International Journal of Advances in Computer Science and Technology

The role of Smart Technologies in Managing Customer Knowledge: A Survey Study

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ABSTRACT

Contemporary organizations in the era of the knowledge economy have taken care of managing customer knowledge to achieve efficiency and effectiveness in the work entrusted to them, and at the same time, recent developments in information technology have pushed organizations to acquire smart technologies, which help them deal with customers intelligently to find smart solutions that achieve the goals of both the client and the organization.

In this scientific study, we touched on the role of smart technologies in managing customer knowledge through the main question: What is the role of smart technologies in managing customer knowledge? by using the method of critical review to review a set of studies related to the variables of the study.

The results of the study showed that smart technologies contribute to the success of managing customer knowledge and smart technologies enable managing customer knowledge anywhere, anytime, and they also affect the customer experience.

The current study found that customer knowledge is the basis for gaining competitive advantage, and through its management helps in gaining customers and building databases in organizations, the study has recommended organizations to use smart technologies in customer knowledge management to meet the wishes and needs of their customers, and that requires the support of the leadership of the organization with all resources, It is also recommended that researchers and specialists in the field of knowledge management and managing customer relationships pay more attention to addressing research areas extensively in smart solutions that contribute to the support of customer knowledge management.

Key words : Knowledge Management - Customer Relations Management - Customer Knowledge Management - Smart Technologies

1. INTRODUCTION

Contemporary organizations in this era rely on knowledge in the product industry, and this necessitates finding plans to benefit from the acquired knowledge assets, which are intangible assets, which are the knowledge inherent in the minds of individuals as a result of experiences and experiences and the exchange of ideas with others, as well as the behaviors and needs of customers, including "customer knowledge", which is the knowledge that the organization's customers have formed about & from, and is one of the components of intellectual capital, which is reliable in achieving competitive advantage.

Therefore, organizations must persevere in acquiring customer knowledge and investing it according to a clear strategy to improve the work environment and this strategy is known as customer knowledge management, which is an integration between knowledge management and customer relationship management, which helps organizations deal with customers intelligently, towards finding smart solutions that seek to achieve the goals of the client and the organization, which is represented in the organization's knowledge of the direction of each customer, And improve the products offered to customers. (1)

Since the advent of the Internet, man has lived in two worlds (the real world and the virtual world), which is moving towards the use of information technology in his life, and due to modern trends in technology have resulted in a variety of technologies, called "smart technologies", which are technologies that contribute to sustainable development and constitute a good living environment.

This has led to an increasing amount of data in the world day by day, due to the use of the Internet and smart technologies, where data has become important for many organizations, a collection of data that is difficult to manage in databases.(2)

We also find that the recent developments facing organizations in ICT have pushed them towards the acquisition of smart technologies to manage customer knowledge (need and impression) that they possess, to achieve excellence, sustainability, and maintain competitiveness.

There are many previous studies that have touched on the topic of the role of smart technologies in managing customer knowledge and addressed it from different angles, including the study (3) which aimed to identify the technological factors that support customer knowledge management, the study (4) which aimed to explore digital technologies that support companies in customer knowledge management strategies and the study (5) which aimed to know the effects of smart technology on customer dynamics and customer experience, We note that the

current study is consistent with previous studies on the subject of dealing with customer knowledge and management, and we will analyze these studies with reference to their most prominent features, but the current study differs from it in several aspects such as the research gap addressed by this study, in order to form an idea of the problem of the study through the following question: What is the role of smart technologies in managing customer knowledge?.

We answer the question of the study, through the use of the methodology followed and the analysis of those studies, then we address the results and discussion with a comment that includes the most prominent research trends and years of publication, then aspects of agreement and disagreement and finally the conclusion.

2. METHODOLOGY

Based on the question of the study and its suitability to the nature of the study, the method of critical review was used, which is a method that examines the ideas of writers and researchers on a topic from the point of view of another person, and depends on the researcher's knowledge of the subject in addition to other factors aimed at clarifying some points about the book or article, and not discussing everything that was written, to study many studies and literature and then analyze them, In the field of customer knowledge management and smart technologies, according to a scientific methodology, ensure the answer to the question of the study.

3. PREVIOUS STUDIES

Search engines and databases were searched with the variables of the study, and the results resulted in a scarcity of studies that dealt with the capabilities of smart technologies in the field of customer knowledge, despite the increase in intellectual production and its multiplicity of forms with the emergence of the fourth technological revolution in the field of smart technologies, which focused on different areas (smart cities and others), and also other studies that dealt with customer knowledge from multiple perspectives without harnessing smart technologies in their management, Through this study, the researcher tries to review the published literature in the topics related to the study, we will show the studies that have been selected for their relevance and relevance to this study, and the studies cover the period in the last five years from 2017 to 2021, and present from the latest to the oldest, as follows:

3.1. First study/ The Titled: The impact of Electronique Customer knowledge Management On Perceptual Pattern, a case study of the Mobile Communications Corporation, Mobilis. (6):

This study aimed to identify the impact of electronic customer knowledge management at the level of the perception pattern of customers, and used the descriptive approach and the questionnaire tool, to achieve the objectives of the study, and a non-random sample of 402 customers of the Communications Corporation Mobilis was a referendum, and the results of the study concluded that attention should be paid to the management

of electronic customer knowledge to gain its customers because it supported institutions with the knowledge of their customers and influence them through that knowledge, It also motivates customers to buy, and helps institutions build the database, and to achieve this it is necessary to provide software and acquire the latest technologies for (CKM), as the study found a statistically significant effect at the level of morale ($\alpha \leq 0.05$) of the independent and dependent variable.

The study recommended that Mobilis Communications Corporation to pay attention to the management of electronic customer knowledge to gain its customers, provide material capabilities and software and adopt the latest technologies in electronic customer knowledge management and carry out studies on changes in customer behavior, and constantly renew the database.

3.2. Ninth Study/ The Titled: Customer knowledge management and smart tourism destinations: a framework for the smart management of the tourist experience - SMART. (7):

This study aimed to clarify how to manage customer knowledge in tourist destinations, which enables destination management organizations (DMOs) to intelligently manage the tourism experience, contribute to the creation of smart solutions and promotion of smart tourism destinations (STDs), and used the survey methodology, the methodology of research of design science and the interview tool, to conduct interviews with tourism professionals, where the study contributed to the integration of customer knowledge management and smart tourism destinations by developing a conceptual framework towards the possibility of managing customer knowledge in tourism experiences using technologies. Smart, The results of the study showed that the "tourism experience" is knowledge management for customers that improve and innovates tourism products and services, and the study reached the provision of a framework for creating smart solutions in the tourism experience in line with smart tourism consisting of eight processes in customer knowledge management that includes 30 auxiliary activities.

The study recommended that tourism experiments apply the proposed model with its development and that future studies be conducted that use semantic web neural programming via ontology to improve the extraction of knowledge from tourism experiences.

3.3. Third study/ The Titled: Customer Knowledge Management in SMEs Facing Digital Transformation. (4):

This study aimed to explore digital technologies that support SMEs operating in the creative industries in their CRM strategies and used the survey methodology, focus group, and questionnaire tool to survey 73 handicrafts and retail companies, and the results of the study indicated that the scenario has changed within a few years and that the SMEs surveyed are using intensively traditional technologies that support CRM processes instead of more innovative digital technologies. Which are cheap and easy to use, and the study resulted in a report on the range of digital technologies used in customer knowledge management, and a draft list of tools in which the

digital techniques adopted in the field of customer knowledge management were divided into three groups: (1) relational tools, (2) marketing tools and (3) search optimization tools, The study recommended that future research needs to expand on the findings it relied on different contexts.

3.4. Fourth Study/ The Titled: Detecting customers' knowledge from social media big data: Toward an integrated methodological framework based on netnography and business analytics. (8):

This study aimed to illustrate how to create value from big social data through web integration and business analytics towards leveraging customer relationship management and customer knowledge management and used a qualitative approach and a case study of Aurora, which specializes in the production of ballpoint pens.

The results of the study showed the importance of the integration of big data and web analytics in the development of a customer relationship management strategy, and that customer capital is important in determining the competitive positions of companies, by showing the opportunity to integrate business analytics and sentiment analysis as a typical and well-known approach to social relationship management Big Media data, in addition to the success of the CRM strategy in the era of big social data is conditional on a combination of features that companies have to develop and acquire for their effective use of social media.

The results also showed that social media represents a valuable platform for interacting with customers, but fully exploiting these tools for a more effective and endorsement marketing strategy requires a nurtured investigative lens to activate knowledge management, ICT, and big data.

The study recommended in future research the need to integrate other big data approaches (such as sentiment analysis and social networks), advanced tools, and mechanisms to detect cyber risks and ensure data validity.

3.5. Fifth study/ The Titled: Managing customer knowledge through the use of big data analytics in tourism research. (9):

This study aimed to provide a literary review to present the issues associated with the use of big data in tourism and research trends, where Stone included (60) scientific studies, and the results of the study through the analysis of studies revealed the interest of academics in big data in the tourism sector, and can be justified from two main points of view, first: Big data provides invaluable opportunities for value creation in all industries, Second: Due to the nature of the intensity of information in the tourism sector, it is clear that data, information and knowledge are the basis for gaining competitive advantage in the field of tourism, where they play a role in tourism as a major source of knowledge, although these topics seem to be of crucial importance to ensure the success of big data initiatives, there are issues that do not address them, and in the end the study recommended a set of issues that could be research areas in the future, Most notably, the potential of big data in maintaining innovation, developing new products and new business models.

3.6. Sixth Study/ The Titled: Analyzing Big Data through the lens of customer knowledge management: Evidence from a set of regional tourism experiences. (10):

This study aimed to identify the support of customer knowledge management through big data analytics and used a qualitative approach and multiple case studies to explore a range of local digital events related to the interface of Apulia (southern Italy), and the results of the study concluded that the field of tourism is a knowledge-intensive field, and tourism management requires the creation of value by transforming the huge amount of big data into valuable assets for competitiveness in tourism organizations, There are four cases of local trials selected to understand how CKM is used as an appropriate approach to creating value from big data, where a preliminary description of each local digital experiment was provided in terms of the nature of the digital experience, a comparison of cases based on the three dimensions of CKM (from – about – about), and the results on the analysis of the importance of experiments as a CKM approach to meet the challenge in the value industry of big data in tourism.

The study recommended the importance of awareness of big data as a real source of knowledge and can support the identification of innovative entrepreneurial opportunities for companies, and also recommended a range of research areas that can feed the process of value creation of big data, in terms of the tools, methods, and data generated by customers on social media that can be addressed towards the creation of valuable assets, and how destinations and institutions can leverage big data to be smarter, requiring theoretical and empirical studies.

3.7. Seventh Study/ The Titled: Technological Factors Supporting Customer Knowledge Management: A Case Study Research. (3):

This study aimed to identify the technological factors that support the implementation of customer knowledge management to improve the efficiency and effectiveness of customer relationship management, and the study used the qualitative approach and the tool of case study, interview, and observation to collect data, where the study was conducted based on an in-depth case study in Defrayal Medical Insurance Brokerage Company, from the perspective of a resource-based presentation through several questions using the interview tool with the employees of the entity, A one-month monitoring was also conducted to monitor relationships between departments, knowledge exchange and transfer, and the use of technology tools, and the results of the study concluded that technology-facilitated CRM by automating its knowledge-intensive business processes, and also led to the integration of knowledge management techniques into CRM systems such as research functions and data mining techniques, and led to the application of customer knowledge through CRM processes to increase customer satisfaction and retention.

The study recommended that for CRM and KM initiatives to succeed in achieving efficiency and effectiveness goals, organizational factors (culture and organizational structure, knowledge management processes, and technology systems) must be taken into account in future studies.

3.8. Eighth study/ The Titled: Customer Knowledge Management In the Cloud Ecosytem. (11):

This study is a literary review, aimed at presenting a conceptual model of CKM using big data platforms and cloud computing, and showed the results of the study on traditional knowledge sources and local computing resources to support the knowledge cycle, where each of the CKM areas was conducted independently (big data and cloud computing), and that showed the need to conduct a study that integrates those areas, where it produced an integrated system that uses modern and emerging technologies that support customer knowledge management, It provided the framework for integrating big data analytics and cloud systems, towards creating actionable knowledge to support the knowledge management processes of organizations, and disseminating knowledge as a service based on user requests anywhere, anytime around the world.

The study recommended that future studies could focus on implementation issues toward creating an integrated platform that uses modern and emerging technologies that support cloud-based CKM, migration from on-premises to cloud-based platforms, integration of secure on-premises and multiple cloud systems, and further exploitation of the Internet of Things.

3.9. Ninth Study/ The Titled: Investigating the effects of smart technology on customer dynamics and customer experience. (5):

This study aimed to investigate the effects of smart technology on customer dynamics and customer experience, examine the retail environment in the UK, and contributed to the collection of technology-based consumer behavior literature, the survey approach and structural equation modeling (SEM) was used via AMOS, and a suitable sample of 330 consumers shopping at a retail store in London, UK, was surveyed. The results of the study showed through the literature on smart technology, customer behavior, retail marketing, and retail management about the possibility of applying customer dynamics in the acquisition of knowledge of customer behavior, through the contribution of behavioral intentions and commitment to learning and customer engagement to drive the customer experience, and the study found benefits in the context of retail reflecting the role of customer dynamics and the customer experience in adopting the application of smart technologies in the retail environment, As the results showed in understanding the determinants that affect customer dynamics and customer experience using smart technologies, the study designed a conceptual framework.

The study recommended researchers in the field of study justify the reversal of the sequence of relationships between the customer's commitment, participation, and experience, as the empirical evidence in this area of the study will help researchers rationalize causal relationships between variables that were the focus of this study.

3.10. Second study/ The Titled: The impact of the use of information and communication technology on customer knowledge management : A case study Abu Al-Haj Group. (1):

This study aimed to identify the impact of the use of ICT on customer knowledge management and used the analytical descriptive approach and the questionnaire tool to conduct the study, where the questionnaire was distributed randomly to the customers of Abu Al-Haj Taxi Group in Jordan, and the results of the study found an impact of information technology using the website and mobile on customer knowledge management, as well as the impact of the dimensions of customer knowledge management (known for the customer, know about the customer) in improving the level of meeting the desires and needs provided to customers, The study recommended the distinctive Abu Al-Haj Taxi Group to develop policies and procedures that will enhance the work on the website in the company because of its contribution to obtaining customer knowledge, and also recommended the development of training programs for drivers to motivate customers to use the website and mobile application.

4. RESULTS AND DISCUSSION

Many studies have touched on the subject of customer knowledge management, but the current study was limited to the process of retrieval of intellectual production published on studies that dealt with the topic of the role of information technology in customer knowledge management in general, and the use of smart technologies in customer knowledge management in particular, to ensure that they do not depart from the field of study, and those studies were reviewed in the previous paragraph in a summary showing their potential, The scientific gap addressed by the current study can be expressed through what has been reviewed and through the following:

A. Strengths of previous studies:

The researcher refers to the review of previous studies according to the period between 2017-2021, and included several countries and countries, which indicates their temporal and geographical diversity, and (10) studies were examined, represented in Figure 1:
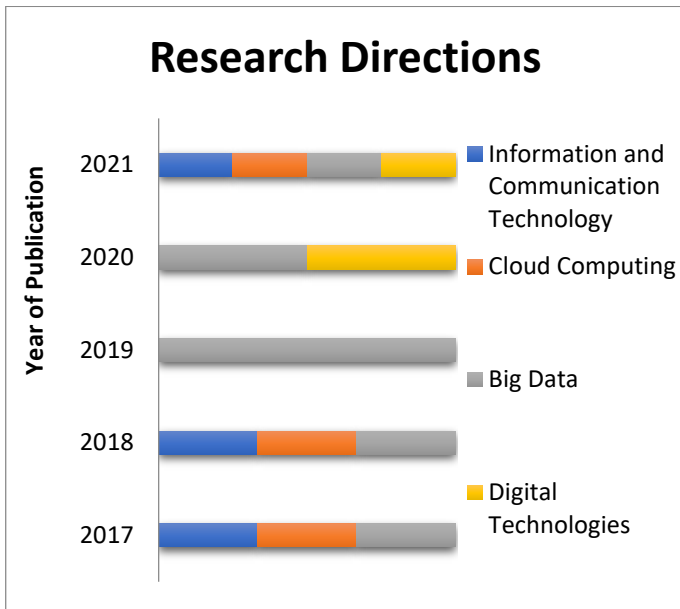
Research Directions

Figure 1: Research Trends and Publishing Year

The previous figure showed the research trends that dealt with in previous studies in four directions, and previous studies were distinguished in addressing the topic of the role of smart technologies in customer knowledge management from different angles, as previous studies diversified in the use of smart technologies and information technology, and also distinguished in the novelty of publication as in the previous figure and the following comment: The first trend was represented in the role of the use of information and communication technologies in customer knowledge management, The debut was in 2017, then in the same year research trends towards the use of ICTs in customer experience were geared towards their application in the acquisition of knowledge through customer dynamics and behavior.

The second trend of studies formed in the use of big data analysis and cloud computing techniques in customer knowledge management in 2018, and 2020 appeared as a new trend by integrating the Internet with big data analysis techniques for customer knowledge management, and in the same year a trend appeared to use the latest digital technologies in customer knowledge management, all those research trends produced a modern trend in customer knowledge management towards the use of smart technologies, The latest studies in 2021 were recommending organizations towards the acquisition of modern and smart technologies, because of the support they provide in the knowledge of their customers and influence them through the management of their knowledge, and this leads to the improvement and innovation of the product and service.

B. Previous studies curriculum:

After reviewing the previous studies, it became clear in the table of curricula of previous studies that the descriptive approach is more used, as shown in Table 1:

Table 1: Previous studies methods

Studies	curricula
First study	Descriptive method
Second study	Survey method and structural equation modeling
Third study	Literary review
Fourth Study	Qualitative approach and case study
Fifth study	Qualitative approach and study of multiple cases
Sixth Study	Literary review
Seventh study	Qualitative approach and case study
Eighth study	Survey curriculum and focus group
Ninth Study	Survey method and design science methodology
Tenth Study	Descriptive approach

It is clear from the previous table that the descriptive approach is the most used in previous studies, as it includes the survey method, the qualitative approach, and the case study or cases, through the collection and interpretation of phenomena and events.

In this regard, we point out that the current study is consistent with previous studies on the subject, and differs from it in the methodology "method of critical review", and the researcher in this study reached through search engines and databases in terms related to the subject of the study The absence of a study that included more than one smart technology in customer knowledge management, and the reason for this is due to the novelty of the subject in the whole world (according to the researcher's knowledge).

C. Similarities in previous studies:

Analysis of previous studies shows that most studies agree on the following points:
- On a common goal which is how to manage and exploit customer knowledge.
- Harnessing information technology and smart technologies in customer knowledge management.
- In the methodology, the descriptive approach was used in most studies, except for the third and sixth studies, which used the literary review.
- Most previous studies have used the resolution tool.
- The first and tenth study in the methodology and tool.
- The fourth and seventh studies in the case study methodology, while the fifth study used multiple case studies.

- The fifth, a sixth, and ninth study in the environment and community of the study "Tourism sector".
- The second and tenth study in dealing with customer behavior.
- The first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth study on the effectiveness and role of information and communication technology in general and smart technologies in particular in the success of customer knowledge management through its processes and dimensions, and in the management of the customer experience intelligently, the study also agreed that customer knowledge management gains new customers and motivates them to buy and contributes to building the database, and that supports organizations in the success of customer knowledge management.

D. Differences in previous studies:

Analysis of previous studies showed that the difference between studies was in the following points:
- The second study about the first, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth study in linking smart technologies to customer dynamics and customer experience, and using the methodology of modeling the structural equation.
- The third study on the first, second, fourth, fifth, sixth, seventh, eighth, ninth, and tenth study in providing an integrated system that integrates big data analytics and cloud systems to support the processes of customer knowledge management in organizations anywhere, anytime around the world.
- The fourth study on the first, second, third, fifth, sixth, seventh, eighth, ninth, and tenth studies on the use of the observation tool to monitor and control relations between departments and employees of the company.
- The eighth study on the first, second, third, fourth, fifth, sixth, seventh, ninth, and tenth study by designing a report on digital technologies in customer knowledge management.

10- Smart technologies contribute to the management of customer knowledge anywhere, anytime around the world.
11- Big data analytics within organizations lead to sound decisions.
12- Big data provides invaluable opportunities for value-making in organizations,

From the previous presentation, it is clear that this study addressed a multifaceted scientific gap by addressing the role of smart technologies in customer knowledge management, and their uniqueness in the use of the method of critical review, where the study previously dealt with several studies, and concluded that the acquisition of smart technologies requires supporting the leadership of the organization with material and human resources.

The study recommended that organizations use smart technologies in customer knowledge management to meet the wishes and needs of their customers and educate employees about the importance of customer knowledge management, and qualify them with smart methods and technologies for smart management.

She also recommended that researchers and specialists in the field of knowledge management and customer relationship management pay more attention to addressing research journals extensively on smart solutions that contribute to customer knowledge management.

- The ninth study on the first, second, third, fourth, fifth, sixth, seventh, eighth, and tenth study on the integration of customer knowledge management and smart tourism destinations, and the establishment of a framework consisting of eight processes of customer knowledge management involving 30 activities.

5. CONCLUSION

This study aimed to shed light on the role of smart technologies in customer knowledge management and to see some relevant studies to reach appropriate evidence and solutions to manage customer knowledge intelligently.
The researcher has reached a set of fundamental points after the previous studies have been listed and analyzed, namely:
1- The client's capital contributes to enabling organizations to determine their competitive positions.
2- Customer knowledge is the basis for gaining a competitive advantage in organizations.
3- Customer knowledge contributes to achieving the competitive advantage of organizations.
4- Knowledge management for customers contributes to the improvement and innovation of products and services.
5- Customer knowledge management helps to win customers, and motivate them to buy.
6- Customer Knowledge Management helps organizations in building a database of customers.
7- For the success of customer knowledge management, there must be a strategy for it.
8- Smart technologies contribute to the success of customer knowledge management processes.
9- Managing customer knowledge using smart technologies that affect the customer experience.

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