image	12.50	8.33
Attention Shift of Decision-Makers	98.15	58.33
No Attention Shift of Decision-Makers	12.50	8.33

5.2 Path Configuration Analysis

Using the fsQCA3.0 software for Boolean minimization, three solutions are output: the parsimonious solution, the intermediate solution, and the complex solution. The parsimonious solution refers to the configuration with the fewest conditions after simple and difficult counterfactual analysis; the complex solution is based on raw data without considering logical remainders, usually containing more configurations and antecedent conditions; the intermediate solution considers only simple counterfactual analysis, incorporating logical remainders that align with theoretical expectations and empirical evidence. Existing research shows that among these three solutions, the intermediate solution, which is reasonable, well-supported, and moderately complex, is generally the preferred choice. Moreover, in the configuration analysis results, core conditions coexist in both the parsimonious and intermediate solutions. Based on this, this paper uses the intermediate solution as the foundation for discussing the results, determining the number of configuration paths and conditional combinations, and then uses the parsimonious solution to identify the core conditions in the aforementioned paths, resulting in the intermediate solution for the configuration path analysis of the discontinuous change in emergency management policies.

As shown in Table 5, the discontinuous change paths of China's emergency management policies mainly include two types: macro-political-driven and focus-event-induced. The overall coverage of these two configuration paths is 87.5%, meaning that these two path types can explain 87.5% of the phenomena of emergency management policy changes.

Table 5. Configuration Distribution of Discontinuous Change Paths in China's Emergency Management Policies (Intermediate Solution)

Item	Focus-Event-Induced	Macro-Political-Driven
Path	1	2
Focus Event Coverage	●	◎
Degree of Policy Monopoly	●	◎
Policy Image Transformation	●	●
Attention Shift	▲	▲
Raw Coverage (%)	75	75
Unique Coverage (%)	12.5%	12.5
Overall Consistency	1	
Overall Coverage (%)	87.5	

Note: "●"and "▲" indicate that the condition occurs, "◎" indicates that the condition does not occur. Among them, "▲" indicates a core condition, "▲"and "▲" indicate necessary conditions. Raw coverage refers to the proportion of cases explained by the path; unique coverage refers to the proportion of cases explained only by the path; overall coverage refers to the proportion of cases explained by all paths.

(1) Focus-Event-Induced Path

The focus-event-induced discontinuous change path of China's emergency management policies refers to Path 1 (Focus Event Coverage, Degree of Policy Monopoly, Policy Image Transformation, Attention Shift). That is, when a focus event occurs and its impact involves multiple provinces or even the entire country, external factors will significantly shake the internal policy subsystem, quickly attracting the attention of decision-makers. At the same time, a negative policy image becomes prominent, and the negative feedback mechanism comes into play. Citizens, social groups, etc., actively participate in politics, entering the policy field and changing the original power structure, thereby driving the macro-political system to pay high attention to the issue, re-examining and defining it, and responding to promote the discontinuous evolution of policies. Typical events include the 2003 SARS outbreak, the 2008 southern snowstorm and Wenchuan earthquake, and the 2019 COVID-19 pandemic.

2003 SARS Outbreak. The SARS outbreak began in Guangdong in December 2002 but was not taken seriously initially. It was not until April 2003, when the outbreak spread nationwide, affecting more than 20 provinces (autonomous regions, municipalities) in mainland China, that it attracted high attention from government departments, news media, and the public due to its strong transmission, unknown pathogen, and the spread of rumors, accelerating the accumulation of a negative policy image. Subsequently, driven by national leaders and medical experts, China began to explore the establishment of a "one plan, three systems" emergency system, revising the "Law on the Prevention and Control of Infectious Diseases" in 2004, promulgating the "National Emergency Response Plan for Public Emergencies" in January 2006, and enacting the "Emergency Response

Law of the People's Republic of China" in 2007, marking a key step in China's emergency management system.

2008 Southern Snowstorm and Wenchuan Earthquake. From January 10 to February 2, 2008, most parts of China, especially the southern regions, experienced four consecutive cooling and snow-rain processes, resulting in severe low-temperature snow and ice disasters. Just three months later, before the post-disaster recovery and reconstruction were completed, an 8.0-magnitude earthquake struck Wenchuan County, Sichuan Province, on May 12, becoming the most destructive, widespread, and challenging earthquake since the founding of the People's Republic of China. These two major disasters severely tested China's "one plan, three systems" emergency management policies, exposing issues such as weak practicality and specificity of emergency plans, insufficient emergency coordination capabilities, and weak policy basis for post-disaster reconstruction, exacerbating the negative image of the policies and prompting high attention and deep reflection from the central government. Consequently, in 2008, the State Council promulgated the "Regulations on Post-Wenchuan Earthquake Recovery and Reconstruction" to guide post-disaster recovery and reconstruction, established the Emergency Rescue and Coal, Electricity, Oil, and Transportation Command to ensure the smooth progress of rescue work for the severe snow and ice disasters, and issued a series of policy documents covering emergency rescue, life resettlement for affected people, health and epidemic prevention, and post-disaster reconstruction, promoting the improvement of the "one plan, three systems" emergency management policies.

2019 COVID-19 Pandemic. At the end of December 2019, unexplained pneumonia cases with exposure history to the Huanan Seafood Market were successively discovered in some hospitals in Wuhan. However, the Wuhan municipal government did not attach sufficient importance to these cases or handle them appropriately. Under public scrutiny, the Wuhan authorities continued to organize various mass gatherings, including the Spring Festival Greeting Ceremony and the Ten Thousand Families Banquet. However, the increasing number of cases and the continuous strain on medical resources, among other issues of inadequate emergency response, led to heightened public concern. Under the guidance of central leadership and infectious disease experts, various epidemic prevention and control policies were successively introduced, which also prompted the enactment of the Biosafety Law. This marked a discontinuity in the evolution of emergency management policies.

(2) Macro-Political Driven Type

The path of China's emergency management policy changes driven by the central government refers to Path 2 (~scope of focus event impact * ~degree of policy monopoly * policy image transformation * attention shift). This indicates that when no single major emergency occurs or its impact does not exceed the local region, regardless of whether the policy field is in a highly monopolized or closed state, a transformation in the policy image occurs, meaning a negative policy image begins to form. If the attention of the macro-political system (central government) is reallocated, emergency management policies are likely to undergo significant changes. In the context of China's unique political system and decision-making discourse, the macro-political system plays a decisive role in driving changes in the policy field. Decision-makers can exert absolute influence over the policy subsystem through internal learning, thereby driving changes in the policy field and achieving policy discontinuity. Typical events include the establishment of the Central National Security Commission in 2013 and the Ministry of Emergency Management in 2018.

Since the 18th National Congress of the Communist Party of China, risks in the new era and under new circumstances have exhibited highly complex and uncertain characteristics. The emergency management system established after the SARS incident, which focuses on multi-hazard comprehensive emergency response, has shown significant inadequacies. Coordination in emergency work often faces issues such as blurred responsibility boundaries and mismatched authority and responsibility, leading to inefficiencies in emergency management. Against this backdrop, in November 2013, the Third Plenary Session of the 18th Central Committee decided to establish the Central National Security Commission. On April 15, 2014, Xi Jinping presided over the first meeting of the Central National Security Commission, where the concept of a holistic approach to national security was first proposed. In the same year, China revised the Work Safety Law. Guided by the holistic approach to national security, in 2015, China promulgated the National Security Law of the People's Republic of China, providing legal support for addressing universal issues in national security and urgent legislative gaps in emergency management. This marked the beginning of China's decision-making and deployment of emergency management work from the strategic height of national security. Especially after the 19th National Congress of the Communist Party of China in 2018, during a new round of institutional reforms, the Ministry of Emergency Management was established, marking another significant transformation in China's emergency management system.

6. Research Conclusions and Policy Implications

6.1 Research Conclusions

The research conclusions of this paper include two dimensions: influencing factors and path distribution. In

terms of influencing factors, based on the analysis of antecedent conditions, attention shift is a necessary condition for emergency management policy changes and can independently influence policy changes. Other factors must be combined to achieve this. In terms of path distribution, based on the configuration analysis results, there are two configuration distributions for emergency management policy changes, which can be divided into macro-political driven type and focus event induced type.

Building on the Punctuated Equilibrium Theory, this paper uses the clear-set qualitative comparative analysis method to explore the influencing factors and paths of China's emergency management policy changes, revealing the mechanism of national emergency management system changes under the combined influence of multiple antecedent conditions. At the same time, this study also addresses the shortcomings of overly singular research methods and theoretical analysis in the field of institutional changes, providing a new approach to traditional qualitative research in this field.

6.2 Policy Implications

The research conclusions of this paper provide two implications for optimizing emergency management policies: First, expanding the policy field to promote multi-stakeholder collaboration. China has a highly centralized administrative system, and the macro-policy system holds absolute dominance. However, an open and inclusive policy field can attract more policy stakeholders, making the policy stakeholders more diverse, thereby providing more knowledge and experience for the formulation of emergency management policies. Therefore, future emergency management work should continuously transform government functions, broaden channels for multi-party participation, and actively guide the orderly entry of experts, scholars, companies, public organizations, and individual citizens into the policy field, promoting scientific and democratic decision-making. Second, strengthening reflection and learning from focus events to grasp the direction of policy changes. Throughout the history of China's emergency management policy changes, focus events such as the SARS incident and the COVID-19 pandemic have largely played a "trigger" role. In addition to impacting the scientific and rational aspects of current emergency management policies, focus events also have significant value for policy reflection and learning. Whether a focus event leads to policy discontinuity depends on whether it attracts the attention of decision-makers. Therefore, in dealing with focus events in the future, policy decision-makers should deeply analyze the underlying causes of focus events, identify the shortcomings and defects in existing policies, and strengthen reflection and learning on policies to provide ideas for policy adjustments and changes.

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