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Decision-Making Process for Outsourcing Training in the National Iranian Gas Company

Zahra. Ashookh[1], Seyyed Ahmad. Hosseini Gol Afshani[2*], Seyyed Ali Akbar. Ahmadi[3]

[1] Department of Technology Management, ST.C., Islamic Azad University, Tehran, Iran
[2] Department of Management, ST.C., Islamic Azad University, Tehran, Iran
[3] Department of Management Payam Noor University, Tehran, Iran

*** Corresponding author email address**: sa_hosseini@azad.ac.ir

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A B S T R A C T

Modern organizational and managerial transformations have made the outsourcing of organizational training services essential. Accordingly, the aim of this study was to determine the decision-making process for outsourcing training in the National Iranian Gas Company, using a mixed-method approach with a sequential-exploratory design of the categorization type. The research strategy in the qualitative section was content analysis, while in the quantitative section, it was a survey. Through content analysis, the literature was reviewed to identify the initial criteria for outsourcing training services, and semi-structured interviews were conducted with 15 experts selected through purposive sampling. Qualitative data analysis was performed using open and axial coding with MAXQDA software. To ensure the credibility and trustworthiness of the qualitative data, Guba and Lincoln's criteria—including credibility, dependability, confirmability, and transferability—were applied. In the next stage, the extracted criteria were screened and confirmed using the fuzzy Delphi method with the input of 20 experts. In the quantitative section (DEMATEL), 37 experts selected through purposive sampling responded to pairwise comparison questionnaires. Quantitative data were analyzed using DEMATEL and the Analytic Network Process (ANP) with MATLAB and Excel software. The criteria were categorized into five main dimensions: goals and vision, management, empowerment, internal processes, and competitive advantage. In the fuzzy Delphi stage, out of 32 components (with 3 components eliminated), 29 components were screened and confirmed. DEMATEL results indicated that the "goals and vision" factor had the highest interaction (influence/influence received), followed by internal processes, management, competitive advantage, and empowerment, respectively, in terms of interaction with other factors.

Keywords: *Outsourcing, Decision-making, Human resource management, Outsourcing training services*

1. Introduction

In recent decades, outsourcing has emerged as a pivotal strategic tool for organizations seeking to optimize resource allocation, enhance efficiency, and maintain competitive advantage in dynamic business environments (Guchhait & Sarkar, 2024; Vining & Globerman, 2017). The rapid globalization of markets, intensified competition, and increasing specialization of services have led organizations to re-evaluate the boundaries of their in-house capabilities and explore strategic partnerships with external providers (Honarvar & Rezaee, 2019; Taghizadeh & Divanbeigi, 2021). This paradigm shift is particularly significant in industries where technological complexity, operational costs, and human resource management challenges necessitate innovative approaches to service delivery (Behi Far et al., 2023, 2024).

Outsourcing, defined as the transfer of certain organizational processes or functions to external entities under contractual arrangements, enables firms to focus on their core competencies while leveraging the expertise, efficiency, and scalability of specialized service providers (Alamtabriz & Shayesteh, 2011; Tabatabaei & Mohammadi, 2021). In the context of human resource management (HRM), outsourcing can encompass a wide array of activities, including recruitment, training, payroll administration, and performance evaluation (Alami & Fattahi, 2018; Eze & Omena, 2019). For public sector organizations and large-scale enterprises such as national oil and gas companies, the decision to outsource specific HR-related activities is often influenced by a combination of strategic, operational, and economic factors (Romero et al., 2020; Taghizadeh & Divanbeigi, 2021).

The oil and gas industry, in particular, operates within a framework characterized by high capital intensity, significant operational risks, and rapid technological advancements (Behi Far et al., 2023, 2024). These conditions make the effective deployment and development of human resources critical to sustaining productivity and innovation (Ebrahimi, 2019; Gholizadeh et al., 2022). Within this context, outsourcing training activities has gained increasing attention as a mechanism to ensure access to the latest technical knowledge, enhance workforce flexibility, and reduce the administrative burden on internal departments (Ashourpour & Najafi, 2015; Mohammadi & Tahmasebi, 2020).

From a strategic standpoint, outsourcing decisions can be conceptualized through frameworks that balance cost efficiency, quality enhancement, and risk management (Mosca & Bordelon, 2017; Vining & Globerman, 2017). The decision-making process typically involves assessing the alignment of potential outsourcing initiatives with organizational goals, determining the strategic importance of the activity in question, and evaluating potential service providers (Ebrahimpour Azbari et al., 2021; Honarvar & Rezaee, 2019). In the specific case of outsourcing training services, the evaluation extends to pedagogical quality, relevance of content, delivery modalities, and the provider's familiarity with industry-specific requirements (Alami & Fattahi, 2018; Romero et al., 2020).

Human capital remains one of the most critical assets of any organization, and its development is closely linked to organizational performance and long-term sustainability (Eze & Omena, 2019; Gholizadeh et al., 2022). Training, as a core HR development function, is essential for equipping employees with the skills and knowledge necessary to adapt to evolving job demands, technological innovations, and regulatory requirements (Ashourpour & Najafi, 2015; Viseh et al., 2023). In the context of the oil and gas industry, training is also a crucial safety measure, given the high-risk operational environment (Behi Far et al., 2023, 2024). Consequently, decisions to outsource training are often motivated by the need to ensure access to specialized expertise, adopt modern training technologies, and meet international operational standards (Guchhait & Sarkar, 2024; Taghizadeh & Divanbeigi, 2021).

The outsourcing of training services, however, is not without its challenges. Concerns related to quality control, loss of organizational knowledge, dependency on external providers, and potential conflicts of interest have been identified as critical barriers (Kshetri, 2017; Mosca & Bordelon, 2017). In addition, the strategic sensitivity of certain training content—particularly in industries with proprietary processes or classified operational procedures—can limit the scope of outsourcing (Behi Far et al., 2023; Honarvar & Rezaee, 2019). As such, decision-makers must carefully weigh the benefits and risks, taking into account both quantitative metrics such as cost savings and qualitative considerations such as alignment with corporate culture and values (Alami & Fattahi, 2018; Alamtabriz & Shayesteh, 2011).

The use of structured decision-making tools, such as the Analytic Hierarchy Process (AHP), Fuzzy Delphi, and DEMATEL, has become increasingly prevalent in outsourcing research (Ebrahimpour Azbari et al., 2021; Tabatabaei & Mohammadi, 2021). These methodologies

facilitate the systematic identification, prioritization, and evaluation of decision criteria, incorporating both expert judgment and empirical data (Behi Far et al., 2024; Guchhait & Sarkar, 2024). By integrating these tools into the decision-making process, organizations can enhance transparency, reduce biases, and arrive at more robust outsourcing strategies (Taghizadeh & Divanbeigi, 2021; Vining & Globerman, 2017).

In recent years, there has been growing interest in the role of human resource flexibility in shaping the outcomes of outsourcing initiatives (Gholizadeh et al., 2022; Viseh et al., 2023). Flexible HR systems are better equipped to integrate outsourced services, adapt to new workflows, and absorb knowledge from external providers (Ashourpour & Najafi, 2015; Eze & Omena, 2019). This adaptability is particularly valuable in training outsourcing, where the integration of external content into existing organizational structures requires coordination, customization, and continuous feedback (Honarvar & Rezaee, 2019; Romero et al., 2020).

Empirical studies in various sectors, including banking (Tabatabaei & Mohammadi, 2021), water and wastewater management (Taghizadeh & Divanbeigi, 2021), and manufacturing (Guchhait & Sarkar, 2024; Honarvar & Rezaee, 2019), have demonstrated that outsourcing decisions are significantly influenced by factors such as cost efficiency, quality enhancement, technological capability, and strategic alignment. In the oil and gas sector, similar patterns have been observed, with additional emphasis on safety compliance, environmental sustainability, and geopolitical considerations (Behi Far et al., 2023, 2024). These sector-specific variables underscore the need for tailored decision-making models that reflect the unique operational realities of the industry (Alamtabriz & Shayesteh, 2011; Ebrahimpour Azbari et al., 2021).

From a policy perspective, outsourcing in state-owned enterprises such as the National Iranian Gas Company is also shaped by regulatory frameworks, labor laws, and national development strategies (Alami & Fattahi, 2018; Vining & Globerman, 2017). Decision-makers must navigate complex bureaucratic processes, stakeholder interests, and political dynamics when considering outsourcing initiatives (Mosca & Bordelon, 2017; Taghizadeh & Divanbeigi, 2021). In this regard, structured evaluation models not only support operational decision-making but also enhance accountability and compliance with governance requirements (Honarvar & Rezaee, 2019; Kshetri, 2017).

Moreover, technological advances such as digital platforms, e-learning systems, and artificial intelligence have transformed the landscape of training delivery (Guchhait & Sarkar, 2024; Kshetri, 2017). Outsourcing providers are increasingly leveraging these tools to offer scalable, customizable, and cost-effective training solutions (Ebrahimi, 2019; Romero et al., 2020). For organizations in the oil and gas sector, adopting such innovations through outsourcing arrangements can lead to significant improvements in knowledge dissemination, skill acquisition, and performance monitoring (Behi Far et al., 2023, 2024).

However, successful integration of outsourced training services requires strong managerial capabilities, including the ability to coordinate with providers, monitor performance, and align external content with organizational goals (Alamtabriz & Shayesteh, 2011; Ebrahimpour Azbari et al., 2021). Managerial competencies such as strategic thinking, communication, and change management play a decisive role in ensuring that outsourcing arrangements deliver the intended benefits (Ashourpour & Najafi, 2015; Ebrahimi, 2019). Inadequate oversight or misalignment between the provider's methods and the organization's needs can undermine the effectiveness of training programs and reduce the return on investment (Honarvar & Rezaee, 2019; Mosca & Bordelon, 2017).

Given these complexities, there is a clear need for comprehensive decision-making frameworks that incorporate both strategic and operational dimensions of outsourcing (Gholizadeh et al., 2022; Vining & Globerman, 2017). Such frameworks should account for the interrelationships between decision criteria, the relative importance of each factor, and the potential trade-offs involved (Behi Far et al., 2024; Guchhait & Sarkar, 2024). Furthermore, they should be adaptable to the specific characteristics of the industry, the regulatory environment, and the organizational context (Romero et al., 2020; Taghizadeh & Divanbeigi, 2021).

This study addresses these needs by developing a decision-making model for outsourcing training activities in the National Iranian Gas Company.

2. Methods and Materials

In this study, a mixed-method approach (sequential exploratory design of the categorization type) was applied. In the first stage (qualitative phase), semi-structured interviews were conducted to address the decision-making process for outsourcing training activities in the National Iranian Gas Company. Subsequently, the fuzzy Delphi method was employed to screen and determine the

importance of components, and in the quantitative phase, based on the factors identified in the qualitative phase, a questionnaire was developed. After collecting and analyzing the data, the initial model was presented and validated, followed by the final outsourcing training model for the gas company. Given its mixed-method nature, this study was based on the philosophical paradigm of pragmatism. In the qualitative phase, the research strategy was content analysis, while in the quantitative phase, the strategy was a survey.

In the qualitative section, the study participants were employees of the National Iranian Gas Company. A non-probabilistic purposive sampling method was used to select the participants. The selection criteria included having at least five years of work experience in the National Iranian Gas Company and holding a master's or doctoral degree in the relevant field. The number of participants was determined based on the principle of theoretical saturation, which was achieved with 11 participants; however, interviews continued until the 15th participant. Given the interpretive and hermeneutic roots of qualitative research, ensuring research credibility and trustworthiness has long been of importance. Guba and Lincoln (1994) presented four criteria—credibility, dependability, confirmability, and transferability. Accordingly, interviews were conducted with experienced staff members, and follow-up sessions were held with participants to review the interview transcripts, extracted codes, and results. Four participants provided feedback on their accuracy, and any inconsistencies were addressed, reviewed, and corrected. For dependability, the researcher developed an "audit trail." Rich and detailed descriptions of the dataset were produced during the data collection phase to enhance the potential for transferability.

In the second phase of the field study, the fuzzy Delphi method was applied. As this method involves collecting the collective knowledge of oil and gas industry experts, 20 experts from this sector were selected purposively and through convenience sampling (individuals possessing knowledge and experience in the subject, willingness to cooperate, sufficient time to participate in Delphi, and effective communication skills). They were asked to answer the questionnaire items. Finally, in the DEMATEL phase, to determine the influence and dependence, as well as to prioritize the dimensions and components of outsourcing training, and in the quantitative section to determine the causal relationships between components, the research sample consisted of 37 gas company employees selected purposively. The selection criteria included teaching in oil and gas disciplines, holding a master's or doctoral degree in oil and gas or human resources, and conducting research and teaching in the field of oil and gas and human resources.

3. Findings and Results

To design a decision-making model for the outsourcing process of training activities in the National Iranian Gas Company, priorities for outsourcing training were extracted from articles and semi-structured interviews with experts. In the qualitative phase, the analysis and interpretation (coding) of the literature and the concepts expressed by experts were carried out, which included open coding and axial coding.

Qualitative content analysis is a research method for the subjective interpretation of the content of textual data through systematic classification processes, coding, and theme development or the design of recognized patterns. Depending on the quality of the relationships between subcategories, these subcategories were combined and organized into a smaller number of categories.

In this stage, sampling continued until the concepts were discovered in the open phase; then, the concepts were classified based on their relationship to similar topics. At this stage, the concepts within the interviews were carefully examined in relation to the subject of outsourcing training in the National Iranian Gas Company. As a result, based on information obtained from semi-structured interviews, key points and themes were coded.

For example, part of the responses to the interview questions was coded as follows:

"… As a result, in re-engineering the organizational missions, we conclude that some operational tasks should be outsourced, and changes should be made in work procedures and processes (depending on the organization's mission and philosophy)…"

This section of the interview clearly describes "deep reflection, review, and revision of activities."

"… Process improvement solutions are related to ensuring that this process—from decision-making, tendering, inquiry, work announcement, to contractor selection—follows a specific standard so that the work can be improved, documented, and codified. Improvement is always the result of receiving feedback (meaning that one round is completed, feedback is received, another round is carried out, and feedback is obtained again). The more these processes are documented and written, the better improvement actions can be implemented…"

This section of the interview clearly refers to "monitoring activities and performance."

Continuing the open coding process and repeated application of constant comparison led to the development of features, dimensions, and categories.

In this stage, the categories developed in the previous step were expanded based on the paradigmatic model. In other words, based on the participants' responses, axial coding and categorization of their answers were performed. These concepts represent distinct features in the responses, indicating important information related to the research questions, and form a pattern found within the dataset that describes observations and organizes and interprets aspects of the phenomenon under study, namely participatory learning.

For example, seven open codes include: "Support for outsourcing activities; adequate knowledge of teaching and learning concepts and principles; willingness and motivation to improve performance; organizational commitment to implementing innovative activities; flexibility and collaboration; motivation and willingness to perform outsourcing activities; …"

Personality traits of the manager, such as extraversion and openness, given that they refer to and emphasize the concepts, activities, and responsibilities of the manager, were classified under a category titled "Manager Factor." Accordingly, the main theme of "Management" emerged, which includes the six sub-themes (open codes) mentioned. Continuing this process led to the formation of five main themes. A summary of the results of categorizing the open codes using axial coding and forming the main themes, based on theoretical foundations and the opinions of each participant, is presented in Table 1.

Table 1

Main Themes and Sub-themes

Main Theme	Sub-theme	Frequency in Interviews
Management	Support for outsourcing activities	15
	Adequate knowledge of teaching and learning concepts and principles	14
	Willingness and motivation to improve performance	15
	Organizational commitment to implementing innovative activities	11
	Flexibility and cooperation	11
	Motivation and willingness to engage in outsourcing activities	10
	Personality traits of the manager, such as extraversion and openness	9
Goals and Vision	Availability of educational materials for group activities	12
	Availability of sufficient time in training programs	11
	Volume of study materials	12
	Balance in developing cognitive and social dimensions	12
	Availability of activities aligned with expertise	13
Internal Processes	Ability to manage and plan activities	15
	Ability to monitor activities and performance	11
	Ability to organize and group activities	9
	Defining roles and success criteria and communicating them to groups	12
	Ability to design and develop educational materials	15
	Deep reflection, review, and revision of activities	14
	Ability to develop implementation methods for activities	12
	Encouragement and consideration in cooperation	11
	Emotional and social support for colleagues	10
Empowerment	Investment management	10
	Access to external expertise	14
	Employee flexibility	11
	Employee focus on core activities	13
	Creation and sharing of knowledge	15
	Scientific and interactive learning	15
Competitive Advantage	Problem-solving ability and responsiveness of employees	11
	Accelerating task completion	12
	Cost management and optimization	16
	Optimal allocation of employees	10
	Related and supporting industries	12

To design a decision-making model for the outsourcing process of training activities in the National Iranian Gas Company, priorities of units for outsourcing training were extracted from articles and semi-structured interviews with experts. Since the number of identified variables was large, and to localize the variables, reduce the inputs, as well as determine the relative importance of the inputs and assess their validity, a weighting limitation was applied to the model. To achieve this, a questionnaire containing 32 components (each question representing one component) was developed, and 20 questionnaires, corresponding to the number of respondents, were distributed among them. All questionnaires were returned complete. These questionnaires were designed qualitatively, based on a five-point Likert scale ranging from "very high" to "very low." After distributing and collecting the questionnaires, the fuzzy Delphi method was used to determine the most important factors, the steps of which are outlined below.

Table 2

Results of the First Round of the Survey Along with the Mean Expert Opinions for the Decision-Making Stage

Decision-Making Stage	Non-Fuzzified Mean – First Round of Delphi	Non-Fuzzified Mean – Second Round of Delphi	Difference Between First and Second Round	Status
Management	Support for outsourcing activities	8.71	8.89	0.17
	Adequate knowledge of teaching and learning principles	9.85	9.67	0.19
	Willingness and motivation to improve performance	8.85	8.89	0.04
	Organizational commitment to implementing innovative activities	9.28	9.16	0.11
	Flexibility and cooperation	8.84	8.94	0.10
	Motivation and willingness to engage in outsourcing activities	8.43	8.61	0.18
	Personality traits of the manager, such as extraversion and openness	7.37	7.25	0.12
Goals and Vision	Availability of educational materials for group activities	9.46	9.54	0.08
	Availability of sufficient time in training programs	8.93	9.08	0.15
	Volume of study materials	8.63	8.72	0.09
	Balance in developing cognitive and social dimensions	8.57	8.65	0.09
	Availability of activities aligned with expertise	8.93	8.85	0.08
Internal Processes	Ability to manage and plan activities	7.96	8.09	0.13
	Ability to monitor activities and performance	8.27	8.24	0.03
	Ability to organize and group activities	8.30	8.21	0.09
	Defining success criteria and communicating them to groups	7.98	8.18	0.20
	Ability to design and develop educational materials	9.25	9.12	0.12
	Deep reflection, review, and revision of activities	9.40	9.57	0.17
	Ability to develop implementation methods for activities	7.86	8.01	0.15
	Encouragement and consideration in cooperation	8.27	8.35	0.09
	Emotional and social support for colleagues	7.13	7.20	0.07
Empowerment	Investment management	9.17	9.26	0.09
	Access to external expertise	8.80	8.73	0.07
	Employee flexibility	9.61	9.53	0.07
	Employee focus on core activities	8.69	8.75	0.06
	Creation and sharing of knowledge	9.13	9.03	0.10
	Scientific and interactive learning	9.88	9.97	0.09
Competitive Advantage	Problem-solving ability and responsiveness of employees	9.11	9.22	0.12
	Accelerating task completion	7.89	8.01	0.12
	Cost management and optimization	8.47	8.50	0.03
	Optimal allocation of employees	8.30	8.19	0.10
	Related and supporting industries	7.28	7.15	0.13

Considering the opinions expressed in the first round and comparing them with the results of this stage, if the difference between the two stages is less than the threshold value of 0.20, based on the required accuracy of the

researcher, the survey process is stopped. As the results of the above table indicate, for some factors, the expert panel reached a consensus, and the level of disagreement between the first and second rounds was less than the 0.20 threshold. Therefore, the above factors were accepted, and the survey process for these factors was terminated.

Among the factors mentioned, those with a non-fuzzified mean expert opinion of less than 8 were removed from the conceptual model of the research. Accordingly, out of the 32 components identified in the five dimensions, three components were removed, and 29 components were confirmed.

The steps for examining the internal relationships between factors were carried out using the DEMATEL method.

By performing calculations in Microsoft Excel, the values of (R), (J), (R+J), and (R−J) were obtained, as shown in Table 3.

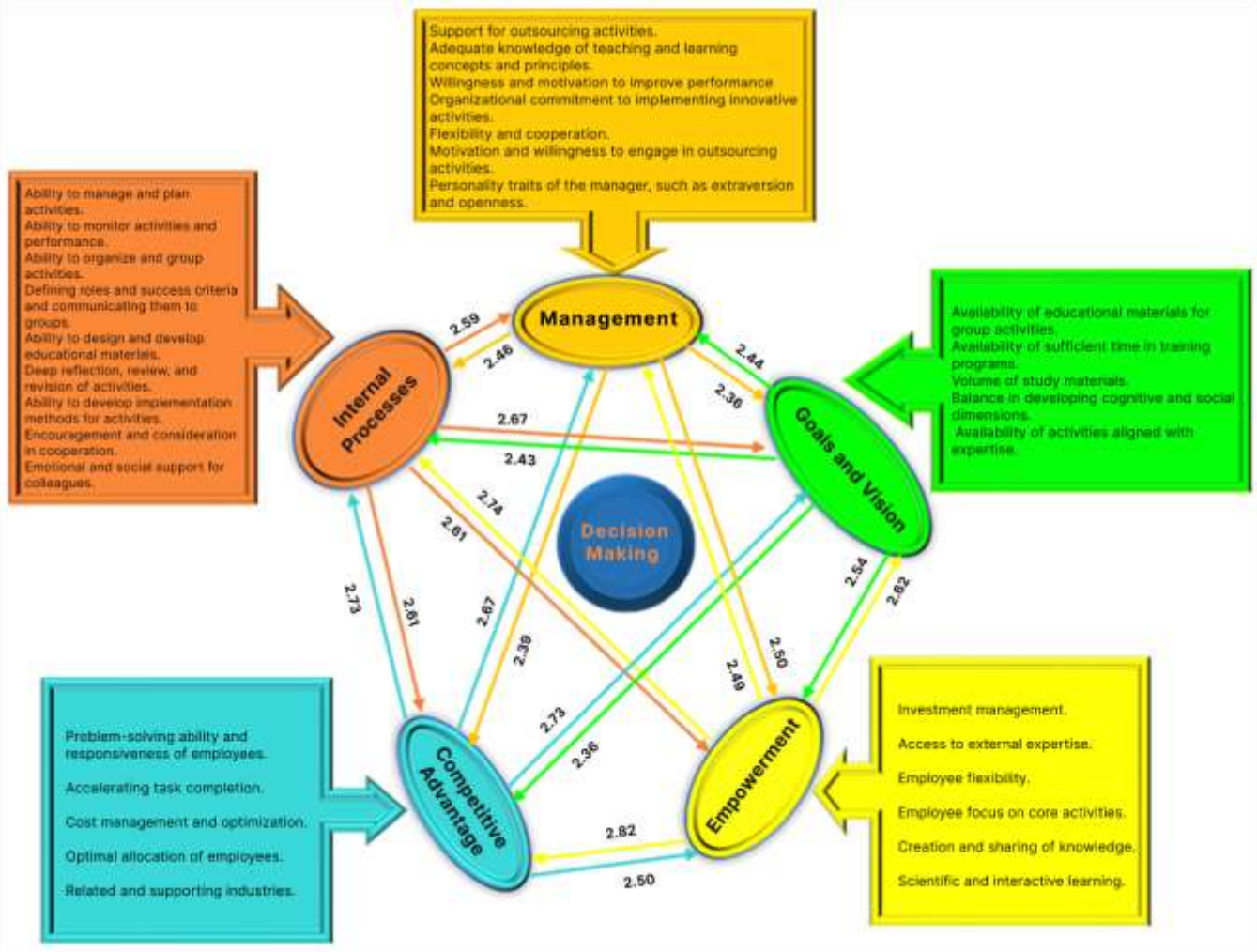
Table 3

Values of (R), (J), (R+J), and (R−J)

	R	J	R+J	R−J
Goals and Vision	12.13	11.78	23.91	0.35
Empowerment	11.12	11.41	22.53	-0.30
Management	12.42	11.42	23.85	1.00
Competitive Advantage	11.09	11.79	22.88	-0.71
Internal Processes	11.76	12.11	23.87	-0.35

Figure 1

Outsourcing Training Model of the Gas Company in the Decision-Making Stage



Accordingly, the factor "Goals and Vision" had the highest level of interaction (influence/influence received), followed by "Internal Processes," "Management," "Competitive Advantage," and "Empowerment" in terms of interaction with other factors. "Management" was the most influential factor on the other factors, followed by "Goals and Vision." Based on the R−J values, these two factors are net influencers. The most influenced factors, in order, were "Empowerment," "Internal Processes," and "Competitive Advantage."

At this stage, based on the information obtained from the previous steps, the criteria influencing participatory learning were ranked according to (R+J) values as follows:

Rank 1: Goals and Vision

Rank 2: Internal Processes

Rank 3: Management

Rank 4: Competitive Advantage

Rank 5: Empowerment

Based on the factors extracted from the literature and interviews, the proposed model in the decision-making stage of the research is presented as follows:

4. Discussion and Conclusion

The findings of this study provide an empirically grounded framework for the decision-making process of outsourcing training activities in the National Iranian Gas Company, highlighting five main dimensions—management, goals and vision, internal processes, empowerment, and competitive advantage—and their respective subcomponents. Using a combination of Fuzzy Delphi and DEMATEL analysis, the study identified "Goals and Vision" as the dimension with the highest overall interaction (R+J), followed closely by "Internal Processes" and "Management." The results further demonstrated that "Management" and "Goals and Vision" were net influencers (positive R−J values), while "Empowerment," "Internal Processes," and "Competitive Advantage" were more influenced by other dimensions. These insights suggest that in the context of outsourcing training, strategic clarity and strong managerial capabilities serve as the primary drivers of decision-making and influence other operational and capability-related factors.

The prominence of "Goals and Vision" as the most interactive factor underscores the importance of strategic alignment in outsourcing decisions. Previous studies have emphasized that outsourcing success is contingent on ensuring that the outsourced function supports the long-term strategic objectives of the organization (Taghizadeh & Divanbeigi, 2021; Vining & Globerman, 2017). In training outsourcing, this alignment entails defining learning objectives that not only address immediate skill gaps but also prepare the workforce for anticipated technological, regulatory, and market changes (Behi Far et al., 2024; Ebrahimi, 2019). This is particularly relevant in the oil and gas sector, where operational safety, environmental stewardship, and technical innovation are integral to corporate strategy (Behi Far et al., 2023; Gholizadeh et al., 2022). The findings here confirm the assertion of (Romero et al., 2020) that clear organizational vision enables more coherent outsourcing arrangements, where providers can tailor training content to meet strategic priorities.

The second-ranked factor, "Internal Processes," reflects the operational backbone that supports effective outsourcing relationships. Capabilities such as planning, monitoring, designing training content, and implementing structured feedback loops were identified as crucial. These results are in line with (Alamtabriz & Shayesteh, 2011) and (Ebrahimpour Azbari et al., 2021), who argue that well-structured internal processes ensure quality control, facilitate communication with providers, and reduce the risk of performance shortfalls. In the current study, interviewees stressed the necessity of standardizing processes across all stages—from tendering and contracting to execution and evaluation—mirroring the recommendations of (Honarvar & Rezaee, 2019), who emphasized process formalization in outsourcing arrangements to avoid delays, cost overruns, and misaligned deliverables.

"Management" emerged as the third most interactive factor but, importantly, showed the highest net influence on other dimensions (R−J). This finding reinforces the central role of managerial competence in shaping the success of outsourcing training projects. The ability of managers to champion outsourcing initiatives, allocate resources, build trust with providers, and integrate outsourced services into existing workflows was repeatedly highlighted. (Alami & Fattahi, 2018) and (Eze & Omena, 2019) similarly emphasized that leadership support, coupled with knowledge of instructional design and adult learning principles, substantially improves outsourcing outcomes. The rejection of the "manager personality traits" component in the Delphi stage suggests that while interpersonal traits like openness and extraversion may contribute to leadership style, they are less critical than skills and behaviors directly linked to the outsourcing process itself.

The lower ranking of "Empowerment" and "Competitive Advantage" in the interaction hierarchy should not be interpreted as a lack of importance; rather, these factors are more likely to be outcomes of effective management, clear strategic vision, and robust internal processes. "Empowerment" factors, such as employee flexibility, access to external expertise, and knowledge sharing, are often fostered through the successful integration of outsourced training into the organizational learning ecosystem (Ashourpour & Najafi, 2015; Viseh et al., 2023). Similarly, "Competitive Advantage" outcomes, including cost optimization, accelerated task completion, and improved problem-solving capabilities, are achievable when outsourcing initiatives are strategically aligned and operationally supported (Guchhait & Sarkar, 2024; Mohammadi & Tahmasebi, 2020).

The decision to reject three components—manager personality traits, emotional and social support for colleagues, and related and supporting industries—reflects the consensus among experts that these factors either fall outside the direct control of outsourcing decision-making or have a less immediate impact on outsourcing success. This aligns with the findings of (Mosca & Bordelon, 2017) and (Kshetri, 2017), who caution against overemphasizing peripheral or contextual factors that do not directly influence contractual performance or learning outcomes. By focusing on the most relevant and actionable factors, the model ensures greater precision and applicability in practice.

A noteworthy contribution of this study is the integration of Fuzzy Delphi and DEMATEL methodologies to refine and prioritize decision criteria. The Fuzzy Delphi approach enabled the systematic filtering of components based on expert consensus, reducing the initial 32 factors to 29 validated components. This step ensured that the model captures only the most salient elements, in line with the methodological rigor advocated by (Ebrahimpour Azbari et al., 2021) and (Tabatabaei & Mohammadi, 2021). The subsequent DEMATEL analysis provided deeper insights into causal relationships between factors, allowing for the identification of net influencers and net receivers in the decision-making framework. As (Behi Far et al., 2024) and (Guchhait & Sarkar, 2024) note, understanding these relationships is essential for effective prioritization and resource allocation in complex outsourcing scenarios.

The ranking of factors based on (R+J) values provides a practical guide for decision-makers in similar organizational contexts. Placing "Goals and Vision" at the forefront suggests that outsourcing training decisions should begin with a strategic assessment of organizational learning needs, ensuring that these are embedded in the contractual scope and performance metrics. The next priority, "Internal Processes," calls for investment in process standardization, monitoring systems, and feedback mechanisms to manage outsourcing engagements effectively. Finally, the influential role of "Management" underscores the need for capacity building among decision-makers, including training in vendor management, negotiation, and performance evaluation (Alamtabriz & Shayesteh, 2011; Ebrahimi, 2019).

The alignment of these findings with prior studies in other sectors supports the generalizability of the model. For example, (Taghizadeh & Divanbeigi, 2021) found that strategic clarity and managerial competence were decisive in outsourcing water and wastewater services, while (Romero et al., 2020) reported similar patterns in the outsourcing of education in Liberia. The emphasis on internal processes echoes the work of (Honarvar & Rezaee, 2019) in dual-channel supply chains and (Gholizadeh et al., 2022) in public sector HR development. This cross-sectoral consistency suggests that while industry-specific factors must be considered, the core dimensions identified here may be broadly applicable to outsourcing decisions involving knowledge-intensive services.

Moreover, the findings highlight the potential for outsourcing training to serve as a strategic lever for organizational transformation. By leveraging external expertise, organizations can accelerate the adoption of new technologies, update skill sets in response to market shifts, and foster a culture of continuous learning (Behi Far et al., 2023; Viseh et al., 2023). However, as (Kshetri, 2017) notes, these benefits can only be realized if appropriate safeguards are in place to protect sensitive information, maintain service quality, and ensure compliance with industry standards. The interplay between outsourcing benefits and potential risks underscores the importance of a balanced, evidence-based decision-making process, as reflected in the proposed model.

Ultimately, this study contributes to the literature by providing a validated, context-specific model that integrates strategic, operational, and capability-related factors into a coherent framework for outsourcing training in the oil and gas sector. The combination of qualitative expert input and quantitative causal analysis strengthens the robustness of the findings and offers actionable insights for practitioners and policymakers. The evidence suggests that focusing on strategic vision, managerial capability, and process optimization will yield the most significant returns from

training outsourcing initiatives (Ebrahimpour Azbari et al., 2021; Vining & Globerman, 2017).

While the study employed rigorous methods and achieved consensus among experts, several limitations should be acknowledged. First, the sample of experts was limited to individuals with experience in the oil and gas sector, which may limit the applicability of the findings to other industries with different operational contexts or regulatory environments. Second, the reliance on expert judgment in the Fuzzy Delphi process introduces potential biases related to individual experiences, preferences, or organizational cultures. Third, although the DEMATEL method provides valuable insights into causal relationships, it is based on subjective evaluations and does not capture dynamic changes over time. Finally, the study focused on outsourcing training services and did not examine other HR functions that might interact with or influence the outcomes of training outsourcing, such as recruitment or performance management.

Future studies could expand the scope of this research by including experts from a broader range of industries and geographical regions to test the generalizability of the model. Longitudinal research designs could also be employed to assess how the relationships between factors evolve over time and in response to external shocks, such as technological disruptions or economic crises. Additionally, integrating quantitative performance data—such as cost savings, productivity gains, or employee retention rates—would provide a more objective basis for evaluating the effectiveness of outsourcing decisions. Comparative studies could further explore differences in decision-making models between public and private sector organizations or between domestic and international outsourcing arrangements.

In practice, decision-makers in the oil and gas sector should begin outsourcing deliberations by ensuring a clear articulation of organizational goals and vision for training. Investment in strengthening internal processes—particularly in standardization, monitoring, and feedback mechanisms—will enhance the ability to manage outsourcing engagements effectively. Developing managerial competencies in vendor management, negotiation, and performance evaluation is essential to maximize the benefits of outsourcing. Organizations should also view outsourcing not merely as a cost-cutting measure but as a strategic tool for capability building and competitive advantage. By applying a structured, evidence-based decision-making framework such as the one proposed in this study, practitioners can improve the likelihood of achieving both immediate operational gains and long-term strategic objectives.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

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