



## THE MEDIATING ROLE OF PRODUCT INNOVATION ON THE RELATIONSHIP BETWEEN MARKETING INFORMATION SYSTEM AND CUSTOMER ORIENTATION

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### Abstract

Marketing information system (KMIS) is an essential factor of developing business' performance and getting sustainable success. The main goal of the research is to measure effect of MIS on customer orientation and product innovation. Also, another goal is to analyze the mediation role of product innovation in relationship MIS and customer orientation. This study sought to analyze the marketing information system and measure its effect on the customer orientation and product innovation. The data of the study were collected using questionnaire. The data were analyzed using statistical tools and SPSS programming. The results of the study showed that the KMIS can positively and significantly effect product innovation. Also, the results show that KMIS can positively and significantly effect customer orientation. Moreover, MIS and product innovation together can positively and significantly effect customer orientation. According to that, product innovation has a mediation role in relationship between KMIS and the customer orientation. The findings are important in terms of developing and revealing the effects of KMIS in Iraqi operations

Research: Extracted from a master's thesis

**Keywords:** Marketing information system, Customer Orientation, Product Innovation

## **1. Introduction**

Developing the marketing information system (KMIS) is important for any business. The importance of KMIS for businesses is related to several issues. The first issue is the change in the business environment. That is, the new global environment creates more competition for businesses. In addition, the second issue is the advance development in the field of communications and information technology. These issues have led to many changes in the businesses environment and structure. Therefore, KMIS has become one of the main tools that help companies working successfully within the new environment. More specifically, the KMIS has become one of the essential elements of developing business performance (Al-Taher et al, 2009). The second issue is that many changes have happened in the past two decades in markets and production technologies. These changes have had a significant role in increasing the market competition. In addition, the developments that accompanied our present-day made it described as the age of knowledge, information and communication technology. Today's business businesses can grow and progress through them in the world. These encourage most businesses to develop their KMIS to improving their operation systems and products to satisfy customers' needs and desires (Al-Taie & Sarhan, 2006). The third issue is that the expansion of marketing information has created tremendous pressure on traditional operational systems. That is because the large volume of data related to the high-speed changes in customers' needs. As a response to that quick change, most businesses adopted strategies to develop their KMIS (Kotler & Philip, 1997). Finally, the customers now become the crucial factor of marketing activities. Therefore, it is important for the businesses to develop their KMIS that can help achieving high customers' satisfaction (Gandhi, 2002). According to these issues, the rational businesses' managers must work on developing their businesses' KMIS. In addition, they should focus more on applying customers' orientation, product innovation to achieve their businesses' goals. This study is applied on Iraqi businesses. Iraqi businesses were selected because Iraq has closed economy for more than 20 years. That is because of the wars, which created many problems related to adopting new technologies. However, after 2003, Iraq has become more economically open towards the entire world. That has increased the global competition and put Iraqi businesses under high pressure. Therefore, it is expected that Iraqi businesses started working on improving their KMIS to improve their performance (Musa & Sattar, 2012). This study focuses on two main problems. First, there is no evidence that shows whether Iraqi businesses have developed their KMIS as a response to the new changes in business environment. Second, the literature does not have studies that test the impact of Iraqi businesses' KMIS on customer orientation and product innovation.

## **2. An Overview**

The marketing information system is a system that contains information about the business and its internal and external environment. It has defined as a group of employees, databases, procedures. They all used to provide routine information to managers and decision-makers within the business (Haag & Phillips, 2007).

It can also be defined as the integrated structure of machinery, programs, equipment, rules, and workforce that collecting data to provide the necessary information. In addition, it can use to forecasts to facilitate the decision-making missions (Etzel & et al, 2004).

The marketing information system, like any other information system, contains three essential elements as shown in figure (1).

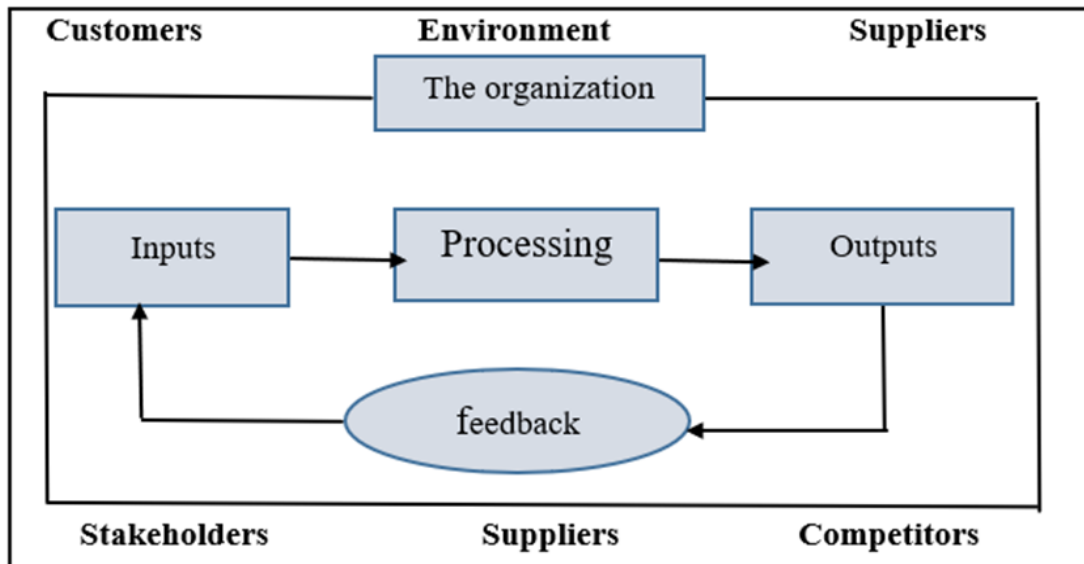


Figure 1: Marketing information system components.

**Inputs:** It is all that enters the system from the primary elements obtained from the business and from the external environment. All the information entering the system will be processing and converting into useful reports.

**Operations:** The process that transforms data into useful information.

**Outputs:** The outputs of the system are usually reports that represent the results of the processing step. The outputs are used for decision-making.

**Feedback :** All information that is coming back from customers, suppliers, stockholders, and others that help improving the operational performance

Customer orientation is one of the businesses' approaches that help focusing on customers. Specifically, considering the customer needs and wants more valued than the businesses' needs. The marketing concept has significantly changed over time in terms of tools, methods, and applications. These changes have led to more changes in marketing functions that started focusing on customer as marketing functions now include marketing planning, marketing control, and marketing information systems. The marketing functions, and then customer orientation, can be affected by some factors (Al-Dewachi, 2000). These factors include suppliers, distributors, and competitors. In addition, there are some external factors such as political, legislations, and socio-cultural environment.

One of the examples of the marketing changes is that many businesses provide special offers and services customers. That indicates the importance of the customer in the marketing process. Figure (2) shows the modern marketing process.

Figure (2) shows that customers are placed in the center of the process. That is, the companies consider customers the starting point for marketing activity, surrounded by the components of the marketing mix (product, price, distribution, and promotion (Kotler et al, 2013).

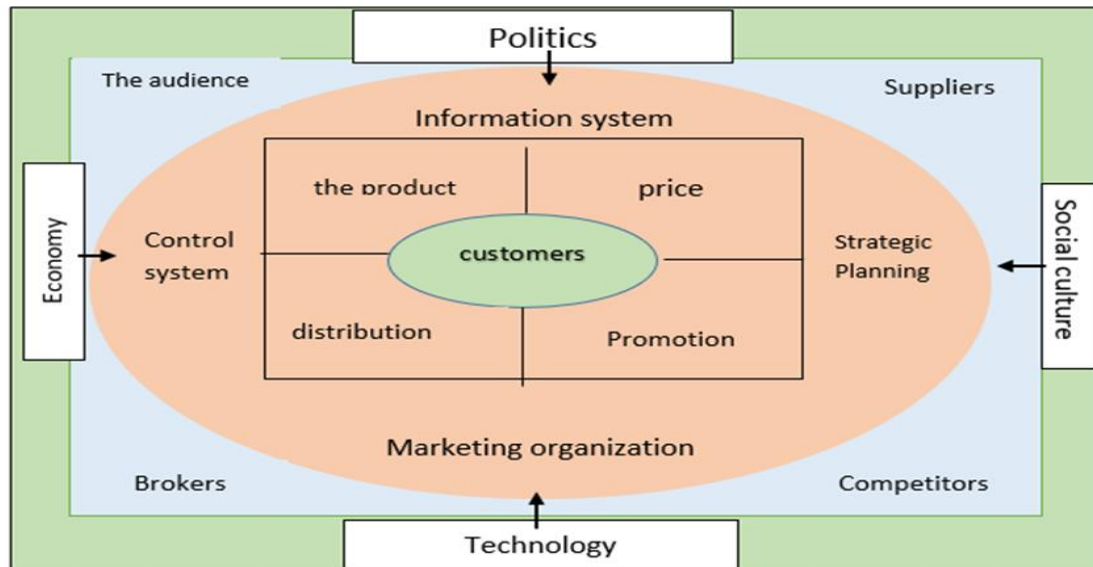


Figure 2: Customer is the center of the business environment.

The product innovative is defined as the process of providing what satisfies the customers' needs. It can be goods, services, ideas, and others (Dendera, 2009). The new product can be defined as the product that is offered for the first time. In other words, the product that is completely new in the market (Abu Jum, 2004).

It is important to indicate that the concept of the new product may not always coincide with the idea of the innovative product (Al-Qaryouti, 2000). It does not always fall within innovation; it even falls within the concept of the original product (Harem, 2003).

Product innovation is an important part of businesses success. Providing innovative products can help businesses obtain high customers' satisfaction. That is because innovative products can satisfy the customers' needs and desires. Products innovative process has many ideas' sources and many stages. Recently, product innovative process is a key factor of market competition.

### 3. Methodology

The method that used to collect data was the questionnaire. The questionnaire has four parts. The first part is the demographic information of the respondents. The second part is related to customer-orientation, which has twelve items. The third part is related to product innovation, which has seven items. The last part is related to marketing information system, which has three items.

The questionnaire consists of (22) main items. The part of demographic information of respondents includes their name, age, gender, education level, and others. Table (1) shows the numbers of items in the questionnaire that are related to each study dimension.

Five departments were selected as the target when collecting data. These departments are the planning department, the marketing department, the production department, and the design department. These were selected because of their strong relationship with the study variables.

The questionnaire sheets were printed on paper and gave directly by hand (face-to-face) to each responder. Three days were given to each responder to fill the questionnaire. During these three days, the researcher was talking to the responders to explain any understandable questions. Then, the information from the questionnaire was formed in Excel sheet to be ready for analyzing.

### **3.1 The purpose of the study**

The purpose of this study is to investigate the performance of the KMIS in a sample of Iraqi businesses. More specifically, the study investigates the impacts of Iraqi businesses' KMIS. The study tests whether Iraqi businesses have applied customer orientation and product innovation. Finally, the study tests the relationship between KMIS, customer orientation and product innovation of Iraqi businesses. Many studies in the literature have presented the KMIS in different ways. They also tested its impact on customers' satisfaction and on the businesses' performance and success. Studies that are related to the marketing information system was to evaluate the role of KMIS towards the customer orientation and product innovation.

### **3.2 The Study Hypotheses**

In accordance with the purpose of the study, the hypotheses were formed as follows:

H1: MIS can positively affect the product innovation.

H2: MIS can positively affect the customer orientation.

H3: The direct impact of product innovation on customer orientation

H4: The product innovation has a mediation role in the relationship between MIS and the customer orientation.

### **3.3 Conceptual Model**

The conceptual model represents the main dimensions of the study. It also represents the nature of the relationships between these dimensions. The model consists of three main dimensions. The first dimension is the customer orientation, which is the dependent variable. The second dimension is the KMIS, which is the independent variable. The third dimension is the product innovation, which is the intermediate variable. The conceptual model is shown in figure (3).

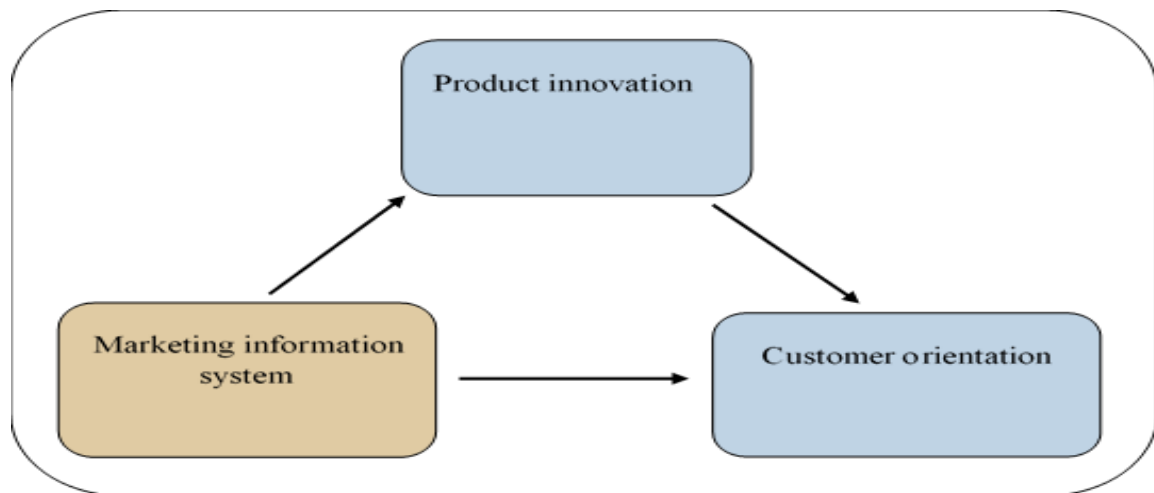


Figure 3: The conceptual model.

### **3.4 The Sample of the Study**

This study focused on the manufacturing companies that apply MIS in Mosul, Iraq. The manufacturing companies are 100 companies in that region. However, there are three companies meet the conditions of having KMIS. According to the purpose of the study, data were collected from departments of marketing, planning, research and development, information technology (IT). As a result of interviews with companies, it was determined that there are 130 employees in these departments.

### **3.5 Collecting data**

The questionnaire sheets were sent to the three companies. Only 110 returns were received, and 10 of them were ignored because they were not filled completely. The 100 returns were only from one of the three companies, which is The State Company for Ready-Made Wear. The other two companies did not respond because these companies have stopped working in MIS practices for a long time. Stopped working in KMIS is due to different internal and external factors. The apparel industry has strong direct connection with the customers. That can help testing the relation between the study dimensions (Al Samman, 2014). The sample size was calculated based on Slovin's formula. The sample size was calculated as following:

$$n = N / (1 + Ne^2)$$

n: the sample size

N: the sample population = 130

e: the confident level which is 95% (the error is 5%)

$$n = 130 / (1 + (130 * 0.0025))$$

$$n = 130 / 1.325 = 98$$

The study has 100 sample returns, which meet the limit of sample size. Therefore, 100 sample sizes were used.

The study used the questionnaire method to collect data (Tellis, 1997). The questionnaire was used because it can provide cheap, quick and efficient large amounts of information. In addition, it also allows getting large sample (Patten, 2016).

The study limitation is the difficulties of collecting data since most companies in Iraq do not have MIS systems.

### 3.6 Data analysis

The method that used to collect data was the questionnaire. The questionnaire has four parts. The first part is the demographic information of the respondents. The second part is related to customer-orientation, which has twelve items. The third part is related to product innovation, which has seven items. The last part is related to marketing information system, which has three items.

The study conducted by Alsuwaidi (2010) was used to form the questionnaire. The questionnaire consists of (22) main items. The part of demographic information of respondents includes their name, age, gender, education level, and others (Alsuwaidi, 2010). Table (1) shows the numbers of items in the questionnaire that are related to each study dimension.

Alsuwaidi (2010) created a synthesis scale for marketing information systems, customer orientation, and product innovation through the papers by Goetsch & Davis (1997), Sheth, Mittal, & Newman (1999), Boone & Kurtz (1998), Harmon (2003), and Kotler (2003), (Lamb et al, 2004).

Five departments were selected as the target when collecting data. These departments are the planning department, the marketing department, the production department, and the design department. These were selected because of their strong relationship with the study variables.

**Table 1: The study dimensions, and the number of items for each dimension.**

Dimensions	Number of questions	The sequence of items in the questionnaire	The sources
Customer orientation	12	Q1- Q12	Goetsch and Davis (1997)
			Alsuwaidi (2010) Sheth and Mittal (1999) Boone and Kurtz (1998)
Product innovation	7	Q13- Q19	Harmon, (2003) Alsuwaidi (2010) Boone & Kurtz (1998)
Marketing information system	3	Q20-Q22	Alsuwaidi (2010) Kotler (2003)

Before analyzing the data that collected via questionnaire, it is important to start with explaining the characteristics of participants. Then, explaining the descriptive analysis of all questionnaire items. The characteristics of participants are shown in table (2).

**Table 2: The characteristics of questionnaire's participants**

Work place	Marketing Dept.	Planning Dept.	Production Dept.	Design Dept.
Male	13	11	22	19
Female	12	14	3	6
Age	28 - 44	40 - 55	35 -58	27 - 36
Education	BA	BA &Master	High school & BA	BA
Experiences (years)	8 -15	13- 18	10 - 20	2 - 16

Table (2) shows the numbers of males and females who respond to the questionnaire and their work location. The table shows the average ages of the participants in the questionnaire. The table shows the education levels and years of experiences of the participants.

Table (3) and (4) show the descriptive statistics of the data that are collected from the questionnaire. The tables show the mean and the standard deviation, and Skewness. The questionnaire items from X1 to X22 are constructed to collected data about the study dimensions.

The data were examined for normality analysis with the coefficients of skewness and kurtosis. The coefficient of skewness is less than ( $\pm 3$ ), and the coefficient of kurtosis is less than ( $\pm 10$ ) indicates that the normal distribution assumption is met, (Kline, 2011).

To examine the outliers that make multivariate normal distribution difficult, Cook distance values were calculated. Cook distance values greater than (1) indicate that there are outliers (Stevens, 2002). The results of these tests are shown in tables (3) and (4). The results show that the Skewness values of items range between (1 and 3). That indicates that the data has normal distribution. The results show that there are no outliers in the data set. Accordingly, all items were normal.

The results of data reliability are shown in Table (5). The results in table (5) indicate that the coefficient alpha is (0.91) for orientation towards the customer. The coefficient alpha is (0.87) for product innovation. The coefficient alpha is 0.80 for marketing information system. The overall coefficient alpha is (0.92). These results indicate that that the scales are highly reliable.

The following analyzes were respectively applied to the data:

1- Exploratory factor analysis was applied to examine the factor structure. Exploratory factor analysis is a statistical technique that is used to reduce data to a smaller set of summary variables. In addition, it is used to explore the underlying theoretical structure of the phenomena (Kline, 2011).

Table 3: Descriptive statistics

Questions	Dimension	Reference	N		Mean	Standard Deviation	Skewness				
							statistic	Std.Error			
X1	Customer Orientation	Goetsch and Davis, (1997)	The preference of customer value elements in demand over to-wear:1. cloth2. Fashion3.Price4. Promotion 5. Distribution								
1			100		1.810	0.693	-0.46	0.19			
2			100		2.550	0.431	1.05	0.19			
3			100		2.250	0.583	-0.75	0.19			
4			100		2.250	0.073	0.05	0.19			
5			100		2.220	0.317	0.20	0.19			
X2			Goetsch and Davis (1997)	The company offers products that are comparable to its competitors with:1. High-quality fabric2. High price3. Modern Model (Fashion) 4. Good promotion5. Wide distribution coverage							
1				100		2.110	0.221	0.91	0.19		
2				100		2.100	0.629	-0.72	0.19		
3				100		1.990	0.771	-0.20	0.19		
4	100			1.650	0.399	0.52	0.19				



5			100		1.720	0.903	-0.65	0.19
X3		Sheth and Mittal (1999)	When customers feel dissatisfied with their products, the company takes corrective action					
			100		1.780	0.317	-1.41	0.19
X5			The company directs its production according to the customer's needs and technical capabilities					
			100		1.850	0.039	-0.42	0.19
X6			Management directs excellent customer care					
			100		2.180	0.189	-0.15	0.19
X4		Goetsch and Davis (1997)	The company offers a variety of products					
			100		1.880	0.526	0.54	0.19
X7			The company develops different marketing offers for multiple divisions or classes					
		100		1.970	0.465	-0.18	0.19	
X8		(Boone and Kurtz (1998))	Design officials meet directly with customers					
			100		1.390	0.730	0.40	0.19
X9		Sheth and Mittal, (1999)	The goal of the company is to establish continuous relationships and contacts with customers					
			100		1.850	0.963	-0.24	0.19
X10			The company seeks to contact customers (contracts) whose purchases have decreased and to find out the reasons					
		100		1.840	0.970	-0.25	0.19	
X11		Boone and Kurtz (1998)	The company contacts essential customers who have stopped dealing with the company to find out the reasons					
			100		1.760	0.258	0.44	0.19
X12			The company gives incentives (discount or gifts) to more dealing customers					
		100		1.920	0.018	-0.35	0.19	

Note: items from X1 to X12 are related to customer orientation. The highest average is 2.55 in X1 and the lowest average is 1.39 in X8. The highest Skewness values are 1.05 in X1, and -0.72 in X2. The highest Standard deviation value is 0.970 in X10, and 0.018 in X12.

Table 4: Continue of descriptive statistic.

Questions	Dimension	Reference	N		Mean	Standard Deviation	Skewness			
							Statistic	Std.Error		
X13	Product innovation	Harmon, (2003)	Product innovation is everyone's responsibility in the company							
			100			1.920	0.018	-0.98	0.19	
X14			The overall atmosphere in the company encourages innovation and renewal							
			100			1.780	0.535	-1.18	0.19	
X15			The company encourages customers to offer product innovation ideas							
			100			1.700	0.535	1.10	0.19	
X16			The company encourages working individuals to provide product innovation ideas							
			100			1.680	0.503	1.06	0.19	
X17			The company monitors the innovations of competitors that brought to the market							
	100			1.990	0.658	1.09	0.19			
X18	The company informs about the latest technologies provided by suppliers in the field of product innovation									
	100			1.870	0.623	-1.00	0.19			
X19	The internet helps the department work towards product innovation									
	100			2.020	0.726	-0.82	0.19			
X20	Marketing information system	Kotler, (2003)	When making important decisions, I need information that the company does not provide to me regarding:1. The need and desires of customers for the specifications of the required products2. Promote company3. Characteristics and models of competing products4. Methods of distribution of competitors and their agents5. Promotion of competitors (efficiency and effectiveness)6. Competitive product prices7. Market conditions							
1			100			1.920	0.505	-0.57	0.19	
2			100			2.080	0.733	0.02	0.19	
3			100			2.250	0.434	-0.46	0.19	
4			100			1.830	0.503	-1.05	0.19	
5			100			2.330	0.733	0.75	0.19	
6			100			2.330	0.503	-0.05	0.19	
7			100			2.250	0.154	0.20	0.19	
X21			There are magazines/catalogs/brochures about my work that I would like to have							
			100			2.650	0.171	1.14	0.19	
X22			The company has an information system (computer, records, documents, reports) through which the required information can be obtained:1. Timely2. Comprehensively 3. Correctly and accurately							
			1	100			2.330	0.503	0.72	0.19
2			100			2.250	0.154	-0.20	0.19	
3	100			1.520	0.328	0.52	0.19			

Note: items from X13 to X19 are related to product innovation. The highest average was 2.02 in X19 and the lowest average was 1.68 in X16. Items from X20 to X22 are related to MIS. The highest average was 2.65 in X21 and the lowest average was 1.52 in X22. The highest Skewness values are 1.14 in X21, and -1.18 in X14. The highest Standard deviation values are 0.726 in X19, and 0.018 in X13.

**Table 5: The results of Cronbach alpha test.**

Dimension	Number of items	Cronbach Alpha
Orientation towards the customer	11	0.91
Product innovation	6	0.87
Marketing information system	3	0.80
Total	20	0.92

The extracted factors will be used to do the regression analysis that tests the study hypothesis. Pearson correlation coefficients were calculated to determine the relationships between scale factors

2- Regression analysis is used to test the hypotheses. It is important to indicate that for the product innovation to have a mediation role, three conditions required to be applied based on Baron & Kenny (1986).

The first condition is that the independent variable (KMIS) should have a significant effect on the mediator variable (product innovation). The second condition is that the independent variable (KMIS) should have a significant effect on the dependent variable (customer orientation). In addition, the effect of the independent variable (KMIS) on the dependent variable (customer orientation) should decrease. The third condition is that the mediator variable (product innovation) should have a significant effect on the dependent variable (customer orientation) (Baron & Kenny, 1986). Analyzes were performed using SPSS 25.0 statistics package program.

#### **4.The Empirical Results**

Before doing the factor analysis, it is important to investigate whether the sample size is sufficient, and whether the data are suitable for factor analysis (Hair et al,2014).

Kaiser-Meyer-Olkin (KMO) coefficient was calculated, and the Bartlett Sphericity test was applied. The results showed that the KMO= 0.88, and the Barlett Sphericity ( $\chi^2 (190) = 1165.10, p < 0.001$ ). These results indicate that the sample size is sufficient, and the scale data is suitable for factor analysis.

The results in table (6) show the correlation between the items that are related to customer orientation (X1 to X12). The results in table (1.6) show that the relationships between the items were found to be statistically significant ( $p < 0.01$ ).

The results in table (1.6) show that the minimum correlation coefficients is ( $r = 0.264$ ), and the maximum is ( $r = 0.686$ ). Therefore, all the items of the first dimension correspond internally. The total score of the axis confirms the internal correlation of the items of the first dimension.

Table 6: Correlation between the items of orientation towards the customer.

	It1	It2	It3	It4	It5	It6	It7	It8	It9	It11	It12
It1	1										
It2	0.521**	1									
It3	0.438**	0.293**	1								
It4	0.548**	0.410**	0.358**	1							
It5	0.506**	0.554**	0.264**	0.487**	1						
It6	0.442**	0.624**	0.384**	0.487**	0.663**	1					
It7	0.474**	0.483**	0.444**	0.487**	0.621**	0.747**	1				
It8	0.351**	0.412**	0.338**	0.309**	0.449**	0.367**	0.449**	1			
It9	0.419**	0.590**	0.350**	0.524**	0.613**	0.656**	0.699**	0.562**	1		
It11	0.598**	0.378**	0.499**	0.430**	0.382**	0.382**	0.536**	0.533**	0.544**	1	
It12	0.526**	0.582**	0.439**	0.527**	0.505**	0.648**	0.648**	0.466**	0.686**	0.561**	1

\*\*p&lt;0,01

The results of table (7) show the relationships between the items that are related to product innovation (X13 to X19). The results were found to be statistically significant ( $p<0.01$ ).

The results of table (7) show that the minimum correlation coefficients is ( $r=0.378$ ) and the maximum is ( $r=0.731$ ). Accordingly, all the items of the second dimension are internally consistent with the overall degree of the second axis. That proves the validity of the internal Correlation of the sections of the second dimension.

Table 7: Correlation between the items of product innovation.

	It13	It15	It16	It17	It18	It19
It13	1					
It15	0.559**	1				
It16	0.432**	0.500**	1			
It17	0.553**	0.594**	0.609**	1		
It18	0.640**	0.593**	0.515**	0.731**	1	
It19	0.378**	0.384**	0.477**	0.558**	0.418**	1

\*\*p&lt;0,01

The results of the table (8) show the relationships between the items that are related to MIS (X20 to X22). The results were found to be statistically significant ( $p<0.01$ ). The minimum correlation coefficients is ( $r=0.521$ ) and the maximum is ( $r=0.605$ ). Accordingly, all the items of the third dimension are internally Correlation with the overall degree of the third axis. That proves the validity of the internal Correlation of the third dimension items.

**Table 8: Correlation between the items of marketing information system.**

	It20	It21	It22
It20	1		
It21	0.605**	1	
It22	0.521**	0.598**	1

\*\*p&lt;0,01

In general, the results of the internal consistency in the previous tables indicate that the questionnaire tool has a high degree of reliability. In addition, its internal correlation is high too, which indicates that the data are suitable for factor analysis.

Principal component and Varimax vertical rotation methods were applied. Since the measurement tool was designed with three factors, the analysis was done by forcing the scale items into three factors. The factor load was taken as (0.5). According to the study conducted by Hair, et al (2014), the items with a factor load of (0.50) and higher can contribute significantly to the variance (Hair, 2014).

Factor loadings for all items were placed between (0.50 and 0.84). That is, there is no item with a factor load value below (0.50). However, two items (item 10 and item 14) have high factor's loadings in more than one factor. The analysis was repeated by removing these items. Table (9) shows the factors, factor loads, and eigenvalues. In addition, it shows the explained variance rates obtained from factor analysis.

**Table 9: Factor analysis results.**

Items	Component			Eigenvalues	% of Variance
	1	2	3		
It9	0,84			8,50	42,48
It7	0,77				
It12	0,75				
It5	0,74				
It6	0,74				
It2	0,74				
It8	0,63				
It11	0,60				
It4	0,59				
It1	0,54				
It3	0,50			1,86	9,32
It18		0,82			
It17		0,80			
It16		0,73			
It15		0,72			
It13		0,69			
It19		0,58		1,76	8,78
It22			0,81		
It21			0,80		
It20			0,73		

The result of the factor analysis showed that the scale consists of three factors. These factors represent customer orientation, product innovation, and marketing information system, respectively.

The factor loads of the items took values between (0.50 and 0.84). The three-factor measurements explain (60.58%) of the total variance.

Table (10) shows the coefficients of relationships between the factors.

The table shows that there is a positive and significant relationship between customer orientation scores and product innovation scores ( $r=0.610$ ,  $p<0.01$ ). In addition, there is a positive and a significant relationship between orientation towards the customer scores and marketing information system scores ( $r=0.420$ ,  $p<0.01$ ).

Table (10) shows that there is a positive and a significant relationship between product innovation scores and marketing information system scores ( $r=0.386$ ,  $p<0.01$ ). The results in table (10) indicate that there was a moderate relationship between the factors. In addition, they indicate that the internal consistency of the scales was sufficient.

Table 10: The coefficients of relationships between the factors.

	Factor	M	SD	1.	2.	3.
1.	Customer Orientation	1,34	0,41	1		
2.	Product innovation	1,62	0,62	0.610**	1	
3.	Marketing information system	2,30	0,69	0.420**	0.386**	1

\*\* $p<0.01$

Using the regression analysis, this part empirically tests the study hypotheses. As indicated before, the study model shows that the marketing information system is the independent variable. It shows that the product innovation is the intermediary variable, and the customer orientation is the dependent variable. The method introduced by Baron and Kenny (1986) was used to test the mediation effect. In addition, the Sobel test is used to determine whether the resulting indirect effect is statistically significant.

The results of regression analysis are shown in the table (11). The results show that in the model (1), the results show that ( $R=0.39$ ,  $R^2=0.15$ ,  $F_1$ ,  $0.33=17.16$ ,  $p<0.05$ ). The results show that the marketing information system affects the product innovation positively and significantly ( $B = 0.35$ ;  $p < 0.01$ ).

As the marketing information system increased, product innovation also increased. According to this result, the H1 hypothesis was accepted.

Table 11: The results of regression analysis

				B	SE	t	p	LLCI	ULCI
	Model 1								
H1	Marketing information system	-- - >	Product innovation	0,35	0,08	4,14	0,00	0,18	0,52
	Model 2								
H2	Marketing information system		Customer Orientation	0,25	0,05	4,58	0,00	0,14	0,36
	Model 3								
H3	Marketing information system	-- - >	Customer Orientation	0,13	0,05	2,58	0,01	0,03	0,23
	Product innovation	-- - >	Customer Orientation	0,35	0,06	6,24	0,00	0,24	0,46
	Total effect								
	Marketing information system	-- - >	Customer Orientation	0,25	0,05	4,58	0,00	0,14	0,36
	Direct effect								
	Marketing information system	-- - >	Customer Orientation	0,13	0,05	2,58	0,01	0,03	0,23
	Indirect effect								
H4	Marketing information system	- -- >	Customer Orientation	0,12	0,04			0,06	0,20

Sobel ( $Z=3,80$ ;  $p=0,0001$ ); LLCI= Lower limit of Confidence interval, ULCI= Upper limit of Confidence interval.

In Model (2), the results show that ( $R=0.42$ ,  $R^2=0.18$ ,  $F_{1, 0.14}=21.05$ ,  $p<0.01$ ). The results show that the marketing information system positively and significantly affects the customer orientation ( $B = 0.25$ ;  $p < 0.05$ ). As the marketing information system increased, customer orientation also increased. According to the result, the H2 hypothesis was accepted.

In Model (3), the results show that ( $R=0.64$ ,  $R^2=0.41$ ,  $F_{2, 0.10}=34.08$ ,  $p<0.01$ ). The results show that the marketing information system can positively and significantly effects customer orientation ( $B = 0.13$ ;  $p < 0.05$ ).

In addition, the product innovation can positively and significantly affect customer orientation ( $B = 0.35$ ;  $p < 0.05$ ). As marketing information system and product innovation increased, customer orientation also increased. According to that, the H3 hypothesis was accepted.

When a product innovation (the mediator variable of the research) was included in the regression analysis, the direct effect of the KMIS on customer orientation decreased ( $B = 0.13$ ;  $p < 0.05$ ). In addition, the indirect effect of the KMIS on customer orientation was found to be significant ( $B = 0.12$ ;  $Z = 3.80$ ;  $p < 0.05$ ). The results obtained showed that the product innovation variable has a partial mediator role in the relationship between marketing information system and customer orientation. Accordingly, the H4 hypothesis was accepted.

## **5. Conclusion**

This study was applied on a sample of Iraqi businesses. The study focuses on the Iraqi businesses because the Iraqi economy was closed for more than 20 years. That created many problems related to adopting new technologies especially the use of MIS.

The businesses today pay more attention to achieve customers' satisfaction. That is because customers now become the crucial factor of marketing activities. Therefore, it is important to develop their marketing information system, customer orientation, and product innovation.

Factor analysis technique was used to identify the study dimensions. Finally, the regression analysis was used to test the study hypotheses.

The results of the study showed that the collected data are reliable, stable, and normally distributed based on skewness and kurtosis coefficients. The results showed that based on Kaiser-Meyer-Olkin (KMO) coefficient, and the Bartlett Sphericity test, the sample size was sufficient, and the scale data were suitable for factor analysis.

Principal component and Varimax vertical rotation methods were applied. Since the measurement tool was designed with three factors, the analysis was carried out by forcing the scale items into three factors. These factors are customer orientation, product innovation, and marketing information system, respectively. The results showed that the three-factor measurement tool explains 60.58% of the total variance.

The regression analysis was used to test the study hypotheses. The results of the study show that KMIS can positively and significantly impact the product innovation, and the customer orientation. These results are in line with the findings of the studies conducted by Nedeva (2004), Ashill & Jobber (2000), and Sadiq (2008).

The results show that the KMIS and product innovation together can positively and significantly affect the customer orientation. In addition, the results show that the product innovation can have a mediation role in the relationship between KMIS and the customer orientation. Following Baron and Kenny (1986), and Sobel test, the results show that product innovation has partial mediator role in the relationship between KMIS and customer orientation.

All of these results are in line the literature. Therefore, the MIS is still performing, but its performance is not enough to achieve its goals. In other words, the MIS can positively affect product innovation by 0.35 and customer orientation by 0.25. However, even the impact of KMIS on other dimensions is significant; it is still small in magnitude. That is because the companies in the sample are a public company, which indicate that they may have some limitations.



In other words, the companies are not independent in terms of decision making and getting financial resources. That can negatively affect the performance of KMIS.

### **6.Limitations**

The contribution of this study is that it analyzes the performance of KMIS of companies that operate under unstable environment (Iraqi economy). That can lead the expectation about the results to be not in line with the literature. However, the study results showed that the KMIS perform normally with some limitations of the company that have shown that the current system does not provide sufficient information to the beneficiaries and the prices of competing products or market conditions, and the lack of rewards and support for employees. The company operates in an unstable environment as a result of the security situation in Iraq, in addition to the impact of the Coronavirus on the company's financial position, which resulted in depriving the company of significant marketing opportunities provided by the state, in being in line with the strategy that could bring it strategic advantages in the future.

### **7.Suggestions**

- Developing an entrepreneurial spirit and creating an appropriate environment for innovation and development, encouraging customers and workers to submit ideas and proposals related to product innovation - and providing rewarding incentives for ideas that find their way of implementation.
- Developing mechanisms to collect information about competitors, monitor the products they put on the market, establish their specifications, prices, and marketing outlets, and study the possibility of developing improved models for them or producing them at reduced prices.
- Increasing the awareness of workers on the modern techniques provided by the suppliers in the field of the garment industry, and the international exhibitions held for this purpose in neighboring countries. And provide information about them and their applicability.
- Educating companies on the importance of establishing computer-based marketing information systems as an urgent necessity to apply customer orientation, designing them in a way that is commensurate with the nature of their activity, production and their own environment.
- Raising the level of the experience of workers in the organization in the field of computer technology and information systems by placing them in the specialized and available training courses.

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## الدور الوسيط لابتكار المنتج في العلاقة بين نظام معلومات التسويق وتوجه العميل

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### المستخلص:

يعد نظام معلومات التسويق (KMIS) عاملاً أساسياً في تطوير أداء الأعمال وتحقيق النجاح المستدام. هذا لأنه يمكن أن يقود العمل لتحقيق أداء عام جيد. الهدف الرئيسي من البحث هو قياس تأثير نظم المعلومات الإدارية على توجه العملاء وابتكار المنتجات. أيضاً، هناك هدف آخر وهو تحليل دور الوساطة في ابتكار المنتج في العلاقة بين MIS وتوجيه العملاء بالإضافة إلى ذلك، يمكن أن يؤدي العمل إلى تحقيق رضا العملاء المرتفع، والذي أصبح عاملاً حاسماً في أنشطة التسويق. لذلك، من المهم تقييم وتطوير نظام معلومات التسويق. سعت هذه الدراسة إلى تحليل نظام المعلومات التسويقية وقياس تأثيره على توجه العميل وابتكار المنتجات. تم جمع بيانات الدراسة باستخدام الاستبيان. تم تحليل البيانات باستخدام الأدوات الإحصائية وبرمجة SPSS. أظهرت نتائج الدراسة أن نظام المعلومات الإدارية يمكن أن يؤثر بشكل إيجابي وإيجابي على ابتكار المنتجات. أيضاً، تُظهر النتائج أن KMIS يمكن أن تؤثر بشكل إيجابي وإيجابي على توجه العملاء. علاوة على ذلك، يمكن أن يؤثر KMIS وابتكار المنتجات معاً بشكل إيجابي وكبير على اتجاه العملاء. ووفقاً لذلك، فإن ابتكار المنتجات له دور وساطة في العلاقة بين KMIS وتوجه العميل. النتائج مهمة من حيث تطوير وكشف آثار نظم المعلومات الإدارية في العمليات العراقية.

المصطلحات الرئيسية للبحث: نظام معلومات التسويق، توجيه العملاء، ابتكار المنتجات

\*البحث مستل من رسالة ماجستير