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## Factors Affecting Customer Relationship Digital Transformation Strategies in Airline Industry: A Grounded Theory Approach

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#### Abstract

The purpose of this study is to examine the factors which influence digital transformation (DT) strategies in customer relationship management (CRM) focusing on airlines in UAE using three key airlines as statistical population. The research was carried out in two separate phases. Applying grounded theory (GT), the first phase took a qualitative approach using a methodological framework adapted from Corbin & Strauss (1990) [1]. This involved 13 CRM experts with deep understanding of digitization processes within the airline sector who were subjected to intensive interviews during this stage. The participants were chosen using the snowball sampling approach, with theoretical saturation based on all important topics and ideas being investigated during the interview process. The qualitative analysis showed that successful CRM digital transformations have two essential phenomena are Strategic Digital Transformation Alignment with CRM Objectives, Technological Adaptation and Innovation. Besides, some causal and intervening conditions, strategies and outcomes have also been found outlining how these elements interact. During the second phase, structural equation modeling (SEM) was employed for validating quantitatively the conceptual framework that had been developed in the previous qualitative phase. Convenience sampling was used to obtain a sample size of 117 employees responsible for CRM activities within the three UAE airline companies. SEM results supported grounded theory conclusions about strategy alignment, smooth integration of new technologies, and encouraging a customer-centric mindset to increase CRM effectiveness, among other topics. The results indicated good model fit thus provided empirical evidence for identified relationships between factors.

Keywords: Customer Relationship, Digital Transformation, Airline Industry, Grounded Theory

#### Introduction

Companies must ensure their survival and long-term presence in this dynamic sector in an era where competition shapes the aviation industry's environment both locally and globally. This requirement is made more pressing by the open nature of the sector, which drives airlines to pursue resilience and quality. A crucial facet of this endeavor is the deliberate endeavor to hold onto clients who provide the foundation for ongoing development and future expansion. The adoption of cuttingedge initiatives like Electronic Customer Relationship Management (E-CRM) is critical to a company's ability to survive in the modern business environment [2]. Marketing, as a dynamic aspect of goal-oriented activities, has developed into a sophisticated area of innovation where everything appears doable. In the airline business, E-CRM has become a major actor with the goal of meeting consumer needs and building long lasting connections [3]. Businesses look for ways to get a competitive edge in a world of increased globalization and competitiveness, and implementing E-CRM has turned into a key differentiator. Companies may customize their strategy to stand out in the crowded market by adding other elements, such as customer knowledge, traditional CRM methods, and a dedication to service quality [4,5]. In order to improve their CRM system, businesses are increasingly heavily involved in handling vast amounts of customer data [6].

E-CRM refers to the process of achieving Customer Relationship Management objectives through the use of web-based resources such as emails, websites, and communication channels. The airline sector has seen a tremendous transition as a result of this well-organized and coordinated process, which has given companies the ability to communicate with consumers in a meaningful way, increase revenue, and provide targeted messaging. The total interactions and engagements respondents have had with the airline's digital platforms website, mobile app, social media accounts, email correspondence, and any other digital touchpoints characterize as their E-CRM experience. These exchanges include things like looking through travel possibilities, booking reservations, getting alerts, contacting customer service or online chat for help, and leaving comments or reviews [7]. E-CRM is a key component in the transformation of the marketing industry, with the main objective being to increase an organization's efficiency in developing and maintaining customer connections. E-CRM helps create a dynamic and responsive marketing environment by assessing marketing performance in light of business outcomes and making wise decisions to improve marketing strategies [8]. It is critical to acknowledge the variety of clients across all generations. Events in life influence attitudes, tastes, and behaviors, which is why marketers increasingly realize how important it is to divide up their clientele based on age in order to operate successfully and efficiently [9]. Currently, one of the most important components to increase an organization's competitiveness is its technological innovation capabilities (TICs). Because measuring TICs requires evaluating several attributes and expert opinions, it is a complex decision-making process that is challenging to complete [10]. For sectors that recognize its potential, digitalization offers a number of benefits [11]. The aviation sector is no different.

This study examines the following topics particular digital infrastructures, the driving forces behind airline digitalization, and the effects of electronic applications on the aviation sector. It focuses on the digital transformation of the airline business in the highly competitive global economy. The secondary goal is to analyze the effects of digitalization from two angles how passengers are impacted during the entire journey, and how airlines are motivated to develop their marketing plans. A few key metrics are taken into account in order to assess the performance of digital infrastructures, maximize operational effectiveness, and enhance customer satisfaction, such as average waiting time and loss rate.

The global rivalry amongst various corporations has intensified with the growth of the aviation sector. Innovations have greatly enhanced technologies, which can change how firms operate and behave [12]. One of these technical advances in the aviation sector that has been driven by technologies that have been embraced as essential business strategies is the digital transformation.

This is also known as "digitalization," which is a term used to describe a social or cultural phenomenon that gives rise to new business models for corporations. A significant change in how businesses use technology to improve their marketing strategies and interact with consumers is represented by the digital transformation of marketing. Due to technological breakthroughs and the growing significance of data-driven decision-making, this shift has become essential for success in the digital era [13]. The aviation sector has made significant financial and human resource investments in recent years to develop new digital technologies, such as sophisticated software packages, mobile communications, websites, and self-service equipment [14]. This kind of progress encourages the company to reconsider ways to raise performance levels. High-tech thus enables airlines to deliver better services to their customers and realize higher value. Nevertheless, given their modest profit margins, the majority of airlines find it difficult to transition from conventional or less practical systems to cutting-edge ones.

According to Silling (2019), customer-centricity has therefore been exaggerated and undervalued [15]. As a result, the aviation sector needs to understand its shortcomings and how to address them. The aviation sector now has more room to develop new business strategies in the digital age thanks to the quick growth of social networks and mobile applications. Target marketing and consumer analysis must be prioritized due to the abundance of social media and other digital platforms [16,17].

The modern global environment is undergoing upheaval, making it impossible to apply conventional methods, tools, and techniques for logistics management in an efficient manner. In this context, several unconventional techniques for creating demand for goods and promoting them, as well as management strategies, "smart" technology, contemporary techniques for luring clients, and digital marketing tools, have become commonplace [18]. According to a poll conducted by Altimeter-Prophet, a consulting firm, among 528 managers and experts on the topic of strategic management of digital transformations [19]. The primary focus of efforts is to enhance the system of connections with customers (54% of experts). Gartner expects that 25% of all consumer contacts in 2019 were automated through the use of machine learning and artificial intelligence. Simultaneously, according to Kwilinski et al. (2023), 91% of businesses want to use artificial intelligence in the future to handle customer connections [18]. The airline industry is witnessing a rapid digital transformation that has significantly altered how businesses handle relationships with their clients. As competition increases and customers become more tech-savvy, airlines are under extraordinary pressure to digital transformation strategies is complicated since it involves many elements including technological infrastructure, organizational culture and regulatory compliance.

However critical these strategies are, there is still an information gap on what specifically influences success of such initiatives in the airline industry, especially among Middle East airlines. It is a significant gap that poses a major challenge to airline companies wishing to remain competitive and meet changing customer demands. This research aims at exploring and finding out the main factors affecting digital transformation of CRM strategies in airline industry through a focus on three major airlines companies in UAE. This study uses grounded theory approach where data collected using in-depth interviews; managers from which we can develop theoretical frameworks based on insights gained from them for guiding managerial decisions towards implementing effective digital CRM strategies for aviation players.

By studying this dynamic sector within Emirates' borders, our paper does not only add knowledge but also provides important tips for airline carriers that want to use technology for enhancing their customer relationship.

#### **Literature Review**

Travelers' purchasing habits are evolving quickly thanks to modern technology.

Today's air travelers may arrange their journey with openness thanks to the information they have access to from many sources. They may evaluate the costs and features of plane tickets before deciding which ones to buy. For this reason, relationship marketing emerges as one of the most important subjects in the modern airline sector. Repurchase passengers are attracted to the airline when excellent ties are built with the client base. Even while service malfunctions do happen occasionally, the airline's CRM initiatives frequently contribute to a reduction in customer dissatisfaction [20]. Many practitioners and academics are currently interested in CRM [21]. Airlines are increasingly implementing customercentric policies, procedures, instruments, and technology to manage customer interactions more effectively and efficiently. They understand that in order to develop close, cooperative partnership relationships with their customers and boost recurring business, they must have comprehensive and integrated customer information. This makes the connection mutually beneficial from an economic standpoint [22,23]. The way businesses interact with their consumers is being profoundly changed by the introduction of new channels and technology, which is increasing the level of integration between the marketing, sales, and customer service departments inside businesses. According to Alshurideh et al. (2019), CRM is an enterprise method that practitioners use to fully understand customer behavior and preferences and build plans and programs that motivate consumers to continuously improve their commercial connection with the organization [24]. Thanks to technology, marketers may reach a worldwide audience with their campaigns, giving them the ability to successfully manage their clientele [25].

Technology investments provide insights into consumer behavior for the objectives of customer relationship management [26]. Ideally, digital transformation in customer relationship management allows businesses to create goods that cater to the unique demands and desires of their clients through automated classification and customer interactions [27]. Consumers can provide feedback on product development [28].

Additionally, it offers insights via ongoing observation of consumer behavior and enhances customer intelligence through customer centricity, customer risk analysis, and customer retention [29]. e-customer relationship management is used in forecasting, algorithmic trading, and organizational intelligence in addition to classification and customer interactions [30]. The term "Electronic Customer Relationship Management," or "E-CRM," was initially used in response to the growing influence of digital technology and the Internet on business operations in the late 20th century. This innovative approach revolutionized the administration and optimization of customer interactions through the use of digital channels like as email, social media, and online portals. E-CRM expands on the core principles of traditional CRM by using technology to enhance customer interaction, expedite communication, and facilitate the collection of crucial customer data for intelligent marketing and service strategies [31]. E-CRM is the method that all businesses use to manage their relationships with customers, according to Aria and Dafoulas (2023) E-CRM aims to establish and maintain long-lasting relationships with current and future customers [32]. Companies collect, store, retrieve, and assess client information. Enhancing customer relations on digital platforms is e-CRM's primary goal. In order to do this, technology must be used efficiently to gather, process, and use customer data for tailored marketing strategies, individualized communications, and personalized interactions [33]. Since it costs more to acquire new customers than it does to keep existing ones, Quaye et al. (2018) contend that a company's customer base connections are a crucial success component [34]. Chi (2018) asserts that E-CRM may help organizations enhance customer experiences, increase revenue, and eventually thrive in the online market [35]. The capacity of businesses and organizations to prosper in the digital era through efficient technology, such chat, social media, email, and other online channels, may be impacted by e-CRMs. Real-time consumer interaction enables businesses to provide help and issue resolution more quickly. E-CRM allows companies to interact with customers anywhere in the world and grow their clientele by overcoming geographical restrictions [9,36]. According to Nair and Aithal (2023), homebased enterprises are growing in importance within India's microscale business sector due to technical improvements and digital transformation [37]. Using correlation, regression, and structural equation modeling, they examined the effects of digital marketing tactics with an emphasis on "Bootstrapping Homepreneurs" in Mid-Kerala districts. The results showed that homepreneur ship is positively impacted by digital transformation marketing techniques, with their drivers being statistically independent. Industry 4.0 and digital transformation are two ideas that should be taken into consideration jointly.

Along with other technical advancements, Industry 4.0's introduction of new technology has brought about a great deal of change in our lives and corporate practices. As new technologies become a part of our daily lives, organizations must

adapt and implement the best strategies possible to ensure digitization, competitiveness, survival, and sustainability. We can refer to this as digital transformation in short. The integration of information and communication technologies (ICT) with manufacturing processes is known as Industry 4.0.

Furthermore, Industry 4.0 aims to create and incorporate information technologies into digitally transformed industries. To improve their ability to manage organizational procedures is the primary objective [38]. To better serve and benefit enterprises, digital transformation is a comprehensive change that involves technology, business processes, and human factors. The market and competitive landscape are shifting due to the introduction of new digital technologies, and it's possible that current company models won't change. Conventional wisdom is drastically altered by digital transformation, and this may have either beneficial or bad effects on enterprises. To refer to digital transformation as only technological would be incorrect. Digital transformation may be defined as an approach that impacts organizational structures and end-to-end business processes [39,40]. Digitalization affects many aspects of the business and society because of the greater network connectivity that these technologies provide. Digitalization is the use of data and digital technology to increase profitability, modify business models, and create a digitally information-centric environment for digital enterprises. Research indicates that the rapid progress of digitization boosts income and benefits both national and international economies [41]. Consequently, industries are urged to embrace digital change. Over time, the concept "digital transformation" has given rise to a substantial body of literature.

Digital transformation, according to Schlallmo and Williams (2018), is the blending of digital technology and business sectors in order to eventually achieve the transformation of the management model and business model [41]. In addition to products, value chains, business models, and services are also going digital [42].

Digital transformation has numerous benefits, but it also comes with significant social and economic concerns [43]. Online fraud is expected to rise as a result of the digital transition, according to some writers [44]. Moreover, research in the literature has demonstrated that privacy and information dissemination are among the issues surrounding the digital revolution [17,45]. Uncertainty surrounds the definition of DT.

Gong and Ribiere (2021) carried out a comprehensive analysis of 134 published definitions of DT in order to fill this vacuum in the literature [39]. In their essay, they describe digital transformation as a basic change process that tries to reinvent an organization's value offer for its stakeholders and significantly improve it. It is made feasible by smart resource and competency exploitation along with innovative use of digital technologies. Actual DT is defined by Saldanha (2019) as considering people, processes, and systems requirements in order to succeed in the impending" Industrial Revolution [46]. "In an ever-evolving digital economy, a different definition of DT centers on aligning technology, business models, and procedures to provide fresh value for both clients and staff [47]. In summary, DT has significantly altered consumer expectations and habits, placing significant pressure on established businesses and causing multiple market upheavals [48]. Examining the trend of digital transformation in the aviation business is a very limited body of study. Nevertheless, this sector is one of the most in need of a change in the way business is conducted.

Among the largest obstacles are low profit margins and high costs (fuel and labor), which need a quick adoption of digital solutions to boost productivity and enhance profits. Increased technological proficiency, e-business expertise, and competitive pressure have driven the industry's digital transition [49]. The recent Covid-19 outbreak has further demonstrated the necessity for enterprises to undergo digital transformation. According to Kronblad and Pregmark (2021), companies will continue to undergo modifications as a result of the pandemic's long-lasting consequences on business models [50]. Adoption of digital solutions has the potential to tackle issues that haven't been solved before, claims Silling (2019). It is stated that by improving the consumer and employee experience, this might serve as a route for developing new income streams and cost-cutting strategies [15]. He said that examples of these kinds of projects include the innovation laboratories operated by large airlines like EasyJet, Ryanair, Lufthansa, etc. Nurhadi et al. (2019) offered proof of the airline industry's necessity for digitization in their analysis of the Indonesian aviation sector [51].

Regardless of the frequency of travel, their research revealed a widespread discontent among travelers with the wi-fi services in Indonesian airports. Moreover, they concluded that digitalized facilities often improve the experience of the consumer [52]. This extensive review of the literature on digital transformation in the airline industry has demonstrated that many studies have touched on various aspects of digitalization such as new technology adoption, customer experience implications and challenges, and digital platform integration. However, there is a big gap in knowledge about what particular factors are necessary to drive successful CRM transformations in this sector. Most of the existing research is based on general trends or isolated case studies overlooking unique regional challenges faced by airlines especially in Middle East countries like Saudi Arabia. This gap is important as it may hinder airlines from coming up with effective strategies for dealing with fast changing technologies and customer expectations. This investigation aims at addressing this gap through a grounded theory inquiry into factors influencing digital CRM transformation strategies specifically within the context of UAE airline industry. Our study is particularly timely given the fast-growing aviation sector in this region and rising pressure on airlines to differentiate themselves through excellent customer service. This study focuses on three major airlines operating in UAE so that it can gain deeper insights about how these organizations navigate digital transformation complexities. Consequently, focusing locally enables us to identify factors that may not be captured in studies conducted elsewhere, thus contributing to a more nuanced contextual understanding of digital CRM in the airline industry. Our study

findings have several practical implications for airline companies. Our research identifies some drivers behind successful transformational efforts towards digitizing CRMs which can be used by practitioners who develop their own e-strategies to enhance respective competitive advantages. For example, understanding how organizational culture supports digital change can help carriers to become more supportive towards innovation. Furthermore, our survey underscores the usefulness of technological infrastructure for seamless integration with existing CRM systems presenting sound advice concerning technical elements during such type of organizational changes taking place today. These insights are crucial for airlines aiming to enhance their customer engagement and loyalty in an increasingly digital world. In addition, our findings extend beyond only addressing an academic problem but also broader policy-making and strategic planning within the aviation sector. The results from our study can form the basis for developing frameworks and guidelines that promote the adoption of digital CRM strategies in this sector by regulators and industry bodies that support digitalization of aviation. By doing so, our study contributes towards creating a more competitive customer-centric UAE airline industry and probably other areas with similar challenges.

Hence, through this research we not only fill an existing literature gap but also provide airlines with practical tools to succeed in the digital era.

#### Methodology

The study is based on a mixed method design that takes qualitative and quantitative approaches to examine the factors that affect digital transformation strategies for customer relationships in the airline sector. The research was carried out in two phases: a preliminary qualitative enquiry using grounded theory which was followed by confirming findings quantitatively through SEM.

#### Phase 1: Qualitative Exploration Using Grounded Theory Participants and Sampling

In Phase 1, we opted for purposive snowball sampling to recruit participants who have extensive knowledge about CRM and digital transformation within the airlines industry.

Thirteen experts were interviewed in-depth from three leading airlines operating in UAE. These included senior CRM managers, IT specialists and digital transformation leaders who were directly involved with implementation and overseeing CRM initiatives as well as digital strategies for their company. Given the specialized nature of the research topic factors affecting customer relationship digital transformation strategies in the airline industry we initially approached a few key informants who were experts in CRM and digital transformation within UAE airlines. These initial participants, who were identified based on their expertise and involvement in relevant projects, were then asked to recommend other potential participants who possessed similar knowledge and experience. This referral process continued, allowing us to reach a broader and more diverse group of experts who might have been difficult to identify through traditional sampling methods. By using snowball sampling, we were able to access a network of professionals deeply embedded in the field, ensuring the richness and relevance of the data collected.

#### **Data Collection**

Semi structured interviews were used to gather data which allowed the researchers to go deeper into areas of interest while ensuring that all important topics are covered.

The interview guide was developed based on existing literature with an aim of exploring participant's experiences, challenges, perceptions of the respondents towards CRM digital transformation. Depending on availability of participants and their preferences interviews were administered using face-to-face or video conferencing platforms. Consent was sought from all respondents before conducting each interview session which lasted between sixty minutes to one hour thirty minutes. During the process audio recording was done permitting accurate transcription later.

#### **Data Analysis**

The grounded theory approach proposed by Corbin & Strauss (1990) guided this analysis where it involves systematic set of procedures aimed at generating a theory derived from raw data itself [1]. The following coding stages had been undertaken:

Open Coding: Line-by-line scrutiny of transcribed interviews resulted in identification and labeling distinct concepts together with phenomena. This stage led to emergence of many categories representing different sides of CRM's digital transformation.

**Axial Coding:** After open-coding stage, categories which emerged were connected together during this stage; hence establishing relationships among categories and subcategories. For example, the authors investigated the links between organizational culture and technology adoption rates.

**Selective Coding:** In this final stage of coding, the categories which have been established were integrated and refined into a coherent theoretical framework. One central phenomenon was identified around which other categories were organized to reveal the major drivers for CRM digital transformation strategies. Data collection and analysis were conducted iteratively until theoretical saturation when no new insights or categories emerged from further data [53]. This assured both strength and comprehensiveness of developed theory model.

Variable	Frequency	Percentage (%)		
Total Respondents	13	100		
Role in Organization				
- Senior CRM Managers	5	38.5		
- IT Specialists	4	30.8		
- Digital Transformation Leaders	4	30.8		
Gender				
- Male	9	69.2		
- Female	4	30.8		
Experience in CRM/Digital Transformation				
- 5–10 years	6	46.2		
- More than 10 years	7	53.8		

#### **Table 1: Descriptive Statistics of Respondents**

#### Phase 2: Quantitative Validation Using Structural Equation Modeling (SEM) Participants and Sampling

After developing this theoretical framework, it must be validated quantitatively through conducting a study. This involved using convenience sampling technique to select 117 staff members who had been tasked with responsibilities of CRM in United Arab Emirates airlines. These respondents comprised of CRM practitioners as well as IT personnel operating in areas of digital transformation, thus encompassing diverse viewpoints within CRM sphere.

#### **Data Collection**

A structured survey was designed for use based on constructs as well as relationships that had been identified during qualitative phase. A single construct-specific item containing multiple measurement items each with a Likert scale was used to gauge different aspects influencing digital transformation in CRM accurately. Before being fully deployed, the questionnaire was pilot tested among some participants to guarantee its clarity and reliability. In order to quantify the dimensions and correlations found during the qualitative phase of the study, a structured survey questionnaire was created. Multiple assessment items for each concept were evaluated using a five-point Likert scale that went from "Strongly Disagree" to "Strongly Agree." To ensure a range of viewpoints, the survey was sent to 117 CRM practitioners and IT staff working on digital transformation at UAE Airlines. A pilot test was carried out among a group of participants prior to deployment in order to assess the questionnaire's dependability, clarity, and fit with the study's goals. Before collecting data on a large scale, the instrument was improved based on feedback from the pilot test.

#### **Data Analysis**

The survey was completed by the participants at their own time as it was sent electronically. In the SEM, statistical method for assessing structural relationships between measured variables and latent constructs, the data collected were analyzed.

This happened in two phases Structural Model Assessment With a good measurement model, we assessed structural relationships between constructs. This included evaluating hypothesized paths derived from qualitative phase for significance and strength. These tests were conducted using indices such as Chi-square statistic, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Indexes (CFI), Tucker-Lewis Indexes (TLI). Therefore, this two-stage methodological approach provides a comprehensive exploration and validation of factors influencing customer relationship digital transformation strategies in airline industry. By combining qualitative insights with quantitative validation processes, this study presents a strong foundation that is useful for both academic debates and practical changes within the sector as well.

#### **Results**

In the present research, three levels of coding were used as outlined in Corbin and Strauss's grounded theory methodology: open coding, axial coding, and selective coding. Each step contributed to a comprehensive comprehension of airline industry customer relationship digital transformation strategy determining factors.

**Open Coding:** During the first phase of open coding, authors went through line by line in each interview transcript systematically analyzing them and tagging or labeling those concepts that emanated from data. This process at the outset yielded many codes which were facets of CRM digital transformation. For example, we had such codes like "customer data integration," "technological challenges," "employee resistance" and "regulatory constraints." These were raw data points that later would be clustered into more meaningful groups.

**Axial Coding:** In this axial coding stage, our main goal was linking different codes identified during open coding into categories and subcategories. Connecting categories to their subcategories as well as understanding conditions, context

and interactions among them characterized this stage. For instance, category "technological challenges" can be further divided into subcategories like legacy system integration and data security concerns. This phase resulted in development of a skeletal framework that connected different aspects of digital transformation in CRM showing how some factors affect others within the airline business.

**Selective Coding:** The last part involved refining categories so as to make them flow logically together thereby forming a coherent narrative or theory. At this point we identified a core category known as 'strategic alignment of digital transformation with customer relationship management'. This central category has linked all other categories which show that successful CRM digital transformation requires technology advances aligned with strategic objectives, customers' needs and corporate culture.

Selective coding enabled us to produce a theory grounded on empirical evidence that explains what drives & blocks CRM digitalization efforts in airlines operating in UAE making it possible for practical interventions. Through these three phases of encoding methods our study brought out important insights on how these complex interplays impacts upon Digital Transformation Strategies in CRM practices of UAE airlines and what key recommendations can be given to industry players. According to the results of the interviews, several factors for each dimension were confirmed, as shown below, based on the dimensions of grounded theory.

#### **Core Phenomena**

Core phenomena are the main ideas that emerge from the data and become the focus of the study.

- Strategic Digital Transformation Alignment with CRM Objectives: This key essence involves integrating digital transformation efforts with overall customer relationship management (CRM) goals of the airline industry, thereby ensuring that digital initiatives are not just on their own but also in line with the strategic view of enhancing customer experience, loyalty and retention. Strategic alignment is crucial to ensure that technological investments directly impact broader organizational objectives.
- Technological Adaptation and Innovation: In order to achieve success in digital transformation in the regional airline
  industry there needs to be continuous adaptation of technology. In this sense, it refers to the use AI, machine
  learning or big data analytics by CRM strategies which are ahead of anything else seen so far. In terms of staying
  competitive and satisfying ever-changing demands of customers', aviation companies must always remain at the
  forefront of every new technology introduction.

#### **Causal Conditions**

They are underlying causes/conditions that bring about the core phenomena

- Digital Transformation Executive Leadership Commitment: One major causal condition that drives successful
  realization process for a company's digital revolution activities commitment by the highest-level corporate personnel
  toward digitization plans. Once top executives prioritize programs like these and allocate sufficient resources, it sets
  necessary intentions for people working in an organization and promotes an innovative culture.
- Competition Pressures on the Market Competitors: The competitive landscape within which organizations operate serves as a significant driver towards adopting digital transformations. Airlines have to improve their CRM approaches by innovating them better than their rivals if they want to maintain their market share. This pressure can accelerate adoption processes when it comes to new technologies and way of doing things.
- Regulatory Compliance Requirements: There are a number of legal conditions that must be met in regard to data protection, safety standards and so forth. A good example is when these political frameworks influence how fast or far digitalization will take place given that all such undertakings adhere to relevant laws.
- Customer Expectations for Seamless Digital Interaction: One of the major drivers of digital transformation is the need for modern consumers to have seamless personalized interactions across every digital platform. This expectation drives airlines to innovate through mobile apps, online booking systems and in-flight entertainment.

#### **Intervening Conditions**

These are contextual factors or variables that come between causal conditions and core phenomena.

- Technological Change Resistance by Employees: Employees' resistance is one significant hindrance towards successful completion of a company's digital transformation process. It may be due to fear of losing jobs, lack of qualifications or discomfort with new procedures. In order to facilitate smooth implementations, overcoming this form of opposition requires training programs as well as open channels for consultation.
- Organizational Culture of Innovation: The success rate associated with any digitization initiative largely depends on whether an organization has a culture that supports innovation while at the same time encouraging risk taking. Airlines with strong innovative cultures are likely to experiment with technology at their disposal and adapt faster than anyone else can imagine.
- Resource Allocation and Budget Constraints: Determining the adequacy of the resources applied is always a key criterion for success in digital transformation. Technological adoption scope may be limited by budget constraints; thus, organizations should consider first-time investments in important areas.
- Training and Skill Development Programs: Organizations should train their employees to enable them to use new CRM tools in order to overcome resistance among workers. Digital transformation remains on track through continuous learning and support.

#### **Strategies**

Strategies are approaches, techniques or interventions that can be used to address core phenomena or mitigate causal conditions or intervening ones.

- Staged Implementation of Digital Solutions: Airlines can implement digital CRM solutions sequentially to manage
  risks and ensure that each stage is successful before moving on. This approach minimizes the potential for disruption
  and allows for adaptations along the way.
- Cross-functional Collaboration for CRM Integration: Effective digital transformation requires cross-departmental collaboration amongst various departments like IT, marketing or customer service. Cross-functional teams can make sure that CRM initiatives are well-integrated and in sync with organizational goals.
- Investment in Data Analytics and AI for CRM: By investing in advanced analytics as well as AI technologies airlines can acquire deep insights into customers' behavior and preferences. This information is used to shape service delivery, predict trends, or improve overall experiences among clients.

#### Consequences

The consequences depict what results out of core phenomena as well as strategies put forth to address them.

- Enhanced Customer Satisfaction and Loyalty: Successful digital CRM strategies lead to higher levels of customer satisfaction and loyalty. Personalized experiences without any glitches result in a repeat business opportunity with positive company's reputation.
- Improved Operational Efficiency: With businesses undergoing a shift through digitization, operations have become streamlined thereby reducing costs while improving efficiency of CRM processes. As such, this leads to faster service delivery rates alongside improved resource management systems.
- Scalability of CRM Solutions: Digital CRM solutions allow airlines to expand their business and customer base without compromising on quality. This is particularly important as the airline industry continues to grow globally.

#### **Context (Contextual Factors)**

These are the general circumstances surrounding a phenomenon or the external factors that affect how these strategies work.

- Regulatory Environment in the UAE: When designing digital CRM strategies, airlines are also influenced by regulations in place especially on aviation and data protection matters. Therefore, a breach of these laws can result in failure of digital initiatives.
- Cultural Norms and Customer Behavior in the Middle East: Understanding the cultural context and customer behavior in the Middle East is critical for developing effective digital CRM strategies. Thus, airlines should develop their tactics based on what locals understand better.
- Economic Conditions and Airline Industry Dynamics: The economic environment and competitive dynamics of the airline industry in the UAE impact the resources available for digital transformation and the urgency of CRM innovation.
- Technological Infrastructure Availability: The availability of technological infrastructure such as high-speed internet or cloud computing is a key enabling factor for practical implementation of digital CRM strategies.
- Global Airline Industry Trends: Global trends, such as sustainability focus & low-cost carriers rise shape airline's priorities hence affecting their digitalized approach to managing relationships with customers (CRM).
- Stakeholder Expectations and Involvement: The expectations and involvement of stakeholders, including customers, employees, and shareholders, play a significant role in shaping digital CRM strategies. Engaging stakeholders is crucial for successful implementation.



Figure 1: Confirmed Grounded Theory Model by Experts

During the second phase of our research, we used SEM to validate and test the relationships that were discovered during phase one of grounded theory. SEM was employed in analyzing data collected from 117 customer relationship management staffs working at three airlines based in UAE for this model evaluation. In other words, with this method, we could confirm these theoretical constructs through quantitative means as well as how they are connected which were derived qualitatively from the initial interviews. This is especially true for looking at various factors influencing digital transformation strategies in CRM within airlines using SEM.

	CFI	NNFI	NFI	AGFI	GFI	RMSEA	$\chi^2/df$
Acceptable Range	≻ 0.9	≻ 0.9	≻ 0.9	≻ 0.9	≻ 0.9	≺ 0.08	≺3
Causal	0.94	0.98	0.97	0.92	0.94	0.055	1.716
Context	0.97	0.96	0.96	0.91	0.92	0.072	2.228
Intervening	0.99	0.98	0.97	0.91	0.94	0.052	1.646
Strategies or Mechanisms	0.98	0.97	0.97	0.91	0.95	0.062	1.904
Consequences	0.98	0.96	0.96	0.93	0.97	0.053	1.678
Core Phenomena	1	1	1	1	1	0.000	0.193

Table 2	2: 1	The	Fit	Indices	of	the	Dim	ensions
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Figure 2: Output of PLS Software for Measuring Factor Loadings of the Model



Figure 3: Output of PLS Software to Measure the Significance of Factor Loadings of the Model

The findings from SEM supported the conceptual model developed in phase one. The indices provided by the model suggested good fit, indicating that there was statistical significance between strategic alignment and its impact on some variables such as data integration and technological adoption. Consequently, our previous qualitative insights are confirmed. We find evidence that digital transformation success within airline CRM relies heavily on three elements-strategic alignment, technology adoption and cross-functional collaboration through SEM analysis. Furthermore, this analysis identified employee resistance and resource allocation as moderating variables in ensuring success of these initiatives towards digitalization process, thus highlighting their criticality to be addressed by airline managers while

planning for CRM system initiation. These results provide a comprehensive, evidence-based framework that can guide airline companies in optimizing their CRM digital transformation strategies.

#### **Discussion and Conclusions**

The service sector has grown in significance recently and currently contributes significantly to the gross domestic product (GDP) of the world economy. According to available data, the service industry will continue to expand rapidly in the upcoming years [54]. Businesses in the service industry also always have to deal with the problem of operating in uncertain settings. Consequently, innovation and digital transformation are necessary for businesses to create a winning competitive strategy.

The use of digital technology is growing in significance for accomplishing corporate objectives. Managers are becoming more interested in DT as a means of achieving differentiation and a competitive advantage [55]. Though little research has been done on the impact of DT on firm performance, the majority of the attention in DT literature has been on DT as a concept and the adoption process [56]. Groups like Ukko et al. (2019) have investigated DT using two primary dimensions managerial capability and operational capability, in a different line of inquiry [57]. Based on previously conducted research in this area, these dimensions were developed [58].

The researchers discovered that when a sustainability strategy acts as a mediator, management talents have a major influence on performance [59]. Digital transformation has completely changed how businesses operate, build relationships with suppliers, customers, and other stakeholders, and support innovation in business models and customer value generation in recent years [60]. According to Verhoef et al. (2019), digital transformation refers to a company's use of digital technology to construct a new digital business model that helps the company produce and appropriate more value [48]. Organizational capacities, operational procedures, and business processes are all impacted by this change [61]. The way that organizations and customers connect is changing due to digitalization. Specifically, customers may interact actively and smoothly with businesses and other customers over dozens of media channels, traversing an ever-growing number of touchpoints during their customer journey [62]. The current study seeks to investigate and determine the main factors that affect digital transformation strategies of CRM in the airline industry specifically focusing on two major airlines in UAE. We endeavored to gain an understanding of the underlying dynamics and difficulties that airlines face while integrating digital technologies into their CRM practices by using a grounded theory approach. Our study was carried out in two stages: Firstly, we conducted qualitative interviews with CRM experts for conceptual framework development and secondly, we used Structural Equation Modeling to quantitatively verify this framework. Results from the grounded theory analysis demonstrated a complicated mix of factors which significantly influence the digital transformation of CRM across airlines. These elements were grouped into core phenomena, intervening conditions, causal conditions, consequences, and strategies. In due course technological integration, data driven decision making and customer centric culture were seen as critical to forming successful strategies for a digitized era within organization. Also arising out of this research paper among other things are several crucial causal conditions like alignment of organization digital initiatives with aligned organizational goals availability of digital infrastructure available in terms technology required for implementation amongst others. In conclusion, this research contributes to the literature on digital transformation in airline industry by shedding light on various aspects of CRM strategies. These factors were uncovered through application of grounded theory and validated via SEM which ensured their soundness both theoretically and practically relevant. With airlines continually adapting to an increasingly digital world, the insights gained from this investigation can help them optimize their CRM practices so that they would perform better in the long run within a competitive aviation environment. In addition, future research may build upon these findings by examining how cutting-edge technologies such as artificial intelligence and big data analytics affect CRM implementation in airlines [63].

#### **Abbreviations**

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