

# INFLUENCE OF DIGITAL TECHNOLOGIES ON DIGITAL TRANSFORMATION OF KENYA AIRWAYS

Andrew Beecher Njagi<sup>1</sup>, John Ndavula<sup>2</sup>

<sup>1</sup>Jomo Kenyatta University of Agriculture and Technology

<sup>2</sup>St. Paul's University

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**Abstract:** The purpose of the study was to determine the influence of digital technologies on digital transformation in Kenya Airways. The study was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Digital Maturity Model. The study employed the convergent parallel mixed methods design. The study targeted all the 410 Management staff holding positions designated Grade H11 to H15 all the departments as of March 2020. The sampling was guided by Taro Yamane formula which yielded a sample size of 157 respondents. A questionnaire tool and an interview guide were used to collect data. Data was analysed using both descriptive and inferential statistics. The study found out that digital transformation process varied across the various departments and was therefore not harmonised across the entire organisation; cloud computing, website modernisation, journey maps and employee performance tracking initiatives were responsible for up to 77 % of the variations in the digital transformation of the organisation; and the use of customer journey maps and employee performance tracking impacted the most on digital transformation at Kenya Airways. The use of data and digital technologies to understand the customer needs behaviour and to develop responsive products had led to digital transformation at Kenya Airways. Recommendations were that the senior management at Kenya Airways pays more attention to two technologies namely, customer journey maps and employee performance tracking, for they were found to be the most impactful on digital transformation. Further research is suggested to identify other variables responsible for transforming organisations digitally.

**Keywords:** Customer Journey Maps, Employee Performance tracking, and Digital Transformation.

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## 1. INTRODUCTION

Fast growing digital technologies have radically changed the business environment (Hess & Hartl, 2017). To deal effectively with a progressive unsteady surrounding and to completely influence on the convenience brought about by the digital technologies, institutions will have to change their trading. Digital transformation (DT) vision is widespread in most institutions, but time and again they fail to succeed (Hartl & Hess, 2017). Ahlemann (2016) posits that DT is a big test for many institutions.

DT is the use of digital technology which include but not limited to new media, cell phone, data analysis or embedded systems that allow great development in trade which include improvement in client service, remodel performance or establish different trade ventures (Fitzgerald *et al.*, 2013). DT affects large parts in companies which goes beyond their borders, this is through transforming the output, company operations, distribution mediums, and logistics network (Matt *et al.*, 2015).

Definition of digital technology used most often is provided by Fitzgerald *et al.* (2013). According to their definition, the main differentiator between digital technology initiatives and any other operational technology (OT) initiative that involves the implementation of digital technologies is the notion of novelty associated with the technologies that are

implemented. However, the restriction of digital technology initiatives to those involving new digital technologies is problematic because the perception of novelty is always a matter of perspective.

Nambisan *et al.* (2017) tried to resolve this by defining DT as the utilization of digital technique through undertaking transformation, that is recently developed to be embraced by a company but may already be well established in other organizations. A typical example is the use of cloud services in the newspaper industry (Karimi & Walter, 2015), even though such services are already well established in the software industry (Leimeister *et al.*, 2010). Surprisingly, the term digital technology is only rarely mentioned in digital innovation literature, which has gained momentum in recent years. Literature on digital innovation focuses on the enhancement of physical products or a new organizational logic (Yoo *et al.*, 2010) that is orchestration of technological innovations (Nambisan *et al.*, 2017), which are also critical elements of transformations (Fichman, 2014). This school of thought has its origin in marketing theory and was later adopted in organization science (Lusch & Nambisan, 2015).

In some cases, digital technologies are connected to specific digital technologies. For example, Nwankpa and Roumani (2016) identified DT with specific technology including cloud computing, big data, mobile and new media platforms. However, the drastic speed of technological advancements, suggests that DT should not be defined by using very specific technologies that could be outdated in just a few years. Digitalised technology brings about fresh possibilities and a thriving economy. Nonetheless, incorporating and utilizing the freedom that come from hi-tech prevails a big issue for trade, mainly companies in industrial revolution, and propose more investigation (Yoo *et al.*, 2010). To maximise on the advantages of technology, the execution of information technology should go hand in hand with institutional transformation. Other than that, the benefits stemming from information technology application is still on small scale and layered on the present company state (Venkatraman 1994). DT in this case supersedes the mere digitalization of products and services by the use of digital technologies (Hess *et al.* 2016). For businesses to improve, a comprehensive overhaul is needed. Institutions have to make alterations and computerize their enterprise blueprint and the dynamic company environment, such as composition, operations and lifestyle. (Fitzgerald *et al.*, 2014).

DT differentiates itself from the other Information Technology allows trading modifications in terms of pace and its comprehensive appliance. (Bharadwaj *et al.*, 2013; Porter & Heppelmann, 2014). DT has increased the rate of revolution, disturbances and aggressive changes of organisational context. Further, DT as a result supersedes the scanty digitalization of outcomes, services and business have to redefine their industries and value propositions (Porter & Heppelmann, 2014). Therefore, we define DT as the Information Technology enhanced transformation in institutions where products, services, core processes are digitized (Hess *et al.*, 2016). DT involves making use of technology to redefine procedures to produce desired results. The objective is to utilise digital technologies not only to duplicate of available services in an automated format, rather to use digital technologies to change that resource to a very important idea (Samuels, 2018).

Although it is perceived as a threat by society, it should be considered as an important competitive advantage especially in economic development. Because in the fourth industrial revolution, future business models are being created and integrated into all business operations. Therefore, it is expected that huge investments will be felt, more so with the computerised technology that can provide significant capital equipment within the transformation exercise (Ovaci, 2017).

Aviation field has been faced with many challenges in industry due to its nature, which include expensive prices, periodic orders, great contention, and fragility to outside disturbance (Tolkin, 2010). This is further exacerbated by other endogenous and exogenous challenges in the operating environment, which make it difficult to operate airlines successfully (Mhlanga, Steyn & Spencer, 2018). Consequently, structural, endogenous and exogenous challenges produce thin profit margins for airlines thereby prompting airline managers to identify critical success factors to overcome these challenges (Ssamula, 2014). With the global competition and the intensification of globalization, it is necessary for aviation companies to act quickly in the adaptation process so that they can become a digital enterprise. The life expectancy of products is getting smaller, the service is getting more, and it is a proof of how fast the change must be. It is beneficial to be able to offer products to the market effectively and efficiently and to utilize open innovation strategies to shorten the innovation cycle.

In the last 30 years, many changes have been witnessed in the airline industry, this includes the increasing revenue share of low fare airlines and also the test they encounter from volatile infestations from malady epidemic. In the following 30 years, a leading edge of information technology revolution and transformation will arise, and it will be more turbulent.

Some see it before the taxi driver arrives at Uber, expansive aviation industry, quoting the taxi industry, the entertainment industry before downloading the internet, and the print industry before computer design software (Sahin, 2019).

This is a period of great change in the Air industry. The changing landscape of innovation, aviation and aircraft manufacturers are constantly trying to keep up. Often, companies that make airline and aircraft are ill equipped to respond to rapid changes. They produce planes intended to be in service for several decades. For instance, car manufacturers, aircraft manufacturers and pilots recognize the need to slow down the development of hardware and software for aeroplanes. At the moment, institutions are planning on a number of possible transforming systems which will create ways to use regular airways for the next few decades (Zhang, 2017).

The market is constantly evolving and giving rise to disruptive digital technologies, such as 3D printing, data analytics, and mobile computing (Nambisan *et al.*, 2017), forcing established organizations to transform in order to remain competitive. We refer to the organizational transformation process of using and combining digital technologies in new ways to radically transform an organization as digital transformation. The success of purely digital organizations such as Netflix, Spotify, or Amazon, as well as the bankruptcy of traditional companies such as Kodak or Blockbuster, are examples of digital transformation (Goh *et al.*, 2011). Under this heading, scholars from information systems, management, or organization science are contributing to a growing body of knowledge concerning this phenomenon (Agarwal *et al.*, 2010; Fitzgerald *et al.*, 2013; Majchrzak *et al.*, 2016; Rowe, 2018).

Today smart phones have become more common and emergence of many applications. Airline companies and aircraft manufacturers are adapting to accommodate in-flight use. Last year, for an application called Boeing Cabin, passengers started setting up illuminating the adjacent locality, as well as launching an application that allows flight attendants to call, request for meals, more so control whether the toilet is free. In the meantime, the mobile telephony that have been modified inner parts including the Recaro CL6710 first class intended to give permission to cellular phones to adjust their seat *quid pro quo* (Stannard, 2017).

Twelve months to come, aviation industry across the world might be faced with a problem of establishing the most recent and unfolding digital technologies which will have a prospective to better services to the customers, potentially improving both locally and instantly and have operational efficiencies. It would be right to analyse artificially intelligent without thinking about robots. In the previous years, much talked about the robots face-to-face with the customer to provide on-site support to the passengers, but it could be the operational role that robots will have the most impact (Initiatives, 2017).

The Haneda Robotics Laboratory of Japan Airport Terminal has come out as a frontrunner in view of this field after a short time judge seven robots in a live airfield surrounding. The robots should be in a position to carry out various tasks ranging from proposing the potential security risks to the transport of suitcases. When all is said and done fleet of fleets will be employed at the Airfield in by 2020. Inche on Airport is also investigating a new generation of robots in other parts of Asia not long ago conducted a test on a manual by Airport cleaning Robot.

Digital transformation is tightly connected to every business. Nanterme and Daugherty (2016) identify five new technology trends that shape digital transformation. They include robotics, agile employees, digital matchmakers, re-imagining industries and employee trust of online confidentiality. The first trend is robots. This is heightening for growing and transformation. With the help of Artificial Intelligence (AI), the next wave of solutions will collect information from gather data from unrivalled quantity from various structures that offer answers that transform the base of an organization by conducting order, information and the workforce.

The second trend is liquid workforce relates to companies investing in the tools and technologies they need to keep pace with the digital age. But there is often a critical factor behind: the workforce. Companies need more than just the right technology; This technology needs to be used by the right people to make the right things in an adaptable, changeable and responsive liquid workforce. The third trend is platform workforce. This relates to technology based, platform-focused ecosystems that now form amongst the industry. Strategically leveraging technology to produce digital businesses, leaders are now creating an adaptable, scalable and interconnected platform economy that successfully supports an ecosystem-based digital economy.

The fourth trend is predictable disruption. This relates to how less dramatic and sustainable changes from new platformbased ecosystems are. As these ecosystems create a strong, predictable deterioration, all business and economic sectors will be completely reformulated and rediscovered. The fifth trend focuses on digital trust. New technologies create

risks yet in the absence of digital trust, businesses find it challenging to use and share data that supports the day to day operations of their entities. For this reason, today's most advanced security systems or applications go beyond providing environmental safeguards and are strongly committed to the highest ethical grade for data.

The airline industry has not been left behind it has been at the forefront of digital disruption, thus changing the way people travel. Nonetheless, World Economic Forum research suggests airlines should brace themselves for another wave of digital transformation (WEF & Accenture, 2017). Airlines continue to make more and more strategic choices in order to enhance their service delivery and product offering, reduce overall costs and cope with industry competition and challenges (Gathoni, 2017). These choices include adoption of emerging digital technologies.

According to Lanzolla and Anderson (2008), companies adopt digital technology as a way of levelling the playing field with more established organizations. The technologies also increase the competitiveness of organisations (Narayan, 2015). The digital technologies are increasingly becoming available and with its accessibility to vast amounts of data. The data includes big data, some of which is open data. This in turn is leading to changes in the strategic context of organisations. Organisational aspects that are affected by the proliferation of digital technologies include the structure of competition, the conduct of business, and the performance of organisations (Hirt & Willmott, 2018).

Indeed, research firm McKinsey finds that when companies' transformation efforts are deployed aggressively and across multiple dimensions, they improve their performance. To succeed, the effort should impact all parts of the business. Technology isn't something a business bolts onto its existing model; it's something the business leverages to unlock new opportunities. Digital Transformation is Really Business Evolution (Endler, 2018). Despite the global push towards developing digital workplaces, many organizations have either yet to develop a digital strategy and initiate digital transformation or have a digital strategy in place but are unsure how to set it in motion. This is, and will continue to be, a problem moving forward. Recent research from IDC predicts that by 2023, more than half of all worldwide GDP is predicted to be driven by products and services from digitally transformed industries (Jyoti, 2018).

Travel in Africa is a challenge. Distances that should take a few hours can take days simply because the connectivity does not exist. This inefficiency has an economic cost. The low density of the African intra-continental network makes it impossible to realize the potential benefits of a connected African economy (IATA, 2019). Africa accounts for just 2% of the world's air transport traffic in terms of passenger kilometres.

According to Chingosho (2009), operating an Airline in Africa is more expensive than operating airlines in countries in other regions. Factors that make operation costs higher in Africa are high fuel cost, smaller fleet, price fluctuations, low internet penetration, and lower credit card penetration in the region. Chingosho further argues most African governments have monopolised airline service provision which in turn keeps the costs for air travel and cargo services comparatively higher (IATA, 2010). Despite all this, there exists a huge potential for Africa in the aviation market because of its vast population (Buyck, 2010). In effect, African airlines need to develop business models that would help mitigate the high costs of running airlines and the low demand for air travel and cargo services.

Despite such challenges, the potential of the African aviation market has never been in doubt, but the continent's carriers have so far struggled to tap this opportunity. Titus Naikuni, the former Kenya Airways CEO, summarises the potential for aviation in Africa succinctly, "Africa is the world's second largest continent with a population of 1 billion; this is comparable to China's and India's. Yet it is having difficulties communicating with itself even by telephone. Roads are not good and railway line are not good, so you need air transport. The potential is big" (Buyck, 2010, p. 33). The development of a network suitable to the high costs and sparse demand in the African markets, will go a long way to developing an overall sustainable business model.

It is critical to study how the aviation industry in Kenya is responding to the global trend of digital transformation. One of the major airlines in Kenya and a National carrier. Kenya airways was founded in 1977 following the break-up of the East African Community and subsequently resulting in the demise of the jointly owned East African Airways. Kenya Airways was founded by the Kenyan government. In 1996 Kenya Airways became the first African flag carrier to become privatized and is currently a public-private partnership. The largest shareholder is the Government of Kenya (48.9%), 38.1% is owned by KQ Lenders Company 2017 Ltd. (in turn owned by a consortium of banks), followed by KLM, which has a 7.8% stake in the company. The rest of the shares are held by private owners. Kenya Airways has defined its ambitions for the future in a plan called Project Mawingu (Swahili for clouds) expanding the KQ network with the

addition of several destinations and aircraft each year. The growth aspirations that KQ has for the future are to operate 115 destination by 2021 which means more than doubling the number currently operated (Kenya Airways, 2011). The strong growth aspiration that Kenya Airways has resulted in a more complex network and thus the size and complexity of recovery operations will increase. For this reason, there is a need to change along with the ever-changing situation for the airline.

The aviation industry is highly competitive, and it is bound to become worse with converging global markets. To survive, the airline industry needs to create strategies that would help them navigate the changing business environment. In view of this, it is important to understand how Kenya Airways adapted to digital transformation efforts with a view of enhancing its ability to leverage on opportunities, threats and challenges currently prevalent in the marketplace. Profitability in the aviation business remains a major challenge. The industry is faced with very stiff competition and therefore every effort must be made to ensure superior quality of service offering. Kenya Airways has developed strategies that would increase its efficiency and competitiveness. In turn this would make the airline more attractive to potential shareholders. According to Lanzolla and Anderson (2008) the airline's management has to recognize the need for change as key to its survival in a highly volatile business environment.

Despite the global push towards developing digital workplaces, many organizations have either yet to develop a digital strategy and initiate digital transformation or have a digital strategy in place but are unsure how to set it in motion. This is, and will continue to be, a problem moving forward. Recent research from IDC predicts that by 2023, more than half of all worldwide GDP is predicted to be driven by products and services from digitally transformed industries (Jyoti, 2018). Yet, within and in-between these literature streams, there is considerable disagreement regarding what the characteristics of an organization's digital transformation are. This is reflected in inconsistencies, overlapping and contradictory definitions, and different and heterogeneous schools of thought. However, the diversity of theories and concepts from different disciplines often encourage compartmentalization of perspectives that do not enrich each other. According to Orlikowski (2000), past research has focused on technology and its relationship with organizational structures, processes, and outcomes. However, digital innovations build on novel characteristics that differ from earlier technologies. These characteristics include reprogram ability, the homogenization of data, and the self-referential nature of digital technology (Yoo *et al.*, 2010).

Because we lack clarity about the exact nature of digital transformation, it is difficult to appropriately compare, analyse, and discuss the phenomenon. Therefore, this study sought to find out how the influence of digital technologies, organization culture, organization strategy, customer insights affect digital transformation of the Kenya Airways.

## 2. STATEMENT OF THE PROBLEM

Rapid advancement in digital technology has fundamentally altered the competitive dynamics of organisations (Hess & Hartl, 2017). To cope with an increasingly unstable environment and to fully leverage the opportunities opened by new technologies, organizations need to transform their businesses. Digital transformation initiatives are prevalent throughout industries, yet often experience failure (Hartl & Hess, 2017). Ahlemann (2016) contends that digital transformation is a major challenge for many organizations. Digital transformation requires the organization to deal better with change overall, essentially making change a core competency as the enterprise becomes customer driven end to end. Bloomberg (2018).

Airlines are entering a period of significant disruption as rising costs and competition force airlines to identify new ways of saving costs and change the way they interact with their customers. In order to survive and prosper in these conditions, airlines must rationalize their processes and increase asset utilization through adoption of technology to a greater degree than ever before. Most airlines have adopted digital transformation strategies yet the effect of digital transformation on airline performance has received little attention in academic inquiry. The field of information technology is critical to organisational growth in the current competitive business environment (Gathoni, 2017). Effective use of IT has the potential to improve organizational efficiency, cost effectiveness, and service delivery to customers.

The strong growth aspiration that Kenya Airways has will result in a more complex network and thus the size and complexity of recovery operations will increase. For this reason, there is a need to change along with the ever-changing situation for the airline. The aviation industry is highly competitive, and it is bound to become worse with converging

global markets. To survive, the airline industry needs to create strategies that would help them navigate the changing business.

Kimani (2015) conducted a study which reviewed how information technology influenced the performance of organisations. The study focused on the Population Services Kenya organisation. Also, Irungu (2012) conducted a study that focused on the relationship between ICT utilization and its influence on the performance of Kenya Airways. Majority of the literature reviewed reveals most aviation organisations are looking to information and communication technologies to improve the operations of their business. Although these studies are contextual to Kenya, most of them have examined the use of ICTs in general and not digital transformation strategies in particular.

Digital transformation holds the promise of revolutionising businesses. Yet, many companies may not be making correct investments in digital transformation to capitalise on the opportunity and positively transform their customer's experience. The business models of yesterday are changing, and disruption is happening in all industries, across all markets. The disruption is driven by among other factors, new technology, cultural shifts, organisational strategies and customer insights making it increasingly challenging for companies to stay connected with their customers. In view of this, this study presents a more specific investigation on how Kenya Airways is adapting to digital transformation efforts with a view of enhancing its ability to leverage on opportunities, threats and challenges currently prevalent in the marketplace. Therefore, the study was an attempt to understand to what extent Kenya Airways has embraced digital transformation with a keen interest to digital technologies.

### 3. LITERATURE REVIEW

Digital technologies have the potential to make an organisation more innovative which in turn can influence the performance of an organisation (Westerman *et al.*, 2014). Digital technologies are transforming traditional industry structures (Berman *et al.*, 2016). Components of digital technologies include hardware, software, facilities and services that are critical in supporting business systems and information technology delivery (Gartner, 2019).

An increase in transformation technologies has been witnessed with the increased significant potential impact in the world. The technology selection depends on the need of the organisation to transform legacy business processes to deliver superior customer value experience. Organisations also are required to set up dynamic business models using these technologies (Badnakhe, 2019). Scott (2017) posit that there is a strong association between digital technology and Digital Transformation. Therefore, reviewing this association is key to understanding how organisations can grow in the present-day technological world.

Critics argue that technology doesn't lead to transformation of organisations (Kavadia *et al.*, 2016). They further posit that technology by itself is not a fully responsible for transformation. According to Westerman (2017) technology by itself is not a catalyst for value addition to a business, rather, the value issues from conducting business differently because a particular technology makes that possible. These arguments point to the need to examine organisational transformation processes in a more holistic way in order to determine the extent to which they contribute to the transformation of the organisation.

PROS (2019) argues that digital transformation vision requires that airlines take the steps to upgrade digital technologies which include software and IT components, provide team training, and hire qualified personnel with the skills necessary to meet new challenges related to digital transformation. Kenya Airways has been on a journey to enhance customer's experience on an airline's website and mobile app, optimization of pricing systems all geared to a steady focus on improving customer experience as well as cloud strategic vision to improve on operational efficiency. Thus, this study was apt because it provided avenues for determining the extent to which digital technologies at Kenya Airways are contributing to holistic digital transformation. In effect, the study provided a better understanding of factors contributing to the transformation of organisations.

According to Fitzgerald *et al.* (2013), digital transformation can be defined as the practice of employing new digital technologies to enable organisations to achieve major improvements in business. The technologies used may include mobile devices, new media, analytics and embedded devices. Some benefits of digital transformation include an enhanced customer experience, company operation streamlining and creation of new business models. Digital transformation necessarily impacts a company's sales channels, products, processes and supply chains (Matt *et al.*, 2015). Digital

transformation does not just digitize a company's resources, rather, it fundamentally changes the business models (Horlacher *et al.*, 2016). Digital transformation initiatives necessarily affect all sections of the organization.

To achieve digital transformation, an organisation must consider its transformative digital vision, digital governance, iterative transformation roadmap, and digital engagement (Westerman *et al.*, 2011). At the corporate level, the management has to craft a strong vision for the transformative approach. Secondly, effective digital governance guarantees proper implementation of digital transformative agenda. Thirdly, a roadmap for iterative transformation needs to be developed in order to realize superior forms of digital transformation. Lastly, the process of digital engagement ensures that a corporate culture that views the transformative agenda positively is inculcated in the workers.

According to Westerman *et al.* (2011), the digital transformation framework has three components. The first component is strategic assets which include sales force, point of sale, and distribution channels, products and content, product innovation, partnership network, brand, customer knowledge, and culture. The second component is digital building blocks. They include sales force, point of sale, and distribution channels, products and content, product innovation, partnership network, brand, customer knowledge, and culture. The third component is digital investments. This involves capital investment in ERP, cloud platforms and data analytics in order to increase an organization's competitiveness. According to Westerman *et al.* (2011), effective digital transformation involves introducing the digital future, investing in digital transformation, and organising a company's structure so that the top-down model is enhanced.

Further, Corver and Elkhuizen (2014) posit that the customer, product, organisation, process and system components are essential to the digital transformation framework. They further emphasize that digital transformation often begins with the customer of a particular organisation. In essence then, the customers should be at the centre of the transformative agenda. This can be achieved by improving service levels and digitisation customer experience. This can be followed by digitising operations, products and services that the organisation offers in the market.

Kimani (2015) conducted a study which reviewed how information technology influenced the performance of organisations. The study focused on the Population Services Kenya organisation. Kimani investigated the level of use of information technology and how it influenced performance at Population Services Kenya. The study adopted the descriptive survey research design. Questionnaires were used to collect quantitative data from 438 staff of the organisation. Study findings indicate that the employees had access to various digital devices at the company. The study established a positive relationship between the level of IT use and organisational performance. Recommendations suggest that companies ought to encourage the use of IT devices and services in order to enhance their competitiveness and improve the quality of service to their customer base. The study also recommended for further research to be conducted on challenges of implementing IT use in Kenyan organisations.

Irungu (2012) conducted a study that focused on the relationship between ICT utilization and its influence on the performance of Kenya Airways. The research design utilized in the study was the descriptive survey design where a total a random sample of 244 employees of the Kenya Airways were selected and administered with questionnaires. Findings show that ICTs are a critical driver of organizational performance in the airline industry. The recommended that Kenya Airways ought to align its ICT implementation at a strategic level.

TimoMäkinen (2017) conducted a study on how organisations could build a strategy for digital transformation. He focused on the case study of the construction industry in Sweden. The aim of his study was to determine the digital transformation process in a traditional industry setting. Findings indicate that existing digital strategy focus heavily on individual transformative digital initiatives while paying little emphasis on the value of digitizing the traditional business processes which would in turn establish a strong base for digital innovating.

Fortune Nwaura (2018) conducted a study where she made comparisons of conceptual frameworks regarding digital business transformations. The study examined a variety of theoretical and conceptual that relate to digital business transformation. The study adopted a qualitative design. Findings indicate that industry-based research is not aligned with academic research. The study recommends that organisational transformation should focus on digital technologies and their transformative effects on industry segments and organisational structures through digitalisation.

Vuksic, Ivancic and Vugec (2018) conducted a study on Digital Transformation. The literature review method was adopted where 29 relevant papers were selected for analysis. Findings indicate that digital transformation received little

scholarly attention. In addition, it was a new area in the field of information systems research. The conclusion is that the scarcity of empirical research points to the need for more studies to be conducted in the area of digital transformation.

#### 4. METHODOLOGY

The study was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Digital Maturity Model. The study employed the convergent parallel mixed methods design. The study targeted all the 410 Management staff holding positions designated Grade H11 to H15 all the departments as of March 2020. The sampling was guided by Taro Yamane formula which yielded a sample size of 157 respondents. A questionnaire tool and an interview guide were used to collect data. Data was analysed using both descriptive and inferential statistics.

#### 5. FINDINGS

Components of digital technologies include hardware, software, facilities and services that are critical in supporting business systems and information technology delivery (Gartner, 2019). Information was sought from the respondents regarding the presence and features of the digital technologies adopted at the organisation. The purpose of this information was to determine the extent penetration of the digital technologies within the organisation over five dimensions that include cloud computing, websites, mobile applications, journey maps and employee performance tracking. The section concludes by determining the effect of the adoption of digital technologies on the digital transformation of the organisation by the use of inferential statistics.

The study sought information regarding the operations at Kenya Airways with particular regard as to cloud computing as one of the digital technologies available to organisations for digitisation. A statement was posed to the respondents on their organisation's use of the most current architectures and systems for cloud computing. The respondents were required to rate their level of agreement on a 4-pointer scale where 1 represented Strongly Disagree (SD), 2-Disagree (D), 3- Agree (A) and 4-Strongly Agree (SA). Proportions, percentages and descriptive statistics of means were used to analyse the data. The responses were as summarised in Table 1.

**Table 1 Adoption of cloud computing technology**

Statement	Response	Frequency	Percent	Mean
Our organisation uses the latest architectures for cloud computing. (for example, use of office 365, Altea systems, cargo system)	Agree	48	40	3.54
	Strongly Agree	72	60	
<b>Total</b>		<b>120</b>	<b>100</b>	

The findings in Table 1 show that the organisation used the latest architecture for cloud computing as confirmed by 40% of the respondents who agreed and a further 60% who strongly agreed. The architecture included office 365 for office productivity, Altea systems for passenger management and cargo system for the management of cargo business. The mean perception of the respondents was also assessed by the use of the descriptive mean statistic on a scale of 1 to 4, where 1 represented Strongly Disagree 2-Disagree, 3-Agree and 4-Strongly Agree. According to Table 4.21, the mean statistic for the statement was 3.57 which rounds off to 4 on the pointer scale translating to "strongly agree", and leading to the finding that the use of cloud computing at the organisation led to the organisation becoming data driven.

ANOVA techniques were employed to determine whether the perceptions on cloud computing varied across the respective departments in the organization and the results were as summarized in Table 2.

**Table 2 ANOVA on respondents' perceptions on cloud computing**

Statement		Sum of Squares	df	Mean Square	F	Sig.
In your opinion, to what extent has the Adoption of digital technologies led to the digital transformation of the organisation?	Between Groups	29.247	5	6.413	7.4	0.412
	Within Groups	27.4	114	0.273		
<b>Total</b>	<b>Total</b>	<b>56.647</b>	<b>119</b>			

Results in Table 2 show an F distribution statistic of 7.429 which was associated with a significance of more than 0.05 (Sig.> 0.05) implying that there were no variations in perceptions across the various departments of the organisation on the adoption of cloud computing.

Information was also sought regarding on the use of websites as a digital technology available to organisations for digitisation. A statement was posed to the respondents on their organisation's use of current website technologies where the respondents were required to rate their level of agreement on a 4-pointer scale where 1 represented Strongly Disagree (SD), 2-Disagree (D), 3- Agree (A) and 4-Strongly Agree (SA). Proportions, percentages and descriptive statistics of means were used to analyse the data. The responses were as summarised in Table 3.

**Table 3 Adoption of websites modernization**

Statement	Response	Frequency	Percent	Mean
Our organisation uses the latest architectures for website modernisation	Disagree	24	20	3.42
	Agree	24	20	
	Strongly Agree	72	60	
<b>Total</b>	<b>Total</b>	<b>120</b>	<b>100</b>	

The findings in Table 3 show that the organisation used constantly updated websites as confirmed by 20% of the respondents who agreed and a further 60% who strongly agreed. However, 20% disagreed. The respondents stated that the websites used included Kenya Airways website, Cargo and Pride Center. The mean perception of the respondents was 3.40 which rounds off to 3 on the pointer scale translating to "agree", leading to the finding that the use of websites at the organisation led to the organisation being data driven.

ANOVA techniques were employed to determine whether the perceptions on cloud computing varied across the respective departments in the organization and the results were as summarized in Table 4.

**Table 4 ANOVA on respondents' perceptions on cloud computing**

Statement		Sum of Squares	df	Mean Square	F	Sig.
Our organisation uses the latest architectures for website modernisation	Between Groups	25.143	5	5.223	6.3	0.453
	Within Groups	24.412	114	0.242		
<b>Total</b>		<b>49.555</b>	<b>119</b>			

Results in Table 4 show an F distribution statistic of 6.312 which was associated with a significance of more than 0.05 (Sig.> 0.05) implying that there were no variations in perceptions across the various departments of the organisation on the adoption of websites.

The study inquired on the use of mobile applications for the digitisation of the organisation. A statement was posed to the respondents on their organisational use of mobile application and technologies and the respondents were required to rate their level of agreement with the statement on a 4-pointer scale where 1 represented Strongly Disagree (SD), 2-Disagree (D), 3- Agree (A) and 4-Strongly Agree (SA). Proportions, percentages and descriptive statistics of means were used to analyse the data. The responses were as summarised in Table 5.

**Table 5 Organizational use of mobile application**

Statement	Response	Frequency	Percent	Mean
Our organisation uses the latest architectures for mobile application that is interactive and user friendly	Disagree	32	26.7	2.93
	Agree	64	53.3	
	Strongly Agree	24	20	
<b>Total</b>		<b>120</b>	<b>100</b>	

The findings in Table 5 show that the organisation used constantly updated websites as confirmed by 53.3% of the respondents who agreed and a further 20% who strongly agreed, while 26.7% disagreed. The respondents stated that the websites used included Kenya Airways website, Cargo and Pride Center. The mean perception of the respondents was

2.93 which rounds off to 3 on the pointer scale translating to “agree”, leading to the finding that the use of websites at the organisation led to the organisation being data driven.

ANOVA techniques were employed to determine whether the perceptions on cloud computing varied across the respective departments in the organization and the results were as summarized in Table 6.

**Table 6 ANOVA on respondents’ perceptions on mobile applications**

Statement		Sum of Squares	df	Mean Square	F	Sig.
Our organisation uses the latest architectures for mobile application that is interactive and user friendly	Between Groups	3.467	5	0.693	1.5	0.189
	Within Groups	52	114	0.456		
<b>Total</b>		<b>55.467</b>	<b>119</b>			

Results in Table 6 show an F distribution statistic of 1.520 which was associated with a significance of more than 0.05 (Sig.> 0.05) implying that there were no variations in perceptions across the various departments of the organization on the adoption of websites.

The study also inquired on the of Customer journey maps at the organisation as a digitisation technology. According to Weir (2018) a customer journey map is a tool to visualize the experience of interacting with a brand from a customer’s point of view. A statement was posed to the respondents on their organisational use of customer journeys where the respondents were required to rate their level of agreement on a 4-pointer scale where 1 represented Strongly Disagree (SD), 2-Disagree (D), 3- Agree (A) and 4-Strongly Agree (SA). Proportions, percentages and descriptive statistics of means were used to analyse the data. The responses were as summarised in Table 7.

**Table 7 Organisational use of customer journeys**

Statement	Response	Frequency	Percent	Mean
Our organisation uses customer journey maps to drive organisational technology development	Disagree	40	33.3	
	Agree	56	46.7	
	Strongly Agree	16	13.3	2.79
	Nonresponse	8	6.7	
<b>Total</b>		<b>120</b>	<b>100</b>	

The findings in Table 7 show that customer journeys were used by the organisation as confirmed by 46.7% of the respondents who agreed and a further 13.3% who strongly agreed, while 33.3% disagreed. A further 6.7% of the respondents did not respond. The mean perception of the respondents was 2.79 which rounds off to 3 on the pointer scale translating to “agree”, leading to the finding that the use of customer journeys at the organisation led to the organisation being data driven.

ANOVA techniques were employed to determine whether these findings on customer journeys varied across the respective departments in the organization and the results were as summarized in Table 8.

Results in Table 8 show an F distribution statistic of 14.142 which was associated with a significance of less than 0.05 (Sig.< 0.05) implying that there was a variation in perceptions of the staff across the various departments of the organisation.

**Table 8 ANOVA on respondents’ perceptions on customer journeys**

Statement		Sum of Squares	df	Mean Square	F	Sig.
Our organisation uses customer journey maps to drive organisational technology development	Between Groups	19.6	5	3.92	14	.000
	Within Groups	31.6	114	0.277		
<b>Total</b>		<b>51.2</b>	<b>119</b>			

**Table 9 Employee performance tracking**

Statement	Response	Frequency	Percent	Mean
Our organisation uses digital technologies for tracking employee performance (for example use of online systems for appraisal)	Disagree	40	33.3	2.8
	Agree	64	53.3	
	Strongly Agree	16	13.3	
<b>Total</b>		<b>120</b>	<b>100</b>	

The findings in Table 9 show that customer journeys were used by the organisation as confirmed by 53.3% of the respondents who agreed and a further 13.3% who strongly agreed, while 33.3% disagreed. The mean perception of the respondents was 2.80 which rounds off to 3 on the pointer scale translating to “agree”, leading to the finding that the use of customer journeys at the organisation led to the organisation being data driven.

ANOVA techniques were employed to determine whether these findings on customer journeys varied across the respective departments in the organization and the results were as summarized in Table 10.

**Table 10 ANOVA on respondents' perceptions on employee performance tracking**

Statement		Sum of Squares	df	Mean Square	F	Sig.
Our organisation uses digital technologies for tracking employee performance	Between Groups	9.524	5	1.905	4.9	.000
	Within Groups	41.333	106	0.39		
<b>Total</b>		<b>50.857</b>	<b>111</b>			

Results in Table 11 show an F distribution statistic of 4.885 which was associated with a significance of less than 0.05 (Sig.< 0.05) implying that there was a variation in perceptions of the staff across the various departments of the organisation.

The findings agree with Nwankpa and Roumani (2016) who found that in some cases, digital transformation is connected to specific digital technologies including cloud computing, big data, mobile and new media platforms.

To find out how digital technologies influence digital transformation of Kenya Airways, correlation analysis was conducted between the various digital technologies studied under this section and digital transformation. Correlation statistics were generated as summarised in table 11.

**Table 11 Correlation between digital technologies and digital transformation**

Digital Technology	Correlation Coefficient	Sig. (2-tailed)
Use of the latest architectures for cloud computing.	.272*	.003
Use of the latest architectures for website modernisation	.264*	.004
Use of the latest architectures for mobile application	.140	.127
Use of customer journey maps	.496*	.000
Use of digital technologies for tracking employee performance	.210*	.022

\*. Correlation is significant at the 0.05 level

Findings in table 11 show that there was a positive correlation between the use of the latest architectures for cloud computing and digital transformation at the organisation which was statistically significant (Sig.<0.05). There was also a positive correlation between website modernisation and digital transformation at the organisation which was statistically significant (Sig.<0.05). Table 13 also shows that there was a positive correlation that was statistically significant between the use of customer journey maps and digital transformation also between was tracking of employee performance and digital transformation.

These findings imply that cloud computing, website modernisation, journey maps and employee performance tracking initiatives at the organisation had led to a digital transformation. On the other hand, Table 11 shows that there was a

positive correlation between the use of mobile applications and digital transformation which was not statistically significant.

Further analysis was conducted to determine the extent to which the adoption of the various digital technologies (cloud computing, website modernisation, mobile application, customer journey maps and employee performance tracking) had influenced digital transformation at the organisation. Regression modelling techniques were adopted to identify variables responsible for the causal effect and the following regression model developed:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + \epsilon$$

Where:

Y = Digital transformation (Dependent Variable)

B<sub>0</sub> = Constant of Regression

X<sub>1</sub> = Cloud computing (Independent Variable)

X<sub>2</sub> = Website modernisation (Independent Variable)

X<sub>3</sub> = mobile application (Independent Variable)

X<sub>4</sub> = Customer journey maps (Independent Variable)

X<sub>5</sub> = Employee tracking performance (Independent Variable)

ε = Error term

The SPSS software was used to generate the multiple regression statistics at 0.05 level of significance and the results were as shown in Table 12.

**Table 12 Regression statistics on digital technologies and digital transformation variables**

Model	Model Fitting Information			
	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	180.876			
Final	54.128	126.748	16	.000
Pseudo R-Square				Sig.
Cox and Snell				0.678
Nagelkerke				0.77
McFadden				0.533
Effect	Likelihood Ratio Tests			
	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	54.128 <sup>a</sup>	0	0	.000
Cloud computing	54.128 <sup>a</sup>	0	0	.000
Website modernisation	54.128	0	2	1.000
Mobile application	76.308	22.181	4	.000
Customer journey maps	110.169	56.041	4	.000
Tracking of employee performance digitally	93.052	38.925	4	.000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Parameters	B	Std. Error	Wald
Intercept	-34.574	2781.232	.000
mobile application	17.243	1879.349	.000
customer journey maps	34.574	2781.232	.000
Tracking of employee performance	34.239	2546.597	.000

Table 12 presents the various sections of the resulting regression model. Model Fitting Information shows the 'goodness of fit' test results of the model. The statistics show a chi square value of 126.748 which was associated with  $p < 0.05$  implying that statistically significant causal effect existed between the dependent variable and at least one of the independent variables in model.

The Pseudo R-Square section of Table 14 show that the Coefficient of Determinant  $R^2$  of the model was 0.770 (Nagelkerke) suggesting that the explanatory power of the independent variables over the dependent variable was 77% implying that the remaining 23% of the variations in the model were taken care of by the error term. Thus, leading to the finding that the five digital technologies studied namely, cloud computing, website modernisation, mobile application, customer journey maps and tracking employee performance digitally were responsible for up to 77 % of the variations in the digital transformation of the organisation. Further investigations are therefore necessary to identify those other digital technologies that lead to the digital transformation of the organisation.

The Likelihood Ratio Tests section of Table 12 shows that three of the five independent variables were responsible for the statistically significant variations in the dependent variable because they were associated with (Sig.<0.05). The variables are mobile applications, customer journey maps and Tracking of employee performance. Their respective beta coefficients were used to extract the regression model. On the other hand, cloud computing and website modernisation were not statistically significant to be retained in the model for they were associated with  $p > 0.05$ .

The parameters section of Table 14 provides the beta co-efficient parameters for the resultant regression. The model was therefore summarized as:

$$Y = -34.574 + 17.243X_3 + 34.574X_4 + 34.239X_5$$

Where:

Y= Digital transformation (Dependent Variable)

$X_3$  = Mobile application (Independent Variable)

$X_4$ = Customer journey maps (Independent Variable)

$X_5$ = Employee tracking performance (Independent Variable)

$\hat{\epsilon}$ . = Error term

Mobile applications had a beta coefficient of 17.243 while Customer journey maps and employee performance tracking had 34.574 and 34.239 respectively. The coefficients implied that customer journey maps and employee performance tracking impacted more on the dependent variable when compared to Mobile applications. Kenya Airways can therefore pay more attention to these two technologies in order to realise digital transformation at a faster pace. While the Coefficient of Determinant  $R^2$  of the model was 77%, further investigations are necessary to identify the remaining technologies that were responsible for digitisation at the organisation.

## 6. CONCLUSION AND RECOMMENDATION

Digital technologies are effective tools for digital transformation. The selection of cutting edge technologies ensures that organisations stay ahead of competition Modern innovations in cloud computing, website modernisation, customer journey maps and employee performance tracking are an invaluable investment for an organisation, particularly those in

the airline business because they ensure a complete digitisation of all business processes within departments ultimately leading to digital transformation.

The senior management at Kenya Airways should pay more attention to two technologies namely, customer journey maps and employee performance tracking, for they were found to be the most impactful on digital transformation. The adoption of company issued computers, tablets, iPads, mobile phones, and other digital technology gadgets should be implemented and harmonised in all the respective departments within the organisation.

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