Marketing Engineering and Its Role in Supporting the Customer Journey

An Analytical Study of the Opinions of a Sample of Students at Imam Ja'far al-Sadiq University (peace be upon him), Najaf Branch

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Abstract.

This study aims to identify marketing engineering and its role in supporting the customer journey. This study was applied at Al-Imam Al-Sadiq Private University, Najaf branch as a field of study. The research community amounted to (320) university students, from whom a sample of (180) questionnaires were selected. SPSS.v27 and (Microsoft Excel.2010) programs were used in the statistical analysis process. This study adopted the analytical approach in its research style, and it included four dimensions for the independent variable, marketing engineering, represented by (technology-based operations, benchmarking, data-based decision-making, and market trend analysis). The study also adopted five dimensions for the dependent variable, the customer journey, which are (channels and technological disruption, service failure and recovery, co-innovation, customer response, and service satisfaction). The study reached a set of conclusions, including that there is a high level of impact of marketing engineering in supporting customer journey procedures at the university under study. The results also indicate that there is an acceptable level of student satisfaction at the university under study. The beneficiaries of the university's services through their interest in the services it provides to its students and beneficiaries of its services. The study recommended a set of recommendations, including that the university administration should increase its interest in adopting the dimensions of marketing engineering in order to facilitate the benefit of customers represented by students during their journey to obtain and benefit from its services.

Keywords: Marketing Engineering, Customer Journey, Imam Ja'far Al-Sadiq University (peace be upon him)

1. INTRODUCTION

Marketing engineering is an evolving field that combines engineering and data science principles with traditional marketing strategies, contributing to improving customer experiences and enhancing the effectiveness of marketing campaigns. In light of the rapid changes taking place in the business world, it has become essential for companies to gain a deeper understanding of customer behavior and preferences, a goal that marketing engineering seeks to achieve through data analysis and the use of modern technologies. The customer journey begins with product awareness, proceeds through the research and comparison processes, and ends with the purchase decision and post-purchase interaction. Marketing engineering plays a vital role at each of these stages. By

understanding customer behavior and analyzing data, companies can design personalized experiences that effectively meet consumer needs. Furthermore, marketing engineering contributes to enhancing effective communication between brands and their customers, increasing the chances of success in achieving marketing objectives. Analytical tools also enable measuring the effectiveness of strategies and adjusting them based on the data obtained, enhancing companies' ability to adapt to market changes. This thesis will explore the role of marketing engineering in supporting the customer journey, focusing on how data and technology can be used to improve experiences and foster loyalty. The factors that influence customer behavior will also be analyzed and how they can be leveraged to achieve positive results for businesses. Marketing engineering is a vital field that combines the theoretical foundations of marketing with the practical applications of technology and data. This engineering aims to improve marketing strategies by analyzing customer behavior and tailoring experiences to suit their needs. In light of increasing competition in global markets, companies have become in dire need of a deep understanding of the customer journey, which reinforces the importance of studying the key variables that influence this journey.

2. MATERIALS AND METHODS

2.1. Marketing engineering concept

When looking at the concept of the word (engineering), we see that it refers to evaluating, drawing, and determining the shape and scope of things in a correct manner. Therefore, the engineer is the person who researches quantities, dimensions, and sizes in a scientific manner in order to clarify an idea or solve a specific problem [1]. The subject of marketing engineering has become one of the new fields that emerged within the marketing environment during the last period of the twentieth century, as it came in response to an actual need imposed by the rapid development in marketing activity and the penetration of engineering techniques into it. With the development of marketing methods, mechanisms, and models, an urgent need emerged to understand the essence of marketing activity in order to facilitate ways to develop a strategy appropriate for future developments and challenges that adopts stable and clearly defined marketing plans and moves towards activating marketing management [1]. indicated that in recent years, a new position has been adopted, known as "marketing engineer." This position is an experienced expert in market dynamics and the mechanism of marketing products and services, and is adept at using the best methods that achieve effective results in a short time and at very low costs [2].defined marketing engineering as a systematic approach to harnessing data and knowledge to drive effective marketing decision-making and implementation through an interactive decision-making process supported by technology and model-driven [1]. believes that marketing engineering means evaluating matters and charting the appropriate form for marketing plans, methods, and approaches to ensure they are in place. This is the linguistic understanding of the term marketing engineering. From an administrative perspective, it means adopting high precision, from technical and economic aspects, to the level of engineering precision in developing, approving, and ratifying marketing plans within the organization to ensure the highest level of marketing for the services and products offered by the organization.

2.2. Dimensions of marketing engineering

To understand the dimensions of marketing engineering, one must understand the essence of marketing activity, which focuses on creating harmony and consistency between the needs and desires of the market and the capabilities of marketers. To achieve this compatibility, it requires dialogue and integration between the main activities of the organization, such as its goals and the study of customer behavior. There must also be a system for measuring performance efficiency, reviewing positions, and correcting the path to ensure that the market is directed towards achieving the required compatibility [1].. Despite the importance of the topic of marketing engineering, there is a lack of measures used by researchers to measure the variable of marketing engineering. However, the researcher was able to obtain some measures to measure this variable, which were adopted because they are compatible with the nature of the topic and the field of study, and which the researchers adopted [1, 2]. They can be reviewed through the following, including the following:

2.2.1. Technology-based operations

are a set of processes and services implemented by IT professionals for customers, both internal and external, and used by these same processes and services to carry out their own business. Businesses create a specific definition of these processes and services to market their products. These processes often include management, conception, planning, design, and implementation [3].

[4] indicated that rapid technological advancements constantly create an abundance of new opportunities that marketers can capitalize on. Technology-based marketing is a term that refers to an organization's application of emerging technology to establish or otherwise enhance its competitive advantage. According to [5]. technology-based operations tend to adopt sequential new product development processes that involve creation, manufacturing, and marketing as separate, virtually non-overlapping phases. The idea of adopting an integrated, interactive new product development process, in which key marketing managers from R&D, engineering, manufacturing, and marketing are involved from the outset, is inconsistent with the experience of most technology-based processes.

2.2.2. Benchmarking

The current trend in marketing management development is benchmarking and testing new products in the market, which identifies further directions for improving competitive advantages. Benchmarking is an ongoing process of discovering, studying, and evaluating the best in other organizations in order to use the acquired knowledge in their organization's work to improve productivity and the quality of business function performance. In management, benchmarking is used to gather information. In the field of logistics, it is a tool for solving the efficient operation of transportation systems and order fulfillment. Benchmarking also provides information for developing and adopting marketing decisions. In the 1980s [6] and [7] defined benchmarking as a valuable tool for

assessing market progress in implementing sustainable development values by comparing key performance indicators with excellence standards for products and services. It is also a tool for improving marketing capabilities. Organizations have implemented benchmarking procedures in various areas such as monitoring customer satisfaction and brand management.

2.2.3. Data-driven decision-making

The inability to make decisions is one of the main reasons for executive failure. Lack of decision-making ranks much higher than lack of specific or technical knowledge as an indicator of business success. Decision-making is a vital part of the business world. Every individual in the organization has the autonomy to make a decision that affects Business. Business decisions impact many aspects of an organization, from branding to other aspects. Business decisions are also subject to bias based on decision-makers' perceptions and organizational constraints, such as organizational structures and regulations. To overcome this bias, data is needed. These large amounts of data, often referred to as big data, are transformed into information that can be leveraged for decision-making purposes [8]. According to [9] data-driven decision-making improves customer intelligence to develop a marketing strategy. This involves using online and offline channels to collect complex data that is then analyzed to better understand customers. The collected and analyzed data helps marketers understand customer psychology and purchasing patterns, enabling the marketing team to develop and implement personalized marketing strategies. As a result, organizations that adopt data-driven marketing practices are able to connect with their audiences, thereby building loyalty and trust, which translates into higher sales and stable revenues.

2.2.4. Analyzing market orientation

[10] shows that, in contrast to the marketing concept and its inculcation as a marketing orientation, market orientation refers not only to actual customers but also to potential customers. At the same time, it takes into account the influence of competitors and integrates interfunctional coordination. Market orientation is defined as an organizational culture that effectively and efficiently creates all the conditions necessary to generate superior customer value. A market-oriented organization is one whose actions are based on the marketing concept [11] see market orientation as a strategic approach in which the organization focuses on understanding customer needs and desires. Market orientation is also a rational behavior to achieve desired goals according to anticipated conditions. It includes a competitor-focused orientation and the ability to apply knowledge and skills and coordinate internal resources to meet market-related business needs. Marketing orientation can identify the conditions and foundations necessary for business development, such as marketing capabilities and needs-oriented marketing strategies, as well as business opportunities and challenges.

2.3. Customer Journey

2.3.1. Customer journey concept

The development and deployment of new technologies can radically change how customers search for information, evaluate goods and services, make purchasing decisions, and share their experiences with others. Many of these changes are driven by technological investments in new marketing opportunities. For example, $50 billion is expected to be spent on marketing technologies globally by 2023. While organizations invest in technology for various marketing purposes, the potential returns on their investments depend on understanding how to use technologies to better manage the customer journey [12] and [13]. Improving the customer journey through marketing automation not only enhances customer experiences but also contributes to significant revenue generation. Intelligent automation technologies, such as artificial intelligence and machine learning, play a crucial role in improving marketing strategies by enabling organizations to analyze customer data more effectively. Reitsamer suggests that organizations focus not just on touchpoints but on the entire customer journey, which can lead to positive outcomes, such as increased revenue and reduced customer churn. Customer experience refers to the customer's responses and reactions throughout the customer journey [14] define the customer journey as a process that spans time and has traditionally been divided into stages, such as pre-purchase, purchase, and post-purchase.

2.3.2. Customer journey dimensions

Many researchers have differed on defining the dimensions of the customer journey, given its recent popularity. Researchers have settled on the following dimensions: service satisfaction, service failure and recovery, co-innovation, and customer response. These dimensions were mentioned by [15 – 18] These dimensions are the most frequently used and align with the field of study, which can be explained as follows:

2.3.2.1. Channels and Technological Disruption

Technological advancements have led to an abundance of new innovative touchpoints that overcome time and location constraints in the service environment. The introduction of new technologies, channels, and devices has significantly transformed the way customers experience and interact with services throughout their journey. Brands are increasingly using 28 technologies in their operations to improve the service experience. The success of companies in the digital age depends on their ability to track and understand the service offering as a whole, and to respond to the process of value creation and delivery. Companies must recognize the new roles and interconnections between different touchpoints and their contributions to the customer experience to effectively manage the customer journey [17].

Emerging technologies have disrupted organizational contexts, business processes, and sectors. They represent shocks to the system. We focus on retail telecommunications

service provider offerings across various packages, including mobile and internet services [18 , 19]

2.3.2.2. Service Failure and Recovery

Service failures are interruptions that cause customers to deviate from their normal journey. They can include unplanned touchpoints, missed touchpoints, malfunctions at touchpoints, or irregularities in the sequence of touchpoints. Failures can occur at any stage of the journey and cause temporary or permanent negative impacts on the customer experience. A temporary service interruption raises customer expectations regarding service quality, thus narrowing their tolerance. A poor service experience can lead customers to abandon their services and make the brand less attractive to potential customers due to negative word of mouth. A successful service recovery can turn the crisis around, convince customers, and enhance customer loyalty to the brand. Customers continually adjust their expectations throughout their relationship with an organization, making the moment of a service failure a determining factor in its consequences [17] , [20]. explain that even the best service providers make mistakes in service delivery. Among the reasons for these failures is the labor-intensive nature of many services, which inevitably leads to more variable results than mechanical production processes. Service performance volatility and failure also arise from the inability to separate service production from its consumption, which prevents quality inspections of most services before delivery. Therefore, service marketers have a significant interest in understanding the consequences of failure and how to provide effective recovery, so they can reduce customer dissatisfaction after failure and thus retain customer business.

2.3.2.3. Co-creation

Co-creation is the collaborative effort to generate innovative and exceptional design by diverse actors from organizations, customers, and collaborative partners. Collaboration between organizations and customers is one of the most important factors that has helped achieve these goals. Information has become readily available at the touch of a finger. Suppliers, on the other hand, have slightly less bargaining power due to technological advances that can connect their potential customers to their competitors with relative ease. Innovation is not only dependent on organization; customers are also considered as users [21].

[16] discusses the concept of co-innovation in the context of customer journey literature, primarily focusing on the role of service networks and customers in shaping the customer experience. This aspect views firms and customers as actors in the value proposition, adding value through their resources and participation in the process. Firms provide service interfaces with communicative and interactive touchpoints, while customers apply their skills and knowledge to leverage service experiences, co-create value, and customize their experience along the customer journey.

2.3.2.4. Customer Response

Satisfied customers and customer responses are a market asset and can generate greater profits, more sales, and increased market share. Customer responses lead to customer satisfaction, which is defined as the overall assessment of an offering's performance compared to customer expectations. Many approaches have been shown to be effective in implementing customer demand fulfillment practices. Supply chain efficiency should be measured by its responsiveness to customers. Effective customer responsiveness is even more important in developing market conditions, such as clean technology markets, and the alignment between customer responsiveness and market context will lead to good customer relationships [22].

[23] believe that information is a key component in creating corporate responsiveness, i.e., the ability to anticipate or respond quickly to customer demands. Most companies are well aware of the need to become more responsive to customers in order to develop and maintain close, long-term relationships. Due to the proliferation and widespread use of social media, companies' ability to influence the extent of customer awareness of a brand or its value has increased significantly. Keller (2001) argued that a positive shift in customer trust in a brand—i.e., the reliability and integrity of the relationship—is one of the most critical observable customer responses. Furthermore, when consumers have a high level of trust in an organization, they expect consistency in terms of superior performance and adherence to high standards or rules.

2.3.2.5. Service Satisfaction

Customers feel satisfied when the expected values of a product, service, or relationship are met. Achieving and maintaining a high level of customer satisfaction is a critical indicator of an organization's performance. Satisfactory customer evaluations lead to a positive reputation, customer retention, and repurchase intentions, leading to long-term relationships and profitability. Customers derive satisfaction and dissatisfaction from interactions with various touchpoints, such as employees, website interfaces, and online communities, along the customer journey. Customer satisfaction is primarily perceived as the alignment of service delivery with customer expectations [16] , [24]. stated that service is the integration of business processes, policies, procedures, tools, technologies, and human efforts to facilitate customer satisfaction with services, with or without assistance, using the Internet and other networks. Service has great potential to improve service quality while simultaneously generating significant savings for service providers due to customer satisfaction with the services provided.

3. RESULTS AND DISCUSSION

3.1. RESULTS

The study adopted the descriptive analytical approach, and used the necessary means and tools to obtain data and information related to its variables. The researcher reviewed various scientific sources, including books, periodicals, research, master's and doctoral theses, in addition to information available on the Internet, which contributed to building the theoretical framework of the study. As for the applied aspect, the researcher relied on the questionnaire form as the main tool for collecting data related to testing the study hypotheses and achieving its objectives, after presenting it to a number of arbitrators and experts in this field. Through field visits to the organization under study, the researcher conducted personal interviews with a number of students, which added scientific value to the study by diagnosing the problem and collecting data accurately. The researcher relied on the programs SPSS.v.27 and Microsoft Excel.2010 to analyze the questionnaire form data, as they were used to conduct the necessary statistical analyses to obtain accurate and reliable results that serve the objectives of the study.

3.2. DISCUSSION

3.2.1. Study community and sample

This study aims to identify marketing engineering and its role in supporting the customer journey. This study was applied at Al-Imam Al-Sadiq Private University, Najaf branch as a field of study. The research community amounted to (320) university students, from whom a sample of (180) questionnaires were selected. SPSS.v27 and (Microsoft Excel.2010) programs were used in the statistical analysis process. This study adopted the analytical approach in its research style, and it included four dimensions for the independent variable, marketing engineering, represented by (technology-based operations, benchmarking, data-based decision-making, and market trend analysis). The study also adopted five dimensions for the dependent variable, the customer journey, which are (channels and technological disruption, service failure and recovery, co-innovation, customer response, and service satisfaction). Before starting the field study project, it is necessary to determine the study community and sample and state their characteristics because it is the basis on which the study focuses. It is necessary that there is compatibility between the study community and sample, which allows the possibility of generalizing the results of the study that The researcher reached it on the study community. Accordingly, the current study community was determined by the researcher before selecting the sample so that its items match the same characteristics. The net distributed questionnaires that were subjected to analysis amounted to 180 questionnaires according to the statistical table for determining the sample size mentioned by [25].

3.2.2. Study Methodology

The researcher adopted the analytical method in the study methodology, which is based on taking a sample from the study community so that it truly represents it. Their answers to the questionnaire are taken as a basis for the descriptive aspect and analytical statistical operations related to the study variables to arrive at results that can be interpreted and formulate conclusions drawn from those results, in addition to the information the researcher reaches during personal interviews with decision-makers in the organization under study.

3.2.3. Message scale stability

Before beginning the various statistical tests in this study, it was necessary to determine the extent of the scale's reliability across all the necessary data, as the reliability and consistency of its items is an urgent necessity for its reliability. To determine the availability of reliability in the current study's scale, the researcher extracted Cronbach's Alpha coefficient values for the current study's scale using SPSS V.27, the results of which are shown in Table 3-10.

Table Error! No text of specified style in document.1. Cronbach's Alpha coefficient for the study scale

Cronbach's alpha	Number of paragraphs	The symbol	Dimension	Cronbach's alpha	variable
0.766	4	X1	Technology-based operations	0.9 16	Marketing Engineering X
0.849	4	X2	Benchmarking		
0.827	4	X3	Making data-driven decisions		
0.760	4	X4	Market trend analysis		
0.776	4	Y1	Channels and technological disruption	0.939	Customer Journey Y
0.837	4	Y2	Service failure and recovery		
0.880	4	Y3	Co-innovation		
0.846	4	Y4	Customer response		
0.913	4	Y5	Service satisfaction		

Source: Prepared by the researcher based on the results of SPSS V.27.

According to Table (3-10), the results indicated that the Cronbach's alpha coefficient for the study variables and dimensions exceeded (0.70), which indicates the availability of stability and internal consistency for the items of the scale used according to [26].

4.2.3. Descriptive analysis of study variables

Descriptive analysis represents the lens through which the prevalence of the variables covered by the study can be observed in the community of the organizations being studied. Descriptive statistical analysis relies on providing a summary of the response of the studied sample according to the main or sub-variables of the study, relying on some descriptive statistical indicators. Descriptive analysis reveals an important aspect of quantitative data analysis, and describes the data by describing the behavior of the studied

sample (the sample relied upon in collecting the data), which gives the researcher a clear idea of the nature of the analyzed data. This requires relying on a set of descriptive indicators represented by the (arithmetic mean) indicator, which shows the extent of the sample's response to the studied variables, and the (standard deviation) indicator, which shows the extent of deviation of values from their arithmetic mean. The hypothetical mean value (3) was adopted, according to [26], as the extracted arithmetic mean value that exceeds or equals the hypothetical mean value is considered an acceptable value, i.e. (there is a response), and the opposite is considered rejected, i.e. (there is no response, which requires addressing it or focusing on it and drawing the attention of management to address the reasons for not achieving acceptable values); based on a five-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) by reviewing the arithmetic mean, standard deviation and relative importance as follows:

First: Descriptive analysis of the independent variable (marketing engineering):

To determine the level of availability of the independent variable, marketing engineering, which consists of four dimensions: (technology-based operations, benchmarking, data-driven decision-making, and market orientation analysis) in the organization under study, a number of tests were conducted related to (mean, standard deviation, and relative importance). Based on that, Table (3-16) shows the descriptive statistics and the final ranking of the dimensions, which shows the extent of the study sample members' interest in these dimensions and the extent of their contact and seriousness on the ground (practical), where the technology-based operations dimension (X1) achieved first place with an arithmetic mean (3.97), relative importance (0.79), and standard deviation (0.83), and the market orientation analysis dimension (X4) achieved first place with an arithmetic mean (3.80), relative importance (0.76), and standard deviation (0.85), as their ranking came in the following form (technology-based operations, benchmarking, data-based decision-making, market orientation analysis).

Table 2. The ordinal importance of the dimensions of the marketing engineering variable

Ordinal importance	relative importance	standard deviation	arithmetic mean	Dimension
the first	0.79	0.83	3.97	Technology-based operations
the second	0.76	0.92	3.82	Benchmarking
the third	0.76	0.94	3.82	Making data-driven decisions
Fourth	0.76	0.85	3.80	Market trend analysis
	0.77	0.74	3.85	Marketing Engineering

Source: Prepared by the researcher based on the results of SPSS V.27.

Second: Descriptive analysis of the dependent variable (customer journey).

To know the level of availability of the dependent variable, the customer journey, which consists of five dimensions (channels and technological disruption, service failure and recovery, joint innovation, customer response, and service satisfaction) in the

organization under study, Table (3-17) shows a number of tests related to (mean, standard deviation, and relative importance). Based on that, Table (3-22) shows the descriptive statistics and the final ranking of the dimensions, which shows the extent of the study sample members' interest in these dimensions and the extent of their contact and seriousness on the ground (practical), where channels and technological disruption (Y1) ranked first with an arithmetic mean (3.86), relative importance (0.77), and standard deviation (0.83). On the other hand, service failure and recovery (Y2) ranked second with an arithmetic mean (3.64), relative importance (0.73), and standard deviation (1.06). Joint innovation (Y3) ranked third with an arithmetic mean (3.62), relative importance (0.72), and standard deviation (1.01). Customer response (Y4) ranked fourth with an arithmetic mean (3.52), relative importance (0.70), and standard deviation (1.04). Service (Y5) ranked fifth with an arithmetic mean of (3.42), relative importance of (0.68), and standard deviation of (1.21). It was ranked as follows: (channels and technological disruption, service failure and recovery, joint innovation, customer response, service satisfaction), as shown in Table No. (3-22).

Table Error! No text of specified style in document.**3. The ordinal importance of the dimensions of the customer journey variable**

Ordinal importance	relative importance	standard deviation	Average	Dimension
the first	0.77	0.83	3.86	Channels and technological disruption
the second	0.73	1.06	3.64	Service failure and recovery
the third	0.72	1.01	3.62	Co-innovation
Fourth	0.70	1.04	3.52	Customer response
Fifth	0.68	1.21	3.42	Service satisfaction
	0.72	0.84	3.61	Customer Journey

Source: Prepared by the researcher based on the results of SPSS v.27.

Testing the first main hypothesis (H01):

The first main hypothesis (H01) states: There is no significant correlation between marketing engineering and the customer journey. In order to prove the validity of this hypothesis, Table (3-23) related to the correlation matrix showed the existence of a significant correlation between (marketing engineering and the customer journey). The value of the correlation coefficient between them reached 0.784**)) at a significance level of (0.01). This calls for rejecting the null hypothesis and accepting the alternative hypothesis (H1), which states the existence of a significant correlation between marketing

engineering and the customer journey. Four sub-hypotheses branch out from this hypothesis, which are:

Sub-hypothesis testing.
1- There is no significant correlation between technology-based operations and the customer journey.Table (3-23) related to the correlation matrix shows the existence of a significant correlation between technology-based processes and the customer journey. The value of the correlation coefficient between them reached (0.600** at a significance level of (0.01), which calls for rejecting the null hypothesis and accepting the alternative hypothesis (H1), which states that there is a significant correlation between technology-based processes and the customer journey.

2- There is no significant correlation between benchmarking and customer journey: Table (3-23) related to the correlation matrix shows the existence of a significant correlation between the benchmark and the customer journey. The value of the correlation coefficient between them reached (0.642**) at a significance level of (0.01). This calls for rejecting the null hypothesis and accepting the alternative hypothesis (H1), which states that there is a significant correlation between the benchmark and the customer journey.

3- There is no significant correlation between data-based decision-making and the customer journey: Table (3-23) related to the correlation matrix shows the existence of a significant correlation between data-based decision-making and the customer journey. The value of the correlation coefficient between them reached (0.675**) at a significance level of (0.01). This calls for rejecting the null hypothesis and accepting the alternative hypothesis (H1), which states that there is a significant correlation between data-based decision-making and the customer journey.

4- There is no significant correlation between the market orientation analysis and the customer journey: Table (3-23) related to the correlation matrix shows the existence of a significant correlation between the market orientation analysis and the customer journey. The value of the correlation coefficient between them reached (0.745**) at a significance level of (0.01), which calls for rejecting the null hypothesis and accepting the alternative hypothesis (H1), which states that there is a significant correlation between the market orientation analysis and the customer journey

	Correlations											
		x1	x2	x3	x4	x	y1	y2	y3	y4	y5	y
x1	Pearson Correlation	1	.607**	.591**	.608**	.828**	.234**	.521**	.582**	.534**	.523**	.600**
	Sig. (2-tailed)		.000	.000	.000	.000	.002	.000	.000	.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
x2	Pearson Correlation	.607**	1	.671**	.575**	.855**	.287**	.558**	.614**	.534**	.576**	.642**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
x3	Pearson Correlation	.591**	.671**	1	.587**	.856**	.313**	.619**	.679**	.552**	.550**	.675**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
x4	Pearson Correlation	.608**	.575**	.587**	1	.819**	.381**	.629**	.647**	.608**	.609**	.745**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
x	Pearson Correlation	.828**	.855**	.856**	.819**	1	.362**	.693**	.752**	.662**	.672**	.784**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
y1	Pearson Correlation	.234**	.287**	.313**	.381**	.362**	1	.320**	.336**	.223**	.257**	.488**
	Sig. (2-tailed)	.002	.000	.000	.000	.000		.000	.000	.003	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
y2	Pearson Correlation	.521**	.558**	.619**	.629**	.693**	.320**	1	.788**	.700**	.634**	.860**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
y3	Pearson Correlation	.582**	.614**	.679**	.647**	.752**	.336**	.788**	1	.757**	.725**	.901**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
y4	Pearson Correlation	.534**	.534**	.552**	.608**	.662**	.223**	.700**	.757**	1	.820**	.885**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.003	.000	.000		.000	.000
	N	180	180	180	180	180	180	180	180	180	180	180
y5	Pearson Correlation	.523**	.576**	.550**	.609**	.672**	.257**	.634**	.725**	.820**	1	.875**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	180	180	180	180	180	180	180	180	180	180	180
y	Pearson Correlation	.600**	.642**	.675**	.715**	.784**	.488**	.860**	.901**	.885**	.875**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	180	180	180	180	180	180	180	180	180	180	180

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Prepared by the researcher based on the results of SPSS v.27.

Testing impact hypotheses

This paragraph includes testing the main and sub-hypotheses of influence through the following:

Testing the second main hypothesis (H02):

The second main hypothesis (H02) states: There is no significant influence relationship between the independent variable (marketing engineering) and the dependent variable (customer journey). For the purpose of testing this hypothesis, Table (3-24) presents the results of evaluating the structural model for this hypothesis.

Table Error! No text of specified style in document.**4. Results of evaluating the second main hypothesis model**

The result	R^2 rate	of determination$R2$	value F	p Value	R	influence relationship	hypothesis
Reject the null hypothesis and accept the alternative hypothesis	0.612	0.614	283.379	0.000	0.784	Marketing Engineering -> Customer Journey	H2

Source: Prepared by the researcher based on the results of SPSS v.27.

Table (3-24) shows the analysis results that showed a significant influence between marketing engineering and the customer journey. The influence relationship is significant when the p-value does not exceed 0.05 according to the rule (26). Therefore, the null hypothesis was rejected and the alternative hypothesis (H1) was accepted, which states that there is a significant influence relationship between marketing engineering and the customer journey. The results also showed that the adjusted coefficient of determination reached (0.612), which indicates that the variable (marketing engineering) was able to explain the dependent variable (customer journey) by (61%), and the remaining percentage is other factors that were not addressed by the study. Based on Table (3-25), the hypothesis that states: (There is no significant influence relationship for the independent variable (marketing engineering) on the dependent variable (customer journey) is rejected, and the hypothesis that states that there is a significant influence relationship between marketing engineering and the customer journey is accepted.

Testing the sub-hypotheses of the second main hypothesis

The sub-hypotheses of the second main hypothesis state the following:

1- There is no significant influence relationship between technology-based operations and the customer journey:

Table (3-25) shows the results of the analysis that concluded that there is a significant influence between technology-based operations and the customer journey. The influence relationship is significant when the p-value does not exceed 0.05 according to the rule (Hair et al., 2017). Therefore, the null hypothesis is rejected and the alternative hypothesis (H1) is accepted, which states that there is an influence relationship between technology-based operations and the customer journey. The results also showed that the adjusted coefficient of determination values reached

(0.356), which indicates that the dimension (technology-based operations) explains the dependent variable (customer journey) by (36%), and the remaining percentage is other factors that were not addressed by the study. Based on Table (3-25), the hypothesis that states: ((There is no significant influence relationship for (technology-based operations) on the dependent variable (customer journey) is rejected and the hypothesis is accepted Which states that there is a significant influence relationship between technology-based processes in the customer journey.

Table Error! No text of specified style in document.**5. Results of evaluating the model of the first sub-hypothesis of the second main hypothesis**

The result	R^2 rate	of determination R2	value F	p Value	R	Relationship of variables	hypothesis
Reject the null hypothesis and accept the alternative hypothesis	0.356	0.360	99.954	0.000	0.6	Technology-driven <- operations Customer journey	H21

Source: Prepared by the researcher based on the results of SPSS v.27.

2- There is no significant influence relationship between benchmarking and the customer journey:

Table (3-26) shows the results of the analysis that concluded that there is a significant influence relationship between benchmarking and the customer journey. The influence relationship is significant when the p-value does not exceed 0.05 according to the rule (Hair et al., 2017). Therefore, the null hypothesis is rejected and the alternative hypothesis (H1) is accepted, which states that there is a significant influence relationship between benchmarking and the customer journey. The results also showed that the adjusted coefficient of determination values reached (0.409), which indicates that the (benchmarking) dimension explains the dependent variable (customer journey) by (41%), and the remaining percentage is other factors that were not addressed by the study. Based on Table (3-26), the hypothesis that states: ((There is no significant influence relationship for (benchmarking) on the dependent variable (customer journey) is rejected, and the hypothesis that states that there is a significant influence relationship for benchmarking on the customer journey is accepted. Customer.

Table Error! No text of specified style in document.**6. Results of evaluating the model of the second sub-hypothesis of the second main hypothesis**

The result	R^2 rate	of determination R2	value F	p Value	R	Relationship of variables	hypothesis
Reject the null hypothesis and accept the alternative	0.409	0.413	125.114	0.000	0.642	<- Benchmarking Customer Journey	H22

hypothesis							

Source: Prepared by the researcher based on the results of SPSS v.27.

3- There is no significant influence relationship between data-based decision-making and the customer journey:

Table (3-27) shows the analysis results that concluded that there is a significant influence between data-based decision-making and the customer journey. The influence relationship is significant when the p-value does not exceed 0.05 according to the rule (Hair et al., 2017). Therefore, the null hypothesis is rejected and the alternative hypothesis (H1) is accepted, which states that there is a significant influence relationship between data-based decision-making and the customer journey. The results also showed that the adjusted coefficient of determination reached (0.453), which indicates that the dimension (data-based decision-making) explains the dependent variable (customer journey) by (45%), and the remaining percentage is other factors that were not addressed by the study. Based on Table (3-27), the hypothesis that states: ((There is no significant influence relationship for (data-based decision-making) on the dependent variable (customer journey) is rejected, and the hypothesis that states that there is a significant influence relationship is accepted. Morale of data-driven decision making in the customer journey.

Table 7. Results of evaluating the model of the third sub-hypothesis for the second main hypothesis

The result	R^2 rate	of determination R2	value F	p Value	R	Relationship of variables	hypothesis
Reject the null hypothesis and accept the alternative hypothesis	0.453	0.456	149.159	0.000	0.675	Data-Driven Decision Making -> Customer Journey	H23

Source: Prepared by the researcher based on the results of SPSS v.27.

4- There is no significant influence relationship between market orientation analysis and customer journey:

Table (3-28) shows the results of the analysis, which concluded that there is a significant influence between market orientation analysis and customer journey. The influence relationship is significant when the p-value does not exceed 0.05 according to the rule (Hair et al., 2017). Therefore, the null hypothesis is rejected and the alternative hypothesis (H1) is accepted, which states that there is a significant influence relationship between market orientation analysis and customer journey. The results also showed that the adjusted coefficient of determination values reached (0.508), which indicates that the dimension (market orientation analysis) explains the dependent variable (customer journey) by (501%), and the remaining percentage is other factors that were not addressed by the study. Based on Table (3-28), the hypothesis that states: ((There is no significant influence relationship for (market orientation analysis) on the dependent variable (customer journey) is rejected, and the hypothesis that states that there is a significant influence relationship for market orientation analysis on Customer Journey.

Table 8. Results of evaluating the model of the third sub-hypothesis for the second main hypothesis.

The result	R ^{2} rate	of determination R2	value F	p Value	R	Relationship of variables	hypothesis
Reject the null hypothesis and accept the alternative hypothesis	0.508	0.511	185.942	0.000	0.715	Market Trend Analysis -> Customer Journey	H2 4

Source: Prepared by the researcher based on the results of SPSS v.27.

Table (3-29) displays the results of the simple linear regression for the sub-hypotheses of the second main hypothesis, which concluded that there is a significant influence relationship between the dimensions of marketing engineering on the customer journey variable, which is significant when the value of (P) does not exceed 0.05 according to the rule of (Hair et al., 2017). Based on the table above, it is clear that the null hypotheses (H02-2, H02-1, H02-3) were rejected, as the results showed that the adjusted coefficient of determination values reached (0.300, 0.304, 0.441), which indicates that the dimensions of the independent variable (marketing engineering) were able to explain the dependent variable (customer journey) according to the apparent proportions, and that the remaining proportions are other factors not addressed by the study.

Table 9. Results of evaluating the model of sub-hypotheses of the second main hypothesis

The result	R ^{2} rate	of determination R2	value F	p Value	Relationship of variables
Reject the null hypothesis and accept the alternative hypothesis	0.356	0.360	99.954	0.000	Technology-driven Customer <- operations journey
Reject the null hypothesis and accept the alternative hypothesis	0.409	0.413	125.114	0.000	<- Benchmarking Customer Journey
Reject the null hypothesis and accept the alternative hypothesis	0.453	0.456	149.159	0.000	Data-Driven Decision Making -> Customer Journey
Reject the null hypothesis and accept the alternative hypothesis	0.508	0.511	185.942	0.000	Market Trend Analysis Customer Journey <-

Source: Prepared by the researcher based on the results of SPSS v.27

3.3. Discussion

The results of the statistical analysis revealed a strong positive correlation between marketing engineering and the customer journey in the organization under study. The correlation level reached a very high value, which means that implementing marketing engineering will lead to a significant increase in the customer journey. The results also showed that the organization under study's adoption of marketing

engineering, through its dimensions tested in our current study model at the aggregate level, plays a significant role and contributes effectively and effectively to enhancing the customer journey. The results of the statistical analysis showed that the "market orientation analysis" dimension is the most influential among the marketing engineering dimensions in supporting the customer journey. These results indicate that the training and development procedures adopted by the organization under study were effective and contributed to improving the capabilities of human resources.

4. CONCLUSIONS

The researcher was able, based on the results of the study, to conclude the following:

1- The university under study has an appropriate technological environment that facilitates student admission procedures and the preservation of their academic information.
2- The university under study is keen to facilitate academic procedures for students compared to other private universities.
3- The university under study works to provide a comprehensive database of everything related to student affairs, which is used in making some decisions related to students.
4- The university under study is interested in analyzing market trends regarding students' desires and the majors that align with their aspirations.
5- The university under study seeks to address the technical problems that cause technological disruption in the links related to student admission procedures and the management of their academic affairs.
6- The university under study has an acceptable level of student and beneficiary satisfaction with the university's services, based on their interest in the services it provides to its students and beneficiaries.
7- Marketing engineering has a high impact in supporting customer journey procedures at the university under study.

4.1. Recommendations

1- The administration of the university under study should keep pace with developments in modern technology in order to facilitate their procedures for students and the beneficiaries of their services.
2- The university under study should pay attention to the procedures adopted by other universities and benefit from them in solving some of the problems that arise in their application and strive to excel over them by simplifying their procedures.
3- The administration of the university under study is required to pay more attention to providing a database for students and all services provided to beneficiaries.
4- The university administration should pay more attention to market trends and community requirements, identify the scientific specializations desired by students, and strive to establish scientific departments related to those specializations.
5- The university should strive to diagnose and address the existing defects in admission channels, technical problems, and technological disturbances that students face during the process of applying to the university or benefiting from the technical services it provides.

6- The administration of the university under study is required to work to provide all academic requirements while providing a university environment appropriate to students' orientations in order to gain their satisfaction with the university services provided to them.

7- The university administration should increase its interest in adopting marketing engineering dimensions in order to facilitate the benefit of customers, represented by students, during their journey to obtain and benefit from its services.

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