



The Interplay of Accounting Professionals' Emotional Intelligence, Decision-Making Styles, and Client Relationship Quality in Erbil's Manufacturing Companies

Abdulrahman Mawlood Mustafa¹ *, Hewa Hama Zeyad Saleem² 

¹International University of Erbil, Erbil, 44001, IRAQ

²Ministry of Higher Education and Scientific Research, Erbil, 44001, Kurdistan Region, IRAQ

DOI: <https://doi.org/10.63841/iue31602>

Received 07 Jul 2025; Accepted 20 Aug 2025; Available online 17 Jan 2026

ABSTRACT:

This study examines the dynamic interplay among emotional intelligence, decision-making styles, and client relationship quality within the unique context of accounting professionals in Erbil's manufacturing companies. Grounded in Mayer and Salovey's four-branch model of emotional intelligence that integrates EI theory, decision-making models, and client relationship literature, the research aims to unravel the complex relationships shaping professional behaviours and outcomes. A Structural Equation Modeling approach was applied to a cluster sample of 422 responses from Bakhtiari, Brayaty, Nuseran, Kuran Ankawa and Eskan districts in Erbil, Kurdistan. According to the study, emotional intelligence directly affects directive decision-making in a significant manner as opposed to analytical and rational decision-making styles. The study upholds that directive decision-making does not mediate the relationship between emotional intelligence and client relationship quality compared to analytical decision-making and rational decision-making styles whose effects are moderate and high, respectively. This research contributes to the existing literature by bridging the gap between emotional intelligence studies and professional practices, particularly within the realm of accounting in manufacturing. Practical implications derived from the findings are expected to inform strategies for enhancing emotional intelligence, optimizing decision-making approaches, and ultimately improving client relationships in Erbil's manufacturing companies.

Keywords: Analytical decision-making, decision-making styles, directive decision-making, emotional intelligence, mediating effect, rational decision-making.



1 INTRODUCTION

In an era marked by persistent economic challenges, fostering organizational resilience has become imperative for businesses striving to achieve their strategic objectives. The global economy continues to grapple with the lingering effects of the 2008 financial crisis and the more recent disruptions caused by the COVID-19 pandemic [1]. In this context, implementing cost-effective strategies that enhance repeat business, drive revenue growth, improve customer satisfaction, strengthen customer retention and loyalty, build a positive brand image, and create opportunities for cross-selling and up-selling is critically important. One such strategy is the cultivation of high Client Relationship Quality (CRQ), a key determinant of long-term business success. Drawing on the definition of relationship quality by Wong and Zhou [2], CRQ can be operationalized as the degree of client satisfaction, trust, loyalty, and overall favorable perception toward a service provider. Achieving high CRQ necessitates the development and maintenance of close, meaningful, and value-driven relationships with clients. As emphasized by Aghazadeh and Hoang, the foundation of CRQ lies in consistent trust-building, effective communication, a deep understanding of client needs, and the reliable delivery of value [3].

Meanwhile, despite the growing recognition of CRQ as a strategic asset, the evolving roles of accounting professionals in manufacturing firms within the Kurdistan Region, particularly in Erbil, have not received commensurate scholarly attention. These professionals are no longer confined to traditional functions such as financial reporting and auditing; they increasingly contribute to cost control, revenue optimization, and strategic decision-making [4]. Given this expanded

602 *Corresponding author: abdulrahmanmawloodm@gmail.com

<https://ojs.cihanrtv.com/index.php/public>

scope, their ability to manage client relationships effectively is paramount. However, the success of CRQ initiatives often depends on the decision-making styles adopted within organizations. As Elbanna and Elsharnouby note, decision-making styles can either support or undermine organizational strategies and outcomes. Inappropriate or inconsistent decision-making may hinder CRQ development, leading to inefficiencies and eroded client trust [5]. Therefore, organizational leaders must ensure that appropriate and effective decision-making styles are implemented at the right time and in the right context.

Integrating emotional intelligence (EI) into decision-making processes can mitigate the risks associated with poor judgment and enhance the effectiveness of CRQ strategies by aligning decisions with clients' emotional and practical needs. However, despite the theoretical promise of such integration, empirical research on the interplay between EI, decision-making styles, and CRQ remains limited, particularly in non-Western and non-financial service contexts [6,7]. This gap underscores the need for context-specific investigations. A significant challenge in CRQ research is the difficulty of developing sustainable, high-quality client relationships amid competitive markets, unmet expectations, and communication breakdowns. Addressing these challenges requires a nuanced understanding of clients' needs and emotions, core components of emotional intelligence. Yet, the role of EI in enhancing CRQ within accounting practices in Kurdistan has been largely overlooked. Empirical studies exploring this interplay are scarce, with existing research predominantly concentrated in sectors such as healthcare [8] and retail [9]. The exclusion of Kurdistan and its manufacturing sector from such discourse limits the generalizability of findings and weakens the relevance of existing models to local professional contexts. Furthermore, while the integration of multiple constructs such as EI and decision-making styles holds promise for enhancing CRQ, such synergistic approaches remain underdeveloped. There is limited understanding of how emotional intelligence interacts with specific decision-making styles (directive, analytical, and rational) and how these interactions influence client relationship outcomes. Notably, there is a dearth of research examining whether these decision-making styles mediate the relationship between emotional intelligence and CRQ. To address these gaps, this study aims to examine the interplay among emotional intelligence, decision-making styles, and client relationship quality among accounting professionals in Erbil's manufacturing sector. Specifically, it seeks to answer the following research questions:

- 1) Amid challenges in client relationship quality, how significant are the relationships linking emotional intelligence and directive, analytical, and rational decision-making styles with client relationship quality?
- 2) In organizations where emotional intelligence levels vary among employees, to what extent do directive, analytical, and rational decision-making styles mediate the impact of emotional intelligence on client relationship quality?

The significance of this research lies in its potential to enhance professional competence, inform organizational strategy, and address sector-specific dynamics within a unique regional context. By providing empirical insights into the interplay between cognitive and emotional factors in professional decision-making, the study contributes to both theoretical development and practical application in the field of accounting and client relationship management. This study focuses on accounting professionals in Erbil's manufacturing sector, aiming to bridge critical empirical gaps by developing a sector-specific model that incorporates emotional intelligence, decision-making styles, and client relationship quality. Given the unique relational and operational challenges faced by accountants in manufacturing companies, it is critical to understand how these factors interact so as to enhance professional effectiveness. The empirical findings contribute not only to the theoretical advancement but also offer practical insights for designing targeted training and development programs that boost interpersonal competencies and service delivery to meet the unique demands of the manufacturing industry.

2 LITERATURE REVIEW

The integration of emotional intelligence (EI) into professional decision-making and client relationship management has gained increasing scholarly attention, particularly in service-oriented professions such as accounting. This study is grounded in Mayer and Salovey's (1997) four-branch model of emotional intelligence, which conceptualizes EI as the ability to (1) perceive emotions, (2) use emotions to facilitate thought, (3) understand emotional meanings, and (4) manage emotions in oneself and others [10]. This model provides a robust and empirically validated framework for examining how emotional competencies influence cognitive and interpersonal processes in organizational settings. - Recent research affirms that individuals with higher EI are better equipped to navigate complex social environments, regulate stress, and make balanced decisions, skills critical for client-facing professionals (Joseph et al., 2023). A 2023 meta-analysis by Martins et al. in Journal of Organizational Behavior found that EI significantly predicts leadership effectiveness, team performance, and customer service quality across diverse industries, reinforcing its relevance in professional service delivery. Similarly, in a study of financial professionals, Ashkanasy and Daus (2023) demonstrated that EI enhances ethical judgment and reduces decision-making biases, particularly under pressure.

Decision-making styles, commonly categorized as directive, analytical, rational, and intuitive, are shaped by both cognitive and emotional factors. While earlier studies emphasized cognitive dominance in analytical and rational decision-making [4], emerging evidence suggests that emotional regulation and empathy play a supportive role, especially in high-stakes, client-dependent contexts. For instance, Kankam and Charnor found that in consumer-facing services, individuals with high EI are more likely to adopt balanced decision-making approaches that integrate data with emotional cues, leading to improved trust and loyalty outcomes [9]. This aligns with the Mayer-Salovey model, which posits that emotions can facilitate, rather than hinder, rational thought when properly managed. In the accounting profession, where precision, ethics, and client trust are paramount, the interplay between EI and decision-making is particularly salient [10]. A 2023 study by Alsalmi and Omrane in the International Journal of Management and Sustainability examined EI in Iraqi industrial organizations and found that self-awareness, empathy, and emotion regulation significantly enhanced leadership and interpersonal coordination, key components of effective client relationship management [11]. Similarly, Egbaria explored EI's role in career decision-making among professionals and concluded that emotionally intelligent individuals are more adaptive, reflective, and client-centric in their choices [12].

Client Relationship Quality (CRQ), defined as the degree of trust, satisfaction, commitment, and mutual understanding in a professional-client relationship [13], is increasingly recognized as a strategic asset in accounting. Aghazadeh and Hoang emphasized that consistent communication, reliability, and emotional attunement are foundational to CRQ in audit and advisory services [4]. However, despite the growing recognition of EI's role, empirical studies linking EI, specific decision-making styles (e.g., analytical, rational), and CRQ, particularly in non-Western, manufacturing-based accounting contexts, remain scarce.

While prior research has examined EI and decision-making in isolation like Zaki, Abd-Elrhaman and Ghoneimy [14] and El Othman [15], few studies have integrated these constructs within a unified model. Notably, Leonidou et al. highlighted the mediating role of EI in international buyer-seller relationships but did not explore how specific decision-making styles channel this effect [16]. This gap is especially pronounced in emerging economies like the Kurdistan Region of Iraq, where rapid professionalization in accounting has outpaced scholarly investigation. By applying Mayer and Salovey's four-branch model, this study unifies the conceptualization of EI and advances theoretical understanding by examining how EI influences directive, analytical, and rational decision-making styles, and how these styles, in turn, affect client relationship quality. It responds to recent calls for context-sensitive research on emotional intelligence in professional services [19,20] and contributes novel empirical insights from a region underrepresented in the global literature. Furthermore, this study advances the theoretical discourse by examining the joint impact of emotional intelligence and decision-making styles on client relationship quality, thereby contributing to a more holistic model of professional effectiveness in client-facing accounting roles. In light of these observations, the next section of the study explores the interplay between emotional intelligence, decision-making styles and CRQ with the goal of filling these voids.

2.1 RELATED STUDIES AND HYPOTHESES DEVELOPMENT

Foremost, research on the interplay between decision-making styles, EI, and CRQ remains in its early stages. Consequently, there is limited understanding of the interactive connections among these constructs. To address this gap, this study first acknowledges the established role of emotional intelligence in shaping decision-making styles. Indeed, the influence of EI on decision-making has been widely recognized in academic literature. For instance, Zaki, Abd-Elrhaman and Ghoneimy [14] examined the impact of emotional intelligence programs on decision-making styles, while El Othman et al. explored the relationship between personality traits, emotional intelligence, and decision-making approaches [15]. Although these studies provide valuable insights, they often fail to differentiate among specific decision-making styles, making it difficult to design EI development programs tailored to particular organizational contexts. Therefore, as a contribution to existing research, this study specifically examines the significance of directive, analytical, and rational decision-making styles in enhancing the effects of emotional intelligence on CRQ.

Second, this study recognizes that decision-making styles play a crucial role in influencing CRQ. Supporting this, Izogo et al. found that factors such as information sharing, expertise, and customer orientation significantly affect relationship quality in Nigeria's retail banking sector [7]. Similarly, Al-Wugayan identified relationship quality and customer experience as key determinants of relational outcomes in Kuwaiti retail banks [6]. Kwon and Mariano also investigated related factors in retail banking services, focusing on interaction quality, physical environment quality, and outcome quality as predictors of customer satisfaction [16]. However, these studies largely overlook the dynamic role of decision-making styles in shaping CRQ, potentially leading to an incomplete or inaccurate understanding of how managerial decisions affect client relationships. To address this limitation, the current study focuses explicitly on the effects of directive, analytical, and rational decision-making styles on CRQ.

Third, Estrada-Guillén, Monferrer-Tirado, and Moliner-Tena conducted a study involving 1,125 customers in Spain to explore ways of improving relationship quality during economic crises [18]. Their findings highlight the interconnection between economic conditions, emotional intelligence, and customer-bank relationship quality. While the study confirms general relationships, it does not explore the specific mechanisms or nuances underlying these connections. Given the complexity of CRQ challenges faced by organizations, narrowing the scope of this study to examine the combined

influence of emotional intelligence and specific decision-making styles, directive, analytical, and rational on CRQ is both justified and necessary.

Research on mediating and moderating effects in emotional intelligence and CRQ is rapidly expanding, enriching theoretical and practical knowledge. The potential to incorporate additional variables remains significant. For example, Leonidou et al. examined the moderating role of foreign culture in enhancing international buyer-seller relationship quality and long-term orientation through emotional intelligence [16]. By integrating variables such as directive, analytical, and rational decision-making styles as mediators, a more comprehensive understanding can be achieved of how organizations can leverage decision-making processes to improve CRQ. This approach gains particular significance when robust analytical methods, such as structural equation modeling (SEM), are employed. In this context, applying and validating an SEM framework becomes highly feasible. However, a notable limitation in current literature is the marginalization of specific decision-making styles in academic discourse. Despite their recognized importance in driving organizational outcomes, directive, analytical, and rational styles are often overlooked. For instance, Kankam and Charnor focused on the mediating role of brand trust and brand loyalty in the relationship between emotional intelligence and consumer decision-making [9], which may lead to biased conclusions if the underlying decision-making styles are not explicitly considered. In line with this, Elbanna and Elsharnouby emphasized that decision-making styles can either enhance or hinder organizational strategies and outcomes [5]. Therefore, integrating these styles into the analysis is essential. This shift addresses the existing gap between emotional intelligence research and its practical application in professional settings.

Alsalmi and Omrane's study highlights the profound impact of emotional intelligence on leadership within Iraqi industrial organizations [11]. The research identifies three key pathways through which EI influences leadership: self-awareness and decision-making, empathy and relationship management, and effective communication and conflict resolution. However, a significant research gap persists in the systematic integration of emotional intelligence with specific decision-making styles and client relationship quality. This study aims to bridge that gap by providing a comprehensive understanding of how EI shapes critical aspects of accounting professionals' roles. These findings offer a foundational insight into the pivotal role of emotional intelligence in leadership dynamics. By building on this knowledge, the present study extends existing research to Erbil's manufacturing sector, focusing on the unique challenges and opportunities faced by accounting professionals.

Egbaria's study investigates the role of emotional intelligence in career decision-making among Israeli-Palestinian high school students [12]. While this research contributes to understanding EI in educational contexts, a clear gap exists regarding its application in professional environments, particularly within the accounting profession in manufacturing firms. Much of the existing literature emphasizes emotional intelligence in academic or general organizational settings, with limited focus on sector-specific professional roles. This study aims to fill that gap by examining how emotional intelligence influences decision-making styles and client relationship quality among accounting professionals in Erbil's manufacturing companies, thereby extending the understanding of EI from educational to professional domains. To achieve this objective, the following section explores the interactive relationships between emotional intelligence, decision-making styles, and CRQ.

2.2 THE INTERPLAY BETWEEN EMOTIONAL INTELLIGENCE, DECISION-MAKING STYLES AND CRQ

According to Bradberry and Greaves, EI refers to the ability to recognize, understand, manage, and effectively use one's own emotions and those of others in social and interpersonal contexts [21]. It encompasses self-awareness, empathy, emotional regulation, and social skills, enabling individuals to leverage emotional information for informed decision-making, problem-solving, and the development of positive relationships. As such, EI plays a critical role in professional environments where interpersonal dynamics influence outcomes. Decision-making styles, on the other hand, represent the characteristic approaches individuals employ when making choices or solving problems. These styles reflect cognitive and affective tendencies and vary across individuals and contexts. Common decision-making styles include rational decision-making, which relies on logical reasoning and structured evaluation; analytical decision-making, which emphasizes systematic data analysis and evidence-based judgment; intuitive decision-making, which is guided by experience, instinct, or subconscious processing; and impulsive decision-making, characterized by rapid choices with limited deliberation. The adoption of appropriate decision-making styles can significantly influence CRQ, a key determinant of organizational success. As Fincham and Rogge note, high CRQ reflects client satisfaction, trust, and loyalty, fostering long-term engagement and enhanced business opportunities [13]. Despite its importance, the interplay among emotional intelligence, decision-making styles, and CRQ has not been thoroughly examined in prior research, particularly within the accounting profession [6,7]. This study addresses this gap by investigating how emotional intelligence shapes directive, analytical, and rational decision-making styles, and how these, in turn, affect CRQ among accounting professionals in Erbil's manufacturing sector. Understanding these relationships is vital, as it contributes to enhancing professional competence and underscores the centrality of trust, communication, and client understanding in accounting practice. Moreover, identifying these linkages can inform the design of targeted training programs aimed at improving both emotional and cognitive decision-making competencies.

It is important to recognize that emotional intelligence influences the selection of decision-making styles. Individuals with high emotional awareness are more likely to make empathetic, client-centered decisions, taking into account the emotional consequences of their actions. Those with strong self-regulation skills tend to make balanced, deliberate, and reflective choices. In contrast, individuals with lower EI may be prone to impulsive or emotionally reactive decision-making, which can undermine client trust and relational stability. Given the scarcity of empirical studies examining the specific effects of emotional intelligence on directive, analytical, and rational decision-making styles, particularly in professional service contexts, this research fills a critical void. Grounded in Mayer and Salovey's four-branch model of emotional intelligence, which emphasizes the abilities to perceive, use, understand, and manage emotions, the study posits that individuals who excel in these competencies are more likely to exhibit higher levels of EI [10], leading to improved interpersonal and organizational outcomes. Based on this theoretical foundation, the following hypotheses were formulated:

- H1: Emotional intelligence has significantly positive effects on directive decision-making styles.
- H2: Emotional intelligence has significantly positive effects on analytical decision-making styles.
- H3: Emotional intelligence has significantly positive effects on rational decision-making styles.

2.3 DECISION-MAKING STYLES' IMPACT ON CLIENT RELATIONSHIP QUALITY

Empirical gaps in this domain remain substantial and multifaceted. To the best of the researcher's knowledge, the interactive relationships among emotional intelligence, decision-making styles, and CRQ have not yet been systematically explored, particularly within the context of accounting professionals in manufacturing sectors. This study posits that decision-making styles significantly influence CRQ. For instance, professionals who employ rational, evidence-based decision-making are more likely to build client trust by demonstrating logical consistency, transparency, and objectivity in their judgments. Conversely, individuals who rely on impulsive or emotionally reactive decisions may undermine client confidence, especially if their choices lead to adverse outcomes. Furthermore, this study argues that EI influences the selection and application of decision-making styles, and that both EI and decision-making styles collectively shape client relationship quality. Individuals with high emotional intelligence, characterized by self-awareness, empathy, and emotion regulation are better equipped to manage interpersonal dynamics and align their decisions with client expectations. When such individuals also adopt appropriate decision-making styles, they are more likely to foster positive, enduring client relationships, thereby enhancing overall CRQ. Thus, the integration of emotional intelligence and effective decision-making represents a valuable asset for professionals seeking to strengthen client interactions and build long-term trust. Despite the theoretical plausibility of these relationships, empirical investigations into their interplay remain limited. This gap becomes particularly significant when considering the potential mediating role of specific decision-making styles, directive, analytical, and rational in the relationship between emotional intelligence and CRQ. Prior research has largely overlooked these mediating pathways [16]. To address this deficiency, the current study advances a more nuanced model that examines not only direct effects but also indirect, mediated relationships. This approach enhances the theoretical understanding of how emotional intelligence translates into improved client outcomes through specific cognitive and behavioral mechanisms. In light of these considerations, the following hypotheses are proposed:

- H4: Directive decision-making style has a significantly positive effect on client relationship quality.
- H5: Analytical decision-making style has a significantly positive effect on client relationship quality.
- H6: Rational decision-making styles have a significantly positive effect on client relationship quality.
- H7: Directive decision-making style significantly mediates the relationship between emotional intelligence and client relationship quality.
- H8: Analytical decision-making style significantly mediates the relationship between emotional intelligence and client relationship quality.
- H9: Rational decision-making style significantly mediates the relationship between emotional intelligence and client relationship quality.

Both hypotheses are vital not only for highlighting the complex relationships among the variables (e.g. directive decision-making style has a significantly positive effect on client relationship quality) but serve to guide on the possible strategies that can be applied to enhance the desired organizational outcomes. Consequently, both hypotheses are crucial for answering the research questions. This helps to enhance the lack of clarity on the theoretical implications of emotional intelligence in the service sector. Amid such observations, these hypotheses, therefore, lead to the development of the following conceptual model to address the unexplored mediation effects analysis gap:

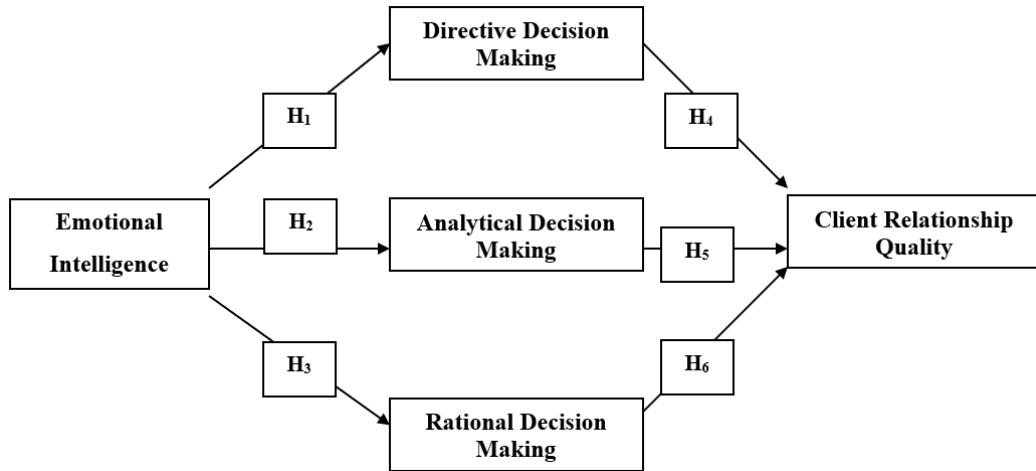


FIGURE 1. Conceptual model

3 METHODOLOGY

This study employed a quantitative research design using a cross-sectional survey to examine the interplay between emotional intelligence, decision-making styles, and client relationship quality among accounting professionals in Erbil's manufacturing sector. The research aimed to collect numerical data to test predefined hypotheses using statistical analysis. A structured questionnaire was administered to gather measurable and standardized responses, enabling generalization of findings within the target population. Concerning methodological gaps, this scholarship fills a gap in the application of a Structural Equation Modelling (SEM) approach, which explores the interactive connections linking emotional intelligence and directive, analytical and rational decision-making styles with client relationship quality. This is pivotal for providing a comprehensive understanding of their impact on accounting professionals' experiences and outcomes. According to Ringle et al., SEM is a statistical method used for analyzing the relationships between observed and latent variables [22]. By incorporating an SEM approach, the study was able to investigate the mediating effects of decision-making styles in the relationship between emotional intelligence and client relationship quality. This was essential for uncovering the nuanced mechanisms through which these constructs interact. Moreover, SEM allows for the exploration of practical implications by quantifying the relationships between variables [22]. The findings of this study underscore the critical role of emotional intelligence in shaping effective decision-making styles and fostering high quality client relationships in Erbil's manufacturing sector. Thus, by identifying the interplay between emotional intelligence and specific decision-making styles particularly rational and analytical approaches, this research provides actionable insights for organizational leaders and professional development trainers. Institutions can leverage these results to design EI-focused training modules, refine recruitment criteria, and promote client-centered service cultures. Future research could extend this framework to other industries or cross-cultural contexts to enhance generalizability.

3.1 POPULATION AND SAMPLING

Kurdistan is experiencing rapid economic growth, with a burgeoning manufacturing sector playing a significant role. Understanding the accounting practices within this sector is vital for sustaining growth, attracting investments, and contributing to the region's economic development. Meanwhile, there has been a lack of studies analysing the interplay of emotional intelligence, decision-making styles, and client relationship quality within the context of Kurdistan's manufacturing companies. To add further depth to the study and avoid skewed decisions, we devoted attention to Kurdistan's manufacturing companies at a time when related have confined their examinations to banks [18], Greek exporters [16] and the healthcare sector [8]. Apart from these novel contributions, by examining accounting professionals working in Kurdistan's manufacturing companies, we hoped to shed light on their adherence to regulatory requirements, accounting principles, and professional standards. This can contribute to improving compliance and promoting ethical conduct within the industry. Furthermore, focusing on accounting professionals working in Kurdistan's manufacturing companies allowed us to understand better their specific and contextual challenges and requirements and hence tailored training programs can be designed to enhance their skills and competencies. Consequently, this can elevate the overall quality of accounting practices in Kurdistan's manufacturing companies.

The study uses a cluster sample of Bakhtiari, Brayaty, Nuseran, Kuran Ankawa and Eskan districts in Erbil, Kurdistan. This allows for a diverse representation of manufacturing companies, capturing industry, structure and business size variations, and enhances the generalizability of findings to the broader manufacturing landscape in Kurdistan. Apart from effectively gathering information from targeted manufacturing companies leading to a more reliable and precise analysis

of the accounting practices and challenges, the initial cluster study can serve as a baseline for future longitudinal studies. As such, this enables researchers to track changes and trends in accounting practices within Kurdistan's manufacturing sector over time. A convenient sample of 20 manufacturing companies was selected from each of the 5 cluster districts and questionnaires were distributed to cost accountants, management accountants, certified public accountants, internal auditors and financial analysts.

The population of this study consisted of accounting professionals working in manufacturing companies in Erbil, Kurdistan Region of Iraq. This includes cost accountants, management accountants, certified public accountants (CPAs), internal auditors, and financial analysts. A total of 500 questionnaires were distributed and 422 fully completed responses were collected, resulting in an 84.4% response rate. The sample included 284 males and 138 females, with professional roles distributed as follows: 18 cost accountants, 68 management accountants, 148 CPAs, 112 internal auditors, and 76 financial analysts. This diverse representation enhances the reliability and generalizability of the findings within the regional manufacturing context.

3.2 DATA COLLECTION TOOLS

Data were collected through a self-administered online and paper-based questionnaire containing closed-ended questions with a five-point Likert scale (ranging from 1 = Strongly Disagree to 5 = Strongly Agree). The survey was distributed between June 13 and August 27, 2023, ensuring sufficient time for participant engagement. The method allowed for efficient data collection while maintaining consistency in responses and minimizing interviewer bias.

The questionnaire was designed to measure four key constructs: emotional intelligence (EI), directive decision-making (DDM), analytical decision-making (ADM), rational decision-making (RDM), and client relationship quality (CRQ). Emotional Intelligence (EI) was measured using 12 items adapted from Estrada, Monferrer, and Moliner [18], based on Mayer and Salovey's four-branch model of emotional intelligence, which includes perception, facilitation, understanding, and regulation of emotions [10]. Decision-Making Styles (DDM, ADM, RDM) was assessed using 8 items for directive, 6 for analytical, and 8 for rational decision-making, derived from Kwon and Mariano [16]. Client Relationship Quality (CRQ) was evaluated using 12 newly developed items tailored to the accounting context, focusing on trust, satisfaction, communication, and commitment in client interactions. All items were translated into Kurdish and Arabic where necessary, then back-translated to ensure accuracy.

To ensure clarity and prevent bias commonly referred to as "Likert scale crush", a pilot test was conducted with three accounting professionals, including cost, management and certified public accountants. Based on their feedback, ambiguous items were rephrased, instructions were clarified and response options were standardized. The final survey utilized a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to assess participants' perceptions of their emotional intelligence, decision-making styles and client relationship quality. This pre-testing phase enhanced the instrument's face validity and improved overall reliability.

3.3 DATA ANALYSIS

To answer the formulated research questions, a SEM approach was applied. By applying an SEM approach, we analysed the structural connections linking emotional intelligence and directive, analytical and rational decision-making styles with client relationship quality. Additionally, it is through this approach that directive, analytical and rational decision-making styles mediating effects on emotional intelligence's impact on client relationship quality were uncovered. The feasibility and significance of a structural equation model to determine structural connections linking two or more variables as well as ascertain mediating and moderating effects are academically traceable [22,23]. Along similar lines, the lack of studies incorporating mediating effects has been a cause for concern. Existing evidence is limited and often points to aspects such as the moderating role of foreign culture on buyer-seller relationship quality and long-term orientation using emotional intelligence [16]. SEM was employed to test the hypothesized relationships between emotional intelligence, decision-making styles and client relationship quality. Prior to hypothesis testing, explanatory factor analysis was conducted to confirm the underlying construct structure, with factor loadings evaluated using a cut-off of 0.60 [22]. Convergent validity was assessed using the Average Variance Extracted (AVE) while discriminant validity was established through the Heterotrait-monotrait (HTMT), with values below 0.90 indicating discriminant validity [23]. Internal consistency and reliability were evaluated using Cronbach's alpha test and rho_A, ensuring robustness of the measurement model.

4 RESULTS

A total of 422 questionnaire responses were collected from 284 male and 138 female respondents comprising 18 cost accountants, 68 management accountants, 148 certified public accountants, 112 internal auditors and 76 financial analysts. Such a diverse number of accounting professionals entails that the collected responses are well-poised to offer diverse and generalizable insights into accounting professionals' EI, decision-making styles and CRQ. Hence, when effectively harnessed, such findings can enhance regulatory requirements, accounting principles, and professional standards compliance.

Table 1. Demographic analysis

Variable	Description	Count	Percentage
Gender	Male	284	67.30
	Female	138	32.70
	Total	422	100
Age group	18-25 years	66	15.64
	26-33 years	164	38.68
	34-41 years	156	36.97
	42 years and above	36	8.53
Academic qualification	Total	422	100
	Diploma	18	4.27
	Bachelor's degree	178	42.18
	Master's degree	212	50.24
	Ph.D.	14	3.18
Position	Total	422	100
	Cost accountants	18	4.27
	Management accountants	68	16.11
	Certified public accountants	148	35.07
	Internal auditors	112	26.54
Experience level	Financial analysts	76	18.01
	Total	422	100
	Less than 1 year	8	1.90
	1-3 years	26	6.16
	4-6 years	54	12.80
	7-9 years	68	16.11
	10 years and above	266	63.03
	Total	422	100

Besides, the respondents' academic and experience levels are high enough to warrant an effective understanding of the application of EI, decision-making styles and CRQ strategies in Kurdistan's manufacturing companies. To reinforce this notion, the employee respondents had diplomas (4.27%), bachelor's degrees (42.18%), master's degrees (50.24%) and Ph.D. degrees (3.18%) as shown in Table 1. Moreover, 63.03% of the employee respondents have been serving the manufacturing companies for at least 10 years.

4.1 FACTOR ANALYSIS

By applying the factor analysis method, the study was able to determine related EI, decision-making styles and CRQ constructs. As such, the desired structural equation model was estimated using 8 EI, 3 directive, 4 analytical and 4 rational decision-making style constructs. The dependent variable CRQ comprised of 7 selected constructs that were related to each other with factor loadings of at least 0.70 as displayed in Table 2. This enhanced the validity of the study findings. Moreover, the fact that the related outer weights are significant at 0.001 level attests to this notion. On the other hand, the related VIF values are less than 3 indicating that no multicollinearity issues were detected. Amid such observations, the study proceeded further to ascertain the variables' discriminant and convergent validity.

4.2 DISCRIMINANT AND CONVERGENT VALIDITY

The HTMT results provided in Table 3 are less than 0.90 as per Henseler, Ringle et al.'s [22]. Hence, this entails that discriminant validity exists among the variable's emotional intelligence, directive decision-making, analytical decision-making, rational decision making and client relationship quality. With all the AVE values surpassing 0.50, convergent validity was established [22]. As a result, the study upholds that the variables offer valid explanations about the interplay of emotional intelligence, decision-making styles, and client relationship quality within the context of Erbil accounting professionals' experiences and outcomes.

4.3 RELIABILITY TESTS

Given that Cronbach's alpha values of more than 0.7 were recorded indicating that the variables have a high internal consistency and are highly reliable [22]. Similarly, rho_A and composite reliability findings provided in Table 4 exceeded the same benchmark of 0.70 and this further warrants the study's ability to offer reliable explanations [22]. Nevertheless, more testing was done to see whether the estimated structural equation model is ready to provide error-free findings that may be used for client relationship quality policies and strategic decision-making. As a result, the established model fitness test results are shown in the following section of the study.

Table 2. Factor analysis

Selected Items	Factor Loadings	Outer Weights (Sig.)	VIF
Emotional Intelligence Constructs			
I can bounce back from setbacks and remain emotionally stable.	0.749	0.000	1.067
I can handle conflicts and disagreements in a calm and empathetic manner.	0.801	0.000	1.093
I am comfortable expressing my emotions in a healthy and constructive way.	0.748	0.000	1.112
I can stay focused and motivated even when facing challenges.	0.830	0.000	1.289
I am adept at building and maintaining positive relationships with others.	0.835	0.000	1.408
I can effectively manage my own emotions, especially in stressful situations.	0.720	0.000	1.301
I can easily understand and relate to the emotions of others.	0.745	0.000	1.266
I can accurately identify and understand my own emotions.	0.810	0.000	1.560
Directive Decision-Making Styles Constructs			
I make decisions quickly and do not dwell on them.	0.700	0.000	1.425
I prefer making decisions on my own and taking full responsibility.	0.895	0.000	1.897
I make clear and straightforward decisions.	0.790	0.000	1.646
Analytical Decision-Making Styles Constructs			
I take time to deliberate before making a decision.	0.775	0.000	1.033
My decisions are primarily based on data and evidence.	0.800	0.000	1.902
I carefully weigh pros and cons and assess all available options.	0.710	0.000	1.637
I thoroughly research and gather information before making decisions.	0.790	0.000	1.510
Rational Decision-Making Styles Constructs			
I always consider ethical principles and moral values when making decisions.	0.702	0.000	1.416
I strive for consistency in decision-making across different situations.	0.806	0.000	1.930
I consider potential risks and uncertainties before making decisions.	0.700	0.000	1.872
I align my decisions with long-term goals and objectives.	0.700	0.000	2.007
My decisions are primarily based on logical reasoning.	0.754	0.000	1.964
Client relationship quality constructs			
We have built a strong and enduring relationship with the client, and they are likely to continue working with us in the future.	0.844	0.000	0.985
Our services consistently provide value to the client, meeting or exceeding their expectations.	0.832	0.000	1.024
We effectively address and resolve issues or concerns raised by the client.	0.754	0.000	1.367
We respond promptly to client inquiries and requests.	0.814	0.000	1.005
Clients trust our expertise and have confidence in our ability to meet their needs.	0.793	0.000	1.922
The communication between me/my team and the client is clear and effective.	0.700	0.000	1.971
We understand and are responsive to the specific needs and expectations of our clients.	0.723	0.000	1.814

Table 3. HTMT analysis

	EI	DDM	ADM	RDM	CRQ	AVE
EI						0.639
DDM	0.724					0.597
ADM	0.619	0.633				0.626
RDM	0.503	0.506	0.518			0.698
CRQ	0.427	0.481	0.694	0.469		0.714

EI: Emotional intelligence; DDM=Directive Decision-Making; ADM=Analytical Decision-Making; RDM=Rational Decision-Making; CRQ=Client Relationship Quality.

Table 4. Reliability tests

	Cronbach's Alpha	rho_A	Composite Reliability
EI	0.785	0.820	0.824
DDM	0.817	0.836	0.840
ADM	0.822	0.810	0.826
RDM	0.791	0.808	0.816
CRQ	0.813	0.806	0.814

4.4 MODEL FITNESS

According to Amran, Lee, and Devi's (2014) model fit summary results, the SRMR value is less than 0.08 and this denotes a good fit. Additionally, the NFI value is above 0.95 for the entire sample, indicating an excellent fit [23]. The model's fitness aspect gains traction as the χ^2 value of 127.70 is significant at 1% thereby showing a satisfactory model fit as shown in Table 5 [23]. Consequently, the applied structural equation model yielded a reasonable assessment of the interplay of emotional intelligence, decision-making styles, and client relationship quality within the context of Erbil accounting professionals' experiences and outcomes. Amid such observations, the next section proceeds further to interpret the established path analysis results.

Table 5. Model fit summary

Model	SRMR	NFI	χ^2	d_G	d_ULS
Saturated model	0.072	0.988	127.70*	0.615	1.018
Estimated model	0.072	0.988	127.7*	0.615	1.018

* Significant at 0.001.

4.5 PATH ANALYSIS

Following the provided Table 6 results, hypothesis 1 was supported as emotional intelligence's positively significant effects on CRQ were validated. Apart from hypotheses 2 and 3 that were not supported, hypotheses 4, 5 and 6 were supported leading to inferences being drawn that directive, analytical and rational decision-making have significantly positive effects on client relationship quality. Such effects were characterised by relatively high explanatory power as supported by the provided R^2 values. The model indicates that EI explains 80.6% of the variance in DDM, 59.5% of the variance in ADM, and 72.5% of the variance in RDM. Additionally, DDM explains 44.6% of the variance in CRQ, while ADM and RDM explain 36.1% and 60.2% of the variance in CRQ, respectively. On the other hand, the model's predictive relevance was established following the recording of Q2 values of 0.307, 0.328, 0.548, 0.321, 0.394 and 0.445 are greater than 0.30 [22], implying that there is strong predictive relevance and that the model is robust and useful for theory and practice.

Table 6. Path analysis results

HOC	Unstd. Est.	Std. Est.	t.stat.	p.Val.	R ²	Q ²	Hypothesis
EI -> DDM	0.342	0.108	3.167	<0.001	0.806	0.300	<i>H₁:</i> Supported
EI -> ADM	0.176	0.135	1.304	>0.005	0.595	0.328	<i>H₂:</i> Not supported
EI -> RDM	0.340	0.229	1.485	>0.001	0.725	0.548	<i>H₃:</i> Not supported
DDM -> CRQ	0.668	0.180	3.822	<0.001	0.446	0.321	<i>H₄:</i> Supported
ADM -> CRQ	0.510	0.126	4.048	<0.001	0.361	0.394	<i>H₅:</i> Supported
RDM -> CRQ	0.627	0.141	4.447	<0.001	0.602	0.445	<i>H₆:</i> Supported

Unlike directive decision-making, analytical decision-making and rational decision-making styles' mediating effects on the relationship between emotional intelligence and client relationship quality were supported. According to the results provided in Table 7, analytical decision-making and rational decision-making's mediating effects on the relationship between emotional intelligence and client relationship quality are moderate and high, respectively. As a result, hypothesis 7 was not supported while hypotheses 8 and 9 were supported. Having established these findings, a discussion of these findings is offered in the next section.

Table 7. Indirect effects analysis results

	Std. Est.	t.stat.	p.val
EI -> DDM -> CRQ	0.062	0.486	0.128
EI -> ADM -> CRQ	0.479	7.835	<0.001
EI -> RDM -> CRQ	0.622	9.129	<0.001

5 DISCUSSIONS

The results support Hypothesis 1, indicating that emotional intelligence (EI) has a significant positive effect on directive decision-making styles ($\beta = 0.342$). This suggests that individuals with higher EI are more likely to adopt directive approaches, characterized by assertiveness, clarity in communication, and confident decision-making. While prior studies have broadly examined EI's influence on decision-making [14,24], this study offers novel, context-specific insights within the accounting profession in Erbil's manufacturing sector. The findings imply that emotionally intelligent professionals may exhibit stronger leadership capabilities in structured environments where clear direction and decisive action are valued. Consequently, organizations with a directive-oriented culture may benefit from integrating EI development into leadership training programs. In contrast, Hypotheses 2 and 3 were not supported, indicating that EI does not significantly predict analytical or rational decision-making styles. This challenges assumptions that emotional awareness inherently enhances cognitive decision-making processes. While Zaki, Abd-Elrahman, and Ghoneimy explored EI in decision-making broadly [14], they did not isolate these specific styles. Our findings contribute new empirical evidence that analytical and rational decision-making may be driven more by cognitive skills, contextual demands, and organizational norms than by emotional intelligence alone. This aligns with Mayer and Salovey's four-branch model, which positions emotional regulation as supportive rather than central in highly analytical tasks [10]. Therefore, EI, while vital for interpersonal effectiveness, may play a secondary role in decision-making styles that prioritize logic, data, and systematic reasoning. These results underscore the multifaceted nature of decision-making, which is shaped by a combination of individual competencies, situational factors, and institutional culture. For manufacturing firms aiming to strengthen analytical and rational decision-making, targeted training in critical thinking, data interpretation, and problem-solving frameworks may be more effective than general EI interventions.

The study further confirms that directive ($\beta = 0.668$), analytical ($\beta = 0.510$), and rational ($\beta = 0.627$) decision-making styles each have a significant positive impact on client relationship quality (CRQ), supporting Hypotheses 4, 5, and 6. These relationships have not been systematically examined in prior literature, particularly in non-banking contexts [6,7,16]. The strong explanatory power of these styles suggests that professionals who are decisive, data-driven, or logically consistent in their decisions are better positioned to build trust, meet client expectations, and sustain high-quality relationships. From a managerial perspective, these findings advocate for leadership development programs that balance emotional intelligence with cognitive decision-making skills. Directive styles may enhance clarity and accountability, while analytical and rational approaches foster transparency and objectivity both critical for client trust. Organizations should therefore adopt a holistic development model that integrates EI with domain-specific decision-making competencies.

Crucially, the mediating analysis reveals that analytical and rational decision-making styles significantly mediate the relationship between EI and CRQ (Hypotheses 8 and 9 supported), whereas directive decision-making does not (Hypothesis 7 rejected). This indicates that the positive influence of emotional intelligence on client relationships is primarily realized through cognitively oriented decision processes, not through authoritative or top-down approaches. In other words, emotionally intelligent accountants enhance client relationships not by being directive, but by applying structured, logical, and evidence-based reasoning in client interactions. This finding represents a key theoretical contribution, demonstrating that EI's value in professional service delivery is amplified when channeled through analytical and rational frameworks. It also suggests that leadership coaching should focus on helping professionals integrate emotional awareness with rigorous decision-making practices, particularly in client-facing roles.

CONCLUSION

The study's main emphasis was to examine the interplay of emotional intelligence, decision-making styles, and client relationship quality. Thus, to accomplish this objective, the study used an SEM approach to further enhance the effectiveness of attempts aimed at boosting CRQs by integrating and harnessing the combined roles of emotional intelligence and decision-making styles that are still in their infancy stages. According to the study, emotional intelligence directly affects directive decision-making in a significant manner as opposed to analytical and rational decision-making styles. In the context of this study, the directive, analytical and rational decision-making styles' positive effects on client relationship quality were validated. As a consequence, the study upholds that directive decision-making does not mediate the relationship between emotional intelligence and client relationship quality compared to analytical decision-making and rational decision-making styles whose effects are moderate and high, respectively.

Based on the empirical findings of this study, this study urges organizations to implement emotional intelligence training programs for accounting professionals to strengthen self-awareness, empathy, and interpersonal communication and encourage the use of rational and analytical decision-making frameworks in client engagements to enhance transparency and build trust. Organizations must also develop performance evaluation systems that reward not only technical accuracy but also relational competencies and client satisfaction. In terms of professional development and education, there is a critical need to integrate EI and behavioral decision-making modules into accounting curricula at universities and certification programs such as CPA and ACCA. It is also critical to use case-based learning to simulate real-world client interactions and train students in managing emotional and cognitive aspects of decision-making. Policymakers and

regulatory bodies must support industry-wide standards for client relationship management in professional services and fund research on soft skills development in technical professions, particularly in emerging economies like the Kurdistan Region.

CONTRIBUTIONS

The research contributes to a more holistic understanding of decision-making processes by examining both the emotional intelligence and decision-making styles of accounting professionals. This may provide theoretical insights into the interplay between cognitive and emotional factors in professional decision-making. Empirically, the study contributes by providing insights into the experiences of accounting professionals in Erbil. This empirical understanding is valuable for practitioners, researchers, and policymakers in the region and potentially informs the development of tailored interventions or training programs. By empirically testing the relationships proposed in theoretical models, the study contributes to the validation of these models in the real-world context of accounting professionals thereby enhancing the credibility and applicability of the theoretical frameworks.

LIMITATIONS AND SUGGESTIONS FOR FUTURE STUDIES

This study is subject to certain limitations. First, the sample is restricted to accounting professionals in Erbil's manufacturing sector, which may limit the generalizability of findings to other regions or industries. Second, the cross-sectional design captures data at a single point in time, preventing causal inferences. Third, the reliance on self-reported data may introduce common method bias, despite procedural remedies. Future research could adopt longitudinal designs, include objective performance metrics, or expand the scope to service-based or public-sector organizations. Additionally, comparative studies across different cultural or regulatory environments could further enrich the understanding of EI and decision-making in professional accounting. Future research should explore specific aspects of emotional intelligence that have the most significant impact on client relationship quality, allowing for more targeted interventions. Additionally, further studies can also investigate moderating factors that might influence the relationships between decision-making styles and various outcomes, providing more nuanced insights into the contextual appropriateness of each style.

FUNDING

N/A.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

REFERENCES

- [1] M. Ahmad, R. Bashir, & H. Waqas, "Working capital management and firm performance: are their effects same in covid 19 compared to financial crisis 2008?," *Cogent Economics & Finance*, vol. 10, no. 1, pp. 2101224, 2022.
- [2] A. Wong, & L. Zhou, "Determinants and outcomes of relationship quality: a conceptual model and empirical investigation," *Journal of International Consumer Marketing*, vol. 18, no. 3, pp. 81–105, 2006.
- [3] S. Aghazadeh, & K. Hoang, "How does audit firm emphasis on client relationship quality influence auditors' inferences about and responses to potential persuasion in client communications?," *Accounting, Organizations and Society*, vol. 87, p. 1-41, 2020.
- [4] R. T. Azeez, "Development cooperation for higher education in Kurdistan Region-Iraq," *Global South and Perspectives on Development Partnerships*, vol. 174, no. 2, pp. 57-60, 2023.
- [5] S. Elbanna, & T. H. Elsharnoubi, "Revisiting the relationship between formal planning process and planning effectiveness: Do organizational capabilities and decision-making style matter?," *International Journal of Contemporary Hospitality Management*, vol. 30, no. 2, pp. 1016–1034, 2018.
- [6] A. A. Al-Wugayan, "Relationship versus customer experience quality as determinants of relationship quality and relational outcomes for Kuwaiti retail banks," *International Journal of Bank Marketing*, vol. 37, no. 5, pp. 1234–1252, 2019.
- [7] E. E. Izogo, A. Reza, I. E. Ogbu, & C. Oraedu, "Determinants of relationship quality and customer loyalty in retail banking: Evidence from Nigeria," *African Journal of Economic and Management Studies*, vol. 8, no. 2, pp. 186–204, 2017.
- [8] C. Filippioni, S. F. Pizzoli, M. Masiero, I. Cutica, & G. Pravettoni, "The partial mediator role of satisficing decision-making style between trait emotional intelligence and compassion fatigue in healthcare professionals," *Psychological Reports*, vol. 127, no. 2, 868-886, 2024.

- [9] G. Kankam, & I. T. Charnor, "Emotional intelligence and consumer decision-making styles: the mediating role of brand trust and brand loyalty," *Future Business Journal*, vol. 9, no. 1, pp. 1–11, 2023.
- [10] J. D. Mayer, "The four branches model of emotional intelligence," [Online]. Available: www.unh.edu/emotional_intelligence, 2007.
- [11] B. M. K. Alsalmi, & A. Omrane, "The effects of emotional intelligence on leadership effectiveness (A prospective case study of three industrial companies in Iraq)," *Journal of Positive Psychology & Wellbeing*, vol. 7, no. 2, pp. 988–1006, 2023.
- [12] H. Egbaria, "Emotional intelligence and its relationship to the career decision making difficulties among Israeli Palestinian high school students," *European Journal of Social Science Studies*, vol. 8, no. 6, 2023.
- [13] F. D. Fincham, & R. Rogge, "Understanding relationship quality: Theoretical challenges and new tools for assessment," *Journal of Family Theory & Review*, vol. 2, no. 4, pp. 227–242, 2010.
- [14] H. N. Zaki, E. S. A. Abd-Elrhaman, & A. G. H. Ghoneimy, "The effect of emotional intelligence program on decision making style," *American Journal of Nursing*, vol. 6, no. 6, pp. 524–532, 2018.
- [15] R. El Othman, R. El Othman, R. Hallit, S. Obeid, & S. Hallit, "Personality traits, emotional intelligence and decision-making styles in Lebanese universities medical students," *BMC Psychology*, vol. 8, pp. 1–14, 2020.
- [16] C. H. Kwon, D. H. Jo, & H. G. Mariano, "Exploring the determinants of relationship quality in retail banking services," *KSII Transactions on Internet & Information Systems*, vol. 14, no. 8, pp. 3457–3472, 2020.
- [17] L. C. Leonidou, B. Aykol, J. Larimo, L. Kyrgidou, & P. Christodoulides, "Enhancing international buyer-seller relationship quality and long-term orientation using emotional intelligence: the moderating role of foreign culture," *Management International Review*, vol. 61, pp. 365–402, 2021.
- [18] M. Estrada-Guillén, D. Monferrer-Tirado, & M. Moliner-Tena, "Improving relationship quality during the crisis," *The Service Industries Journal*, vol. 40, no. 3, pp. 268–289, 2020.
- [19] A. Blažys, "Leader's emotional intelligence and project success in the professional services industry," Ph.D. dissertation, Vilnius Universitetas, 2025.
- [20] J. P. Thomas, K. Asha, G. M. Shaju, D. Anto Pravin Singh, & R. Melba Kani, "Enhancing organizational dynamics: The impact of emotional intelligence on managerial performance and employee engagement in Tamil Nadu's banking industry," *International Journal of Occupational Safety and Ergonomics*, pp. 1–14, 2025.
- [21] T. Bradberry, & J. Greaves, "Emotional Intelligence 2.0," TalentSmart, 2009.
- [22] C. M. Ringle, M. Sarstedt, R. Mitchell, & S. P. Gudergan, "Partial least squares structural equation modeling in HRM research," *The International Journal of Human Resource Management*, vol. 31, no. 12, pp. 1617–1643, 2020.
- [23] J. F. Hair, M. Sarstedt, T. M. Pieper, & C. M. Ringle, "The use of partial least squares structural equation modeling in strategic management research: a review of past practices and recommendations for future applications," *Long Range Planning*, vol. 45, no. 5, pp. 320–340, 2012.
- [24] G. M. Kundi, "Relationship between emotional intelligence and managerial decision-making styles: Multi-mediation analysis," *Amazonia Investigia*, vol. 10, no. 46, pp. 244–258, 2021.