








“Impact of integration management on performance in the UAE”

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IMPACT OF INTEGRATION MANAGEMENT ON PERFORMANCE IN THE UAE

Abstract

Integration management is a significant factor of success in different types of organizations. Yet, the definition of integration management and ways to measure performance in a comprehensive framework need to be investigated in different environments. This paper analyzes the impact of integration management practices on company performance in the United Arab Emirates (UAE). The study uses a questionnaire that was designed with constructs and dimensions following the literature review. The components of integration management are supply chain integration, supplier integration, customer integration, knowledge transfer with customers, and managing knowledge transfer channels with customers. A questionnaire was distributed among organizations in the UAE. Statistical analysis methods were employed to analyze 94 responses, e.g. reliability tests, ANOVA, and correlation analysis. The results show that integration management improves organizational performance to a considerable degree in the UAE. The impact of these practices was positive and significant on the performance of organizations, with an average correlation coefficient of 0.81. The comprehensive assessment for integration best practices and performance and their relationship are done for the first time in the context of the UAE organizations.

Keywords

supply chain integration, knowledge management, performance, customer integration, supplier integration, UAE

JEL Classification

J50, H11, P17

INTRODUCTION

Integration management is necessary for business (in general) and project management. A basic part of integration management is supply chain integration. The miscommunication in the supply chain network may lead to bad performance. Integration management links and communicates all business activities and tasks, including procurement and distribution activities. The integration in the supply chain network is considered the critical factor in enhancing and improving performance. According to Siagian et al. (2021), supply chain integration assists resilience, flexibility, and innovation to enhance business performance during the COVID-19 pandemic. According to Fitriyani and Fietroh (2021), SMEs must use factors such as communication and knowledge sharing skills to survive and achieve the expected goals in the COVID-19 times.

The integration can have different factors and dimensions. In this study, the concentration is on supply chain integration, knowledge transfer with customers, and managing communication channels with customers. Even though supply chain integration contains supplier integration and customer integration, the three constructs were measured separately to show the importance of each. Supply chain integration is "the extent to which all activities within an organization, and the activities of its suppliers, customers, and other supply chain members,

are integrated” (Uwamahoro, 2018). Supply chain integration is also necessary for project management. However, the concept “project integration management” is different from the “integration management” used in this study. Integration management is more general. Supply chain integration was measured by customer integration, internal integration, and supplier integration (Beheshti et al., 2014; Uwamahoro, 2018; Naqbi et al., 2018; Amoako et al., 2020). However, the concentration in this paper is on customer integration and supplier integration. Beheshti et al. (2014) measured supplier integration by the level of a strategic partnership with suppliers, the participation level of suppliers in the design phase and the cycle of procurement and manufacturing, the introduction of a prompt ordering procedure, and sound procurement through the network. These measures are also used in this paper. Improving performance can be in general management and project management. In this study, the words “factors” and “constructs” are used interchangeably to mean the same thing to assess both integration management and performance. However, those factors for integration management are called “practices”. The word “dimensions” is used to mean subfactors, where a construct/factor consists of a group of dimensions.

1. LITERATURE REVIEW AND HYPOTHESES

This section starts with the general concept where integration management affects performance. Then some particular practices (success factors) and performance measures are presented from the previous studies. The effect of integration management on performance is extensively presented in the literature. For example, Masuin et al. (2019) defined integration as building a governance structure that systematically deals with the stakeholders’ needs. They highlighted the positive and direct correlation between integration and performance. Wang et al. (2018) studied the influence of sharing and integrating the information with the stakeholders on improving business performance. Shahzad et al. (2016) found that organizational integration increases performance through innovation in the whole organization and the functions developed in the previous projects. Al Hazza et al. (2014) proposed a conceptual scheme for the relationships between the owner and contractor with time-cost trade-off analysis of construction projects. Their results confirm the necessity for constant feedback in the planning process to develop a proposal that satisfies both parties. Al Safarini et al. (2021) investigated the impact of effective communication on the performance of construction projects in the UAE.

As one of the basic constructs in this study, supply chain integration creates value through managing inter-organizational learning (Zhu et al., 2018). Shukor et al. (2021) examined the influence of supply chain integration on supply chain agility

and flexibility in manufacturing firms. A strong correlation between environmental uncertainty and supply chain integrations was found. Lu et al. (2018) found a correlation between supply chain integration and operational performance. However, this relationship is ‘non-linear’ and depends on market uncertainty. Panahifar et al. (2018) measured the supply chain collaboration by trust, information readiness, information accuracy, and information security. They examined the effect of these factors on sales growth and overall operational performance. Um and Kim (2019) examined the influence of supply chain collaboration on performance. Moreover, Kim and Nguyen (2018) studied the effect of dimensions such as collaboration in the supply chain, support and commitment to the supply chain, and sharing the benefits and risks. The performance was not only defined in terms of costs. Actually, it was defined in terms of supply chain quality (Le et al., 2021). Moreover, according to Saber et al. (2014), the performance was measured by cost, quality, innovation, and marketing time. Naqbi et al. (2018) used supply chain sustainability as the performance measure to assess the impact of supply chain integration in the UAE.

One of the essential success items that promote the integration process is managing communication channels. The communication channels are responsible for the data and information flow between the different stakeholders in the supply chain. Yuliadi and Nugroho (2019) claimed that information communication technology is an integration tool that can improve management capabilities and relationship capabilities

and support supply chain integration. Wu and Hsieh (2012) suggested a new project information integration management framework to integrate project information efficiently. The results showed that the proposed framework provides an efficient integration system of project information. Nyandongo and Davids (2020) investigated the relationship between communication and project management performance. They utilized quantitative research by using a questionnaire distributed to project management professionals. The results showed that there was a clear positive correlation between communication and project outcomes. Shad et al. (2019) conducted a qualitative investigation by interviewing ten project team members and found that communication plays a vital role in project management due to its integrating nature and that communication skills significantly affect project success. Ssenyange et al. (2017) examined project communication and project performance in Uganda's public universities. They used a cross-sectional survey design. It was found that there is a significant positive relationship between project communication and project performance. Achar et al. (2021) studied the roles of communication channels in housing construction of Kenya using descriptive and inferential statistics. The results showed that communication channels are vital to the execution of construction projects. Thomas (2013) studied the effectiveness of computer-based and conventional communication channels on knowledge transfer between purchaser and provider in new product development projects. A significant positive linking between knowledge transfer and performance was found.

Another success factor in enhancing performance is knowledge management and information sharing among the supply chain. Sharing previous experience and related knowledge with supply chain partners will reduce time to market and uncertainty during the project life and enhance the common understanding that leads to better performance. Therefore, the influence of knowledge transfer activities on supply chain flexibility becomes a need (Blome et al., 2014). Knowledge transfer is one of the most challenging factors in organizations compared to functional organizations (van Waveren et al., 2014). This complexity comes from the teams of temporary nature. Ali et al. (2018) addressed the vital concern of knowl-

edge management in software projects. They proposed a framework that comprised critical constructs of knowledge management and described their effect on project performance. The effect of knowledge governance and knowledge sharing on project performance was analyzed, depending on cross-sectional data collected from software firms. Park and Lee (2014) proved by empirical evidence that trust will lead to knowledge sharing between the supply chain in information systems projects. The technique used was a cross-sectional survey. The findings proved that trust and dependence heavily affect knowledge sharing, driving to good team project performance. Shi et al. (2021) examined the impact of knowledge sharing on innovation activities using a structural equation model. It was found that joint innovation activities in the construction supply chain positively affect explicit knowledge sharing, tacit knowledge sharing, and innovation performance. Hong et al. (2004) developed a model to explain how shared knowledge among buyers, providers, and internal capabilities enhances performance and reduces time to market, and creates value to customers. Lin et al. (2008) used cross-sectional data to analyze the influence of integration and knowledge sharing between supply chain partners on performance in new product development projects. They found that integrating and transforming the knowledge will give a competitive advantage. Moreover, Landaeta (2008) explored the relationships among the level of knowledge transfer on the project performance. It was shown that knowledge acquired from various projects positively correlates with project performance. Furthermore, Maqsood et al. (2003) examined the effect and advantages of sharing knowledge across the supply chain in construction projects. Jewels and Ford (2006) proved that project performance is positively correlated with project knowledge in IT projects.

This study aims to contribute to the literature on integration management and its effects on performance in the UAE. Thus, the paper designs a comprehensive framework to analyze all the variables (both input and output).

This study develops the following hypotheses:

H_1 : *Integration management has a positive influence on performance.*

H₂: The levels of applying integration management practices in the UAE are proper and sufficient.

H₃: The performance levels in the UAE organizations are proper and sufficient.

2. METHODS

After an investigation of the literature about the effect of integration management on performance, a research gap was found. Further investigations were done to determine which measures for input variables and output variables should be used. Figure 1 contains major variables (factors), and under each factor, there are some dimensions to measure this factor. These dimensions are listed in Table 1. The main hypotheses were formulated. Fast screening for the companies was administered to send the questionnaire to their employees. A proper sample size was determined. The questionnaire was designed based on the detailed dimensions found in Table 1 and then was sent electronically to these employees. Statistical analysis, based on respondents' answers and containing descriptive statistics and hypotheses analysis was performed, and the meaning of results was explained.

This study measures the hypothetical relationship between integrated management and performance by analyzing the proposed factors as presented in Figure 1. Both customer integration and supplier

integration are parts of supply chain integration. Supply chain integration measures the integration in the supply chain in general, and the other two constructs are more specific. Therefore, there must be a strong correlation between the three of them. The difference between knowledge transfer with the customer and managing knowledge transfer channels is that the first one is about the process of knowledge transfer, and the second one is about the channels for knowledge transfer. There is a big overlapping between knowledge transfer and customer integration. In this paper, three of the five constructs are about the relationship with customers because of its importance. Therefore, the relationship with customers has been given weight larger than the relationship with suppliers in the study model. For the knowledge transfer with customers, the transfer of knowledge is in two directions (from and to customer).

The present study is quantitative research because it involves the empirical testing of the main hypotheses. The quantitative approach begins with research hypotheses and explores how the hypotheses can be answered through various mathematical and statistical tools. To determine sample size, a convenience sampling method was used. As a population listing was not readily available, this study employed Roscoe's Rule of Thumb to determine sample size. This rule posits that the sample size ranges between 30-500 respondents is suitable for carrying out quantitative research. Therefore, the sample size was 94 respondents in this study. They are employees

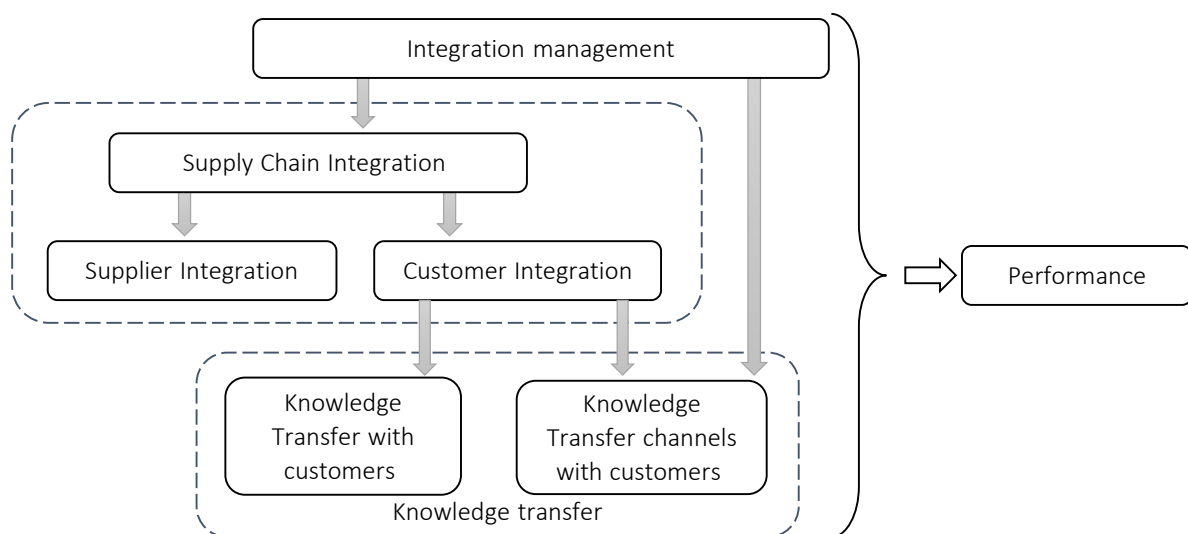


Figure 1. Research framework

with experience from UAE organizations. The responses to the survey were collected through self-administered questionnaires using random sampling. Respondents were given enough time to complete the survey. During the data collection process, all ethical guidelines were followed. Using Microsoft Excel, the collected data were organized, arranged, and analyzed. To determine the validity of the research hypotheses, several data analysis tools and techniques were employed, including reliability, ANOVA, and correlation analysis. The questionnaire contained in its first part questions concerning gender, age, experiences, and education of the participants. Experience, for example, is essential to check the validity of the results. The effect of other factors on results can also be checked. The respondents chose in the second and the third parts of the questionnaire, based on a Likert scale from 1 to 5, the degree to which the practices are applied and the performance dimensions

are obtained, respectively. For the best practices, 5 means strongly agree that this practice is applied, while for performance measures 5 means strongly agree that this dimension of success was obtained. Therefore, 1 means strongly disagree.

The factors were categorized into six major groups with their dimensions as presented in Table 1. The questionnaire was designed based on Table 1 because it focuses on the research gap. This gap in the UAE is related to the combination of the five mentioned input factors. For example, integration management can sometimes be measured only for project management based on the definition of the project management body of knowledge (PMBOK). On the other hand, some studies focused on the integration of supply chain management. Therefore, a comprehensive framework is needed, where it can be applied in general management and project management.

Table 1. Factors and dimensions of integration management and performance

Factors	Dimensions
Input variables: Integration management	
Supply Chain Integration (SCI)	Developing supply chain collaboration to improve customer service (SCI 1)
	Developing supply chain relationship with the customer to improve on-time delivery (SCI 2)
	Considering factors that affect supply chain integration (Manpower development, reliability of supply, and trust) (SCI 3)
	Establishing long-term relationships with supply chain members (SCI 4)
Supplier integration (SI)	Strategic partnership with a supplier (SI 1)
	Participation of suppliers in the design stage (SI 2)
	Participation of suppliers in the process of procurement and production (SI 3)
	Establishing a quick ordering system (SI 4)
Customer integration (CI)	Stable procurement through a network (SI 5)
	Computerization for customer ordering (CI 1)
	Considering employee engagement for better customer integration (CI 2)
Knowledge transfer with customers (KT)	Ensuring that needed data is easily accessible to the customer (CI 3)
	Sharing experience or technology with customers (KT 1)
	Providing valuable advice to customers (KT 2)
	Helping customers to solve problems (KT 3)
	Understanding the importance of learning from customers (KT 4)
Managing knowledge transfer channels with customers (MKT)	Learning relevant experience, technology, and management knowledge from customers (KT 5)
	Engagement in formal or informal face-to-face communication with customers (MKT 1)
	Using written documents, emails, or videos to share knowledge with customers (MKT 2)
	Communication with customers through the information system (MKT 3)
Output variables: Performance	
Performance (P)	High quality of work (P 1)
	Reducing the costs (P 2)
	Meeting deadlines (P 3)
	A high level of customer satisfaction (P 4)
	A high level of employee satisfaction (P 5)
	Overall success (P 6)

3. RESULTS

Figure 2 provides descriptive statistics. Participants are employees working in organizations in the UAE. Figure 2 shows that 84% of the participants are males and 16% are females. Participants were classified according to their age. A total of 46 participants are 18-24 years old. This represents 48.9% of the total sample size. There are 35 respondents aged 25-34 years. Thirteen participants between 35 and 44 years of age participated in the study. Moreover, 57 respondents have experienced between 0-3 years. The respondents with this experience accounted for 60.64 %. Twenty-four respondents had experience ranging from four to five years. Eleven participants had 7-9 years of experience, and two participants had more than 10 years of experience. An overview of the study participants' qualifications is also shown in Figure 2. In the sample size, 29 individuals had less than 12 years of education, which constituted 30.85% of the cumulative frequency. Thirty-four of the individuals in the sample have an undergraduate degree. There were 31 individuals with 18 years or more of education. It can be observed that the ma-

majority of the individuals were undergraduates having education between 14-16 years.

To test the reliability of constructs, Cronbach's alpha value was calculated to measure the internal consistency between dimensions representing the same construct. The results are summarized in Table 2. All the alpha values are greater than 0.60. The highest Cronbach's alpha was found in performance variables, and supply chain integration was next with 0.823. This value is below the maximum alpha value of 0.90, which is recommended by Streiner (2003). Alpha numbers that are too high may suggest some items are redundant since they are testing the same issue in different ways.

Table 2. Reliability of study variables

Variables	Number of Items	Cronbach's alpha
SCI	4	0.823
SI	5	0.764
CI	3	0.673
KT	5	0.807
MKT	3	0.602
P	6	0.824

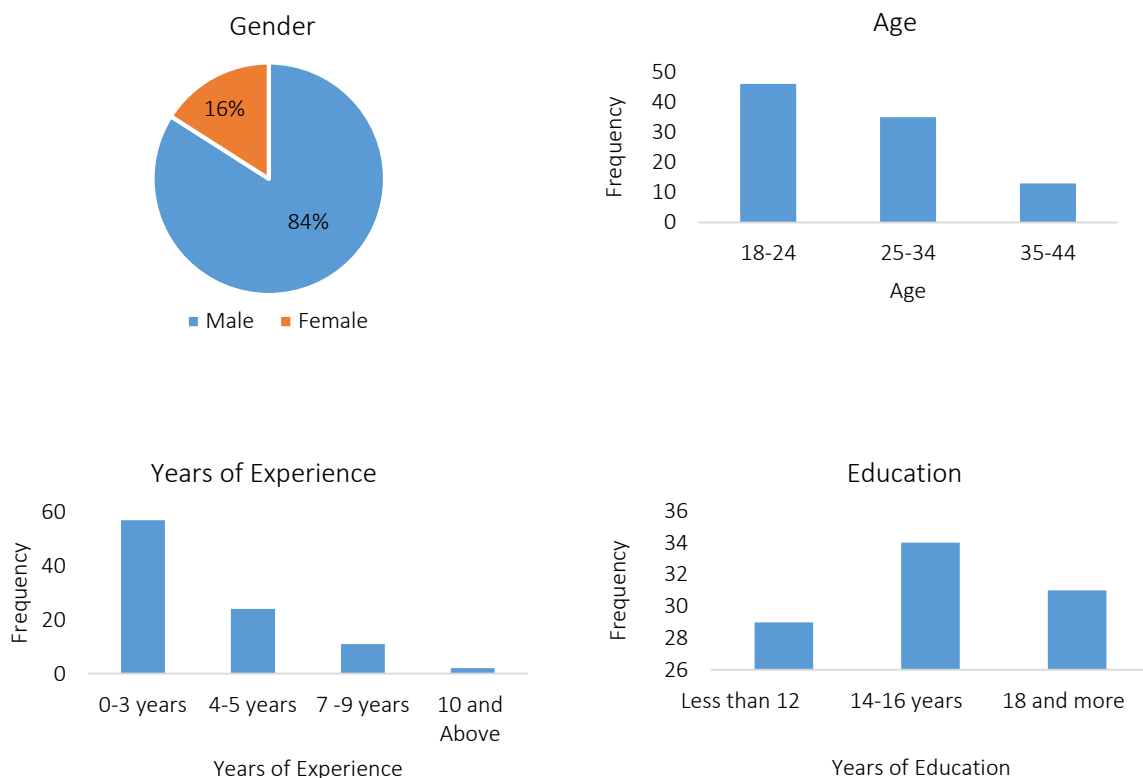


Figure 2. Descriptive statistics for participants' characteristics

Correlation analysis is used to determine if there is any correlation between the variables, and the signs positive (+) or negative (-) indicate the direction the variables go with each other. In this study, 'r' values range from 0.659 to 0.893 as shown in Table 3. This is expected because of the overlapping between different variables. The relation between all variables has a strong positive correlation, which means that high X variable scores go with high Y variable scores. The most important values are those for performance with the integration management practices. All the values are greater than 0.75. This means that the null hypothesis can be rejected, indicating a strong correlation between integration management practices and performance in general (hypothesis 1). Figure 3 presents graphically the relation between supply chain integration and knowledge transfer with customers. Other factors have a similar relationship.

Table 3. Correlation between integration management factors and performance

	SCI	SI	CI	KT	MKT	P
SCI	1	.733	.654	.777	.659	.810
SI	.733	1	.764	.793	.765	.893
CI	.654	.764	1	.787	.776	.757
KT	.777	.793	.787	1	.775	.794
MKT	.659	.765	.776	.775	1	.811
P	.810	.893	.757	.794	.811	1

To deeper investigate the factors affecting the integration management practices and performance, statistical analysis including the average and the variance was calculated for all the dimensions and was presented in Table 4. The main purpose of this statistical analysis is to reveal the spread and variability of the data. For example, the variation of SCI dimensions ranges from 0.81 to 1.30. All the average values are greater than 3.5 except for SI 3 and P 2. However, they are still greater than 3 indicating sufficient application level of integration management in general, but with different levels. For example, MKT 1 is with the greatest value. This is for hypothesis 2, and that means that there is evidence that the levels of application of integration management practices are generally satisfactory. The results of the t-test show the same conclusion where the p-values were found to be less than 0.05. For performance, it is clear that one has a good performance, where the highest value was for P 1, which is about quality of work. For hypothesis 3, there is evidence that the performance in terms of its dimensions is generally satisfactory in the organizations of the UAE. To further investigate if there are significant differences in the degrees of application of different practices, and success achievement, ANOVA analysis is presented in Table 5. As expected, SI and P have p-values below 0.05, which indicate a high difference between the general average and at least one of the dimensions of the factor. This is most probably because of the values that are below 3.5 previously mentioned.

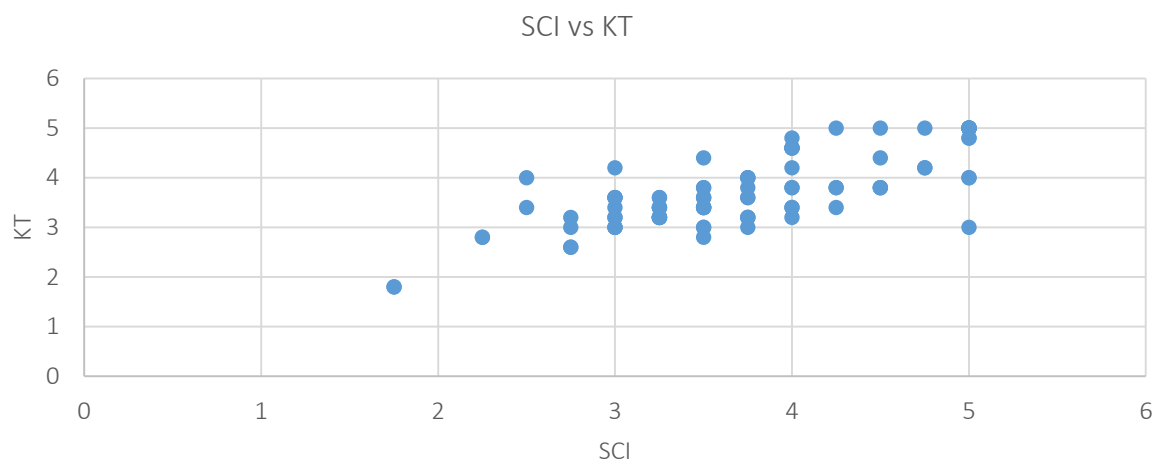


Figure 3. Relationship between SCI and KT

Table 4. Statistics for dimensions of integration management and performance

Dimensions	Count	Average	Variance
SCI 1	94	3.66	1.30
SCI 2	94	3.81	0.89
SCI 3	94	3.70	0.81
SCI 4	94	3.74	0.86
SI 1	94	3.85	0.60
SI 2	94	3.58	0.93
SI 3	94	3.39	1.01
SI 4	94	3.85	0.77
SI 5	94	3.52	1.15
CI 1	94	3.83	0.59
CI 2	94	3.70	1.05
CI 3	94	3.65	0.89
KT 1	94	3.79	0.93
KT 2	94	3.73	1.05
KT 3	94	3.54	1.13
KT 4	94	3.84	0.78
KT 5	94	3.70	0.89
MKT 1	94	3.88	0.94
MKT 2	94	3.59	1.18
MKT 3	94	3.59	0.71
P 1	94	3.88	0.90
P 2	94	3.46	1.19
P 3	94	3.70	0.79
P 4	94	3.83	0.85
P 5	94	3.78	0.69
P 6	94	3.81	0.69

Table 5. ANOVA test of study factors

Factor	p-value
SCI	0.758
SI	0.001
CI	0.380
KT	0.270
MKT	0.067
P	0.026

4. DISCUSSION

To get informative results, enough statistical analysis tools were used in this study, to cover the three hypotheses. These tools are descriptive statistics, t-test, correlation coefficient, and ANOVA test. While, the first and the most important hypothesis was tested using correlation coefficient, basic

statistics, mean and standard deviation, and t-test was used to investigate the other two hypotheses. A further step was to use ANOVA to check if there are differences among the factor's dimensions. Some differences were found.

The main results show satisfactory levels for applying the practices of integration management in the organizations in the UAE. They also show satisfactory performance levels. However, some dimensions are more significant than others. The reactionaries can focus more on enhancing such dimensions with lower levels, such as SI 3, for better performance. Generally, it was found that a strong correlation is evident among factors and between integration management and performance. This main result is expected based on the literature review. That means that for the organizations to have good performance, they must carefully consider the best practices of integration management. Moreover, there was clear evidence that cost performance needs more consideration to have better levels.

Generally, the results in this study are in agreement with results found in the literature. To compare results generally with earlier studies, it is simpler to compare one or more factors of integration management with the results of this study. This is because the framework used in this study is comprehensive and its parts are taken from several studies. Regarding the practices of integration management, some studies focused on supply chain integration. Others focused on knowledge transfer. For example, Lu et al. (2018) found a strong correlation between supply chain integration and performance. On the other hand, Thomas (2013) found a positive relationship between knowledge transfer and performance. Maybe the closest study to this study investigating the UAE organizations is Naqbi et al. (2018), in which a positive relationship was also found between supply chain integration and performance. However, this study has its unique results such as the internal differences among the factors' dimensions.

CONCLUSIONS

The study contributes to the project management body of knowledge in that it reveals the impact of integration management on performance. The findings of this paper extend the literature in this field by

indicating the importance of integration management on performance in UAE organizations. In this perspective, a set of integration factors were proposed for integration and performance. Data were collected from 94 respondents through a questionnaire survey. Statistical analysis tools were used to test the hypothesis of a possible relation between integration and performance. The main result revealed the positive impact that the proposed components of integration management have on organization performance. Such results were obtained by correlation test. Furthermore, results show a satisfactory level of application for the practices of integration management. Success measures were also satisfactory for most of the organizations. Research can be conducted in the future to compare best integration management practices among various countries in the region. It is also possible to investigate and sort these practices by importance in the era of COVID-19.

AUTHOR CONTRIBUTIONS

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Data curation: Qasem Alshehhi.

Formal analysis: Mohammed Alnahhal, Qasem Alshehhi, Ahmad Sakhrich.

Investigation: Mohammed Alnahhal, Qasem Alshehhi.

Methodology: Mohammed Alnahhal, Qasem Alshehhi, Ahmad Sakhrich.

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Writing – original draft: Mohammed Alnahhal, Qasem Alshehhi, Ahmad Sakhrich, Shadi Altawi.

Writing – review & editing: Mohammed Alnahhal, Shadi Altawi.

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