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Critical Success Factors for Innovation Management in Regional Joint Ventures: A Study of Gulf Petrochemicals Industries Company

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Abstract

The study intended to investigate the important success factors for innovation management in regional joint ventures, as well as to aid in the discovery of strategies inherent in such regional strategic alliances and approaches to overcoming obstacles. The mixed technique was employed in the study: (1) a semi-structured interview with 21 members of the Gulf Petrochemical Industries Company's board of directors and top management. (2) a Delphi surveying approach, with a sample of 85 middle managers, as it is a model for a joint venture corporation involving the Kingdoms of Bahrain, Saudi Arabia, and Kuwait. Organizational learning, strategic control, resource integration (complementarity), institutional context, and external environment unpredictability are the five basic components of the study. The findings revealed numerous essential success criteria for innovation management at Gulf Petrochemical Industries Company (GPIC). Organizational learning elements, strategic control factors, resource integration factors, institutional context factors, and external environment uncertainty factors are among these. Top management interviews also revealed five joint venture success factors: resilience management, aligned competency, enterprise governance, direct investment, and agility emphasis.

Keywords: *Critical Success Factors, Innovation Management, Regional JVs, JV Strategies, GPIC*

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1. Introduction

Business and industry operate in a changing, dynamic, and complicated environment that is subject to numerous wide technological advances, which raises the level of competitiveness. This means that businesses must develop new methods and strategies to attain excellence in a competitive environment by improving their ability to innovate and bring new items to market faster than competitors (Bhalla, 2010). Many organizations, however, may face limitations in their ability to provide these innovative services, prompting them to create value in the interconnected market by collaborating and participating with stakeholders to access missing resources and achieve cooperation in the production process (Roser et al., 2013).

There are new approaches and tactics for bringing institutions together in joint ventures. These institutions are led by the parent company, which is known as a joint venture (Nippa & Reuer, 2019), and are organizational entities formed and managed by both domestic and foreign firms, each of which contributes resources to the achievement of shared strategic goals (Meschi & Riccio, 2008; Shenkar & Zeira, 1987). Organizations and industries have entered the world of innovation, where globalization mixed with rapid technology improvements means that organizations must adapt swiftly and continuously, typically through innovation (Brown & Eisenhardt, 1995; Gilson & Shalley, 2004). Firms with a higher capacity for innovation can respond to competitive challenges

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more effectively by establishing new capabilities that provide a competitive advantage.

The goal of this research is to investigate the important success variables for innovation management in the GPIC, a regional joint venture in Bahrain. The study employs a mixed method of qualitative and quantitative approaches, with the qualitative approach taking the form of semi-structured interviews with 21 participants, including (9) board of directors from the parent companies that established the joint venture, namely (Nogaholding) from Bahrain, (SABIC Agri-Nutrients Investment Company) from Saudi Arabia, and (PIC) from Kuwait, as well as (12) top managers from the JV itself (GPIC). The interviews were divided into two parts: the first was to identify critical success factors for innovation management for each dimension identified in the literature review, and the second was to capture strategies among partners to harness resources and support innovation management within the joint venture. While the quantitative method was delivered in four rounds to 85 GPIC middle management (superintendents and supervisors) via a closed survey utilizing a Delphi-based strategy.

1.1 Study Problem

Business organizations face numerous dangers and crises, affecting their survival, continuity, reputation, and competitive position. GPIC, a unique joint venture in the GCC region, faces challenges in the oil and petrochemical industries. This research aims to investigate success

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variables for managing innovation in joint ventures, specifically GPIC, based on a case study in Bahrain. The study aims to examine value co-creation in domestic firms and the impact of inter-partner factors on joint ventures. Previous research has focused on international and local joint ventures, but the case study of GPIC in Bahrain has a research gap. The study aims to utilize interviews and questionnaires with decision-makers in top and middle management, addressing the gap in previous studies.

1.2 Research Objectives

The main aim of this study is to explore the critical factors in the success of innovation management in a joint Venture for JV in GPIC in Bahrain. More specifically, this study seeks to achieve the following objectives:

1. To identify critical innovation management factors for the regional JVs.
2. To identify innovation management strategies for the use of resources within JVs.
3. To propose an innovation management factors model in regional JVs.
4. To propose an innovation management strategies model in regional JVs.

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1.3 Research Questions

The main research question for the study is 'What are the intrinsic innovation management factors of regional JV (GPIC) in Bahrain?' The research also confronts the following sub-questions

1. What are the critical innovation management factors for regional JVs?
2. What are the innovation management strategies for harnessing resources within regional JVs?
3. What is the model of the innovation management factors in regional JVs?
4. What is the model of innovation management strategies in regional JVs?

2. Literature Review

2.1 Joint Venture

JVs aim to improve affiliated companies' opportunities for market growth and economic expansion, as well as to contribute to the host country's economic and technological development (Chang et al., 2015; Hilmersson et al., 2012; Liu et al., 2013), and it contributes to the host country's economic, market, and technological development. Partners with compatible abilities, resources, and cultures are found to retain strong relations and are likely to achieve significant JV success in a well-planned JV framework (Ozorhon et al., 2010). According to Ali et al.

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(2017), in order for partners to fulfill their aims, they must strive for cooperation among all parties involved and benefit each other from their advantages.

The primary benefits of forming IJVs include economies of scale and synergy, access to a larger pool of resources, and the elimination of a competitor or foreign market entry. Other grounds for entering a foreign market could be that the firm has obtained sufficient expertise in the area and believes it is ready to acquire equity ownership in another company. Before acquiring total equity and operating as a wholly owned subsidiary, the company may pick a JV plan to obtain additional expertise and experience in the overseas market. JVs may also be selected as an entrance strategy when smaller enterprises seek to finance R&D projects (Kumar, 2010). Table (2.1) depicts many forms of JVs.

Table (1) Type of Joint Ventures

Type	Overview
Domestic Joint Ventures	Domestic joint venture means all partners from the same nationality, e.g., Saudi Butanol Company (SABUCO), formed in 2013 by Saudi Arabian Amiantit Company, and Saudi Kayan Company. And Sadara Chemicals Company.
Regional Joint Ventures	A regional joint venture is set up by partners of different nationalities in the same region, e.g., Gulf Petrochemical Industries Co. (GPIC) formed in 1979 by Nogaholding (Bahrain), SABIC (Saudi Arabia), and PIC (Kuwait) in the GCC region.
International Joint Ventures	International joint venture set up by partners of different nationalities, e.g., Avanade formed in 2000 by Accenture (Ireland) and Microsoft (USA)

An international joint venture is a partnership between two or more partners from different locations, aiming to share risks, divide earnings, and exchange resources. The agreement can be limited, renewed, or changed to form a new partnership. Both domestic and foreign investors

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have entered into joint venture agreements. Joint ventures are becoming more popular in many regions due to the recognition of their importance in company operations. Shares in joint ventures help businesses establish control systems, such as standards, processes, regulations, hierarchies, norms, and goals (Leonard et al., 2020).

Companies define these systems before embarking on the joint venture, and their performance is reviewed based on these formal controls to monitor their overall development and achieve objectives. International joint venture managers must share common interests, expertise, and attitudes to build a collaborative company culture. They also highlight the link between joint venture concepts and innovation, such as process, organizational product, and marketing innovations. Joint ventures offer new ideas and strategies for delivering services and manufacturing products, resulting in fresh manufacturing, marketing, and organizational tactics (Nguyen et al., 2019).

Das and Rahman (2010) confirm that cultural differences between JV partners negatively affect alliance performance and jeopardize survival due to relational issues. Furthermore, rather than variations in power distance, differences in uncertainty avoidance between home and host countries have a detrimental impact on JV survival (Barkema, 1997).

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2.2 Business co-creation in Joint Venture

According to Roser et al. (2013) and Still et al. (2014), co-creation is viewed as a strategy for building relationships in B2B co-innovation, allowing organizations to develop their potential capabilities and increase their ability to deal with the various challenges they face and adapt to frequent market changes, allowing them to maintain their competitive position. The development of a shared exchange of knowledge and the transmission of practitioners' experiences ensures the enhancement of the degree of innovation in co-creation interactions (Lambert & Enz, 2012). Innovation in the context of co-creation is also dependent on the capabilities of the participating organizations, their level of cooperation, and their level of confidence (Joshi & Chebbiyam, 2011).

Co-creation, according to academics, is a process that demands a high level of engagement and cooperation between enterprises in order to produce new products and services (Vargo & Lusch, 2010; Alves, 2013; Osborne et al., 2016; Ma et al., 2019). Co-creation increases the value and competitiveness of a company in a competitive setting (Silva et al., 2013). Co-creation, according to Torfing and Srensen (2019), is a process that contributes to the development of additional value for businesses, since the nature of creating this value depends on the method followed by the companies in reaching this value. Value generation in JVs can be measured in a variety of ways. One of the most prominent and commonly utilized approaches is the stock price reactions method (Merchant &

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Schendel, 2000). Other methodologies offered by the researchers included corporate financial performance and managerial appraisal (Kale et al., 2001).

2.3 Joint Venture Timeline

The joint venture has a long history, but the legal framework and concepts are relatively new. In the early history of Egypt, Babylon, and Syria, joint ventures were utilized to support reasonable trading operations, and it evolved as a commercial tool to do business. Joint venture concepts and legal forms needed to be developed more quickly at this time. During these eras, it lacked the continuity and diversity that current companies enjoy and exploit. Germany, Italy, England, and France formed joint ventures in order to concentrate their cash and spread their risks. With no satisfaction, a legislative framework has just been constructed to control corporations and partnerships. The terms of the agreement are primarily determined by the parties' construction, yet there are some characteristics that apply to all joint ventures (Nichols, 1950).

Karpel and Merger, (1999) investigated the European Commission's judgment on the merger of McDonnell Douglas Corporation and Boeing Company. They describe how they effectively carried out their space exploration innovation plans. Boeing is the world's largest manufacturer of commercial planes, helicopters, and military aircraft. In the late 1990s, joint ventures realized the evolution of firms pooling their resources, expertise, and sophisticated tactics. Nkomo (2019) researched Toyota

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market expansion, and the findings revealed that Toyota cars first entered the Indonesian market in 1971. It entered the market through a joint venture with Astra Motor, and by 1977, it was producing automobiles in Indonesia. Because of joint venture innovations, their sales more than doubled; Toyota is still one of Indonesia's top four automobile sellers today. This historic triumph was the result of Toyota's groundbreaking international Multi-project vehicle strategy, which was unveiled in 2003. They manufactured vehicles that were perfectly suited to the Indonesian market.

2.4 Innovation management in Joint Ventures

Many appealing joint ventures are taking advantage of the opportunity to create strategic, civic-minded, public-private initiatives, one-time collaborations, and new companies. Companies' ability to improve service delivery or product quality by adopting new tactics and ideas into existing processes is referred to as innovation. The incorporated measure attempts to improve efficiency and optimize profitability (Anderson, 2019). Sunny and Ruby (2013) also stated that when two companies form a joint venture, they employ diverse board tactics and new technology to manufacture items and provide services. These two companies' strategies match each other's deficiencies, increasing their competitive edge over their competitors. It demonstrates that joint ventures constantly assist organizations in being innovative and competitive. Joint ventures assist organizations avoid market failures and allow small businesses that form

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JVs with larger corporations to expand. Bringing new ideas from the people and resources from the two companies provides an environment favourable to substantial breakthroughs being begun and embraced.

Nam (2011) study on joint ventures in China's automobile sector defines innovation as using new techniques and strategies to improve company performance. This involves forming teams with new resources and ideas, learning from colleagues with similar expertise, and utilizing new resources to maximize potential. Innovation is a multidisciplinary activity requiring diverse skills. According to Robert Baron (2011), small businesses often lack access to resources like finance, people, machines, and infrastructure for innovation management. Joint ventures can help them overcome these challenges by offering reciprocal benefits and fostering innovation. By collaborating, strategic organizations can establish synergy and resources, enabling partners to invest in innovative processes and technologies.

3. Methodology

3.1 Qualitative Methodology

Because of the unusualness of being listened to, an interview tool provides respondents with unique opportunities to examine, be motivated, and feel empowered (Kaar, 2009). It is a popular method of data gathering that gives a rich source of information about the participants' ideas and perceptions (White, 2003). The in-person and online interviews

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helped to clarify the Critical Success Factors for Innovation Management. The procedure was as follows: (1) conduct the interview, (2) record, (3) save, (4) transcribe, and (5) analyze the content using thematic framework analysis software such as ATLAS.ti.

The researcher must choose a sample of whether to conduct interviews, surveys, or other data collection approaches to answer the interview questions. There are two types of sampling methods: "probability or representative sampling" and "non-probability or judgment sampling," where the researcher chooses the things to sample based on his prior knowledge or the expert's judgment. The current study's population includes top management in the joint venture (GPIC) as well as the corporations that formed the joint venture, Nogaholding from Bahrain, SABIC from Saudi Arabia, and PIC from Kuwait. The sample size used was 21 participants.

3.2 Qualitative Methodology

According to the current model variables, the survey instrument was a composite of multiple subscales. The primary goal of the survey is to identify essential success criteria for managing innovation in regional joint ventures. The composite instrument is made up of 80 items gathered through interviews with top management personnel in the JV (GPIC) and the firms that formed the JV (Nogaholding) from Bahrain, (SABIC) from Saudi Arabia, and (PIC) from Kuwait, who are the decision makers in the JV process. The Social Science Statistics Package (SPSS) was used for

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quantitative analysis, generating descriptive statistics and calculating mean and standard deviation.

4. Results

4.1 Interview Findings

4.1.1 Resilience management strategy

Resilience management strategy is crucial for joint venture company advancement, encompassing safety, security, business development, productivity, and ergonomics. Effective communication between top management and middle management is essential for employee performance and plan implementation. Resilience management relies on listening and debating issues before making decisions, ensuring that all stakeholders are informed and engaged in the decision-making process.

Key Performance Indicators (KPI) are a forerunner to automated record systems such as SAP. Key Performance Indicators are one tool that may be used in conjunction with the SAP system to assess business performance and ensure that strategic goals and targets are reached. The no-silo strategy promotes transparency among the JV parent businesses and enables for the timely sharing of best practices. Transparency during committee meetings enables JV businesses to identify and report risks, allowing them to mitigate and adjust their procedures to improve overall performance.

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Clear communication between parent firms improves information transfer, enabling them to engage on beneficial subjects while limiting harmful activities. Briefings between local management and the board of directors are crucial for strategic objectives fulfillment. Parent firms contribute expertise, experience, contacts, and resources during crises. GPIC benefits from parent company training courses, workshops, and industrial training in Saudi Arabia and Kuwait. Maintaining open communication between board members and executive management ensures long-term viability. A strong risk management system and competency exchange program for administrative and technical workers are essential.

Agile methods, like GPIC, have proven more effective in crisis management during crises than during the pandemic. Parent businesses are equal partners, and information exchange impacts joint venture performance. Enterprise risk management (ERM) is crucial in industries like petrochemicals and oil & gas. GPIC's success during the pandemic was due to resource sharing among parent firms, facilitating orders and shipping for customers. Risk management and leadership challenges are crucial for organizations, especially in the face of unpredictable issues like market stagnation, price changes, and political changes. Joint ventures with critical partners face challenges in recovering losses during crises, requiring a mechanism to limit risk and ensure business continuity operations.

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4.1.2 Aligned competency strategy

Competency management maturity is determined by an organization's ability to invest in and build competencies that align with business objectives. Effective partnerships have a shared vision and values, with mutuality and synergy being the guiding principles. Discovery and alignment discussions on vision and value are crucial before launching a relationship. The joint venture's similarities in cultures, markets, and people's thinking can be advantageous, as parent firms are aligned in most business elements. The shared culture and business character of the joint enterprise have resulted in tremendous alignment among corporate systems.

Parent firms' history of effective collaboration and knowledge exchange drives the joint venture's success. Working together allows parent firms to capitalize on each other's capabilities, giving the joint venture a competitive advantage. Knowledge-sharing platforms allow companies to exchange information and ideas, allowing them to grow and prosper. GPIC benefits from parent company training courses, workshops, and industrial training in Saudi Arabia and Kuwait. This exemplifies collaboration and partnership between parent corporations and the joint venture.

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4.1.3 Enterprise governance strategy

The article of association is a document that outlines the rights and responsibilities of a company's members and contains its rules. It allows the company to modify the article of association with a majority vote. The association article ensures parent firms' involvement in the joint venture, sharing their plants' knowledge and technology, allowing the new joint venture to grow and build market share. Parent companies share a strong foundation of trust, enabling effective collaboration and partnership. The 12 working committees help companies share expertise and strengthen partnerships. Parent businesses have committees of independent non-executive directors, such as the audit committee, which helps align strategic objectives, analyze and manage risk, and ensure resource usage.

4.1.4 Direct investment strategy

Parent companies, as large corporations, have the power to negotiate gas supplies and prices with regional groups and governments, enabling them to influence situations during crises. Collaboration with other regional authorities is crucial for reducing risk and avoiding disruptions. GPIC addresses risks and uncertainties through enterprise risk management, business continuity, and catastrophe recovery. GPIC benefits from parent company training courses, workshops, and industrial training in Saudi Arabia and Kuwait, promoting collaboration and partnership between parent corporations and the joint venture. Improved communication

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between board members and executive management teams is essential for the joint venture's long-term viability.

GPIC successfully processed orders and shipments during the pandemic lockdown, enabling resource switching among parent companies in the same region. This improved competency exchange program for administrative and technical workers benefits workflow, particularly in factory operations. Parent businesses have the authority to negotiate gas supply and prices with associations and governments, as well as an independent non-executive director audit committee. This enterprise governance enables parent firms to coordinate their strategic objectives and adapt to any event.

4.1.5 Agility focus strategy

The competency exchange program benefits administrative and technical employees by assessing their competencies and providing training in areas for improvement. This approach enhances collaboration and strengthens joint venture and GPIC systems. Focusing on agility is crucial for long-term success, promoting creativity and innovation. Companies that restructure today to prioritize agility, rapid change, and execution are better equipped to survive the epidemic and thrive in the face of future unpredictability. Swapping resources and people between JV partners is essential for reducing risk and ensuring business continuity.

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4.2 Survey Technique findings

4.2.1 Round 1: Identification of critical innovation management factors

In the first round, a list of critical innovation management factors was compiled by (21) members of top management; a total of 193 factors were gathered for the five dimensions of Organizational Learning (42 determinants), Strategic Control (48 determinants), Resource Integration (44 determinants), Institutional context (14 determinants), and Environmental uncertainty (45 determinants). After combining a total of 80 elements, such as Organizational Learning (18 determinants), Strategic Control (16 determinants), Resource Integration (14 determinants), Institutional context (14 determinants), and Environmental Uncertainty (18 determinants), the results were as follows.

Table (4.1)Overview of critical innovation management factors from Round 1

			N
Organizational Learning	42	18	21
Strategic Control	48	16	21
Resource Integration	44	14	21
Institutional context	14	14	21
External Environment Uncertainty	45	18	21
Overall	193	80	

4.2.2 Round 2: Selection of critical innovation management factors for each dimension

Organizational Learning (18 determinants), Strategic Control (16 determinants), Resource Integration (14 determinants), Institutional

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context (14 determinants), and Environmental uncertainty (18 determinants).

Table (4.2) Summary of data for organizational learning from Round 2

Organizational Learning	Mean	Std. Deviation	N
Understanding information and its benefit (OL1)	1.53	.663	55
Defining clear responsibilities (OL2)	1.65	.947	55
Proper change management process (OL3)	1.65	.615	55
Technical know-how (OL4)	1.51	.573	55
Audit the partners (OL5)	1.78	.832	55
Top management support and incentive (OL6)	1.40	.683	55
Assign a focal staff to manage knowledge (OL7)	1.89	.916	55
Sharing knowledge and evaluating learning (OL8)	1.58	.809	55
Conducting field visits and industrial training (OL9)	1.55	.571	55
A succession plan to transfer knowledge between generations (OL10)	1.62	.707	55
Having partner companies with global experience (OL11)	1.65	.726	55
Clear Channels of Communications (OL12)	1.55	.633	55
Committees for knowledge sharing and learning (OL13)	1.64	.754	55
Understanding gaps in knowledge (OL14)	1.76	.793	55
Developing learning plans (OL15)	1.56	.764	55
Acceptance for change (OL16)	1.47	.663	55
Smart targets and goals (OL17)	1.47	.766	55
Transparent approach (OL18)	1.73	.781	55

Table (4.3) Summary of data for strategic control from Round 2

	Mean	Std. Deviation	N
Exchanging experiences with other companies (SC1)	1.62	.623	55
Strong company governance (SC2)	1.64	.754	55
Having digitalized systems (e.g., dashboard) (SC3)	1.87	.982	55
Board of directors' audit and cost optimization committee outcomes (SC4)	1.76	.816	55
Performance evaluation using KPIs (SC5)	1.55	.715	55
Experienced management team (SC6)	1.51	.605	55

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Improvements to process and technology (SC7)	1.55	.633	55
Clear company-approved strategy (SC8)	1.45	.603	55
Support from the parent company representatives (SC9)	1.82	.863	55
Strong reporting policy (SC10)	1.71	.658	55
Standardization across the organization (SC11)	1.55	.715	55
Continuous dialogue between partners (SC12)	1.62	.733	55
Clear objectives and budgets (SC13)	1.45	.538	55
Control for OPEX, CAPEX, and budget expenditures (SC14)	1.56	.739	55
Controlling allocations for projects (SC15)	1.67	.695	55
Equal shares and votes for parent companies (SC16)	1.93	.813	55

Table (4.4) Summary of data for resource integration from Round 2

Resource Integration	Mean	Std. Deviation	N
Working within mutual committees between the Parent companies (RI1)	1.78	.738	55
Focus on similarities of business and facilities (RI2)	1.82	.796	55
Establishing international business networks (RI3)	1.65	.615	55
Exchanging resources and experience (RI4)	1.56	.570	55
Secondment of human resources and equipment during the major activities (RI5)	1.56	.601	55
Using benchmarks and best practices (RI6)	1.62	.733	55
Using capabilities and strengths of each party (RI7)	1.67	.610	55
Utilize the marketing global network and offices of the parent companies (RI8)	1.62	.733	55
Availability of research and studies of parent companies' R&D centers for future expansion (RI19)	1.91	.776	55
Auditing team from the parent companies (RI10)	1.76	.838	55
Creating a mutual business benefits group (RI11)	1.91	.727	55
Pooling of financial resources to sustain and grow GPIC and increasing profits for the shareholders (RI12)	1.75	.865	55
Openness and willingness of the parent companies to share and complement the resources (RI13)	1.67	.721	55
Access to procedures, policies, and guidelines of the parent companies (RI14)	1.75	.775	55

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Table (4.5) Summary of data for institutional context from Round 2

Institutional Context	Mean	Std. Deviation	N
Avoiding personal favoritism and supporting equity (IC1)	1.58	.686	55
Understanding and managing cultural diversity (IC2)	1.75	.584	55
Good accounting practices for a healthy financial management system (IC3)	1.62	.707	55
Respect for local and international regulations (IC4)	1.60	.760	55
Support from the government and country leadership of partners (IC5)	1.51	.635	55
Leadership in health, safety, environment, and quality (IC6)	1.49	.663	55
Sustainability of management and strategy despite changes in people (IC7)	1.60	.710	55
Clear policies & procedures to protect workforce rights (IC8)	1.47	.690	55
Good regional diplomatic relationships (IC9)	1.60	.683	55
Having one unifying vision (IC10)	1.53	.573	55
Solid financial position to ensure continuity (IC11)	1.60	.564	55
People-centric approach for development, goodwill, and personal growth (IC12)	1.62	.593	55
Corporate citizenship (IC13)	1.76	.769	55
Ownership stability and sustainability (IC14)	1.51	.742	55

Table (4.6) Summary of data for external environment uncertainty from Round 2

External Environmental Uncertainty	Mean	Std. Deviation	N
Comprehensive risks mitigation plan with a clear timeline	1.71	.875	55
External expertise feedback	1.60	.596	55
Studying international opportunities and possible future expansions	1.60	.710	55
Long-term strategy plan to address GPIC strategic objectives	1.35	.552	55
Controlling operational risks	1.49	.635	55
Proactive and contingency strategy	1.47	.539	55
Regular situation analysis	1.64	.620	55
Long-term strategic outlook	1.55	.662	55
Utilizing the pool of expertise in future project	1.44	.501	55
Immediate communication for making faster decisions	1.47	.573	55

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Monitor compliance cost	1.78	.712	55
Full understanding of the external variables and their impact on GPIC	1.45	.571	55
Responsible leadership that operates the complex and ensures adherence to systems and procedures	1.62	.782	55
Updating business continuity plans	1.53	.539	55
Transparency to overcome any conflicts	1.75	.844	55
Strong ERM (Enterprise Risk Management)	1.38	.593	55
Assigning each executive accountability to mitigate the risk	1.67	.695	55
Plan for global markets outlook and market uncertainties	1.58	.686	55

4.2.3 Round 3: Selection of the critical success factors for innovation management

For round 3, the 55-middle management's choices for the five variables for innovation management in regional joint ventures were documented and examined in terms of frequency values, mean frequencies, and Cochran's statistics, as described by Tables 4.7 and 4.8:

Table 4.7 shows the center values of tallied responses for the organizational learning dimension, which range from.25 to.77. "Technical know-how," Main 0.77", variance frequencies 0.179; followed by "Top management support and incentive," Main 0.74", variance frequencies 0.198; and "Smart targets and goals," Main 0.70", variance frequencies 0.215. While "Assign a focal staff to manage knowledge," Main 0.25, variance frequencies 0.198, was the least frequent factor, it was followed by "Understanding information and its benefit," Main 0.26, variance frequencies 0.198, and "Committees for knowledge sharing and learning," Main 0.34, variance frequencies 0.229. A Cochran's analysis of matched frequency dimensions was performed, and the test reveals

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differences among the 54 employees (Cochran's = 94.036a a) and strong significance with a p-value 0.001.

Table 4.8 shows the central values of tallied responses for the Strategic Control dimension, which range from.15 to.83. "Experienced management team," Main 0.83, variance frequencies 0.144; and "Clear company approved strategy," Main 0.83, variance frequencies 0.144; followed by "Strong company governance," Main 0.77", variance frequencies 0.179; and, "Clear objectives and budgets," Main 0.74", variance frequencies 0.178. While "Equal shares and votes for parent companies" was the least frequent factor (Main 0.15, variance frequencies 0.131), it was followed by "Continuous dialogue between partners." Main 0.26, variance frequencies 0.198, and "Standardization across the organization" The main value is 0.43, and the variance frequencies are 0.250. A Cochran's analysis of matched frequency categories was performed, and the test reveals differences among the 55 employees (Cochran's = 120.889a) and high significance with a p-value of 0.001.

Table 4.9 shows the center values of tallied responses for the resource integration dimension, which range from.15 to.83. "Using benchmarks and best practices" had the highest rank of variables included in the organizational learning dimension, with a Main 0.88 and variance frequency of 0.144. The second rank of factors included in the resource integration dimension was "Exchanging resources and experience"; "Using capabilities and strength of each party"; and "Utilize the

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marketing global network and offices of the parent companies," and "Openness and willingness of the parent companies to share and complement the resources," which had the same central "0.75" and variance frequencies 0.189; followed by "Working within mutual committees bet" "Focus on similarities of business and facilities" was the least common element. Main 0.40, variance frequencies 0.244; then "Creating mutual business benefits group" Main 0.45, variance frequencies 0.253; and "Pooling of financial resources to sustain and grow GPIC while increasing shareholder profits." Main 0.49, variance 0.49 frequencies 0.255. A Cochran's analysis of matched frequency categories was performed, and the test reveals differences among the 55 employees (Cochran's = 55.595a) and high significance with a p-value of 0.001.

Table 4.10 shows the center values of tallied responses for the Institutional context dimension, which range from.45 to.83. "Clear policies & procedures to protect workforce rights" was ranked first in the Institutional context component. The main coefficient is 0.83, and the variance frequencies are 0.144. The second rank of factors included in the Institutional context dimension was shared by two categories: "respect for local and international regulations" and "leadership in health, safety, environment, and quality," both of which had the same main "0.77" and variance frequencies 0.179; and "sustainability of management and strategy despite changes in people," which had the same main "0.74" and variance frequencies 0.198. While the least frequent factor was "Having

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one unifying vision," Main 0.45, variance frequency 0.253; "Creating mutual business benefit group," Main 0.45, variance frequency 0.253; and "Understanding and managing cultural diversity," and "Corporate citizenship" had the same rank Main 0.47, and the same variance frequencies 0.254. A Cochran's analysis of matched frequency categories was performed, and the test reveals differences among the 55 employees (Cochran's = 49.978a) and high significance with a p-value 0.001.

Table 4.11 shows the main values of tallied responses for the Environmental Uncertainty dimension, which range from.19 to.79. "Strong ERM (Enterprise Risk Management," Main.79, variance frequencies 0.168; "Full understanding of the external variables and their impact on GPIC," Main.72", variance frequencies 0.207; and "Transparency to overcome any conflicts," Main.68", variance frequencies 0.222 were the factors with the highest rank in the Institutional context dimension. In comparison, the least frequent element was for two categories, "Regular situation analysis" and "Utilizing pool of expertise in a future project," all of which had the same main.19, followed by "Plan for global market outlook and market uncertainties." The main value is 0.23, and the variance frequencies are 0.179. A Cochran's analysis of matched frequency categories was performed, and the test reveals differences among the 55 employees (Cochran's = 117.391a) and high significance with a p-value 0.001.

Table 4.7. *Summary of ranked panel data for organizational learning factors from Round 3*

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Organizational Learning	Value 0	Value 1	Mean	Variance of Frequency	Ranks
Understanding information and its benefit (OL1)	39	14	.26	.198	17
Defining clear responsibilities (OL2)	32	21	.401	.244	13
Proper change management process (OL3)	32	21	.405	.244	14
Technical know-how (OL4)	12	41	.77	.179	1
Audit the partners (OL5)	34	19	.36	.234	15
Top management support and incentive (OL6)	14	39	.74	.198	2
Assign a focal staff to manage knowledge (OL7)	40	13	.25	.189	18
Sharing knowledge and evaluating learning (OL8)	20	33	.622	.239	6
Conducting field visits and industrial training (OL9)	29	24	.45	.253	12
A succession plan to transfer knowledge between generations (OL10)	25	28	.534	.254	9
Having partner companies with global experience (OL11)	27	26	.49	.255	11
Clear Channels of Communications (OL12)	18	35	.661	.229	4
Committees for knowledge sharing and learning (OL13)	35	18	.34	.229	16
Understanding gaps in knowledge (OL14)	21	32	.60	.244	8
Developing learning plans (OL15)	20	33	.628	.239	7
Acceptance for change (OL16)	18	35	.664	.229	5
Smart targets and goals (OL17)	16	37	.70	.215	3
Transparent approach (OL18)	25	28	.538	.254	10
				N	53
				Df	17
				Cochran's Q	94.036[a]
				Asymp. Sig.	P< .0.001

Table 4.8. *Summary of ranked panel data for strategic control factors from Round 3*

Strategic control	Value 0	Value 1	Mean	Variance	Ranks
Exchanging experiences with other companies (SC1)	25	28	.53	.254	9
Strong company governance (SC2)	12	41	.77	.179	3
Having digitalized systems (e.g., dashboard) (SC3)	21	32	.60	.244	7
Board of directors audit and cost optimization committee outcomes (SC4)	28	25	.47	.254	11
Performance evaluation using KPIs (SC5)	21	32	.60	.244	7
Experienced management team (SC6)	9	44	.83	.144	1
Improvements to process and technology (SC7)	20	33	.62	.239	6
Clear company-approved strategy (SC8)	9	44	.83	.144	1
Support from the parent company representatives (SC9)	26	27	.51	.255	10
Strong reporting policy (SC10)	30	23	.43	.250	13
Standardization across the organization (SC11)	30	23	.43	.250	14
Continuous dialogue between partners (SC12)	39	14	.26	.198	15
Clear objectives and budgets (SC13)	14	39	.74	.198	4
Control for OPEX, CAPEX, and budget expenditures (SC14)	17	36	.68	.222	5
Controlling allocations for projects (SC15)	29	24	.45	.253	12
Equal shares and votes for parent companies (SC16)	45	8	.15	.131	16
			N		53
			df		15
			Cochran's Q		120.889[a]
			Asymp. Sig.		P< .0.001

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Table 4.9. *Summary of ranked panel data for resource integration factors from Round 3*

Resource Integration	Value		Mean	Variance	Ranks
	0	1			
Working within mutual committees between the Parent companies (RI1)	15	38	.72	.207	6
Focus on similarities of business and facilities (RI2)	32	21	.40	.244	14
Establishing international business networks (RI3)	17	36	.68	.222	7
Exchanging resources and experience (RI4)	13	40	.75	.189	2
Secondment of human resources and equipment during the major activities (RI5)	26	27	.51	.255	10
Using benchmarks and best practices (RI6)	9	44	.83	.144	1
Using capabilities and strengths of each party (RI7)	13	40	.75	.189	2
Utilize the marketing global network and offices of the parent companies (RI8)	13	40	.75	.189	2
Availability of research and studies of parent companies' R&D centers for future expansion (RI9)	18	35	.66	.229	9
Auditing team from the parent companies (RI10)	18	35	.66	.229	9
Creating a mutual business benefit group (RI11)	29	24	.45	.253	13
Pooling of financial resources to sustain and grow GPIC and increasing profits for the shareholders (RI12)	27	26	.49	.255	12
Openness and willingness of the parent companies to share and complement the resources (RI13)	13	40	.75	.189	2
Access to procedures, policies, and guidelines of the parent companies (RI14)	17	36	.68	.222	7

N	53
df	13
Cochran's Q	55.595[a]
Asymp. Sig.	P< .0.001

Table 4.10. *Summary of ranked panel data for institutional context factors from Round 3*

Institutional Context	Value		Mean	Variance	Ranks
	0	1			
Avoiding personal favoritism and supporting equity (IC1)	17	36	.68	.222	6
Understanding and managing cultural diversity (IC2)	28	25	.47	.254	12
Good accounting practices for a healthy financial management system (IC3)	26	27	.51	.255	11
Respect for local and international regulations (IC4)	12	41	.77	.179	2
Support from the government and country leadership of partners (IC5)	21	32	.60	.244	9
Leadership in health, safety, environment, and quality (IC6)	12	41	.77	.179	2
Sustainability of management and strategy despite changes in people (IC7)	14	39	.74	.198	4
Clear policies & procedures to protect workforce rights (IC8)	9	44	.83	.144	1
Good regional diplomatic relationships (IC9)	19	34	.64	.234	8
Having one unifying vision (IC10)	29	24	.45	.253	14
Solid financial position to ensure continuity (IC11)	15	38	.72	.207	5
People-centric approach for development, goodwill, and personal growth (IC12)	22	31	.58	.247	10
Corporate citizenship (IC13)	28	25	.47	.254	12
Ownership stability and sustainability (IC14)	17	36	.68	.222	6
			N		53

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df	13
Cochran's Q	49.978[a]
Asymp. Sig.	P< .0.001

Table 4.11. *Summary of ranked panel data for external environment uncertainty factors from Round 3*

External Environment Uncertainty	Value		Mean	Variance	Ranks
	0	1			
Comprehensive risks mitigation plan with a clear timeline (EU1)	25	27	.53	.254	10
External expertise feedback (EU2)	35	17	.34	.229	14
Studying international opportunities and possible future expansions (EU3)	24	28	.53	.254	11
Long-term strategy plan to address GPIC's strategic objectives (EU4)	24	28	.55	.253	8
Controlling operational risks (EU5)	23	29	.57	.250	7
Proactive and contingency strategy (EU6)	18	34	.66	.229	4
Regular situation analysis (EU7)	42	10	.19	.158	17
Long-term strategic outlook (EU8)	23	29	.55	.253	8
Utilizing the pool of expertise in future projects (EU9)	42	10	.19	.156	17
Immediate communication for making faster decisions (EU10)	18	34	.66	.229	4
Monitor compliance cost (EU11)	31	21	.40	.244	13
Full understanding of the external variables and their impact on GPIC (EU12)	15	37	.72	.207	2
Responsible leadership that operates the complex and ensures adherence to systems (EU13)	22	30	.58	.247	6
Updating business continuity plans (EU14)	29	23	.43	.250	12
Transparency to overcome any conflicts (EU15)	17	35	.68	.222	3
Environmental uncertainty [Strong ERM (Enterprise Risk Management) (EU16)	11	41	.79	.168	1
Assigning each executive accountability to mitigate the risk (EU17)	35	17	.32	.222	14
Plan for global markets outlook and market uncertainties (EU8)	40	12	.23	.179	16

N	52
df	17
Cochran's Q	117.391[a]
Asymp. Sig.	P< .0.001

4.2.4 Round 4 Results - Friedman / Kendall's W

Transparent approach (M.6.64), understanding knowledge gaps (M.6.38), Acceptance for change (M.5.39), sharing knowledge and evaluating learning (M.5.90), Smart targets and goals (M.5.69), Succession plan to transfer knowledge between generations (M.5.40), Developing learning

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plans (M.5.21), Clear Channels of Communications (M.4.76), Top management support and incentive (M.4.55), and Technical k

Rankings based on 43 experts were then assessed using metrics for the mean rank, variation of rank, Kendall's coefficient of concordance, and Friedman's chi-square (Q), as shown in Table 4.12. For organizational learning, Kendall's tests demonstrate strong employee consensus (=.060) and Friedman's test shows, i.e., Friedman's = 22.732, p-value.007.

Exchanging experiences with other companies (M.6.79), Performance evaluation using KPIs (M.6.12), Having digitalized systems (e.g., dashboard) (M.6.05), Improvements to process and technology (M.6.00), Support from parent company representatives (M.5.38), Control for OPEX, CAPEX, and budget expenditures (M.5.52), Clear objectives and budgets (M.4.98), Clear company approved strategy (M.4.6).

Rankings based on 43 employees were then assessed using metrics for the mean rank, variation of rank, Kendall's coefficient of concordance, and Friedman's chi-square (Q), as shown in Table 4.13. For organizational learning, Kendall's tests demonstrate strong employee consensus (=.067), and Friedman's test shows, i.e., Friedman's = 25.491, p-value.002.

The ranking of Resource Integration in round 4 appearances in table 4.26. is the availability of research and studies of parent companies' R&D centers for future expansion (M.6.69), Integration [Auditing team from the parent's companies (M.6.45), Access to procedures, policies, and

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guidelines of the parent companies (M.6.02), Establishing international business networks (M.5.81), Utilize the marketing global network and offices of the parent companies (M.5.52), Exchanging resources and experience (M.5.17), Using capabilities and strength of each party (M.5.02), Working within joint committees between the Parent companies (M.5.00), Openness and willingness of the parent companies to share and complement the resources (M.4.95), and, Support from the parent companies representatives (M.4.36).

Rankings based on 43 employees were then assessed using metrics for the mean rank, variation of rank, Kendall's coefficient of concordance, and Friedman's chi-square (Q), as shown in Table 5.14. For organizational learning, Kendall's tests demonstrate strong employee consensus (=.059), and Friedman's test shows, i.e., Friedman's = 22.400, p-value.008.

The ranking of Institutional context in round 4 is shown in table 4.15. is Good regional diplomatic relationships (M.6.69), People-centric approach for development, goodwill, and personal growth (M.6.31), Ownership stability and sustainability (M.6.14), Support from the government and country leadership of partners (M.6.05), Avoiding personal favoritism and supporting equity (M.5.74), Solid financial position to ensure continuity (M.5.50), Leadership in health, safety, environment, and quality (M.5.26), respect for local and international regulations (M.4.55 Sustainability of management and strategy despite changes in people

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(M.4.52), and, Clear policies & procedures to protect workforce rights (M.4.24).

Rankings based on 43 employees were then assessed using metrics for the mean rank, variation of rank, Kendall's coefficient of concordance, and Friedman's chi-square (Q), as shown in Table 4.16. For organizational learning, Kendall's tests demonstrate strong employee consensus (=.077), and Friedman's test shows, i.e., Friedman's = 29.101, p-value.001.

The ranking of External Environmental Uncertainty in round 4 shows in table 4.17. are: Comprehensive risks mitigation plan with a clear timeline (M.6.81), Studying international opportunities and possible future expansions (M.6.67), Controlling operational risks (M.6.50), Long-term strategic outlook (M.6.14), Responsible leadership that operates the complex and ensures adherence to systems and procedures (M.5.79), Immediate communication for making faster decisions (M.5.00), Proactive and contingency strategy (M.4.90), Strong ERM (Enterprise Risk Management) (M.4.60) Full understanding of the external variables and their impact on GPIC (M.4.33), and, Transparency to overcome any conflicts (M.4.26).

Rankings based on 43 employees were then assessed using metrics for the mean rank, variation of rank, Kendall's coefficient of concordance, and Friedman's chi-square (Q), as shown in Table 4.18. For organizational learning, Kendall's tests demonstrate strong employee consensus (=.108), and Friedman's test shows, i.e., Friedman's = 40.722, p-value.001.

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Table 4.12. *Summary of ranked panel data for organizational learning factors from Round 4*

	N	Mean	Variance	Overall Rank
Technical know-how (OL4)	42	4.52	9.768	10
Top management support and incentive (OL6)	42	4.55	9.522	9
Clear Channels of Communications (OL12)	42	4.76	9.210	8
Smart targets and goals (OL17)	42	5.69	6.463	5
Developing learning plans (OL5)	42	5.21	6.563	7
Acceptance for change (OL6)	42	5.93	4.409	3
Understanding gaps in knowledge (OL14)	42	6.38	5.022	2
Sharing knowledge and evaluating learning (OL8)	42	5.90	8.869	4
Transparent approach (OL18)	42	6.64	8.235	1
Succession plan to transfer knowledge between generations (OL10)	42	5.40	11.369	6
Valid N (listwise)	42			

N	42
df	9
Kendall's W[a]	.060
P-Value.	< .001

Table 4.13. *Summary of ranked panel data for strategic control factors from Round 4*

Strategic Control	Mean Rank	Variance	Overall Rank
Experienced management team (SC6)	4.52	10.499	10
Transparent company-approved strategy (SC8)	4.62	7.754	8
Strong company governance((SC2)	4.57	6.885	9
Clear objectives and budgets (SC13)	4.98	6.951	7
Control for OPEX, CAPEX, and budget expenditures (SC14)	5.52	5.524	6
Improvements to process and technology (SC7)	6.00	4.683	4
Having digitalized systems (e.g., dashboard) (SC3)	6.05	6.729	3
Performance evaluation using KPIs (SC5)	6.12	8.351	2
Exchanging experiences with other companies (SC1)	6.79	8.514	1
Support from the parent company representatives (SC9)	5.83	12.923	5

N	42
Df	9
Kendall's W[a]	.067
P-Value.	< .01

Table 4.14. *Summary of ranked panel data for resource integration factors from Round 4*

	Mean Rank	Variance	Overall Rank
Support from the parent companies' representatives	4.36	10.235	10
Exchanging resources and experience (RI4)	5.17	9.996	6
Openness and willingness of the parent companies to share and complement the resources (RI13)	4.95	7.315	9
Utilize the marketing global network and offices of the parent companies (RI8)	5.52	6.353	5
Using capabilities and strengths of each party (RI7)	5.02	4.414	7

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Working within mutual committees between the Parent companies (RI1)	5.00	5.073	8
Establishing international business networks (RI3)	5.81	8.158	4
Access to procedures, policies, and guidelines of the parent company (RI14)	6.02	7.829	3
Availability of research and studies of parent companies' R&D centers for future expansion (RI9)	6.69	8.316	1
Auditing team from the parent company (RI10)	6.45	11.815	2

N	42
df	9
Kendall's W[a]	.059
P-Value.	< .01

Table 4.15. *Summary of ranked panel data for institutional context factors from Round 4*

Institutional Context	Mean Rank	Variance	Overall Rank
Clear policies & procedures to protect workforce rights	4.24	10.332	10
Respect for local and international regulations	4.55	7.278	8
Leadership in health, safety, environment, and quality	5.26	5.954	7
Sustainability of management and strategy despite changes in people	4.52	5.865	9
Solid financial position to ensure continuity	5.50	5.476	6
Avoiding personal favoritism and supporting equity	5.74	6.637	5
Ownership stability and sustainability	6.14	5.930	3
Support from the government and country leadership of partners	6.05	7.656	4
Good regional diplomatic relationships	6.69	9.975	1
People-centric approach for development, goodwill, and personal growth	6.31	12.902	2

N	42
df	9
Kendall's W[a]	.077
P-Value.	< .01

Table 4.16. *Summary of ranked panel data for external environment uncertainty factors from Round 4*

External Environment Uncertainty	Mean Rank	Variance	Overall Rank
Strong ERM (Enterprise Risk Management) (EU1)	4.60	10.344	8
Complete understanding of the external variables and their impact on GPIC (EU2)	4.33	8.472	9
Transparency to overcome any conflicts (EU3)	4.26	6.832	10
Proactive and contingency strategy (EU4)	4.90	7.161	7
Immediate communication for making faster decisions (EU5)	5.00	5.268	6
Responsible leadership that operates the complex and ensures adherence to systems and procedures (EU6)	5.79	6.221	5
Long-term strategic outlook (EU7)	6.14	7.052	4
Controlling operational risks (EU8)	6.50	6.061	3
Studying international opportunities and possible future expansions (EU9)	6.67	8.423	2

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Comprehensive risks mitigation plan with a clear timeline (EU10)	6.81	9.573	1

N	42
Df	9
Kendall's W[a]	. 108
P-Value.	< .001

5. Discussion

Organizational learning is a method that organizations can use to enhance their operations by gathering experiences and accumulating knowledge over time. This procedure builds on the previously stated requirement for a critical approach to innovation management that is based on experience and knowledge rather than chance. Organizational learning is also a cycle that necessitates the search for information and critical areas of interest, the creation of knowledge by observing the item and understanding its relationship to the organization's processes, the retention of the gathered knowledge, and finally, the transfer to the necessary areas within the organization that require improvement. This discovery was consistent with the findings of a study conducted by Chen et al., 2020. It also agreed with Scaringella and Burtschell (2017).

The additional strategic control component focuses on the plans and execution procedures that are specific to the scenario, approach, and organization. Each organization is expected to have a strategy plan for achieving its objectives and implementing its innovation management. In circumstances where regional joint ventures are required, strategic control complicates the process and necessitates re-strategizing to harmonize both sides' approaches. Failure to achieve such a balance of needs

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indicates danger for the success of the companies concerned. Strategic control is also a repeating tactic in the models and frameworks examined for innovation, as confirmed by Allen & Link (2013) and Jost (2011).

The resource integration process is concerned with the proper use of goods that assist an organization in achieving its objectives. This is required for joint ventures since it combines resources and strives to maximize their utilization in the combined venture. Furthermore, resource integration guarantees that the appropriate tools and processes are used at the appropriate phases. Misappropriation of resources has been identified as a key cause of project failure. This is also true for creative procedures and strategic model implementation.

The institutional environment is an element that offers the background information required to integrate the creative concept into the procedures. So far, innovation management has been successful in generating the necessary ideas for the appropriate setting. These concepts are always evolving in response to the needs of the organization. Updating the context in response to changes in the institution's methods is required for dealing with innovation. The greater the business's dynamism, the greater the necessity to redefine and build the inventive context. The end result is meant to be strategic plans that are aligned with the anticipated changes, whether creative or not. This results is consistent with the findings of the Chiou and Hu (2001) and Estrada et al. (2010) research.

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The final external environment uncertainty component is connected with adaptability, which orients strategic planning to leave room for risks. Unexpected pressures in a business's external environment may cause it to deviate from the planned events agreed upon by Estrada et al. (2010). These pressures are frequently dealt with through a risk analysis process, which defines how the uncertainties can be dealt with if they arise. According to Sinha (2001), a changing environment necessitates a regular examination of the matching of innovative methods to the dynamic environment. So far, these components have defined the requirements of innovation management in the context of an institution.

6. Conclusion

Joint Ventures (JVs) are crucial for businesses to grow and expand, with a rapid increase in JVs due to the need to reduce operational costs and expand traditional markets. Gulf Petrochemical Industries Co. (GPIC) is a critical JV contributing to the Bahraini economy. Innovation management focuses on co-creation between consumers and companies, with two tracks emerging: user-developed innovative products and open innovation processes. This research identified five critical innovation management factors for regional JVs: organizational learning, strategic control, resource integration, institutional context, and external environmental uncertainty. The study concluded a model for the critical innovation management factors in regional JVs (RQ3) and a model of innovation management strategies in regional JVs (RAEDA), which included

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resilience management, aligned competency, enterprise governance, direct investment, and agility focus (RQ4). The study identified five factors affecting organizational success: transparent approach, knowledge gaps, change acceptance, knowledge sharing, smart targets, institutional context, and external environment uncertainty.

Recommendations

1. Management of innovation is a notion related to the administrative element of the company, particularly top management, thus managers must pay attention to managing innovation for themselves and their staff, and it should be part of the overall performance of the organization.
2. Training employees on innovative thinking, presenting ideas, and motivating them can help manage innovation. Increased co-working spaces and designated areas for gathering work and ideas can further enhance organizational success.
3. Managers should also think about recruiting employees of all ages and encouraging the exchange of experiences from other countries and nationalities. Managers should also search for experienced individuals who can manage social media trends and use them to communicate and connect ideas.

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