



Synergy Unleashed: The Convergence of Digital Transformation, SMART Technology, and Innovation

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ARTICLE INFO

Keywords:

Digital transformation, Innovation, Social, Mobile, Analytics, Radical Openness, Trust.

Received: Jul 20, 2024

Accepted: Aug 27, 2024

Published: Dec 20, 2024

ABSTRACT

This report presents the Digital Transformation and Innovation and the influences associated with the application in all aspects of business. This research aims to address digital transformation focused on five important parameters such as Social, Mobile, Analytics, Radical Openness and Trust and their relationship with innovation. In addition, the literature review identifies the affect and influences addressing these five elements with innovation. The research model covers the use of digital innovation in Business, challenges and opportunities in a qualitative and qualitative approach. Result show that the Five parameters are positively affected by innovation. In the conclusion we recommend some points for future research.

1. INTRODUCTION

In the 21st century, the digital transformation process and outcome accelerate business technology transformation and the creation of sustainable societies. Our life and existence generate history and information, our decisions and actions generate data. This offers a great need for building research on digital transformation and the strength of data [1].

Moreover, Innovation is a needle mover, a method and service to challenge existing norms and use better solution to meet market and life needs. "Innovation is not always a technology it is what results from technology" [2-5]. Innovation can assist us in solving many problems in new reimagined ways. Alternatively, Digital transformation means implementing employees' roles and services in an innovative technological model [6]. Also, it is referred to as: the use of new digital technologies to enable major business improvements in operations and markets such as

enhancing customers experiences, streamlining operations or creating new business models" [7-9] Digital transformation is the final level of digital literacy [10], Digital technologies support innovation and creativity and promote significant change in the professional knowledge domains [11-14]. Many big companies have successfully adopted SMART and have risen to a great level while others who did not adapt have not and became absolute. A recent study showed that all technology spending in the world has been focused on digital transformation by 40%, and many organizations started planning to increase their investment in technology to more than AED 6 trillion [15-18]. The World Economic Forum (WEF) have calculated that by 2025 approximately \$66 trillion value from digitalization will be from platform-driven collaborations [19-22]. Furthermore, digital transformation can have many potential effects on innovation. A resent

student in the United State of America USA showed the effect of innovation on the five largest technological companies who have leveraged digital technologies to innovate in many industries have more scalability, broader market scope, and faster strategic actions that who did not [23-26]. Research on digital transformation and innovation management is still in its early stages, but it is gaining momentum. The digital transformation world is entering an era of prosperity that can pave the way to new insights and deeper understanding on digital- innovation. That is why we need to look in to more on the relationships between digital transformation and innovation to expose opportunities and challenges for more deep understanding on the topic and help policy makers to set policies and goals for the topic [27-32]. Though a systematic literature reviews the paper will identifies and categorize the next generation model of ICT-enabled public sector transformation Smart government and Innovation, in smart government concept, the “SMART” stands for, Societal, Mobile, Analytics, Radical Openness and Trust. The research method used for this study are presented in the following section and after that we present our main results and recommendations for future agenda. Proposed Hypothesis is: The relationship between SMART and innovation (Figure 1).

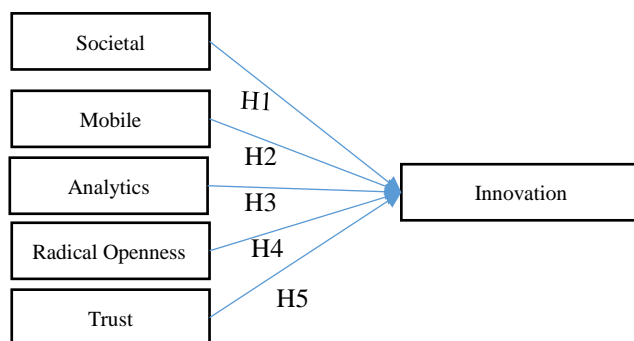


Figure 1: The relationship between SMART and Innovation

2. LITERATURE REVIEW

2.1 Societal and Innovation

Digital transformation has changed and expanded on large scales around the world in the last 10 years [33-39]. One of the main scales toward transformation is applying innovation in many

social and community-based services. By collaborating the social innovation, it helped in increasing the knowledge of the society and stimulate a positive change between the communities.

Social innovation (SI) has always a big impact and change on different communities, societies, and that affected on the performance of the public/private companies and governments [40-45]. The social innovation improvements also had positive effects toward the communities in the mind-sets of the citizens and the technology used by them.

Social innovation has been recognized as a social solution to many kinds of old and new social challenges. There is a need therefore to examine which types of SI are driving impacts in rural areas and the nature of those impacts. Mostly positive impacts are considered as they are involved in the community's process of decision-making and it also involves the society to achieve a range of different objectives, and the provision of new products and services toward the community [46-49].

The relationship between societal and innovation is essential nowadays as it helps to solve some of the world's most pressing problems with new solutions such as fair trade, distance learning, mobile money transfer, restorative justice, and zero-carbon housing [50-53]. In the process of creating solutions, it is also profoundly changing beliefs, basic practices, resources, and social power structures. SI provides a unique opportunity to step back from a narrow way of thinking about social enterprises, business engagement, and philanthropy and to recognize instead the interconnectedness of various factors and stakeholders.

Social innovation influences each country by different aspects and “in today's hyperconnected world, one country's societal problems can become ours [54-59]. Nations are facing slow economic growth, financial instability, political turmoil, hunger, poverty and disease. These are all social issues that must be addressed, one way or the other, and such big problems generate big business opportunities. In fact, more than 80% of economic growth comes from innovation and application of new knowledge” [60].

There are different kinds of challenges toward SI that sometimes it is mistakenly seen by some as

charity. It should be acknowledged that social innovation is adding an extra dimension to innovation, sustaining economic and social growth. Other barriers toward social innovation are the social demand approach, mindset, financial, skills and formation [61-64].

Social innovation measurement may help an organization manage the impact on a project or policy. The set of indicators for measuring social innovation depends on expectations and requirements of organization after determination of the dimension of innovation. The measurement indicators may represent ethical goods, services responsibility, environment, community, education, health protection and poverty areas [65-67].

2.2 Mobile and Innovation

Technological advances have played a critical role in helping businesses develop and thrive over time, especially in a dynamic and complicated market with volatile economic conditions. One of the potential causes behind the failure of any market-based innovation is the success of the invention, which is heavily dependent on customers [68-69]. It's unrealistic to expect all customers to buy and accept new products. Companies, on the other hand, continue to experiment by releasing new features and products. It is necessary to comprehend consumer innovators and the acceptance of new goods [70].

The retail market in 2020 was very different from what it was five years ago. Consumers are on the lookout for innovative methods to buy their favorite goods. Companies are growing more inventive in how they may offer their goods to their consumers in quick, convenient, and cost-effective methods, whether it's through a website, mobile app, or social media [71-73].

Kenneth Lewis, CEO of OneGold Company, pointed out that here is where mobile app innovation came into play. It joins the 91.9% of free applications accessible for Apple users and 96.4% of free apps available for Android users. Global usage of banking apps is increasing, rising from 16% in 2015 to 64% in 2019. Fintech is the fastest-growing area of mobile apps, accounting for 5% of all app downloads in 2019. In 2019, consumers downloaded 204 billion mobile applications, up from 140.7 billion in 2016. That's a total of 204 billion possibilities [74-79].

In addition to companies that gained additional markets, Nike is introduced a cutting-edge smartphone application that allows users to scan their own feet to get the ideal fit, a first in the industry. Nike Fit creates an ultra-precise scan using the customer's smartphone camera, which captures 13 points of data and creates a map of both feet [80-83]. The software makes shoe recommendations using a combination of computer vision, machine learning, and recommendation algorithms. Furthermore, the app is used to improve the customer experience by utilizing the data obtained to better the design of future items.

The major increase in the use of smartphone led a majority of entrepreneurs to have either built or are planning to create mobile applications for their businesses. However, it's critical to recognize the obstacles and devise smart ways to overcome them [84-90]. These are a few challenges businesses face in the approach to innovate and upgrade into a mobile business:

2.2.1 Development Approach

The nature of the business and future objectives when choosing a development method must be examined, such as hybrid development, native development, or even solely web-based mobile app development [91]. The user interface and user experience requirements should also be planned out as a result of this.

2.2.2 Funding

Another issue that arises frequently while developing an application is a lack of funds. It's critical to have a good sense of how much a mobile app will cost in total. It is not a one-time expenditure [92-93]. Money is required for any future value additions to the business' software. The need to conduct thorough market research before deciding on an app development is crucial. It's not enough to have a mobile app for any business; a successful mobile app is also needed, and quality work should be at the top of the priority list.

2.2.3 Customer Reviews and Experiences

The application has to be as simple as possible. It may result in bad consumer feedback. It has the potential to reduce the amount of downloads as well as active users [94]. To get around this, keep

things as basic as possible. Putting useful resources such as movies, pictures, and doc files in your app stores will help to assist the users.

2.2.4 Performance

Most app developers confront a similar issue in guaranteeing world-class app performance, in addition to building a successful app and offering better user experience [95]. The task is creating a functioning program that is free of crashes and errors while also taking up as little space on the device as possible without sacrificing battery life. A well-performing app can attract a large number of users.

2.2.5 Security

In-app security will be a source of worry for developers. Malware should not be present in the program; otherwise, it may cause software or hardware disintegration, necessitating extra time and money to resolve [96]. With so many operating systems and device variations, maintaining application security might be difficult to achieve optimal security standards. App developers face a difficult task in establishing a relationship with end users. If the mobile app fails to connect with end consumers, all of your hard work and money will be nullified.

2.2.6 Analytics and Innovation

Analytics uses big data analytics, devices, and context-aware services to lead policy actions and customize communication and operations [97]. There are different emerging technologies in Data Science as the scoop of business and digital transformation in a constant state of change. With human interaction, it grows by the day. The amount of Data generated from technologies is unmeasurable. Data science aims to collect, process, analyze, and present the data in innovative visual that helps the human understand trends and information's. IT organizations are looking for ways to take advantage of the increasingly large quantities of data they oversee for business by incorporating these innovative systems and data and applying predictive analytics. IT can contextualize and design products and services in an intelligent way to increase business value [98-99].

Data Analytics presents a significant opportunity for many organizations to innovate, but only if they

know what to do with it. In recent research, they examined the different organizational structures that influence data analytics to stimulate innovation. However, some of the results were shocking, professor Lynn Wu Wharton, professor at organization structure and information, said, "economists have documented that we have been spending more and more money per capita on research, but we have a decline in the rate of innovation we are generating, that is because we are spending lots of money with less return, there are many cool data-driven innovations in the market but it rarely a statistic to find any innovation statistics" [100-104].

2.2.7 Data Driven Innovation (DDI)

DDI is an emerging concept that refers to the integration between digital data and analytics into innovation. The role of data analytics in innovation is to provide new knowledge that could not be obtained in a practicable way to identify users' needs or identify new users. In business, DDI promises to create value in many operations, from the optimization of value chains in manufacturing to customer relations and services [105-107]. The public sector is also a vital data user with great access to data. Policymakers will use data to create a wide array of policy issues and address many important aspects of public services by providing policy guidance and promoting growth and well-being. In an interview with Mr. Khaled Al Shamsi Umm AL Quwain Smart Government office and a member of United Arab Emirates AI and Blockchain Council, he said: "UAE government aims to improve the quality of life for its citizens and residents and in order to achieve this vision passion for using AI and its applications in various ways to improve government performance and creative innovative work environment to act, create the development objectives [108-111]."

2.2.8 Artificial Intelligence

Artificial intelligence (AI) is the use of IT systems to mimic the role of human intelligence, problem-solving, learning, and judging. Many businesses see the huge potential in AI, and a recent study showed that over 72% of business leaders believe that AI can increase the human's concentration on work [112]. One of the main goals of AI is to improve the quality and consistency of data, "AI does not tell you what to do, but it tells you what was and what

is,” said Michael F. Gorman, professor of operation management and decisions science at the University of Dalton Ohio. Moreover, another study from Pega showed that after the COVID-19 crisis, organizations are investing more heavily in AI tools to help them meet their customer's needs [113]. The same study calculated that 74% of the respondent believed that it is necessary to invest hugely in intelligent automation for the sake of their organization's success. AI helps in fuelling better decisions and real-time insight to work as well as adapting to the changing context of customers and employees.

2.3 Radical Openness and Innovation

The importance of radical openness and how it influences innovation is clearly pointed as the more openness the more innovative. Openness reflects in transformation of science and innovative ideas and shows how they operates in global context. The expansion of radical openness in innovation is hard because of the uncertainty and the implemented changes in process, organizational structure form and culture [114-115]. Innovation and science are counted as open enterprise. There are many challenges that affects and shapes openness, which are political regulation which some countries enforce on their markets. Financial aids which could be so limited to have research and development in such sectors. Collaboration of local markets and the government support to make them more open and wide [116-119].

Openness is vital to an organization it gives it the flow of technology, develop new structures that suits the new era, keeps the markets in competitive advantage.

Practical examples of radical openness could be the founding of Google Drive and any facility which is similar to open shared storage. It is vital that there is openness so it has the access of so many people [120]. Another example is United Arab Emirates government and The Fifth Generation- 5G which is a landmark to achieve, smart city and artificial intelligence applications.

2.4 Trust and Innovation

Digital transformation is linked through many fields, and has an influence over many of them. The relation between the innovative transformation and trust is the main focus on this part [121]. Discovering the relationship between innovation

and trust goes wide enough to define that any organization or entity needs trust to build up clear innovative ideas and progress on, sometimes it means the organizational culture of trust, transparency and security. Innovation is more about knowledge partnership, collaborative culture and the management of both. Trust in an “underappreciated but potentially high valuable source of value in open innovation networks”. It is one of the hardest things to achieve in any organization, specifically with the bureaucratic systems because of the idea of top management or top leaders having the right of decisions while the middle have to buy the rules without discussion or clarification, the truth is that in most of the top innovative organization they have clear cooperative leaders and teams working together toward, top leaders could clarify as much as they can and talk with their teams so they work smoothly and gain the targeted result, It also shapes the innovation competition between organizations. Concluding how to manage and build the phenomenon of trust inside and outside is always about adopting authenticity, investing in the organization and intellect leadership.

The relation between trust and innovation is has many angles to view firstly what’s influences it and what are the challenges:

Corporate image has an influential rule of trust, more about giving the financial services distribution it is builded through the time by the frequent satisfactory interactions between firms and individuals [122-128]. Trust is important in all sectors, for example the new firm holding up long term financial service it is never trusted unless the result of someone who used to trust to hold up his services. Trust can reduce the uncertainty in all decisions financially. Functional image and institution image also has an important effect on trust, when the corporation maintain the high reputation, it causes the trust of many stakeholders. Trust affects the working networks inside the corporation, by having more trusted employees to think and work hand to hand the idea of success is more likely to spread all the teams are clear about all decisions without the personal side of any conflict [129-131]. Then it affects the strategic network wideness, it is important that all have links to leaders and strategy makers to have the open talk and get the ideas flow easily and then think how to improve and stay innovative without

the fair of failure. The more the employees share their knowledge together the more the organization gets innovative and feels the trust. The challenges are commonly how to build trust in the era of changing to foster innovation with a brave heart, so it is hard to believe in product that is numbered as newly in market. Organization could build trust in innovation and transformation through open dialogue, understanding how a new product or innovative idea works. Gather more information and access to meet clients' expectations and satisfaction [132-139].

To foster innovative ideas or innovate change you need to get the trust of the recipients. In organizations and different sectors, trust is built over time passing it is the result of progressively experienced and reliably independent of individual and employees [140-146].

Practical examples of trust and innovation, is shown in many entities and organizations such as Dubai customs. Director General of Dubai Customs H.E. Ahmed Mahboob Musabih received the "Great Place to Work" certificate, which points that Dubai Customs as the first customs organization to receive such certification of trust inside the organization which measures effective communication, trust, creativity, and teamwork [147-149].

I believe that trust could be improved in innovation by sharing more information between mid-level leaders and their team with a great flow of clear points to work in. Giving the teams wider birth to work freely. Being transparent and honest to the clients, teams and leaders. Creating an environment that support employees' innovative ideas and taking the risk with the study of the factors that shapes it [150]. From the conducted interview, the main recommendations are to enhance group work hand to hand in innovation by forming the right group norms, designing team that works on innovation production strategically, encourage employees trust to innovate freely. Collaborate across the organization boundaries, physical barriers and hierarchical levels and adopting practices such as rotating leadership and peer evaluations.

3. RESEARCH METHOD

As indicated earlier, this paper aims to present the connection involving digital transformation and innovation. To evaluate the relationship, we

conducted a study applied on digital transformation specials from different organizations across United Arab Emirates UAE.

Combination of qualitative and quantitative approach was used to measure the effects. Four interviews were conducted from 4 different organization in UAE, Question were organization in qualitative approach to allow more interactive and explanation from interviewee. For the purpose of achieving the objectives of this research a survey was administered to collect data from expertise in the field. The quantitative method is the best way to get exact statistics and easy compare the results. Due to the challenge of finding the right module to structure our survey by, we agreed on separating the data collection based on each parameter focus expertise and targeted considerations.

4. MAIN RESULTS

Here are the main results based on each parameter: Hypothesis 1: There is a positive relationship between Societal and Innovation.

To measure the social innovation in the region, quantitative research (interview and survey) has been done to acknowledge the results. The data collection has been done in two ways: first an interview with a member in Retail sector who worked in innovation and technology department for 15 years and had impact in SI toward the community by different programs and initiatives (Appendix 2). Mr. Manoj Vijayan, Director of Innovation and Technology Dept. in aswaaq LLC have pointed out his experience in SI, "In the procedure of continuous process of fine tuning, sometimes we end up in a radical and disruptive approach which will have major optimization on time and cost. Which is the direct impact on employees. Anything we do should be an interactive and decision support model."

Moreover, he added that aswaaq LLC have delt with "SI tasks for employees, customers, and partners. But same time this will have a major impact on number of employees who is operating currently. We constantly scale up their skill set to accommodate in other areas of the business (more on a decision support system than operation). Thus, ensuring an ethical transformation". Also, Mr. Manoj have mentioned that different kinds of indicators to measure the SI in the retail sector and they are modern collaborative platforms as Microsoft Office 365, loyalty programs as

personalized and frictionless transactions, various friendly apps to ease the tasks in the physical locations and supply chain that enables a vendor portal (SaaS Model) to address the entire chain of Purchase order processing till the invoicing matching.

The second way that have been done to collect the data is by conducting a survey and have been distributed to different age group of people. In the (Appendix 1) you can find the survey questions with the results. The survey was circulated to identify the SI in UAE communities. In (Table 2), it clarifies the most well-known SI challenge in UAE and that is Employment (66%). The least challenge that has been addressed is Supporting and encouraging Entrepreneurs (11%) as I think in UAE, we have many government offices and initiatives to help the new generations to start their dreams and careers.

There are many SI in Dubai and from the survey it was pointed out Expo 2020, distance learning and smart governments are the most well-known social innovations in the last years. The impact on the society mostly were positive and economic impact (Table1).

Mostly all who have answered the questions are interested to volunteers and be from the SI team to make a change in their community and society. As I see that this is a good advantage toward the future of SI in our communities and the mind-set of the new generations can be active and cooperative (Table 2).

Hypothesis 2: There is a positive relationship between Mobile and Innovation.

A quantitative research method was utilized for the purpose of finding reliable results regarding the consumers' thoughts, standards, as well as their preference on purchasing or using innovative mobile applications available in the market. The data collection is conducted through a one-on-one interview with the In-Charge Manager of Masdar's Innovation Development Department. The interview questions are primarily consisted of the manager's average time spent on his smartphone, as well as his point of views about the convenience that the innovative mobile applications offer in his daily life. Further, the later part of the interview is about the manager's opinions based on his experience in using Masdar's City Mobile App.

The interview opened with the question of how often Masdar's Manager uses his mobile phone. As

provided in (Appendix 1), the interviewee, just like most people worldwide, uses mobile phone almost every minute in every single day for the purpose of entertainment, work, business, and for communication means. The main reason why most people nowadays are inseparable with their mobile gadgets is due to the convenience it offers towards the people's daily activities. Based on (Appendix 1, question 9), the respondent maintained that mobile applications can be efficient and sustainable too. It is sustainable in a sense that various important activities such as payment transactions, grocery shopping, business engagements, and deliveries can be done with just a single tap on their smartphones. More importantly, mobile applications allow the users to effectively manage and access their businesses at their most favorable time of the day. Its features enable people to conduct or attend important business meetings anywhere they may be.

As presented in (Appendix 1), in response to the question of what particular mobile or social media app that the respondent often uses, he inferred that he usually uses Google and Facebook application. Just like the majority of people around the world, Masdar's Manager's commonly used mobile application is Google. Google provides various online services for people and it is predominantly used for search purposes, documents and presentation features, business transactions, and even setting up clear schedules for their day-to-day affairs and undertakings. Since majority of the world population is using mobile phones and lots of mobile applications, the rising threats for data and identity theft is also becoming alarming for the users. Particularly for online bank transactions, it is highly important to ensure the safety of the consumers. On Question 6 of (Appendix 1), Masdar's In-Charge Manager answered that despite the growing threats, he maintained that he gives his full trust for the finance companies for his online banking transactions. This is mainly because of the existing security features the company offers specifically the authentication codes, One-Time-Password (OTP) and privacy policies.

The second part of the interview is comprised of questions about the respondent' assessments of Masdar City Mobile App. He said that he uses the said application and he only has a fairly good feedback based on his experience in using the app. One thing that made him love the app is because of

its engaging features. He also added that he enjoys using the Masdar City Mobile App for it aids the users in navigating places within the city. It does not only navigate, but it also educates people for its informative programs. It tells the background stories and information about the important landmarks, and helps the users to find nearby restaurants and any other amenities within the city. Users of this mobile application generally have only positive feedbacks for this app. The app's features provide great experience to the users, hence generating and attracting more consumers to try the app themselves.

Hypothesis 3: There is a positive relationship between Analytics and Innovation.

To evaluate the relationship between Analytics and innovation a study on 25 SMART digital employees from all over the UAE have been administered. The study asked the participant 5 question regarding the effect and impact of Analytics innovation on their work.

From our survey we have concluded that Analytics and innovation are positively related. Respondents' findings showed that 92% have agreed that Analytics have a positive impact of the digital transformation and it changed how they work in a positive way.

When we asked about the important parameters of the Analytics, 36% of the participants answered that "Technologies" were the most important aspect in the Analytics innovations then followed by Data and Services. This shows how data driven technologies is highly promoted in Analytics government office and play a vital role in increasing the important of Analytics innovation.

Although, Analytics Innovation is a tool to make our life better, this tool has a challenge. During the study we asked about the challenges in Analytics innovation and 64% of the participation said security, 40% said that finding experts in Analytics and Data managers is challenging in their opinion.

To find more about the subject we interviewed a specialist in this field, Mr. Khaled Al Shamsi, Director of Umm Al Quwain SMART government office and one of the UAE Artificial Intelligence Council members. Mr. Khaled was very generous with helping us in our research as he said, "data science is an emerging principal, by 2021 we came to a state that we cannot actually move without it". Furthermore, Mr. Al Shamsi talked about how new digital organizations will kill the traditional ones if

they do not digitalize quicker. There are many organizations do not know what digitalization meant, but at the same time, there are many companies that think data is the new oil. In UAE government there is no place for the old-fashioned services and offices, Government offices directors who do not realize this will be left out.

When we asked Mr. Al Shamsi on how innovation effect Analytics he demystify that Analytics and Innovation are a correlate concept each on bring the best of the other. Why we need to innovate and what we need to innovate are a critical question but when you ask HOW we innovate here come the roll of Analytics, the secret ingredient is Data science as it's the most crucial part of future innovation because it comes from Data. Data helps us to conclude findings as solution for problems from a facts and numbers not from points of view.

The creation of UAE AI council was a very important step in UAE government as its boost the government performance and use integrated SMART digital system to overcome challenges and find a quick and effective solution to creative economic value for the country.

Hypothesis 4: There is a positive relationship between Radical Openness and Innovation.

To collect and gather the common knowledge about Radical Openness and Innovation, an interview has been researched toward the topic, TED eBook authors. We have started with the meaning of (Radical Openness) as it can mean differently toward the subject it relates, and author Tapscott writes on the meaning as "it can mean many things, depending on the circumstance". So, we've looked at four different strategies for openness that ultimately entail some pretty deep changes in business and society."

In addition, Mr. Tapscott added that when it comes to innovation, organizations rarely exploit the power of openness in their business and institutions. It is hardly the first word they would use to describe companies and other societal organizations.

Adding to above, Radical Openness examples are many, as their favorite is "unprecedented steps GlaxoSmithKline took in October 2012 to release all of its clinical trials data on the Web. It was an extraordinary move — a bid to aid in the discovery of new medicines and end any suspicion that the pharmaceutical giant had secrets to hide. This was an incredible first in the ultra-secretive world of

drug development. Chief executive Andrew Witty called the move essential to finding new drugs to treat the diseases plaguing the world and there has been much admiration for these efforts in the broader medical community”, as Mr. Tapscott mentioned.

Moreover, mentioned in the e-book, ways that proved Radical Openness to be successful in different organizations that it increases trust that is an essential glue to the networks and economic. Also, giving companies access ideas and capabilities that lay outside their corporate boundaries. This will help to open stages on which vast ecosystems of exceptional talent create and assemble some of the world’s best innovations, as mentioned by Mr. Tapscott.

Hypothesis 5: There is a positive relationship between Trust and Innovation.

To generate more information and data regarding how trust relates to innovation is positive way, and what is the positive connection between the two variables the researcher has

conducted an interview with an employee in the Federal Authority for Identity and Citizenship (ICA) to analyze and test the hypothesis which is “There is a positive relationship between trust and innovation “. The employee is working for this corporation for nearly 15 years, standing over all the changes happened within his period in leadership. Added also some recommendation to improve and deploy trust that results in innovation.

The point of view in many situations regarding innovation and trust during his experience was summarized in the interview, the main points are : In the ICA and any other organization trust and innovation are positively linked through having the comfort feeling of working freely, the more an organization have trust the more the innovation is conducted by employees for example once we moved the online forms and applications most of the employees were not comfortable of that shift specifically the once who works on the national identity filling information they try their best to be focused so they don’t miss a number or the spelling of any named saved.

The existence of trust in working frame and between employee’s with their leader leads to an innovative activities without the fear of failure, to trust an employee it means to feel confident about the work done before you can see it in other words

we can see that whole teams could fail because their is unspoken annoyance towards one person whom others consider unreliable.

The flow of clear information leads to a confident trusted employee then results with an innovative ideas, open communication makes everything clear and smooth whenever the team lacks this concept it means you may face the failure because of it. Sharing information clearly and making every possible point of communication is a concept that leads to the success of any innovative activity. Most of the companies around are exposing transparency as a part of their strategy and also their principles, that’s a way of showing trust.

5. RECOMMENDATIONS

5.1 Social

We believe Social Innovation can be practiced in different societies globally or locally by many aspects. I think establishing a permanent multi-sectoral Social Innovation Council and create an office for the council will help the citizens to co-operate and easily to frequent visit the office. Another recommendation is that SI can improve the skills and ideas of the society and it can happen by creating training programs and starting with early stage and support them. Last but not least, in our point of view, knowledge sharing initiative can be a major advantage for above recommendations and it will make a big impact toward the social innovation outcomes.

5.2 Mobile

Given the number of existing mobile applications available in the international market, it is vitally important for app developers to formulate a comprehensive framework in developing an application that would certainly attract different target consumers. This is for them to effectively compete to the already existing and well-established names and concepts of mobile applications in the market. The app developers need to utilized an efficient OS in developing their applications for it to become more favourable for consumers. Lastly, as I have observed in this digital era, the technological breakthroughs have also opened doors for an increasing online threat that could harm both the sensitive information and physical health of the users. With these unfolding menaces that comes along with mobile and innovations, it is necessary for mobile app

developers to not solely focus on creating engaging features for their applications but also to ensure their target customers with security and safety of their privacy and essential information.

5.3 Analytics

Although analytics and innovations are positively linked, trends for data-driven innovation are not moving forward dramatically. We are in a great era of technology especially with the rise of AI and machine learning. There is no evident of analytical tools to examine the coloration between these two variables and how we can use them more effectively. For example, we have innovated how we can use AI in analyzing data, but have we learnt to use them effectively with high percentage of efficiency, we do not know as there is no many statistics provided to measure it. This really provide a ripe opportunity for us schoolers to examine some key lessons for the future.

5.4 Radical Openness

Truly, radical openness is a window to opportunity for growth and success. But the pursuit for it entails impediments that threaten and imposes risks for the company. In the light of the foregoing research and thorough analysis, this section recommends the following for the effective implementation of radical openness.

Firstly, the company or organization must constantly train itself to adopt on changes and shall accept that the world is evolving so does the business world. In this context, the company shall support all employees and managers while undergoing certain changes. Constant training and seminars in view of certain changes must be carried out. Furthermore, it is highly recommended that the company shall create a research and innovation team that will introduce certain changes fueled by modernization and current trends of the world. With this team, plans and initiation phase will be magnified by the company and necessary steps will be projected. Thirdly, changes are accompanied by risks. Hence, it is also recommended that the company shall identify, assess, and monitor the risks that could hinder the growth and process. With mitigation plan, the company will be guided. More so, radical change is important and motivation among employees is of great importance. The basic tenet shall be implied to employees by means of

workshop and seminars. Radical openness indeed is a milestone towards success. Seize and take it!

5.5 Trust

We have the view that trust results in innovation and we believe in that the more trusted the employees are, the more innovative the corporation is and this is compatible with all entities local and international. And we are noticing the change in all concepts and principles. Trust transparency and how to build culture is important concepts of success in innovation. We founded from the interview done that most productive corporations have achieved a high level of trust between employees and leaders and has the benefit of opening up clear communication. Be Productive, find teams that encourages open communication, practice the management of team building, share your view of point and faire and don't forget to set up the right norms and always think about transparency because it is the way of making sure that everyone is on the same page and works in alignment with the targeted result.

6. CONCLUSION

Research about the interaction between digital transformation and innovation is still scattered and an overall framework on future theoretical and empirical studies are needed. Thought a review of existing literature reviews on the topic and qualitative research we have examined a micro level of this interaction. Future research on a smaller level of analysis would be hopeful and will provide opportunities and new scope of digital innovation.

“Social Innovation is a response to a social or environmental problem which, once adopted, results in better outcomes than existing approaches.”

To conclude, SI is a major characteristic to improve and transform the thoughts and views of societies around the world to a better living and income by using updated innovations and simplified improvements.

The advancement of technology will continue to push businesses to innovate in order to better serve their consumers' demands. Developing innovative solutions to meet the requirements of our clients as their shopping habits change must always continue. Mobile apps have completely altered the game. One can expect to not only meet

market need for a more accessible shopping experience, but also to lead the way in developing innovative and interesting ways to grow mobile apps to meet future demands.

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Appendix (1), Survey Questions

Survey Questions – Social Innovation in UAE

<https://forms.gle/dGaS5MXfSL1UhAPz6>

Social Innovation

Thank you for participating in this survey that aims to identify and measure the Social Innovation (SI) in UAE. Social Innovation refers to "the process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress."

Kindly read the questions carefully, and answer at your own pace. Our goal is to improve our academic research, and to highlight the SI in the country that have big impact on the society.

This survey should only take 2 minutes of your time. Thank you for your effort and support, your participation is confidential and is very much appreciated.

What is the most important challenge being addressed by the Social Innovation in UAE? *

- Environmental Sustainability
- Improvement of Services / Infrastructures
- Supporting / Encouraging entrepreneurship
- Improvement of governance
- Employment
- Education
- Demographic Challenges (e.g. Ageing population)
- Other...

Please describe one well-known SI in your city? *

Short answer text

How has the SI, you described, led to changes in your city? (e.g. positive or negative, environmental, social, political, cultural, and/or economic impacts, etc.) *

Long answer text

Will you be willing to be one of the SI team members to make a (happy) change in your neighborhood? *

- Yes
- No

S

Table (1)
Survey Answers

What is the most important challenge being addressed by the Social Innovation in UAE?	Please describe one well-known SI in your city?	How has the SI, you described, led to changes in your city? (e.g. positive or negative, environmental, social, political, cultural, and/or economic impacts, etc.)	Will you be willing to be one of the SI team members to make a (happy) change in your neighbourhood?
Environmental Sustainability; Supporting / Encouraging Entrepreneurial; Improvement of governance	Improvement of governance	Yes	Yes
Environmental Sustainability; Improvement of Services / Infrastructures; Improvement of governance; Employment; Education	SMART GOV	Positive	Yes
Employment	Tawteen	No impact at all it was in media headline only!	No
Improvement of Services / Infrastructures; Improvement of governance; Education	Distance learning	efficient way to deliver lessons/information to students/workers. It also saves times and money.	Yes
Environmental Sustainability; Employment	Recycling the old asphalt material (instead of dumping it) and utilize it in different areas in the city (e.g. Residential)	<p>The mentioned impacts below are all considered positive:</p> <p>Economic impacts: Reduced the cost of road construction in some cases.</p> <p>Environmental impacts: Minimized the amount of emissions produced from new asphalt construction activities and the dust that results from the vehicles passing on the road base.</p> <p>Social: The society is much more pleased with the recycled asphalt material rather than the road base material when constructing temporary roads.</p>	Yes
Employment	expo 2020	economic impact	Yes
Employment	Ma'an, Established by the Department of Community Development in February 2019, the Authority of social Contribution "Ma'an" has been bringing the government, private sector, and civil society together to help drive social innovation and build a culture of social contribution and participation while aiming to strengthen Abu Dhabi's position as one of the best global destinations to work and live in.	Positive	Yes
Employment	expo 2020	economic impact	Yes

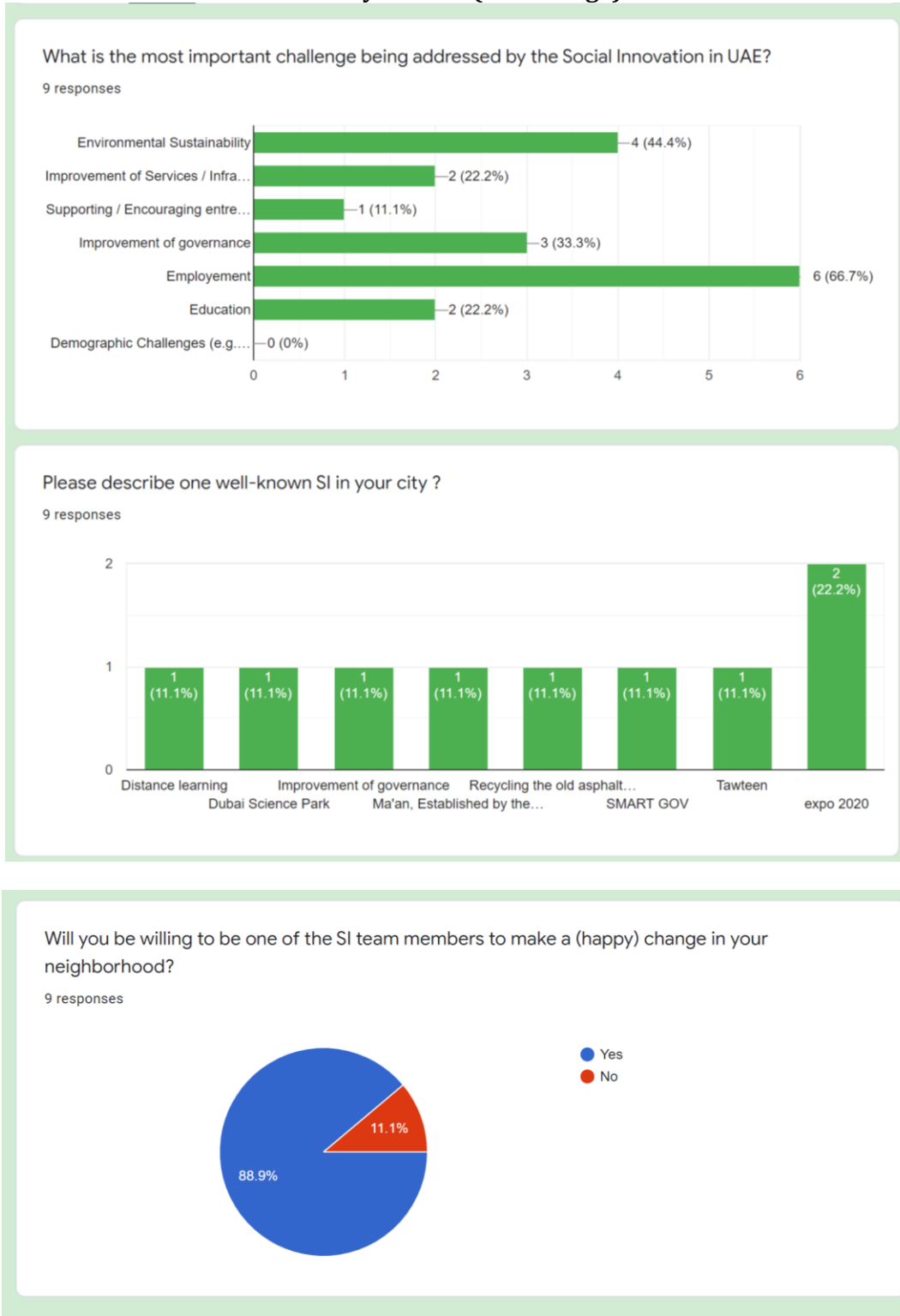
Environmental Sustainability

Dubai Science Park

Educational impact

Yes

Table (2)
Survey Results (Percentage)



Analytics Survey

Do you see Analytic Innovation have affected the digital transformation?	What the most important parameters in the Analytics Innovations?	What are the challenges in Analytical Innovation during the digital transformation?	What are some suggestion to increase the awareness of the important of data driven technologies
Yes	Technologies	Cost	
Yes	Technologies	finding experts;trust in those Technologies;Security	Intensification of courses of the important of data driven technologies.
Yes	Data	lost jobs;finding experts	To add in the workforce and online programs awareness toward the technologies
Yes	Technologies	Security	
Yes	Data	Cost;trust in those Technologies;Security	
Yes	Technologies	trust in those Technologies	Increase awareness through social media
Maybe	Services	lost jobs	
Yes	Technologies	Security	Nothing everything is perfect
Yes	Data	Cost;trust in those Technologies;Security	
Yes	Technologies	finding experts;trust in those Technologies;Security	Intensification of courses of the important of data driven technologies.
Yes	Data	Security	
Yes	Services	lost jobs;Security	
Yes	Services	finding experts	
Yes	Data	lost jobs	
Yes	Services	Cost;trust in those Technologies;Security	
Yes	Technologies	finding experts	
Yes	Technologies	trust in those Technologies;Security	
Yes	Technologies	trust in those Technologies;Security	
Maybe	Services	Cost;Security	
Yes	Data	Cost;finding experts;Security	
Yes	Services	Cost;finding experts;Security	
Yes	Data	Cost;finding experts;Security	
Yes	Services	finding experts;trust in those Technologies	
Yes	Data	Cost;finding experts	
Yes	Services	lost jobs;Security	

Appendix (2) Interviews Questions Societal Interview

Vijayan, M. M., 2021. *Director of Innovation & Technology Dept., aswaaq LLC* [Interview] (14 July 2021).

IT Management- MIS04 610 Assignment - Social Innovation Interview
Summer 2021 Handan Bin Muhammad Smart University

Digital Transformation and Innovation - SMART (Social)

Social Innovation Interview

(aswaaq) LLC Retail and Ecommerce Impact

Part 1: General

1- **Organization name, interviewee name, date of interview**
*aswaaq LLC
 Mr. Manoj Vijayan
 Director Innovation & Technology
 (14 June 2021)*

2- **Brief about the organization (few lines)**
aswaaq LLC is an e-commerce company. It was formed in 2008 and played an important role in serving and empowering the community through industry like Grocery Retail, Food Retail, Travel, Travel using best business practice, standardized approach and cutting-edge technology.

3- **Brief about social innovation (SI) in the organization (few lines)**
It's implemented various platforms and collaborative tools, which enable us to empower and enhance experience across the company for employees, customers, and partners. Customer workshops are conducted for business process re-engineering to optimize and ease the tasks.

4- **Any experiences in social innovation? Innovation which taught you lessons (few lines)**
*In the process of continuous process of fine tuning, sometimes we end up in a radical and disruptive approach which will have major optimization on time and cost. Which is the direct impact on employees.
 Anything we do should be an interactive and decision support model.*

2

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Part 2: main body

5- **Do you have innovation strategy in your organization?** *Yes, we formalized a Charter and Strategy.*

6- **Do you have innovation methodology in your organization?** *Yes, Innovation Framework covers financial impact, risk mitigation and human resource impact.*

7- **How do your organization deal with SI?**
*As we all know social innovation means the risks for employees, customers, and partners. But some time this will have a major impact on number of employees who is operating currently. We constantly scale up their SI set to accommodate in either area of the business (before on a decision support system then operation).
 Thus, ensuring an ethical transformation.*

8- **Can you tell us about this strategy and/or methodology?**
*Our innovation goes through a well-defined control framework to have an ethical approach, avoid exploitation, and minimize failure impact.
 Life
 Disruptive approach: In the context towards Strategy, Financial and Leadership
 Complete Freedom approach: In context towards Technology, Cultural and Intellectual.*

9- **What are the SI indicators to measure in the company?**

No	Social Innovation Indicators	(Tick ✓ if all applied)
1	environmental	✓
2	Community Need	✓
3	Services Responsibilities	✓
4	Customer Happiness	✓
5	Others (please specify)	✓

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10- **Are you using any other indicators to measure?** *Yes*

11- **If (Yes), please specify**
*Modern Collaborative Platform
 Loyalty program
 Q&A/Q&A*

12- **If (yes), Give us a brief about the programs.**
*The Platform is from CRM, various apps are utilized from this platform to ease the tasks independent to the physical location.
 Loyalty Program: Personalization and Personalized transactions.
 Q&A/Q&A: We are having a Frictionless and Operate on Trust model Customer Experience.*

13- **In which SI method do you use the programs below (Tick ✓ if all applied)**

No	Programs	Social Interaction	Social Happiness	Social Usage
1	Company Application	✓	✓	✓
2	Company Website	✓	✓	✓
3	CSR	✓	✓	✓
4	Feedback app	✓	✓	✓
5	Office Visit	✓	✓	✓
6	Others	✓	✓	✓
7	Seasonal events	✓	✓	✓
8	Others (please specify)	✓	✓	✓

4

IT Management- MIS04 610 Assignment - Social Innovation Interview
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14- **Any other tools or processes that lead to SI improvement? What, how, what results, his personal judgement, how to improve it.**
*Q&A/Q&A: We are having a Frictionless and Operate on Trust model Customer Experience
 Supply Chain: Enabled a vendor portal (Self-Model) to address the entire chain of Purchase order processing till the arriving matching. Which will address the gap in the Purchase Order distribution to the vendor and invoice reconciliation, if this process is not optimized rightly, this will have major impact in stock, payment, loss of sales etc.*

15- **What are the strengths and weaknesses in the organization based on the interviewee opinion toward SI.**
*Strength: SI helps in explore and adoption to changes for better efficiency and ease
 Weakness: Adopted quite slowly in the routine cycle. Some resistance towards changes to avoid risk.*

16- **What are the opportunities and threats in the organization based on the interviewee opinion toward SI.**
*Opportunities:
 Since our business are directly responsible for the wellbeing and essential for every thing, we are consistently in the process of enhancement, standardization towards the customer experience.
 Customer adoption of Deliver Channel, which we need an efficient operation.
 Threats:
 Impact on the existing rules
 Demand to improve the SI set
 Disruptive models
 Rapid Change
 Cyber Attack - (Regulation?)*

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17- **Final recommendations or any additions the interviewee likes to add.**
*Collaborative business model with Suppliers, Owners and Partners
 Or for Self model solutions for a Dynamic Scaling
 Or for Q&A model to have a proper Business Continuity Planning with latest recovery point and RIL minimum time
 Or for Cloud model towards zero down time due to cyberattack, system fault, patch update etc.*

***** End of Interview*****

6

Mobile Interview

1. What does your daily activity look like? How many times do you use your mobile phone in a day?

ANS: I use my mobile phone many times in a day. I use it mostly as a morning alarm, as a device where I keep tabs on my schedule, check and reply to my emails, call and text people that I need to talk to anytime of the day. So basically, almost every minute of every day I use my mobile phone.

2. In this fast-paced technological period, what kind of interaction do you expect from the company?

ANS: As a person, I personally want to have a face-to-face contact and engagement to the people that I have a meeting with but with many things that we juggle every day, sometimes the easiest way to attend meetings will be through a device through any type of technology available.

3. With the working atmosphere feeling like always on-the-go, do you want to have access to your company engagements wherever you may be? If so, how do you want that to happen?

ANS: Yes, very much so. Like I said, whatever technology or device available that would allow me to do my business wherever I would be very helpful. Although provided, it should also allow me to engage without hitches and something that I can bring on-the-go.

4. What applications and social media sites do you often use? Do you use your mobile phone to transact any services?

ANS: I often use Google applications to do my business transactions from schedules, to documents, reports, presentations, etc. In terms of social media, I only have Facebook just to keep track with family and friends. However, I also use my phone or any mobile device that I must do bank transactions, check insurance and real estate.

5. What will be the best way to personally engage with the clients even through mobile transactions?

ANS: A good internet connection is one, then of course a good device that would allow you to see and talk to the person without any glitches or technical malfunctions. Also, a good quiet room or place would be appropriate especially for meetings or such.

6. Mobile applications and social media sites are prone to hacking, what possible innovations should the company use to protect its clients and employees?

ANS: One of the challenges that many companies face in upgrading their services into mobile apps is security. Investing in the top-quality security features for the mobile applications can add assurance to the possible hacking or stealing of data from any applications.

7. Digital transactions can easily be manipulated by anyone maintaining the database and networking. How much do you trust the company, as a whole, to maintain the dignity and values of the company when issues arise?

ANS: I trust the company completely. For security and privacy, they have provided privacy policies and authentication codes that are personal to the user only. As being a huge company and is respected by many, I believe that the company will not disappoint its customers.

8. Applying social media, mobile applications, and the website interactions definitely decreases the use of paper, but still uses energy to power electricity and computers. Do you think this is sustainable?

ANS: There is definitely a huge debate about this situation. By using paper, you cut down trees and possibly deforest a certain piece of forest land, then in the process of making the paper itself it produces more carbon - however its also biodegradable. On the other hand, digital media may sound like its more sustainable since electronic parts can be reused. However, the production and manufacturing of the devices would also create a huge carbon footprint. There is still a lot of information lacking in terms of this debate.

9. Enumerate a few ways that makes using mobile application sustainable and efficient in a holistic perspective.

ANS: On a larger perspective, mobile applications nowadays are used usually for payment transactions, shopping and groceries, food deliveries, and business engagements. These mentioned daily activities can all easily be done through one device and without wasting car gas, energy, and time to go one place after another. This is one perspective that people could look at in terms of sustainability in the use of mobile applications.

10. Have you used the Masdar City Mobile App? What is your assessment on the new application?

ANS: Definitely. It has an easy user interface, very interactive for the users. It has nice guided tours that presents a very interesting history of Masdar City. It is highly recommended.

11. What are the strengths and weaknesses of the application?

ANS: One of the many strengths of the app is that it is very engaging. It helps you to navigate the different areas in Masdar City. Tells you stories behind landmarks, helps you find whatever it is you are looking for like restaurants, service providers, any amenities that you wanted to find. So far, there are no weaknesses that I can think of.

12. Have you heard any feedbacks and reviews from clients and other users of the Masdar City Mobile app? If so, what are they?

ANS: Yes, and I hear that it's good and highly recommended.

Analytics Interview

Al Shamsi, K., 2021. *Digital Transformation Analytics and Innovation*.

1. Do you see Analytics Innovations have affected the digital transformation? What is the effect?
2. Why do you think is Analytics in digital transformation so important?
3. What is the most influential Analytics technologies in implementing digital transformation?
4. Please provide an example of the most successful digital initiative that you have led?
5. Data-driven technology have they changed the public sector for the better? Or you still did not see any outcomes yet?
6. Big data, AI, cloud, IoT and many Analytics innovations where do you see this technologies after 10 year?

Radical Openness

Why radical openness is unnerving and necessary: A Q&A with TED eBook authors Don Tapscott and Anthony D. Williams

1. What do you mean by the term ‘radical openness’?
2. You say that old systems are failing us. How so?
3. What factors are forcing the dramatic opening up of society? Financial? Societal?
4. Why is radical openness such an unnerving concept for business?
5. What are the downsides to radical openness? Sometimes, unsavoury forces fill the vacuum left by great change.
6. Any great examples of organizations that first rejected this openness and then engaged it?
7. What are some of your favourite examples of radical openness?
8. Does radical openness operate the same globally as in the US?
9. In what ways has radical openness proved successful for different organizations?
10. Is Wikileaks a good use of radical openness?

Trust - Interview

Federal Authority For Identity & Citizenship , (A.B), 7-July-2021

1. What does trust in the workplace mean to you?

Trust allows me to focus on progressing, without second-guessing about other employees work if it is going smoothly or not or even questioning them working hard, it makes innovation production goes easily. It helps in preventing and eliminating bureaucracy, unnecessary processes, and excessive oversight that can both limit innovation and slow progress.

2. It's easy to develop trust with people you work with daily — but what about people you don't know (new candidates for example) ?

This would take us to the phenomenon of organizational culture, I'm still amazed at how we've manage to create a culture of trust and transparency inside our workplace.

3. What can you do to help engender trust?

It always comes down to how people handle failure and hard situation or struggling points. When people trust each other, the focus is on minimizing damage and getting back to the idea of hard work. The involved parties take responsibility with little encouraging, and they adjust so that all of us as a team can figure out how the hard times and situations we were straggling in will be avoided in the future.

4. Senior leaders make decisions all the time and it's rare that everyone in an organization would agree with those decisions. Sometimes those feelings can even lead to distrusting senior leadership, so how can people managers address times when employees don't agree with or trust senior leaders?

I believe what we have here is constant conversation between leadership with their teams, and in those conversations being as transparent and sharing as much information as they can, so everyone gets the clear view and work on without any doubts of success.

5. Let's say managers find themselves in a situation in which they have amplified the communication that senior leadership is giving the decisions that they've made to their teams, and the teams still aren't really satisfied with it. That manager then elevates those concerns upward, and they're either not met very well, or they're even met with a little backlash from others. What do you believe those managers could do in those cases?

In my point of view and my own experience, leaders are employees too. Sometimes the senior leader is just struggling with how to communicate the message. Or they're struggling with how to more effectively translate it. And many times that tension that comes when an issue is raised. I try to encourage leaders to not get overly reactive to when a leader, a senior leader is struggling with how to best indicate.

6. Identify the tools and/or processes that mitigate trust in your organization.

Transparency and openness help change that default mindset to be positive, built on a foundation and a bound of trusting leaders, even if you don't have all the information that went into a decision made by those leaders. Recognize that building trust takes hard work. Trust must be earned, so we have to be honest and supportive. Quiet sometimes, consistent and then we build on countability.

7. Describe the relationship between innovation inside your organization and trust?

Innovation and working tasks firstly and then will talk about the trust side because I see them connected to each other. Working tasks couldn't be done without having the easy way to contact then in order to get it you need to have the feeling of trust to get the information from the right source. So they are connected, you get innovative once you have the trust to work and the working task get easy.

8. Do you think that trust is mainly putting pressure on working networks?

Actually I believe that trust makes a bound between people inside the entity and it has a positive relationship with working network, the more trust you have the more you feel the freedom to work.

9. What are the strengths and weaknesses in trust the organization based on your opinion?

The strength of our organization is that we have strong base of trust, working progress and high competition. As a weakness we could admit it is not really shown but let's be honest and say we will work to be better always on to improve our services to make our costumers happy and build up more trust.

10. What are the opportunities and threats in the organization based on your opinion?

We will focus on having strong initiative externally, what I mean by that is more contact to our citizens to make them feel that we work hard to serve and satisfy them.



The Pivotal Role of Telehealth Technology in Risk Management and Risk Response Strategies

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ARTICLE INFO

Keywords:

Telehealth, Unknown risks, risk mitigation, project risk management.

Received: June 17, 2024

Accepted: Aug 23, 2024

Published: Dec 20, 2024

ABSTRACT

This research paper is a case study based aims to study how Telehealth technology mitigates Unknown-unknown risks, restrictions, lockdown and quarantine period. The research begins with listing the problem faced by many health sectors as they are searching for ways to provide the assistance required while protecting the healthcare provider and patients. The literature review lists the current existing cases that are using Telehealth technology in the pandemic to reduce the risk in addition to the benefits and challenges of the technology. In this research, two qualitative methods were used; personal interviews and online websites, webinars, and articles. The research involves both national and international organizations to provide the necessary information. As a result of our research method, we found that all mentioned organizations listed have an unknown-unknown risk management strategy. Besides, all of them used previously and are currently using Telehealth technology. Based on the gathered information and the listed methods used, this research's analysis supports the hypothesis that was conducted. According to the findings, Telehealth technology has been an ideal medical care solution during the Covid-19 pandemic, is beneficial for rural areas, and is cost-effective. On the other hand, as any technology is having a risk to it. Some of the risks are privacy protection, availability and accessibility, complicated health conditions, investments in training, incorrect diagnosis, and insurance coverage. As a result of this research, Telehealth technology does mitigate the unknown-risk and has mitigated it.

1. INTRODUCTION

Telehealth is a rapidly advancing technology using a collection of methods for enhancing health care and delivering health services through various telecommunication technologies such as virtual medical services [1-3]. Telehealth is the delivery of a health service across a distance.

Telehealth requires adaptation work and learning new competencies by clinicians, which decreased the dynamics and interaction between those involved in delivering health services [4-11].

Telehealth has many benefits. Thousands of outpatient appointments being reported throughout in major hospitals every year. The technology protects physicians, patients, and their families against contracting infectious viruses. It is crucial to consider the potential of telehealth as an alternative and increase the awareness on its importance [12-19].

The healthcare sector, during the pandemic, required to adapt to the situation. There was a

need to minimize health staff exposure to patients while increasing the patients' care. Health care systems had to adjust the technique of sorting, evaluating, consultations, and caring to patients. The change is to help deliver necessary healthcare while reducing the risk and ensuring healthcare staff and patients' safety. Telehealth technologies were an ideal solution to deliver health services during the pandemic [20-27]. For example, a patient in a rural area has a video conference appointment that may connect them directly to a central city hospital specialist.

During the pandemic, the research showed that Telehealth services had measurable and tangible results in mitigating unknown risk and in delivered the required health services taking into consideration the safety measures, social distancing and lockdown restrictions [28-33].

1.1 Research Problem

The world recently faced pandemic, which affected all sectors and daily life, including health care. People worldwide faced quarantine, lockdown, and strict measures for social distancing were taken. Despite the rapid spread of the virus and safety restrictions, people still need healthcare, medical consultation, and other health services [34-37].

Telehealth technology was a necessary solution during the uncertain time of Covid-19 to ensure citizens' wellbeing and offer the necessary medical and health services required.

1.2 Research Question

How can Telehealth technologies mitigate unknown risk (case study)?

This research will identify/investigate how Telehealth technologies mitigate the unknown risk and assist the health sector during the restrictions, lockdown, and quarantine period.

2. LITERATURE REVIEW

The outbreak of unknown risks shows the healthcare sector's need to adopt better and innovate ways to prevent a public health crisis [38-41]. The pandemics' widespread nature indicates the need for precautionary measures that safeguard physicians from exposure to risks. In this case, there are several opportunities to control the spread of health risks such as COVID -19 to improve care delivery in urban and remote locations. Telehealth is among the alternatives available to enable countries to adopt effective care

practices in response to unknown risks. The technology protects the public, physicians, patients, and their families against contracting infectious viruses. It also supports the equitable delivery of services by enabling physicians to reach out to underserved communities. The technology enables countries to provide medical consultations that enrich citizens' lives through timely access to competent care.

Using Telehealth Technologies to Mitigate Unknown Risk (Case Study)

The UAE continues to make considerable progress in maintaining stable economic growth and stability. The country has made notable progress in relying on the latest technologies for care delivery [42-44]. The progress made by the UAE enables it to catch up with the various stages of technological development that allow the nation to respond appropriately to unknown risks. Similarly, the country proved its ability to utilize state-of-the-art technologies to improve people's health and welfare. Equally, the young population is willing to embrace new technologies, thereby making it easy to integrate healthcare systems in care centers nationally [45-49]. However, healthcare challenges still exist in the UAE due to emerging burdens that also occur in other parts of the world. The high rates of cancer, heart diseases, and the recently COVID-19 indicate the country's need to support collaborations and initiatives that shape its innovativeness. Implementation of tech innovations countrywide could help to address the challenges caused by Coronavirus and other future risks. The 24/7 Telehealth system is among the UAE's options to enable professionals to provide consultations from remote locations. Patients can send information, including photos, to assist in diagnosis and treatment. Equally, the Telehealth approach relieves the local facilities of the burdens of inconvenience and inefficiencies that deny more people the chance to access quality healthcare. The Telehealth technology could apply well during a crisis that requires a quick response to dramatic developments [50-53]. Coronavirus's global media coverage, reactions, and worrying alerts show the government's need to identify new and better ways to prevent human suffering. Further, the COVID-19 brought trends such as overwhelmed care systems, increased need for emergency services, and evacuations that cause panic. Coronavirus's

declaration as a pandemic shows the seriousness of the situation and the need for healthcare systems to get the best equipment and deal with potentially high infection. Moreover, a sound approach has adequate technologies to address population-level anxiety associated with unknown health risks. The fact that the pandemic escalated quickly and without warning also shows the need for adequate prevention efforts [54-59].

Unknown health risks present new opportunities for the UAE to explore unavailable options. According to research, a significant consideration is to exploit the benefits of new technologies to support high-quality service delivery while protecting citizens from contact with infected persons. In this context, telehealth presents one of the best opportunities for the nation to protect healthcare workers from coming into contact with viral infections [60-67]. The technology is vital in low-resource regions or ones that are under immense pressure due to inadequate infrastructure and staff. The lockdowns and restricted movements brought by unknown health risks make individuals vulnerable to stress economic burdens and mental health issues.

Consequently, the government identifies unique and better technologies to help in addressing the needs of patients who require assistance but have limited access to essential resources [68-73]. Under the conditions identified, telehealth becomes an essential asset that has lasting implications across a nation's healthcare delivery system. Research suggest that technology is ideal for the best care that protects the public and professionals from direct contact with infected individuals [74-81].

The decision to use telehealth reduces resource exploitation across the healthcare sector, enhances access to care, and protects patients and physicians from infectious viruses [82-87]. Based on telehealth's massive benefits, it is suggested that technology availability is critical for individuals affected by new health risks. It helps to alleviate fears and anxiety among the public through timely access to information. In this context, patients can access routine care and learn to protect themselves. Equally, providers can identify patients who require additional interventions without making physical contact [88-91]. Therefore, the tools play a vital role in facilitating offices and emergency facilities to respond to a

broader population's needs. Telehealth's past use in responding to the influenza outbreak in the United Kingdom reveals telehealth's potential in changing the health situation nationally. In this case, the innovative solutions reduce visits to healthcare facilities as the government strives to adopt robust interventions to prevent the spread of infectious conditions.

The level of urgency of health pandemics and the rapid spread also calls for broad implementation of telehealth capabilities [92-96]. The challenge is to ensure that every household has the device and networks required to interact with providers. The World Health Organization already requested countries to protect physicians and work on saving the elderly and individuals with other chronic conditions. It also urged nations to safeguard the vulnerable groups by responding effectively to minimize the speed of spreading [97-101]. The priorities set by WHO in response to pandemics show the need for governments to acknowledge telehealthcare's role in reducing interactions and risks associated with the pandemic. Equally, communities can rely on the technology to identify and protect high-risk individuals by reducing exposure to locations frequented by those with the virus [102-109].

Recently, with detecting a case of Coronavirus in a cruise ship, the patients in the cruise ship underwent remote examination without a physician's presence [110-115]. Robotic telemedicine controlled by professionals facilitated the monitoring of blood pressure, temperature, and pulse, thereby paving the way for doctors and nurses' informed decision [116-121].

The high number of infected care personnel and deaths from infectious diseases show the level of risk physicians face as they try to control the situation. On the global scale, the number of documented health risks continues to rise, hence exploring virtual care delivery [122-129]. The solutions allow providers to screen patients for infections away from crowded healthcare facilities. Therefore, telehealthcare keeps unaffected providers and citizens safe, thereby lessening the burden of government and healthcare facilities. However, successful implementation of the solution is only possible through appropriate integration into the healthcare system [130-133]. The barriers to telehealth use require close attention to the different issues that slow and

fragment the technology's uptake. Substantial efforts are necessary to scale-up adoption through routine use of the technology. The limited success in countries such as Australia indicates the need for extensive consultations to enhance the development and implementation of highly functional telehealth services. A similar experience in the United States shows the need for increased willingness among physicians to push for telehealth implementation [134-139]. Such efforts by clinicians make the government aware of the need for timely response to health risks.

Telehealth is categorized among disruptive innovations, showing the need for increased support from healthcare professionals to learn new and better consulting ways [140-142]. The challenges also reveal the need for extensive training to make physicians knowledgeable and aware of technology's relevance in the modern healthcare system. Further, the barriers can be addressed through regular practices that support sustainable solutions. Indeed, physicians should be ready for telehealth to protect themselves from contracting infectious viruses. It is also necessary to include telehealth in the curriculum to send a clear message to professionals about identifying new and better ways to enrich citizens' lives [143-145].

A well-organized healthcare system is necessary to support the expansion of telehealth. In this case, the government collaborates with the private sector to facilitate a whole-system approach that emphasizes the need to embed the innovation into routine functions [146-147]. The strategy also stresses the need for all healthcare providers to be part of the transformations required to enhance response to health risks. Additionally, extensive telehealth adoption requires robust operational networks, policies, and procedures that can be scaled up to respond to the rising population's needs. Therefore, there is a need for change management efforts to ensure everyone within the healthcare sector has the expertise required to respond to emergencies on time. Multiple resources are also essential to support response tactics, assemble the right infrastructure, and have a comprehensive framework at the local and national levels [148]. The absence of a robust strategy undermines the coordination efforts required to address physicians, patients, and the general public.

The gaps in implementing telehealthcare to respond to a crisis in the UAE context indicate additional findings. In this context, the research contributes additional knowledge on the need to adopt the technology during the restrictions, lockdown, and quarantine period. Promoting technology helps safeguard providers, patients, and the general population from an unknown pandemic's increasing challenges [149]. Drawing examples from different parts of the world reveals the need for extensive studies to enable the government to bring much-needed expertise to patients. Further, there are possibilities of experiences extending beyond the current situation. Telehealthcare is among the game changers that will protect the human population from health pandemics' adverse effects. The timely response through comprehensive adoption of telehealthcare is necessary to prepare the country for future issues.

3. METHODOLOGY

Data collection for the topic of how telehealth technologies can mitigate unknown risk during the pandemic was somehow challenging. Covid-19 was an unexpected pandemic that recently occurred, and not much research has been documented using Telehealth technologies as an alternative health care solution. Besides, several local hospitals were contacted to research their risk strategy; however, we were always told that the information is confidential. Moreover, some international Telehealth technology service providers were contacted via email through their website's information contacts to schedule interviews. However, most did not respond. Alternatively, online interviews and webinars were a useful source of information.

3.1 Data collection instruments

Primary data: The data collection instruments used were mainly quantitative data through online interviews and webinars with health professionals and health services companies' representatives. An interview was conducted with a representative from the management in a local hospital.

Secondary data: literature review conducted using articles, journals, information from audit reports, and health providers websites.

The data was analyzed through using excel sheets, content analysis, and narrative analysis.

3.2 Interviews

To have a full overview of the Telehealth technologies industry, interviews were conducted with representatives from different health care providers and hospitals nationally and internationally.

3.2.1 Organizations

- Philips Middle East:

Philips Enterprise Telehealth services and solutions is a technology company that is concerned with creating innovations that help improve human lives. Philips has developed several innovative solutions and technology-related devices to improve health care services.

The Telehealth enterprise is one of the projects that are led and tested by the company. The services are designed to be used in hospitals and at home. The focus of this research is the use of the ICU monitoring technique in hospitals.

- MeMD

It is a telehealth service provider based in the USA that offers comprehensive and customizable telehealth solutions to all community members. It primarily targets individuals and companies that require care for common injuries and illnesses. The interview was conducted on 1st July 2020 to assess the company's risk mitigation strategies: Jessica Taylor, the Chief Operating Officer of MeMD, was the guest interviewee.

- Virtuwell

An online-based health clinic offers modernized healthcare through a simplistic online platform that provides convenience to its clients by saving time and monetary resources. It provides a range of services for health issues such as sinuses, cough, allergies, women's health, sexual health, and kid's health. Carson English, the system administrator at Virtuwell, was interviewed on 2nd July 2020

- Amwell

It is an online-based health organization that enables health providers, insurers, and patients to deliver health care with access and affordability. It achieves this through the support of patients and clinicians by supporting them with appropriate tools to realize improved health outcomes. Jason Medeiros is the Chief Information Officer of

Amwell, and he was interviewed on 1st July 2020.

- Intermountain Healthcare

Since this is a very recent topic with limited resources, the source of information is from secondary data and a Webinar organized by the US-based National Consortium of telehealth resources center on 19th March 2020 about Telehealth and. The webinar was hosted to provide information about developments on the telehealth programs during and a general introduction to telehealth to respond to the Corona Virus situation. Ten thousand people viewed the webinar.

The interview was done with Dr. Kerry Palakanis, Executive Director of Connect Care operations at Intermountain Healthcare in Utah, USA.

Dr. Kerry Palakanis started the webinar with an overview of the company. Intermountain Healthcare is a not-for-profit health system based in Utah, USA with 23 hospitals, 2,200 employed physicians and APC's, 3500 affiliates employed physicians and more than 185 clinics in the Intermountain Medical Group, a broad range of clinics and services, and health insurance plans. Intermountain Healthcare is a team of nearly 40,000 caregivers who serve people's healthcare needs across the Intermountain West, primarily in Utah, southern Idaho, and southern Nevada.

According to Dr. Kerry Palakanis, telehealth services were launched in the company in 2013, starting with 420 visits, 1300 access points, and over 500 providers using telehealth. "Intermountain Healthcare provides an advanced technological platform and seamless integrations that allows patients to get health services they require no matter where they live."

Dr. Kerry Palakanis is the Executive Director of Connect Care operations. Connect Care Pro brings Intermountain's world-class experts and high-quality care to patients, no matter where they are, so they can receive the right care, in the right place, at the right time using telehealth technologies. The goal is to keep patients in their communities whenever possible. However, if a transfer is needed, through the Connect care partnership program, partners provide the necessary support services to patients in coordination with other Connect Care Pro. The program has also been developed to meet small, rural hospitals where access to specialists is often limited.

Some of the other Intermountain virtual services

and programs include:

Critical care, crisis care, stroke, emergency department, connect care, urgent care, infectious diseases, nutrition, wound care, pediatric services, etc.

Moreover, Project ECHO (Extension for Community Healthcare Outcomes) is a collaborative medical education and care management model geared toward primary care clinicians in rural and underserved areas. These caregivers are linked to expert clinical teams led by Intermountain Healthcare providers via video. This allows front-line clinicians to obtain the knowledge and support they need to manage patients who have complex conditions.

The Tele-Critical care pharmacy program is developed to expand front-line pharmacists and other providers working in small and rural facilities to safely and effectively manage pharmaceuticals for critical care patients.

- Masafi Hospital

Masafi hospital is a government hospital located in Fujairah. Operational since 2007 and contains more than twelve sections with more than two hundred workers. Sheikh Khalifa honored it for remote areas. It is accredited by joint commission international accredits (JCIA) with a 98% score of achieving all international standards. Masafi hospital ranked the first out of 200 health institutions and organizations. The interview was conducted with Mr. Obaid Bin Khammas on 10th July 2020.

3.2.2 Risk Strategy, Mitigation, And Management

All providers identified that they do have a risk strategy and methodology in their organizations. MeMD's primary risk strategy is risk reduction as it saves on the resources utilized in the management of risks related to telehealth services. Risk reduction is especially useful in the protection of the business against known risks that have definitive parameters. Notably, the strategy has also been effective in managing the COVID-19 health pandemic as it reduces the rate of infection due to the provision of health services to people from their homes (Klein, 2020).

During the interview with MeMD, Mrs. Taylor identified incorrect diagnosis as one of the significant risks that they face as an online-based company offering health services.

Amwell has adopted a risk strategy that primarily involves the transfer of risks that they encounter. This method has mostly worked well for them due to their connection with other credible stakeholders in health. They mainly assess the risks threatening the business and match them with other reliable organizations that can effectively help eliminate the risks. For instance, in the last few months, Amwell has been having an upsurge in the client requiring their services due to the changes influenced by the pandemic. Their principal risk has been effectively attending to their clients. They have approached this challenge by collaborating with some of their stakeholders to participate in some surplus clients.

Some of the technological tools that are highly utilized in the risk identification and implementation of responses include artificial intelligence and blockchain technologies, respectively. Jason Medeiros confirms that Amwell has a set of strategies for managing unknown risks, which entails managing crises as they occur daily, as it increases the rate of caution among the staff members. In controlling the pandemic, the organization has been continuously implementing the risk reduction and elimination strategies to integrate the necessary changes for optimal results.

According to Carson, Mr. Carson English from Virtuwel identifies that fraud and abuse were some of the significant challenges encountered at Virtuwel.

Moreover, Intermountain Healthcare's strategy is driven by industry-leading clinical experts and includes telehealth in care processes as a tool to accomplish clinical goals.

Like other companies operating telehealth services, securing patients' privacy is one of the main risks. Referring to an article published in the Health Affairs journal, "The success of telehealth could be undermined if serious privacy and security risks are not addressed. "For example, sensors that are located in a patient's home or that interface with the patient's body to detect safety issues or medical emergencies may inadvertently transmit sensitive information about household activities."

"Telehealth devices include mobile software applications (apps) in addition to the hardware. For a medical device to qualify as a Telehealth device, there must be a communication of health

information from the device over a network. This article focuses on network-enabled Telehealth devices where a device collects information from the patient (for example, measuring a function of the body or scanning the environment for safety risks) and then transmits data to a healthcare provider. Without adequate security and privacy protections for underlying Telehealth data and systems, providers and patients will lack trust in Telehealth solutions.” (Hall, J.L. and McGraw, D., 2014)

However, to realize telehealth technology's' full potential, patients and providers must trust Telehealth systems to keep personal information private and secure. Patients give consent for having a device or sensor installed, or for using a health app. However, patients frequently do not read or fully understand privacy policies.

Moreover, “The Health Insurance Portability and Accountability Act (HIPAA) is one of several sectoral federal laws designed to implement these principles. Current laws, however, do not adequately cover the Telehealth environment.” to crisis services, to identify and navigate high-risk periods.

Moreover, the company is looking into raising its information security measures. According to their risk assessment report, the report highlighted a lack of consistency in the company's policies and procedures, which need to be addressed. Intermountain decided to hire KPMG to work on its risk assessment and audit.

For example, “Intermountain now will document several levels of data protection. Based on risk, the organization will determine how best to implement access monitoring, software and hardware intrusion detection, and data loss protection on servers and critical systems.

For instance, the risk analysis helps determine whether Intermountain passwords for specific systems should expire every 30, 60, or 180 days.” Securing medical data for patients is essential in health companies. “While its routine has been to conduct security risk assessments annually, last fall, Intermountain's leadership team decided to step up its risk analysis efforts. That's because they wanted to make certain that the organization could pass any possible HIPAA compliance inspection by the Department of Health and Human Services' Office for Civil Rights”.

Referring to the same webinar organized by the US-

based National Consortium of Telehealth resources center in 19th March 2020 about Telehealth; The webinar hosted Mrs. Mei Wa Kwong, the Executive Director in the Center for Connected Health Policy (CCHP) Mrs. Kwong leads the organization's work on public policy issues as they impact telehealth on the state and federal level. She is also the project Director for the National Telehealth Policy Resource Center.

It is known that in the USA, current laws do not adequately cover the Telehealth environment. Referring to the interview with Ms. Kwong, health insurance policies had to be adjusted and changed. For instance, the insurance eligibility policy mentions geographic locations and site limitations. They were all waived, and all geographical locations now qualify. Since in some states, the telehealth services are covered only within the same state. Intermountain Healthcare is working on extending the telehealth coverage to more states.

When looking into the risk in Masafi Hospital, since it is a significant government hospital, the risk in the hospital and the health sector is an integral part of the nature of daily work. There are many types of risks in the hospital. For example, the risk from the machines which contain very high voltage. The risk in the laboratories which contain chemical and thermal sources. Risks from the patients like the deliberate fire from the mental hospitals. The hospital environment is hazardous to health because of sick people who come from outside the hospital, mixed environment.

3.2.3 Unknown – Unknown Risk

Unknown risks are quite challenging to mitigate since the magnitude and effect of the business's risk is not concretely identified. Currently, most companies and industries have been affected by pandemic, which is an unknown risk. Mitigation of the effects caused by COVID-19 is challenging since it requires constant adaptation to its dynamics Invalid source specified.

However, when researching about the selected health providers, Telehealth technologies proved to have tangible results in mitigating unknown risk. This parts highlights the efforts of different companies and provides measurable results.

With strict social distancing and quarantine measures, telehealth was an ideal and safe alternative to health care services during that

period.

Dr. Kerry Palakanis from Intermountain Healthcare mentioned in the webinar how Intermountain healthcare leveraged telehealth during the Covid-19 crisis. With Intermountain, the following examples are measures that were taken at Intermountain healthcare:

- Converted 50% of the command center to COVID-19 Call center within 8-12 hours
- They took over all the Covid-19 screening calls in Utah. Tele-infectious disease specialist, tele-hospitalist, and command center personnel provided overnight services and command center proposal coordinating screening and care of Covid-19 cases and created a communication system in the command center where all the staff is working together
- Moved 60 nurses to the telehealth call center answering an average of 3,000 calls a day
- Connect care virtual health care visits increased from an average of 150 visits per day to 350
- Since elective surgeries and non-urgent procedures were postponed, doctors have been seeing 30 -50% less patients.
- Redeployed/trained nurses and doctors from closed operations who are currently unable to work in their roles especially since elective surgeries have been canceled system-wide into telehealth to work in call centers and connect care service
- The rapid development of scheduled video visits technology to maintain follow up with patients
- Centralized a result management program
- "Only Flight service" of Intermountain Health owns six helicopters used to transfer Covid-19 cases.
- Used telehealth technology to provide health services to Covid-19 positive patients in hospitals to reduce risk factors
- Established a Covid-19 remote patient monitoring program due to the delay between the time of the results, such as monitoring patients' health and self-recording temperature to feel they are still receiving care while the test results are out.
- A virtual symptom checker and proving an online resource center and hotline
- The company established free emotional

relief hotline for patients open seven days a week.

- Strict safety procurations, social distancing guidelines and hygiene measures for visitors and in-patient management such as screening, general care tips, frequent hand wash and procedural mask worn by all patients who present with a cough and fever before room placement, isolation rooms for positive cases and strict measures for ICU patients.

When analyzing Philips's experience, the unknown risk is dealt with by monitoring the success of the product if the technologies installed in the device. As the company "combines A/V technology, predictive analytics, data visualization and advanced reporting capabilities, delivered by Philips experts". That way, the company can improve the product's effectiveness and increase the success of the customer's usage.

How the risk is identified for the advanced ICU system (Telehealth technology):

- Standardization of System Goals
- Flexibility at the Hospital Level
- Reporting
- Benchmarking
- Staffing Assurance

Three critical ways we support besides staffing:

- o Extend current staff resources
- o Insulate from short-term staffing volatility.
- o Reduce burnout and increase retention

MeMD makes the great utility of the latest qualitative risk assessment tools to manage unknown risks affecting the business. The tools mainly aid in assessing the probability magnitude of effects and the costs required to mitigate additional risks. They primarily rely on nanotechnology and Telehealth services that are tailored to manage such risks.

Virtuwell has, for a long time, adopted the risk reduction strategy in which it strives to minimize the damage caused by a particular risk factor in their business. The pandemic has hurt their business. It has disrupted their normal operations forcing them to adapt to other methods that reduce the impact of the losses incurred in the process. It has achieved this by utilizing technological tools such as artificial intelligence, Telehealth technologies, and remote work by some partners (Spring, 2020). According to Carson, Virtuwell has dealt with unknown risks by integrating diverse risk management and strategic plans to reduce and

gradually eliminate the risks.

Mr. Jason from Amwell mentions that telehealth is affected by a breach of data as one of the main risk factors facing the organization. There has been no encounter of unknown risks in the recent past in the organization.

Covid-19 was an unknown risk that all industries and companies had to deal with. This could be an opportunity to start working on other unknown risks and resource management for the future.

In addition to that, when looking at Masafi hospital's experience in unknown risk, the hospital faced the first unknown risk experience in 2009, which is swine flu from the virus (H1N1). The hospital gained experience on how to deal with the crisis and the recent pandemic and how to be prepared for any unknown risk in future.

3.2.4 Other Technology Tools Used

When investigating other technologies used by different companies addressed, which also supported the risk management process, all companies used Telehealth services. Moreover, being pioneers in the health services sector, they all used Artificial Intelligence. For example, "Intermountain Healthcare has launched its Covid-19 Symptom Checker – a new free online, artificial intelligence (AI) powered tool available to the public on its website to help people assess their risk for Coronavirus, check for symptoms and recommend the most appropriate care required.

Moreover, Robots were also commonly used technology in companies. Philips health care and Intermountain healthcare have both used Robots in surgeries to improve accuracy and save time.

Furthermore, 3D printing is widely used now in healthcare providers. For example, Philips has been recently using 3D printing to create models to help radiologists understand patient anatomy that is difficult to visualize.

Also, Doctors at different Intermountain Medical Centers used 3D Printing technology in surgery's for example, 3D printer's detailed model of a child's heart to save her life, 3D kidney to help save a patient's organ during a complicated tumor-removal procedural.

Masafi hospital uses the technology of Medihealth technology, which is designed to be in the pharmacy with a quick response of collecting medicines according to the doctor's prescription from the Wareed system for each patient.

4. FINDINGS

- Telehealth technologies contributed to the health sector during the pandemic providing tangible results in mitigating unknown risks. With the unusual circumstances, Telehealth technologies were ideal for ensuring patients received the necessary medical care during the pandemic.

- Telehealth is a useful tool in response to unknown risks in the healthcare industry. The technology protects the public, physicians, patients, and their families against contracting infectious viruses.

- With Telehealth services, patients have access to the care they need no matter where they are. This is an excellent benefit for rural areas needing specialized medical care. The UAE should invest more in training medical staff and raising awareness on the benefits of Telehealth services. Collaboration with the private sector is essential in order to support the expansion of telehealth services.

- After Covid-19 and since the pandemic concerned health organizations the most, it would be essential that all health services providers revisit their policies, procedures, and unknown risk assessment strategies for the future, taking into consideration the safety measures implemented during Covid-19 such as social distancing, hygiene, and safety procurement.

- With the Covid-19 unexpected pandemic, some companies require to revamp its management and strategies and develop their technological infrastructure to use them to mitigate risks. Besides, improving R&D and investigating advanced technologies and best practices in healthcare such as advanced 3D printing and AI solutions.

- Telehealth is rapidly evolving using advanced technologies, mobile applications, and networking that holds explicit promises for improving health care. However, serious privacy issues are a risk. Protecting patients' privacy, sensitive data, and medical records are one of the most critical risks that health companies should investigate. With the increasing demand for telehealth and technology-based health services revisiting the security and privacy measures and setting

policies and procedures to govern the process is necessary. The success of telehealth could be undermined if strict privacy and security risks are not addressed.

- Not all insurance companies provide adequate coverage for telehealth services.
- Telehealth is increasingly recognized for its potential to offer cost-effective healthcare services, particularly benefiting rural areas. However, incorrect diagnosis always remains a risk.
- Telehealth services have significant potential in the UAE. However, the increased number of patients needing critical medical care, such as the high rates of cancer and heart diseases, is challenging.
- One of the challenges is to ensure that every household has the device and networks required to interact with providers.

5. CONCLUSION

In conclusion, Telehealth technology has been extremely beneficial for healthcare takers and potential patients during the pandemic. It proved to be a useful tool in response to unknown risks in the healthcare industry.

The technology was widely used to protect patients and health practitioner's against health hazards and the Corona virus. Several healthcare sectors have used this technology, only with the crisis in hand; this technology has moved from being a luxury to be a necessity.

Telehealth technologies have a lot of benefits allowing us to redefine providing health services in the future. However, to upturn the benefit health practitioners need to be trained on using the technology and health providers needs to increase the awareness to patients on the advantages of the technology. The research highlights potential risks of the technology that service providers should tackle.

Based on the research findings, Telehealth technology has mitigated the risk of transmitting the virus mad exceeding the number of patients. It is a promising technology for improving health care services in the future.

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Blockchain Brilliance: Exploring Blockchain's Promise and Perils for Banking Managers in Operational Optimization and Sustainable Progress

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ARTICLE INFO

Keywords:

Blockchain, Banking, Managers, Operations, Optimization, Sustainable, Progress.

Received: Nov 12, 2024
Accepted: Dec 02, 2024
Published: Dec 20, 2024

ABSTRACT

Global banking institutions have recently created a considerable amount of advancements in the process of business schools that are digitalization-driven, which include mobile banking. Nonetheless, most of the efforts have yet to be considered when they relate to the operation of blockchain technology in banking. The reluctance that has been exhibited by most of the banks stands in stark opposite of all the enthusiasm based on what other industries are displaying for blockchain technology. Now, this research paper will examine the benefits and challenges of using Blockchain technology for managers in the banking sector to optimize operations and improve sustainability.

1. INTRODUCTION

The rapid evolution of digital technologies has significantly influenced the global banking sector, driving innovation in operations and service delivery. Amid these advancements, blockchain technology emerges as a transformative force, offering decentralized, secure, and transparent solutions for various banking processes [1]. Despite the enthusiasm for blockchain in other industries, banking institutions demonstrate a cautious approach toward its adoption. This research article explores the dual dimensions of blockchain's potential in optimizing banking operations and promoting sustainability [2-6]. By examining the benefits and challenges from the perspective of banking managers, the study aims to shed light on blockchain's role in enhancing operational efficiency, reducing intermediaries, and fostering financial inclusion [7-11]. Additionally, it addresses the technological and regulatory hurdles impeding blockchain integration, offering insights into sustainable

development within the banking ecosystem. This work provides a comprehensive analysis grounded in both primary and secondary data, contributing to the ongoing discourse on blockchain's viability and strategic impact in the banking industry [12-15].

The research highlights the strategic implications of blockchain technology in reshaping traditional banking frameworks. By leveraging its decentralized ledger system, blockchain introduces unprecedented transparency and security, which are critical for fostering trust in financial transactions. The study also underscores blockchain's potential to reduce operational costs by minimizing reliance on intermediaries and automating processes such as cross-border payments, loan approvals, and compliance checks [16-19]. Moreover, blockchain's alignment with sustainability goals, such as green financing and carbon emission tracking, positions it as a pivotal tool in promoting environmentally conscious

banking practices [20-25]. By presenting case studies and examples from global and UAE banking sectors, the research provides practical insights into successful implementations and outlines pathways for addressing scalability, energy efficiency, and regulatory challenges. Through this dual focus on operational optimization and sustainability, the study offers valuable recommendations for banking managers seeking to harness blockchain's transformative potential effectively.

2. LITERATURE REVIEW

2.1 Strategic technology trends

Blockchain technology influences the banking industry in quite a few directions. In doing so, transactions are quicker and cheaper due to the absence of intermediaries. This enables efficiency in addition to transparency towards its operations of banking activities [26-29]. Traditional financial systems have one point of failure, making Blockchain more secure because it is distributed and encrypted. This reduces the chances of vulnerabilities such as cyber-attacks and data breaches. Blockchain Technology has applicability in the banking sector for the management of risks, security enhancement, and authentication [30-34]. Blockchain is an advanced technology with such features as a decentralized distributed ledger of secure and reliable record-keeping for transactions [35-39]. It promotes immutability, transparency, and reduced needs of intermediaries in financial transactions. Blockchain technology has increased over the last few years in the financial industry. Convert sentences from AI written to human written. Several studies highlighted its potential benefits, such as the reduction of operating costs, easier transactions, and better security arrangements [40-44]. Several studies point to some possible uses of Blockchain in banking, like supply chain financing, trade finance, identity verification and cross-border payment. The given illustrations show how blockchain technology can be helpful in improving customer care and performance. The book by Don Tapscott titled "Block Chain Revolution" explores how such technology can transform banking [45-49]. However, he discusses the use of blockchain technology in enhancing security, reducing fraud and banking process simplification in the sector. Alexander Lipton has published research articles

on blockchain technology and its utilization in finance[50]. His work typically revolves around digital assets, financial contracts, and total revolution in financial operations.

2.1.1 Hypothesis

H1: Blockchain will improve banking sector sustainability

H2: Blockchain will optimize banking operations

2.2 Technical profile

Blockchain technology depends on distributed ledger technology [52-55]. A distributed ledger system (DLT) on a computer network tracks transactions. The security, immutability and transparency of transaction records are assured for the continuation of trust in and securing these banks. "Smart agreements", also known as smart contracts, operate automatically upon fulfilment of specified circumstances. They can improve the banking industry's efficiency by computerizing some processes such as asset transfers, loan approval, and payment settlements [56-59]. Researchers give a thorough analysis of the use of blockchain technology in the banking industry from a managerial viewpoint in their book Blockchain Technology in Banking: A Managerial viewpoint. They explore the implications or benefits that may result from Blockchain and whether it will hinder management or not [60-64]. Managers are also enlightened on how to apply blockchain technology to enhance operations and realize organizational goals. To prove validity for each transaction on a blockchain, specific algorithms are used, e.g., consensus mechanisms including PoW or PoS etc [65-69]. Thus, the management should familiarize themselves with these mechanisms if they need to select the most suitable type of consensus algorithm that fits their specific case. Cryptography forms the basis of blockchain security. Public key cryptography, Hash functions, and digital signatures are tools for protecting user identities and transactions. Managers should know these ways of ensuring the security of blockchain technology in applications [70-74]. In the book Regulatory Frameworks and Blockchain Adoption in Banking, Garcia and Martinez focus on the regulatory aspects of the technology regarding adoption by the banks. The analyses they produce analyze the change in the regulatory situation and what it indicates for bank

directors. However, it explains issues of compliance and how managers must deal with this complex environment by aligning organizational goals with blockchain strategies [75-79].

2.3 Opportunities

The benefits that would stem from the banker's incorporation of blockchain technology will result in a total revolution if they ever occur in the banking sector. Blockchain technology is also beneficial to the financial industry. Blockchain can revolutionize the industry, introduce new services and facilitate financial inclusion, enhanced security, transparency, and operational efficiency. However, it is essential to recognize that these benefits must be planned carefully, including legislative changes and solving technology-related issues [80-84]. Blockchain technology can lower paperwork, automate processes, and remove intermediaries in banking activities. It leads to considerable cost-cutting measures. This is mainly due to blockchains' architecture, which is distributed, and their different encryption techniques [85-89]. It reduces the likelihood of fraud and unauthorized access to individuals' private financial information. The transparency and a trust between the parties involved in financial transactions that is made possible by the permanent record of blockchain technology. Banks provide their customers with live transaction information. A transaction process is faster and thus efficient due to blockchain technology. Cross-border payments, which can sometimes take days, may be completed within minutes or even seconds. By eliminating the need for intermediaries who usually increase operating costs such as paperwork and reconciliation, Blockchain reduces overheads significantly. Blockchain technology makes it possible for novel financial products, including tokenized assets, DeFi apps, as well as currencies like CBDCs [90-94].

The researchers further note that banks that implement this first are ahead in terms of innovation as well as customer-oriented financial services. Certain studies indicate that Blockchain has tremendous potential to transform the financial services market into a vibrant breeding ground for start-up companies, suppliers and collaborators [95-99].

2.4 Case Examples

The adoption and implications for employing blockchain technology in banking have to be analyzed primarily using secondary data sources like company reports, trade publications, transaction data and case studies. Blockchain has shown evidence of higher productivity, lower expenses, enhanced security, and modernized financial services and products, all of which are indicators that it is a game changer in the banking sector [100-104]. One of the largest international banks – JPMorgan Chase – introduced the JPM coin in 2019 as its own virtual currency. The Trezorcoin was built on quorum to serve as a high-speed cross-border payment coin for banks and treasuries. Other secondary data sources, such as financial reports or industry analyses, illuminate the acceptance of JPM Coin and its impact on interbank and possibly in cutting expenses [105-109].

For example, the huge-scale usage of R3's Corda blockchain platform by banks like HSBC, Standard Chartered and ING for alternate price range solutions. Using these safe and green alternate finance strategies, for instance, exchanging documents control and issuing letters of credit, is what Corda makes possible. Industry publications, case studies, and transaction facts show how Corda has impacted change finance to create quicker transaction times, better operation efficiencies, and lower expenses [110-114]. For example, a few central primary banks, such as the ECB and the PBoC, have investigated or trailed CDBC as a kind of government-backed electronic cash. These CBDCs are remodeling monetary coverage in addition to the method of payments. One also can look at studies, research, and white papers, in addition to courses from the central banks that create, compare, or are probable to impact on each the banking industry and the economy especially. Banks that have adopted blockchain era can expose facts concerning their investment plans regarding blockchain technology in their annual reviews, economic statements, and regulatory filing [115-119].

The UAE has demonstrated a willingness to embrace blockchain technology. The government has started projects and collaborations to investigate and apply blockchain-based technology in a number of industries, including finance. By 2021, the plan seeks to use the technology of blockchain to move 50% of government transactions onto the blockchain platform [120-

124]. The UAE government aims to preserve Blockchain Technology Applications in the UAE Banking Industry by implementing this innovation. 11 billion AED worth of transactions and paperwork are regularly handled; 398 million printed materials are produced each year; and 77 million labour hours are completed. Global research has been done on blockchain technology being used in trade finance procedures to improve visibility and lower deception. Banks from several nations have joined finance for trade sites like we.trade and Marco Polo, offering a common and safe platform for business related transactions [125-129].

2.5 Implementation Steps

The use of Blockchain in banking poses many challenges, such as strategic planning, regulatory compliance, and stakeholder engagement. Take specific objectives and how a financial institution will deal with blockchain role in a situation. Explore the feasibility of using blockchain technology in finance. Evaluate whether blockchain technology is appropriate for identified use cases. Develop a team that includes representatives from multiple departments, including operations, acceptance, computer technology, compliance, and risk management. Make sure anyone who might be interested gets involved. Identify the regulatory requirements that need to be met in order to integrate blockchain technology into corporate finance. Contact regulators to ensure transparency and compliance. Choose a blockchain platform that serves the goals. Open-source blockchains like Ethereum, commercial or consensus blockchains like Hyperledger Fabric, and a combination of the two are some of the options. Start with a small proof of concept and determine if the tool is suitable for the chosen use case. This reduces risk at an early age and encourages literacy. Consider how scalable blockchain technology is. As usage increases, the platform should be able to handle additional tasks. Put strong security measures in place to protect against cyber-attacks and unauthorized access. Cryptographic methods and digital contracts should be carefully considered. Learn how to approve the blockchain network. There are many options, such as proof of service (PoS), proof of work (PoW), and more.

Don Tapscott and Alex's groundbreaking book

"Blockchain Revolution" examines how the application of blockchain technology is upending a number of industries, offering cases of successful blockchain applications and their effects on the economy and society. Smart contracts are an essential aspect of blockchain implementation, as Szabo, Nick's book "Smart Contracts: The Blockchain Technology That Will Replace Lawyers" explains. The notion of autonomous agreements is described in this paper, along with some applications that might apply.

3. RESEARCH METHODOLOGY

The aid of the qualitative research design has been taken into consideration in order to gather first-hand information regarding the possible challenges and benefits of utilizing Blockchain technology for managers to improve sustainability and optimize operations in the banking sector. Five technological managers from the banking sector have been considered to gather the primary qualitative information from the individuals who have encountered the advantages and challenges of using the Blockchain technology. This research design has used the exploratory research design in order to fully exemplify the research topic. The reason behind utilizing the experimental research design indicates the fact that the number of information and secondary data (peer-reviewed journals and other varied journals) were taken from authenticate and valid sources, which contain statistical data that had to be extensively searched. The research findings were then interpreted concurrently.

Both the secondary and primary methods have been considered in order to gather the primary and secondary data. The research has managed to conduct in-depth interviews with the participants that have been chosen to offer enlightening information by eliciting their discernments, which the researcher has presented in our analysis section. Authenticate sources from websites and peer-reviewed journals have been gathered and examined as per the findings of the secondary data, and this process has also provided the answers to the objectives of the research project. The interview method proved to be really helpful as it explained and explored the subject opinions of the research, including the experiences, phenomena and behaviour. As interview questions are mainly filled with open-ended questions, it helps to collect

in-depth information from the interviewees. For the interview procedure, the researcher went to five separate banking sectors and interviewed five technological managers from each of those. The meetings have been scheduled as per the preferred timing of the interviewees. Here, for the sampling procedure, purposive sampling will be used in this study as the researcher will be gathering prefatory data from the technology of the banking sectors and getting their perspectives on the advantages that the researcher will be enlightened about the advantages and disadvantages of using blockchain technology in the banking sector. Here, in this study, the researcher will identify and investigate recurring themes from past literary works as we analyze the data using a thematic approach.

3.1 Data Gathering

3.1.1 Primary Data

The interview method has been used to gather the primary data. Here, five technological managers from the banking sector have been considered to enlighten the researcher regarding their viewpoints and thoughts based on the advantages and disadvantages of blockchain technology in the banking sector. Here, the technological experts of the local banking sector have been considered to provide opinions on the questions that are asked of them. They have been asked six questions, and based on those answers, the researchers have begun to interpret the data and derive a significant conclusion from the study. Here, the reason behind utilizing the interview method indicates the fact that the interviews have allowed the researchers to accumulate detailed information regarding the opinions and experiences of the participants based on the blockchain technology in their personal words and findings, offering a richer understanding of the topic based on the research than other methods of data collection.

3.1.2 Secondary Data

The citations from famous authors have been used in this study, and additionally, authenticated and validated articles and peer-reviewed journals from Google Scholar have been taken into consideration as part of the collection process of secondary data. These peer-reviewed sources have made sure that the quality of the citations, which include scholarly articles, is apt. In addition to the referring journals, particular websites have also been utilized to

obtain relevant data that has improved the research's perceived intelligence for the target audiences. In addition, resources from the libraries will be acquired to facilitate further understanding of the subject and potentially contribute to our study project. Here, the themes of the secondary literature have been considered after going through the trends that have been constantly focused on online sources. Analyzing the qualitative secondary literature has helped in bridging the literature gap, too.

4. DATA ANALYSIS

4.1 Primary data

It has already been mentioned that five technological experts of the banking sector have been interviewed in order to get enlightening information regarding the challenges and benefits of utilizing Blockchain technology for the managers for enhancing sustainability and optimising operations. The questionnaire has been comprised of six open-ended questions, which is going to be analyzed in the below section:

The first question that has been asked to the technological managers is about the benefits of utilizing blockchain technology to optimize operations in the banking sector. Manager 1 has opined that blockchain technology has uses encryption and hashing in order to secure the data, depending greatly on the algorithm of SHA256. The address based on the sender, also known as a public key, the transaction, the receiver, and the private key are being transformed through the SHA256 algorithm. In the banking sector, the technology of banking revolutionizes the system by establishing a kind of decentralized data based on unique and digital assets. Additionally, he opined that blockchain technology authorizes the process of payment throughout the world and other kinds of transactions by utilizing the ledgers of encrypted distribution, which are dependent on real-time verification based on the transactions. Hence, as a result, there proves to be no longer any requirement for the intermediaries like correspondent banks or anything. Manager 2 has opined that in conventional banking systems, the process of transactions is typically based on centralized databases. technology, on the other hand, has the ability to record in the manner of the network that is partially decentralized where the trusted employees can host the nodes that are

validated. He further said that the distributed and decentralized nature of the technology of Blockchain makes sure that the accurate and transparent record is based on the transaction, establishing trust among the parties included in the financial transactions of the banking sector. There are several on the basis of how the technology of blockchain is being utilized to lessen the fraudulent activities in the industry of banking. Manager 3 has opined that one of the chief advantage of utilising blockchain technology is it reduces costs. Banks have recently learned that the facility of blockchain can enable them to lessen the infrastructure costs by more or less \$20 in the year 2022 [130-134]. By executing things which include smart contracts inside the platform, banks can facilitate communications with intermediaries and counterparties. This aspect can reduce the cost of running and maintaining contracts. With the help of blockchain technology, banks can lessen the transaction costs from one bank to another bank transaction. Manager 4 stated that Blockchain in the banking sector has been providing faster transactions. Any transaction can be done in a few seconds and is done in a slightly quicker way than other conventional methods. Banks are now capable enough to avoid the middleman who can permit them to make sure that the consumers are able to complete the transaction process at a significantly quicker pace, which has resulted in the fact that banks and customers are capable of finishing the process of more transactions. Manager 5 has opined that blockchain technology has always helped in enhancing security. Shared ledgers have the ability to help the banks secure the transaction process in the banking sector. Initially, they are capable enough to finish the process of transactions and lessen the risk of diverting payments and capturing the transactions [135-139]. Two security keys are there for every transaction, and the public key is accessible for each and every utilizer while that key is shared amongst the parties of the offered transaction. The data of the process of marketing is said to be unchangeable when the method has been verified. The second question that has been asked to the technological experts of the banking sector is the challenges that the employees have faced while using blockchain technology in operations in the banking sector. Manager 1 opined about scalability. Scalability is known to be one of the meaningful

obstacles which blockchain technology should overcome. Conventional public blockchains, which include Ethereum and Bitcoin, can meaningfully come into contact with the performance concerns related to the number of enhanced transactions, and the whole process would lead to more extended processing and enhanced transaction fees. Manager 2 has opined about the deficiency of compatibility and standardization throughout the course of numerous blockchain networks and platforms, which is necessary for financial organizations to integrate Blockchain technologies, and these aspects are already being utilized in built-up infrastructure [140-144]. Various researchers have opined that banks must make sure that numerous blockchains can communicate with one another in a smooth way. Manager 3 has stated about the pseudonymous and decentralized nature of the blockchain technology, and this particular nature can make sure that it is really crucial for the bank to adhere to a few rules and regulations, especially those that are concerned with know-your customer or (KYC) or anti-money laundering also said to be (AML). Financial institutions possess an obligation to innovate the methods which allow them to properly satisfy the requirements while retaining the capability to harvest the advantages provided by blockchain technology. As per the views of Manager 4, it has been known that though the technology of Blockchain is very well known for possessing a strengthening security characteristic, a concern is still there based on data privacy and the protection based on sensitive data. Due to the distributed and open nature of blockchain technology, each and every participants are capable to visualize each and every transaction which are taking place in the network and this process raises concerns regarding the perceptibility of the sensitive data. Lastly, Manager 5 stated that to successfully execute the technology of Blockchain, an efficient upfront expenditure in research, expertise, and infrastructure is necessary. It is really very crucial for the financial to control the ROI or return on investment in order to justify the expenditures that are associated[145-149].

Now, the third question that has been asked to the technological managers is the benefits of utilizing blockchain technology to enhance sustainability in the banking sector. Manager 1 opined that blockchain technology always supports the

financial inclusion process. The process of financial inclusion has been emphasized as the prime enabler of various developmental goals in the SDG or Sustainable Development Goals for the year 2030; this process is specified to be the objective of eight goals that are related to the seventeen goals. Manager 2 opined in a similar way as Manager 1 did. He opined that the blockchain technology definitely supports the financial inclusion process. Pursuing the objectives of the 17 SDG goals necessarily requires more financial inclusion, which can be performed through fostering the accumulation of the process based on savings for investment and consumption, the two of which have the ability to spur growth. If blockchain technology can be effectively used for better financial inclusion, long-term prosperity can be guaranteed on numerous fronts. Manager 3 opined that a banking platform that has been enabled by Blockchain would definitely offer a digital backbone which is required to aid the information transparency for the development of sustainable infrastructure establishment while also authorizing the checks of automated compliance, data integration and data standardization with other numerous digital technologies such as deep analytics also called artificial intelligence and internet of things also called as remote sensors. Manager 4 stated that Blockchain technology has the potential for further establishment in green finance as it has allowed the banking securities to be marketed or traded in most of the smaller units. The establishment of tokenization has been proposed to enhance the requirement to trace where few of the funds are being allocated to improve the transparency in a few financial transactions. Manager 5 has opined that as blockchain technology is making it easier to issue green bonds, investors will be capable enough to increase their payments to green financing. Additionally, the level of detail of financial goods will be improved by blockchain technology, letting most be readily diversified across a vast range of investments and assets. This will assist investors in diversifying the types of portfolios they own. Blockchain also helps with the problems associated with cross-border data exchanges. The fourth question that has been asked to the interviewees is about the challenges that the employees have faced while utilizing blockchain technology to improve sustainability in the

banking sector. Manager 1 and 5 has opined that one of the most essential challenge that most the organization have faced while the implementation of the block chain technology is the issue with energy consumption. The process based on the validating transactions on the network of Blockchain needs a massive amount of computing power, which definitely need a significant amount of energy. This process has led to the issue regarding the carbon emissions and the impact on the environment of the blockchain technology. There are few blockchain projects that have embraced the alternative based on consensus mechanisms, which include PoS that consume meaningfully less energy. Initiatives such as Ethereum 2,0 have aimed to lessen the energy consumption of the networks of Ethereum. While all these attempts are promising, it is pivotal for the community of Blockchain to continue exploring to lessen energy consumption. Manager 2 has opined that blockchain technology possessed a meaningful carbon footprint because of the energy-intensive approach of substantiating the transactions and establishing evolved blocks based on the Blockchain. This energy consumption of the technology of the Blockchain leads to emissions of greenhouse gases that contribute to the process of climate change. Now, Manager 3 has opined that the pollution generated by trading in digital currencies and the core problem of blockchain layout mistakes cannot be separated completely. Blockchain programmers' choices concerning design result in the expensive method of "mining" to confirm a cryptocurrency trade or carry out an NFT trade. Manager 4 stated that blockchain technology provides new possibilities to improve efforts by enhancing the process of verifying emissions and tracking. Its transparency, accountability and immutability make the whole aspect possible to focus on the carbon balances and other metrics of the environment and hold companies responsible for the claims of sustainability [151].

The next question that has been asked to the technological experts is the process through which blockchain technology can be enhanced in the banking sector. Managers 1 and 3 stated that, sharding has the ability to improve the performance and scalability of the Blockchain in numerous ways. It can do this by lessening the amount of information that every node has to

process and store. Sharding has the capability to enhance the speed and throughput of transactions and also lower the fees and latency and by giving out the data and workload throughout numerous shards, distributing the data and workload throughout multiple bits, sharding can improve the resilience and security of the network as it is really more challenging for most of the attackers to disrupt or compromise a considerable portion of the nodes. As per the views of Manager 2 and 5, the future of Blockchain in the sector of finance and is really promising. The cost based on the money transfer among various intermediaries is relatively high. The blockchain technology can diminish the requirement of these intermediaries and aid in lessening the cost meaningfully. It can offer the finance sector with a limpid ledger system. Manager 4 has opined that Blockchain is a powerful tool in aiding the efforts of sustainability. With every features include traceability, transparency and decentralization, Blockchain can improve the practices of sustainability and offer eco-friendly initiatives.

Furthermore, the researcher has asked about offering few examples of the UAE and the global cases and to compare them. Manager 1, 2, 4 has opined that the UAE banking sectors has incorporated the block chain technology in order to boost the green finance. Manager 1 opined that the Central Bank of UAE, the Emirates Institute of Finances, the Bank based on International Standards and the Cop 28 has set afloat the Cop28 UAE at the year's end. Manager 2 stated that the program has tried to motivate the global innovators from the private and the public sectors to utilize technologies like blockchain, Internet of Things, AI and other sensors in order to handle challenges in sustainable and green finance. It has been opined by Manager 4 that JPMorgan Chase has been initiated the JPM coin during the year 2019 to be their personal virtual currency. The coin named as Trezorcoin has been developed on quorum to consider the payment coin related to high-speed cross-border for treasures and banks. On the other hand, Manager 3 and 5 stated that the other parts of the country are not less than the UAE banking sectors. By diminishing the requirement for the intermediaries, the payment systems that are block-chain based has facilitated faster, more affordable and more secure. Manager 5 further stated that Ripple is known to be a global payment

that are being built over the blockchain technology which has focuses on the financial institution to operate the payment systems in the correct time along with the negligible fees by offering an efficient alternative and cost-effective process to the conventional payment methods. Owing to blockchain technologies, it is possible to create new financial products that will enhance customer loyalty and satisfaction, such as smart contracts and digital currencies.

4.2 Secondary Data

Now, after analyzing the primary data, the secondary data will be exemplified which has been gathered from various peer-reviewed journals and articles that are extracted from valid and authenticate sources. From the above discussion of the literature review, it has been found that blockchain technology lessens the likelihood based on weaknesses like data breaches and cyberattacks. Blockchain technologies has the power to develop new financial products like digital currencies and smart contracts that has improved customer satisfaction and loyalty. Blockchain technology can be utilized in the banking industry to enhance security, manage risks, and authenticate transactions. Blockchain is said to be an upgraded technology with features like decentralized ledger of reliable and secured record-keeping process of transactions. The whole process contributes to transparency, immutability and lessen the requirement of intermediaries in the transaction process. In the past few years, blockchain technology has developed in the financial sector. The written sentences based on transform Artificial Intelligence into human-written ones. Various studies has emphasized the possible benefits, involving lower operating costs, significantly simpler transactions, and enhanced security setups. There are many studies that have suggested that blockchain technology may have the ability to find application in the banking industry in areas such as trade finance, supply chain financing, identity verification, and international payments. Hence, blockchain technology can be really supportive in enhancing the customer care and performance. Blockchain technology basically relies on the technology of distributed ledger. The system of distributed ledger or DLT on the network transactions of computer, the transparency, immutability and security of the transactions

records has been made sure for the process of trust securing the banks. Intelligent contracts or Smart agreements can be operated on the fulfilment of the particular circumstances. These processes can enhance the efficiency of banking industry by computerizing few processes which include payment settles, loan approval and asset transfers. Researcher has offered a thorough analysis of the utilization of the blockchain technology in the banking industry from the viewpoint of the managers. This is primarily because of the distributed architecture of blockchains and the various encryption methods they use. It lessens the possibility of fraud and illegal access to people's personal financial data. Further, the researchers also have focused on the banks that adopt the process of blockchain technology first and are more innovative and provide financial services that are focused on the requirements of their consumers. According to some research, Blockchain has the enormous opportunities to turn the financial services industry into a thriving incubator for suppliers, partners, and start-up businesses.

5. RECOMMENDATIONS

Blockchain technology aids in the process of traceability and verification of multistep transactions that require traceability and verification. It can offer lessening compliance costs, secure transactions and speed up the information transfer processing. Blockchain technology can be improved if the sharding technology will be incorporated into the operations. Sharding can enhance the performance and scalability. Sharding enables a secure sharing process based on the storage for data needs, which additionally lessens the cost of deployments and optimizes the operations node. They enable solution layers to administer the lower prices for transactions while utilizing Ethereum's security features. Sharding can aid to divide the process of network and connectivity into fewer partitions and module and this can boost the transfer rate per second of the network. Sharding can appear like a

straightforward procedure, but it actually involves a number of substantial components and characteristics. Having the capacity to scale the process of distributed ledger is the primary advantage that comes from utilizing the sharding. With the approach of sharding, the distributed ledger can usually store the more significant data and has the ability to communicate more nodes, all without dramatically lessening the processing time of transactions.

From the primary and the secondary qualitative sources, it has been found that as the adoption of the blockchain has enhanced, it is more likely to lead to the shift in the landscape of the global payments by empowering the business to transact the process in a seamless manner. Hence, the proposed hypothesis has been proven here as block chain will enhance the sector's sustainability (H1). As it has already proved that the block chain technology has positively impacting the green finances which have been definitely promote sustainability of the banking sectors. Furthermore, Blockchain has also optimized the operations of the banking. According to various researchers, it has been understood that blockchain technology can lessen the paperwork, automate procedures, and eliminate intermediaries in banking activities. It prompts meaningful cost-cutting actions which will definitely optimize the operations.

6. CONCLUSIONS

The technology of Blockchain in the the process of banking has consistently revolutionized the operations by establishing the decentralized database related to the unique and digital assets. Through the process of distributed ledger, it has became relatively much more accessible to transact the purchases through numerous token which has represented the advantage of off-chain. The beneficial factors related to Blockchain in the work of banking have worked around the development of the tokenized security which are carrying the opportunities of cutting the intermediaries together and lessening the exchange fees of the assets.

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Appendix Transcripts

1. How block chain technology is helpful in optimizing operation in the banking sector?

Manager 1: Blockchain technology has utilizes the encryption and hashing in order to secure the data, depending greatly on the algorithm of SHA256

Manager 2: This technology has the ability to record in the manner of network that are partially decentralized where the trusted employees can host the nodes that are validated.

Manager 3: Banks have recently learned that the facility of block chain can enable to lessen the infrastructure costs by more or less \$20 in the year 2022. Executing things which include smart contracts inside the platform, banks can facilitate the communications with the intermediaries and counterparties.

Manager 4: Through using the blockchain technology banks now are capable enough to avoid the middleman who can permit them to make sure that the consumers are able to complete the transaction process at a significantly quicker pace which has resulted in the fact that banks and customers are capable to finish the process of more transactions

Manager 5: Blockchain technology has always helped in enhancing security. Shared ledgers has the ability to help the banks to secure the transaction process in the banking sector.

2. What are the challenges that you have faced while utilizing the blockchain technology to optimize operations in the banking sector?

Manager 1: Scalability is known to be one of the meaningful obstacles which blockchain technology should overcome.

Manager 2: The deficiencies of compatibility and standardization throughout the course of numerous blockchain networks and platforms

Manager 3: Financial institutions possess an obligation to innovate the methods which allows them to properly satisfy with the requirements while retaining the capability to harvest the advantages provided by the blockchain technology.

Manager 4: Due to the distributed and open nature of the blockchain technology, each and every participants are capable to visualize each and every transaction which are taking place in the network and this process raises concerns regarding the perceptibility of the sensitive data.

Manager 5: It is really very crucial for the financial to control the ROI or return on investment in order to justify the expenditures that are associated.

3. What according to you are the benefits of utilizing block chain technology to enhance sustainability in the banking sector?

Manager 1: Blockchain technology always support the financial inclusion process and the process of financial inclusion has been emphasized as the prime enabler of various developmental goals in the SDG or Sustainable Development Goals for the year 2030

Manager 2: Blockchain technology can effectively used for better financial inclusion, long-term prosperity can be guaranteed on numerous fronts

Manager 3: Blockchain offers a digital backbone which is required to aid the information transparency for the development of sustainable infrastructure establishment while also authorizing the checks of automated compliance.

Manager 4: Blockchain technology has the potential for further establishment in the green finance as it has allowed the banking securities to be marketed or trading in most of the smaller units.

Manager 5: Blockchain technology is making it easier to issue the green bonds, investors will be capable enough to increase their payments to green financing.

4. What are the challenges that you have faced while utilizing the blockchain technology to improve sustainability in the banking sector?

Manager 1: One of the most essential challenge that most of the organization have faced while the

implementation of the block chain technology is the issue with energy consumption.

Manager 2: Blockchain technology possessed a meaningful carbon footprint because of the energy-intensive approach of substantiating the transactions and establishing evolved blocks based on the Blockchain.

Manager 3: Blockchain programmers' choices concerning design result in the expensive method of "mining" to confirm a cryptocurrency trade or carry out an NFT trade.

Manager 4: Blockchain technology provides new possibilities to improve the efforts by enhancing the process of verifying emissions and tracking.

Manager 5: This process has led to the issue regarding the carbon emissions and the impact on environment of the blockchain technology.

5. How the process of blockchain technology can be improved in the banking sector?

Manager 1: Sharding has the ability to enhance the performance and scalability of the Blockchain in numerous ways.

Manager 2: The future of Blockchain in the sector of finance and is really promising. The cost based on the money transfer among various intermediaries is relatively high.

Manager 3: Sharding has the capability to enhance the speed and throughput of transactions and also lower the fees and latency and by giving out the data and workload throughout numerous shards

Manager 4: With every features include traceability, transparency and decentralization, Blockchain can improve the practices of sustainability and offer eco-friendly initiatives.

Manager 5: The blockchain technology can diminish the requirement of these intermediaries and aid in lessening the cost meaningful.

6. Can you provide few examples of the UAE and the Global cases and compare them?

Manager 1: The Central Bank of UAE, the Emirates Institute of Finances, the Bank based on International Standards and the Cop 28 has set afloat the Cop28 UAE at the year's end.

Manager 2: The program has tried to motivate the global innovators from the private and the public sectors to utilize technologies like blockchain, Internet of Things, AI and other sensors in order to handle challenges in sustainable and green finance.

Manager 3: The other parts of the country are not less than the UAE banking sectors. By diminishing the requirement for the intermediaries, the payment systems that are block-chain based has facilitated faster, more affordable and more secure.

Manager 4: JPMorgan Chase has been initiated the JPM coin during the year 2019 to be their personal virtual currency.

Manager 5: Ripple, a global payment that are being built over the blockchain technology which has focuses on the financial institution to operate the payment systems in the correct time along with the negligible fees by offering an efficient alternative and cost-effective process to the conventional payment methods.



Driving Education Operational Excellence through Digital Transformation and E-Governance

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ARTICLE INFO

Keywords:

Digital government, E-governance, Digitization, artificial intelligence.

Received: June 10, 2024

Accepted: Aug 21, 2024

Published: Dec 20, 2024

ABSTRACT

The United Arab Emirates is a pioneer in automating public services, positioning digital government as a key component of the fourth industrial revolution, which centers on digitalization and digital transformation. Digitization in education involves the use of desktop computers, mobile devices, the Internet, software applications, and other digital technologies to teach students of all ages. Examples include computer-assisted exams, online universities, e-books, and educational entertainment. Some technology educators and evangelicals believe that education will eventually become a purely digital activity, supported by artificial intelligence and virtual reality. To explore the impact of e-governance on education, an interview was conducted among stakeholders of electronic government institutions, including in-service government officials and leaders of government management programs. The objective is to assess the interview results and shed light on the real digital transformation processes and their success in e-governance to achieve school excellence. The study finds a significant relationship between the use of digital transformation tools and e-governance in schools, indicating that the more digital transformation is implemented, the higher the chances of improving institutional excellence in schools.

1. INTRODUCTION

Digital transformation within the UAE began long before the Covid-19 pandemic accelerated its adoption [1-5]. In 2012, H.E. Sheikh Mohammed bin Rashid Al Maktoum launched the Mohammed bin Rashid Smart Learning Initiative, encompassing all state schools in an effort to create a modern educational environment. This initiative included the implementation of Smart classes in all schools, the distribution of tablets to all students, and the provision of high-speed 4G networks to every state school [6-11].

The outbreak of Covid-19 made the shift to e-education essential to ensure continuous learning and to support the progress of young people in

shaping their future. This study explores the current state of schools under this new system. It specifically aims to identify the benefits and challenges of this digital transformation and to propose solutions to address rising issues encountered by schools [12-18].

2. LITERATURE REVIEW

The United Nations has highlighted the advantages nations can achieve by transitioning to electronic governments, or e-governments. Utilizing the internet for official transactions can significantly reduce costs and enhance process efficiency [19-23]. This transformation decreases the need for

numerous prints, mailings, and procedural steps, and greatly reduces waiting times. By allowing citizens to process applications from home, they become more aware of government rules and regulations. Furthermore, when information is accessible to all employees, cooperation and coordination improve automatically without the need for personal interaction [24-29].

Streamlining business transactions via the internet can enhance economic activities, helping them grow and expand beyond the local scale. This shift fosters a knowledge society where people access information online and find answers to their inquiries without formalities and waiting in lines. These are fundamental changes from the traditional government model to an e-governance model [30-34].

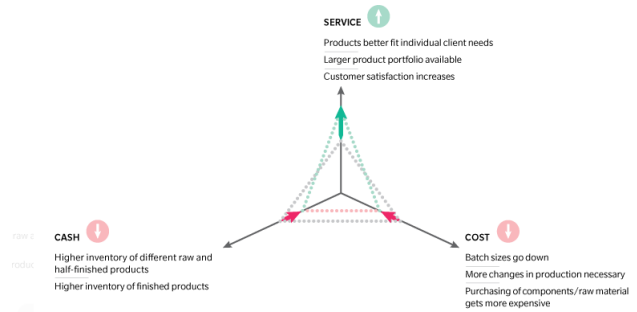
Factors	Traditional Government	E-Governance
Mode of service	Service for citizen	Self-service in many operations
Goal	Citizen in line	Citizen on-line
Expectation	Digital exclusion	Digital participation
Change	Paper intensive	Government on-line
Management style	Transaction intensive	Knowledge management
Orientation	Production cost, efficiency	User satisfaction and control flexibility
Leadership style	By rule and mandate/command and control	Flexible management interdepartmental teamwork, facilitation and coordination
Organizational structure	Top-down hierarchical	Innovative entrepreneurship, multi-directional network with central coordination, direct communication.
Communication	Centralized formal limited channels	Formal and informal direct and fast feedback, multiple channels.
Interaction	Documentary mode and interpersonal interaction	Electronic exchange, no face-to-face interaction
Process organization	Functional rationality, vertical hierarchy of control	Horizontal hierarchy, network organization, information sharing.

1 Source: Ashehry, et al (2006)

It is clear that this transformation is not merely superficial; it has initiated changes across all facets of the public service sector, from overarching vision to daily management practices [35-39]. This aligns with contemporary trends in policy management, which advocate for interactive,

innovative, and integrated services [40-44].

2.1 Supply Chain Triangle



2 Source: OliverWyman (n.d)

The UAE Cabinet approved a Dh 61.35 billion federal budget for 2020 and established an Education Support Fund to foster partnerships with the private sector. Given this substantial investment, the public expects significant results. Consequently, digital transformation efforts must deliver outcomes that match the scale of this investment. Anything less would indicate subpar performance [45-51].

2.2 Hypotheses of the Study

This study assumes that both human and technological factors influence digital transformation capacity, which will be examined using survey data [52-57]. Digital transformation is an enterprise-wide approach, and aligning a school's business strategy with its IT strategy is crucial, especially as IT tends to drive e-governance initiatives. According to scholars, the directivity and strategic linkage between e-governance and IT strategy significantly affect information system efficacy and school performance. Empirical studies and case observations indicate that schools with a strong strategic relationship between IT and school performance use IT more intensively and strategically to enhance performance [58-64]. The authors also found that the strategic linkage between IT and business is highly correlated with both e-governance and innovation. Therefore, the strategic alignment between IT and school operations can impact digital transformation capacity. Given that the ultimate goal of digital transformation is innovation and improved organizational performance, it is assumed that the CEO's digital leadership positively affects digital transformation. Based on the above literature, the following hypotheses were formulated [65-67].

H1: The human factor has a positive impact on the digital transformation capacity.

H2: The technological factor has a positive effect on the digital transformation capacity.

H3: Strategic linkage between IT and school business has a positive impact on digital transformation capacity.

H4: Positive effects of human factors on digital transformation capabilities will be reinforced by CEO's digital leadership.

H5: Positive effects of technology elements on digital transformation capability will be reinforced by CEO's digital leadership.

H6: Positive effects of IT-schools business strategic link to digital transformation capability will be reinforced by CEO's digital leadership.

2.3 Description of the Business

2.3.1 Profile and Industry

The UAE Ministry of Education (MOE) was established in 1971. Since then, the Ministry has undergone continuous development to prepare its youths for future challenges and help them fit into the market economy [68-73].

MOE Vision: The vision of the ministry is geared towards innovative education for some knowledge, pioneering and global society [74-77].

Mission: MOE mission is to develop and innovative Education System for a knowledge and global competitive society, which includes all the age groups to meet the future labor market needs and requirements and to ensure the quality of the ministry of education outputs, and thus provide the best services for internal and external customers [78-82].

MOE adheres to the following values and principles:

- i. Citizenship and Responsibility: With these values, the ministry intends to enhance the national citizenship and social responsibility of every Emirati.
- ii. Islam Values and Principles: The MOE reinforces human values in tolerance, discussion, peace, moderation and volunteering.
- iii. Commitment and Transparency: The MOE commits to professionalism and transparent performance.
- iv. Equality and Justice: The MOE commits itself to improving its community partnership and accountability in the education process.
- v. Participation and Accountability: The MOE

ensures equal educational opportunities for all.

vi. Science, technology and innovation: In these values, the MOE encourages a society that is driven by innovation, science and technology.

2.3.2 The Digital Transformation Journey in Education

As an economic and financial hub, Dubai has been enhancing public policies across all sectors [83-87]. The e-government system has been operational since 2001, following the launch of the Dubai e-government official portal by HH Sheikh Muhammad Bin Rashed Al-Maktoum. Initially, the portal offered 14 online services, making it the first Arab e-government. In 2005, the introduction of an online fee payment system necessitated changes in the IT systems of all government authorities to accommodate this service [88-93]. By 2009, all government services were available online. The Dubai e-government strategy, described on its website, emphasizes accountability, efficiency, innovation, and a forward-looking approach.

In 2013, HH Sheikh Muhammad Bin Rashed Al-Maktoum announced the development of transforming e-government into smart government. A team was established to revise the existing system to incorporate end-to-end customer service [94-101]. The first draft of this initiative was completed by the end of July 2013, outlining a framework for official authorities to organize their work through a high-level planning tool that specifies priorities and implementation mechanisms. The Dubai e-government portal provides users with information about official procedures and the necessary documents for issuing and renewing any official document, fostering a society based on knowledge and awareness of rules and regulations [102-107].

2.3.3 Critical Variables of Digital Transformation

In order to adapt and keep pace with the digital transformation environment, four variables were developed based on the Socio-Technical System (STS) framework (People, Organization, Technology and Tasks, and an extended STS framework from an integrated viewpoint by adding external variables was proposed [108-111].

- Strategic Alignment of Business with IT

The strategic alignment between IT and business plans ensures that business strategies, objectives,

and requirements are coordinated to implement digital transformation effectively [112-118]. This alignment is a key concern for management, as it demonstrates how information technology can support business goals and how business strategies can be adjusted to leverage IT for digital transformation.

- CEO's Digital Leadership

According to research, an effective method for digital leadership is a management-led, top-down transformation approach. They argue that employees must engage in various ways to drive change under the strong leadership of line managers. Therefore, senior decision-makers in the organization must quickly and accurately understand the conditions for change in terms of perception and design. The study also suggests that achieving digital transformation incrementally is challenging [119-123]. Leaders can use digital tools for governance and transformation, which fosters an appropriate organizational culture, talent development, and technical investment. Scholars also found that the strategic alignment between IT and business significantly relates to e-governance and innovation. Thus, the strategic linkage between IT and educational institutions can impact digital transformation capacity [124-127]. Given that the ultimate goal of digital transformation is innovation and organizational performance, it is assumed that the CEO's digital leadership positively influences digital transformation.

- Human Resources

The level of trust and commitment that empowers us to confidently challenge each other and take on the risks of collaboration among our organization's members and departments [128-129].

- Technological Variable

Firms will thrive when new technologies are developed to meet user expectations and keep pace with rapid technological changes. Digital transformations include digitization, but there are significant differences between the two. Digitization refers to converting information from the analog to the digital world or automating processes through information and communication technology (ICT) [130-134]. In contrast, digital transformation is a complex issue that impacts many aspects of a company. Digital technology can lead to fundamental changes in business models, products, processes, and

organizational structures. Several factors must be considered, such as the organization's agility, which is essential for successful change, and a balanced approach to securing company resources, capacity building, and development. However, these conditions often have characteristics that are not clearly understood, potentially leading to management difficulties in the long run if a company overlooks them or takes a different direction.

2.3.4 Critical Variables of E-Governance

- Technical Infrastructure

Education infrastructure facilities are considered a key component of educational outcomes. The primary factors influencing educational goals include curriculum, teacher quality, public relations, and school organization. School infrastructure facilities significantly impact student teaching and learning activities [135-137]. When students feel comfortable and supported in their learning environment, they are more engaged and motivated. Therefore, effective management of educational facilities and infrastructure is crucial to optimize the use of existing resources.

- Qualified Manpower

According to research, human beings are the fundamental basis of a nation's wealth. This principle also applies to educational institutions, making it essential for educational management to address the training needs of its staff, particularly lecturers, who bear the significant responsibility of advancing the institution's educational goals [138-139]. The study suggests that the quality of education largely depends on the quality of the lecturers, which in turn relies on the standard of their professional development. Without well-trained, qualified, and committed lecturers, it is impossible to achieve an effectively functioning educational system.

2.3.5 Relevant Case Studies

Being a recent development, e-governance has been a popular topic for researchers who subjected it to evaluation and diagnosis of challenges. Below are a number of these studies:

i. To evaluate the performance of the e-government of Dubai, the government conducted an evaluation survey to reveal the level of performance for the year 2012-2013 for all its 24

- websites. The evaluation form was posted on its website for respondents, and the results were tallied [140-143]. The results revealed that the general satisfaction among users mounted to 78% with Dubai Water and Electricity Services scoring the highest in customer satisfaction with a score of 93%. The criteria of evaluation included accessibility, usability, content, and policies [144-146].
- ii. It has been investigated the situation of e-education in Bida, Nigeria. The study covered 86 primary schools and found out that 70% of the sample were aware of their computer literacy level and confident about it. The researchers explained that computer literacy should be broken down to specific skills that teachers must be able to master for educational purposes, giving priority to the applications that teachers and students need including Microsoft Office and e-mails [147-149].
 - iii. The impact of e-governance on education in the state of Orissa, India, highlight several benefits such as improved funds management, more efficient service delivery, and enhanced data transparency [150-153]. He argued that since e-governance enhances overall performance by making processes more effective and efficient, these benefits extend to the education sector as well. Mohanty believed that promoting better transparency and interconnectedness is key to achieving these improvements.
 - iv. Researchers analyzed the role of the e-governance system in supporting higher education in India. They suggested that e-governance is the solution to India's untidy educational system. This is because the system allows authorities to monitor these institutions, ensuring that their interactions with society and other stakeholders are effectively managed and maintained [154-155].

3. RESEARCH METHOD

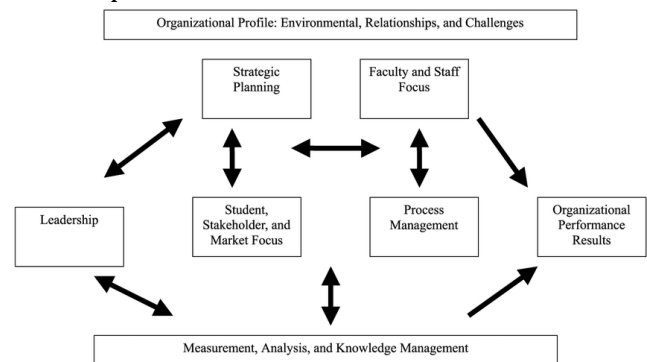
According to observation, "A qualitative study is defined as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting."

Scholars' adoption of the qualitative approach is justified due to the complex and multi-variable nature of the phenomenon being studied, which is

relevant to this research topic. However, because of the large population size, interviews alone may not provide sufficient data to cover a broad sample. To present a more comprehensive and credible picture that encompasses all the interfering factors and represents the different parties involved, the research employed a mixed-method approach.

A survey was distributed to random educators in schools using an instrument developed by the authors, resulting in 103 responses. These responses were analyzed using the SPSS program. Additionally, the study collected data through interviews and desk research. The interview method provided primary data from key sources, including Eng. Amal Abdulrahman, Director of Digital Transformation at MOE; Mr. Khalid Almulla, Director of the Inspection Sector who implemented e-governance in the Department of Inspection; and Mr. Nabeel Albulooshi, Director of Schools. These individuals were selected for their direct involvement in planning and implementing the e-governance system at their respective institutions. Three interviews were conducted via the Zoom online meeting platform.

For desk research, information was gathered from relevant literature focusing on the application of e-governance systems in different countries. This literature provided a foundation for determining how the UAE government could apply the system to its schools and digitalize its services. These case studies also helped predict the likely outcomes of such implementations.



Source: Baldrige National Quality Program: Education Criteria for Performance Excellence (2004)

3 Figure 1: Theoretical Framework, Source made by authors

H1: E-Governance can achieve a high operational excellence in the schools.

H0: E-Governance can not achieve a high operational excellence in the schools.

4. ANALYSIS

Taking the following hypotheses into consideration:

H0: Digital transformation has affected E-Governance in education positively.

H1: Digital transformation has affected E-Governance in education positively, but there are some challenges.

After conducting the interview sessions with the three target interviewees described in the previous section, several findings emerged.

First, the e-governance system is a well-known concept in the UAE, particularly as it has been adopted by the government in its operations. The system aims to enable school management to provide educational services to students and parents 24/7 through online service platforms. This leads to the second finding: the implementation of the e-governance system is designed to enhance communication. From the school management's perspective, the system facilitates easier dissemination of information regarding school policies and activities to students and parents. From the parents' perspective, the system allows them to monitor their children's development and progress at school by providing regular evaluations and assessments from teachers through various communication channels.

Third, the interviewees agreed that the UAE government should play an active role in ensuring the proper application of e-governance in school operations. It is the government's responsibility to ensure schools' compliance with these systems (Amal, Figure 1 from MOE website).

The interviewees contended that implementing the e-governance system would enable school management to offer superior services to their students. Additionally, they noted that the system would aid in fostering a student-centered organizational culture.

4.1 Correlation Analysis

The correlation analysis is conducted with the effectiveness of digital transformation kept constant, while other variables are tested to determine the strength of their correlation.

4.1.1 Gender Correlation (Appendix 1-Table 1)

$r = -0.072$, $p = 0.468$

The negative correlation is significant but weak.

- Operational Excellence and Digital Transformation (Appendix 1-Table 2)

The correlation is significant at the 0.01 level (2-tailed).

The positive correlation suggests that increasing operational excellence can enhance digital transformation effectiveness.

- E-Governance Standards and Digital Transformation (Appendix 1-Table 3)

The correlation is significant at the 0.01 level (2-tailed).

A positive correlation indicates that higher e-governance standards improve digital transformation effectiveness.

- Digital Transformation and Using Improvement Plans (Appendix 1-Table 6)

The correlation is significant at the 0.01 level (2-tailed).

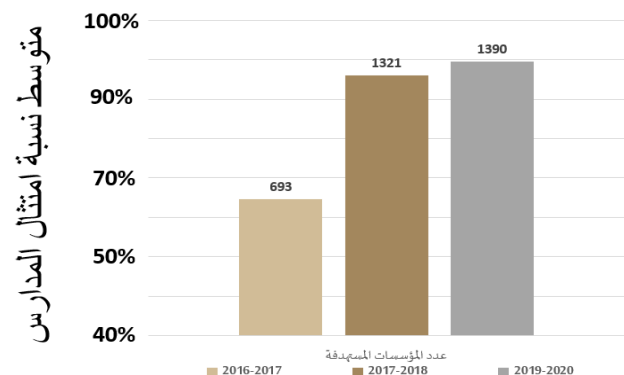
A negative correlation suggests that not using digital transformation for improvement plans decreases school excellence effectiveness.

- Degree of Participation and Digital Transformation (Appendix 1-Table 7)

The correlation is significant at the 0.01 level (2-tailed).

Increasing participation improves digital transformation effectiveness.

- Digital Transformation Tools and E-



- Governance Standards (Appendix 1-Table 8)

The correlation is significant at the 0.01 level (2-tailed).

Using digital transformation tools enhances e-governance standards effectiveness.

- Educational Oversight and Operational Excellence (Appendix 1-Table 9)

The correlation is not significant at the 0.05 level (2-tailed).

Increased oversight for e-governance policies improves operational excellence effectiveness.

- Digital Transformation and E-Governance (Appendix 1-Table 10)

The correlation is significant at the 0.01 level (2-tailed).

Increased digital transformation usage improves e-governance effectiveness.

- Digital Transformation Tools and Operational Excellence (Appendix 1-Table 11)

The correlation is significant at the 0.01 level (2-tailed).

More digital transformation tool usage enhances operational excellence effectiveness.

- Standard of School Excellence and Digital Transformation (Appendix 1-Table 12)

The correlation is significant at the 0.01 level (2-tailed).

Higher school excellence standards improve digital transformation effectiveness.

- Digital Transformation Services and Administration Monitoring (Appendix 1-Table 13)

The correlation is significant at the 0.01 level (2-tailed).

Increased use of digital transformation services improves administration and staff monitoring.

- Age and Effectiveness of Corrective Plans (Appendix 1-Table 14)

$$r = -0.50, p = 0.613$$

There is a significant negative correlation between age and the effectiveness of corrective plans.

4.2 Regression

- Predictors (Constant), Gender, Age, Digital Transformation's Effect on E-Governance for Operational Excellence, Operational Excellence's Contribution to Digital Transformation Implementation, Perception on Increasing Regulatory E-Governance Standards for

School Excellence Enhancing Digital Transformation, Knowledge of E-Governance Concepts, Impact of E-Governance on Educational Procedures and Processes, Use of E-Governance Implemented by Digital Transformation for Improvement Plans and Procedures, Degree of Participation in Improvement Measures, Increase in Using Digital Transformation Tools for Ministry-Specified E-Governance Standards, Knowledge Level of E-Governance Regulations and Policies.

4.3 Appendix 1- Table 15: Model Summary

4.3.1 R Value: 0.440

- Indicates the quality of prediction for the dependent variable (effectiveness of digital transformation and e-governance). A value of 0.440 suggests a moderate prediction quality.

4.3.2 R Square Value: 0.194

- Represents the proportion of variance in the dependent variable explained by the independent variables. A value of 0.194 indicates that 19.4% of the variability in the dependent variable is explained by the independent variables.

4.3.3 Adjusted R Square Value: 0.134

- Provides a more accurate interpretation, showing that the model explains 13.4% of the variability in the dependent variable.

4.4. Dependent Variable

Did Digital Transformation Impact E-Governance for Operational Excellence in Your School?

4.5 Explanation of Significance Test

4.5.1 Overall Model Fit (Appendix1-ANOVA Table 16)

The F-ratio in the ANOVA table (Table 16) assesses whether the overall regression model is a good fit for the data. The table indicates that the independent variables significantly predict the value of the dependent variable: $F(7, 95) = 3.260$.

- Predictors (Constant), Gender, Age, Perception on Increasing Regulatory E-Governance Standards for School Excellence Enhancing Digital Transformation, Knowledge of E-Governance Concepts, Impact of E-Governance on Educational Procedures and Processes, Use of E-Governance Implemented by

Digital Transformation for Improvement Plans and Procedures, Degree of Participation in Improvement Measures, Increase in Using Digital Transformation Tools for Ministry-Specified E-Governance Standards, Knowledge Level of E-Governance Regulations and Policies.

- Dependent Variable

Did Digital Transformation Affect E-Governance to Achieve Operational Excellence in Your School?

5. DISCUSSION

Table 17 presents the statistical significance test results for each independent variable. The t-values are 2.210, -0.083, 1.086, -0.172, -1.366, 1.696, and -0.385, corresponding to p-values of 0.143, 0.029, 0.934, 0.281, 0.864, 0.175, and 0.093 respectively. These p-values indicate that the independent variables are statistically significant.

Ensuring compliance of E-governance with the standards of the Ministry of Education (MOE) significantly enhances the effectiveness of digital transformation. Additionally, an increase in knowledge of E-governance and its policies leads to increased effectiveness of digital transformation. Participants' perception suggests that improving school operational excellence will also enhance the effectiveness of digital transformation. There is a significant positive relationship between digital transformation and the impact of E-governance, indicating that enhancing E-governance can improve school operational excellence. Furthermore, increasing participants' knowledge of E-governance concepts improves the effectiveness of digital transformation.

The majority of respondents were aged between 40 and 49, and the research participants were predominantly female.

5.1 Benefits and challenges of Digital Transformation

Based on the aforementioned findings, it can be suggested that the e-governance system offers several advantages to school operations. These include fostering transparent and efficient communication among stakeholders, facilitating a shared workspace and resources, and enabling collaborative learning and teaching between teachers and students. These benefits stem from the system's characteristic of being open and adaptive.

However, it is important to note that since the

system operates online, occasional cyber-attacks pose a significant threat. Additionally, the system's openness may increase the risk of data theft, which could be particularly detrimental if the stolen data is sensitive and confidential. Furthermore, implementing the system would require substantial funding, necessitating careful consideration by school management to secure the necessary resources.

6. RECOMMENDATIONS

Given the challenges highlighted in the preceding section, the following recommendations are suggested for school management to consider before implementing the e-governance system:

- Develop comprehensive plans for system implementation: Define the vision and objectives of the application clearly. Setting appropriate objectives will assist school management in determining how the system should be utilized and which activities it should encompass. Furthermore, it will provide a clear guideline to all school staff on proper system operation.
- Implement robust data protection measures: Anticipate cyber-attacks and employ advanced protection and security systems to safeguard operations. These systems should filter out activities and deny access to unauthorized users, providing extra protection for shared and exchanged data and information. Additionally, limit access to the system's servers and storage to a few individuals entrusted by stakeholders to minimize the risk of unauthorized access.
- Facilitate active government involvement: Encourage the UAE government, particularly the Ministry of Education, to play an active role in supporting schools in adopting the e-governance system. The Ministry is responsible for establishing the national education plan in the UAE and developing an innovative education system to produce quality graduates. The government can support schools by creating policies on e-governance that assist school management in implementing the system smoothly. Furthermore, the government should enact laws to protect

the exclusivity and security of the system, thereby aiding school management in the proper application of the e-governance system and maximizing its benefits.

5. CONCLUSION

In conclusion, this analysis highlights several key findings and implications for digital transformation within enterprises. Human factors emerge as pivotal, with communication, trust, commitment to cooperation, and a spirit of challenge significantly influencing digital transformation capacity. To optimize these factors, fostering an open organizational culture is paramount.

Additionally, while technological factors positively impact digital transformation, they are often prioritized lower than human factors. Efforts to acquire new technology and strategically apply it to business are essential. The strategic role of IT, particularly in driving business innovation, underscores the importance of technological advancements.

Moreover, strengthening the alignment between IT and business strategy enhances digital transformation capability. Information sharing between the business unit and IT department is crucial for this alignment, ensuring that IT understands and supports the company's strategic goals.

Lastly, the positive impact of CEO digital leadership on all independent variables is significant. CEOs play a key role in aligning human and technological factors with business strategy, highlighting the importance of top-down leadership in driving successful digital transformation. Overall, these findings emphasize the need for a holistic approach, integrating human, technological, and strategic elements to maximize the benefits of digital transformation in organizations.

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Appendix 1: SPSS Resul

Table 1

Correlations

		Gender	Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?
Gender	Pearson Correlation	1	-.072
	Sig. (2-tailed)		.468
	N	103	103
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	-.072	1
	Sig. (2-tailed)	.468	
	N	103	103

Table 2

Correlations

		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Did operational excellence of schools contribute to raise implementing of the digital transformation?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.366**
	Sig. (2-tailed)		.000
	N	103	103
Did operational excellence of schools contribute to raise implementing of the digital transformation?	Pearson Correlation	.366**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 3

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Do you think Increasing the regulatory e-governance standards for school excellence will increase the effectiveness of the digital transformation?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.462**
	Sig. (2-tailed)		.000
	N	103	103
Do you think Increasing the regulatory e-governance standards for school excellence will increase the effectiveness of the digital transformation?	Pearson Correlation	.462**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 4

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	How knowledgeable are you with the concept of E-Governance?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.253*
	Sig. (2-tailed)		.010
	N	103	103
How knowledgeable are you with the concept of E-Governance?	Pearson Correlation	.253*	1
	Sig. (2-tailed)	.010	
	N	103	103

Table 5

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	How impactful are the e-governance on the development of procedures and processes in the educational institution?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	-.224*
	Sig. (2-tailed)		.023
	N	103	103
How impactful are the e-governance on the development of procedures and processes in the educational institution?	Pearson Correlation	-.224*	1
	Sig. (2-tailed)	.023	
	N	103	103

Table 6

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Are the e-governance which implemented by using digital transformation used to develop improvement plans and procedures?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	-.366**
	Sig. (2-tailed)		.000
	N	103	103
Are the e-governance which implemented by using digital transformation used to develop improvement plans and procedures?	Pearson Correlation	-.366**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 7

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	What is the degree of your participation in developing and implementing improvement measures?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.445**
	Sig. (2-tailed)		.000
	N	103	103
What is the degree of your participation in developing and implementing improvement measures?	Pearson Correlation	.445**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 8

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Do increase using of digital transformation tools will ensure the e-governance standards which specified by the Ministry of Education?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.334**
	Sig. (2-tailed)		.001
	N	103	103
Do increase using of digital transformation will ensure the e-governance standards which specified by the Ministry of Education?	Pearson Correlation	.334**	1
	Sig. (2-tailed)	.001	
	N	103	103

Table 9

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	If yes, determine how much knowledge you have of E-governance regulations and policies
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.187
	Sig. (2-tailed)		.059
	N	103	103
If yes, determine how much knowledge you have of E-governance regulations and policies?	Pearson Correlation	.187	1
	Sig. (2-tailed)	.059	
	N	103	103

Table 10

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	In your opinion, does using digital transformation contribute to raising the quality of e-governance standards in schools?
Are the corrective action plans sent from the Inspection Office of the Ministry of Education reviewed?	Pearson Correlation	1	.441**
	Sig. (2-tailed)		.000
	N	103	103
In your opinion, does using digital transformation contribute to raising the quality of e-governance standards in schools?	Pearson Correlation	.441**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 11

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Has using of digital transformation tools effect to raise the percentage of activating School excellence?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.260**
	Sig. (2-tailed)		.008
	N	103	103
Has using of digital transformation tools effect to raise the percentage of activating School excellence?	Pearson Correlation	.260**	1
	Sig. (2-tailed)	.008	
	N	103	103

Table 12

Correlations

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	During the using of digital transformation services, are the standards for the facility and school operational excellence being monitored?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.368**
	Sig. (2-tailed)		.000
	N	103	103
During the using of digital transformation services, are the standards for the facility and school operational excellence being monitored?	Pearson Correlation	.368**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 13
Correlations

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	During the using of digital transformation services, are the standards for the school administration and staff standards being monitored to achieve school operational excellence?
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	.463**
	Sig. (2-tailed)		.000
	N	103	103
During the using of digital transformation services, are the standards for the school administration and staff standards being monitored to achieve school operational excellence?	Pearson Correlation	.463**	1
	Sig. (2-tailed)	.000	
	N	103	103

Table 14

Correlations

Correlations			
		Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Age
Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Pearson Correlation	1	-.050
	Sig. (2-tailed)		.613
	N	103	103
Age	Pearson Correlation	-.050	1
	Sig. (2-tailed)	.613	
	N	103	103

Table 15

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.440 ^a	.194	.134	.748

Table 16

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.752	7	1.822	3.260	.004 ^b
	Residual	53.093	95	.559		
	Total	65.845	102			

Table 17

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.086	.737		1.474	.143
	Do increase using of digital transformation tools will ensure the e-governance standards which specified by the Ministry of Education?	.248	.111	.234	2.210	.029
	In your opinion, does using digital transformation contribute to raising the quality of e-governance standards in schools?	-.030	.357	-.010	-.083	.934
	Has using of digital transformation tools effect to raise the percentage of activating School excellence?	.092	.085	.115	1.085	.281
	Age	-.014	.083	-.016	-.172	.864
	During the using of digital transformation services, are the standards for the school administration and staff standards being monitored to achieve school operational excellence?	-.209	.153	-.136	-1.366	.175
	How knowledgeable are you with the concept of E-Governance?	.553	.326	.214	1.696	.093
	Gender	-.063	.164	-.037	-.385	.701

Appendix 2: Survey**Instrument: Survey****Survey****Correlation between Digital Transformation and E-Governance to Achieve Operational Excellence in Education**

العلاقة بين التحول الرقمي والحوكمة الإلكترونية لتحقيق التميز المؤسسي في التعليم

(We are a student of master's from Hamdan Bin Mohammed Smart University, specialized in institutional excellence and innovation, change management. We will be collecting data which will be used in scientific research. Please be sure that all of the information provided will be kept confidential and used for the research proposes only)

(نحن مجموعة من طلبة الماجستير بجامعة حمدان بن محمد جامعة حمدان بن محمد الذكية من تخصص التميز المؤسسي و الابتكار وإدارة التغيير، ونجمع هذه المعلومات (لاستخدامها في بحث علمي، كن متأكد بأنه سيتم الاحتفاظ بجميع المعلومات المقدمة بسرية تامة واستخدامها لأغراض البحث فقط)

Part one: information about the digital transformation and E-governance**الجزء الاول : معلومات عن التحول الرقمي والحوكمة الإلكترونية**

Sr.	questions	Options	اختيارات	الأسئلة	#
1	Did the Digital transformation effect on the e-governance to achieve operational excellence in your school?	Strongly Agree Agree Natural Disagree Strongly Disagree	موافق بشدة موافق محايد غير موافق غير موافق بشدة	هل أثر التحول الرقمي على الحوكمة الإلكترونية لتحقيق التميز التشغيلي في مدرستك؟	1
2	How knowledgeable are you with the concept of educational inspection?	Limited knowledge Medium knowledge Extensive knowledge Expert	معرفة محدودة معرفة متوسطة معرفة واسعة خبير في المجال	ما مدى إلمامك بمفهوم التحول الرقمي؟	2
3	Did operational excellence of schools contribute to raise implementing of the digital transformation?	Strongly Agree Agree Natural Disagree Strongly Disagree	موافق بشدة موافق محايد غير موافق غير موافق بشدة	هل ساهم تميز أداء المدارس في رفع مستوى تنفيذ التحول الرقمي؟	3
4	Do you think Increasing the regulatory e-governance standards for school excellence will increase the effectiveness of the digital transformation?	Low affect Medium affect High affect No affect	تأثير منخفض تأثير متوسط تأثير عالي لا يوجد تأثير	هل تعتقد أن زيادة معايير الحوكمة الإلكترونية التنظيمية للتميز المدرسي ستزيد من فعالية التحول الرقمي؟	4
5	Are the tools of digital	Yes	نعم	هل يتم الاستفادة من أدوات	5

	transformation used to develop improvement plans and procedures?	No	لا	التحول الرقمي لتطوير الخطط والإجراءات التحسينية؟	
		No info.	لا أعلم		
6	What is the degree of your participation in developing and implementing improvement measures?	High	عالية	ماهي درجة مشاركتك في تطوير و تطبيق الاجراءات التحسينية؟	6
		Medium	متوسطة		
		Low	منخفضة		
7	Do increase using of digital transformation tools will ensure the e-governance standards which specified by the Ministry of Education?	Strongly Agree	موافق بشدة	هل الزيادة في استخدام أدوات التحول الرقمي ستضمن معايير الحوكمة الإلكترونية التي حددتها وزارة التربية والتعليم؟	7
		Agree	موافق		
		Natural	محايد		
		Disagree	غير موافق		
		Strongly Disagree	غير موافق بشدة		
8	If yes, determine how much knowledge you have of digital transformation tools and e-governance criteria?	Limited knowledge	معرفة محدودة	إذا كانت إجابتك بنعم حدد نسبة المعرفة لديك بأدوات التحول الرقمي و معايير الحوكمة الإلكترونية؟	8
		Medium knowledge	معرفة متوسطة		
		Extensive knowledge	معرفة واسعة		
		Expert	خبير في المجال		
9	In your opinion, does using digital transformation contribute to raising the quality of e-governance standards in schools?	Strongly Agree	موافق بشدة	برأيك هل استخدام التحول الرقمي يساهم في رفع جودة معايير الحوكمة الإلكترونية في المدارس؟	9
		Agree	موافق		
		Natural	محايد		
		Disagree	غير موافق		
		Strongly Disagree	غير موافق بشدة		
10	Has using of digital transformation tools effect to raise the percentage of activating School excellence?	Strongly Agree	موافق بشدة	هل أثر استخدام أدوات التحول الرقمي في رفع نسبة تفعيل التميز المدرسي؟	10
		Agree	موافق		
		Natural	محايد		
		Disagree	غير موافق		
		Strongly Disagree	غير موافق بشدة		
11	In your opinion, linkage of digital transformation need a full knowledge of technology?	Strongly Agree	موافق بشدة	برأيك هل تعتقد أن ربط التحول الرقمي يحتاج إلى إمام تام في التكنولوجيا؟	11
		Agree	موافق		
		Natural	محايد		
		Disagree	غير موافق		
		Strongly Disagree	غير موافق بشدة		
12	During the using of digital transformation services, are the standards for the	Strongly Agree	موافق بشدة	أثناء استخدام خدمات التحول الرقمي ، هل يتم مراقبة معايير التميز	12
		Agree	موافق		

	facility and school operational excellence being monitored?	Natural	محايد	التشغيلي للمنشأة والمدرسة؟	
		Disagree	غير موافق		
		Strongly Disagree	غير موافق بشدة		
13	During the using of digital transformation services, are the standards for the school administration and staff standards being monitored to achieve school operational excellence?	Strongly Agree	موافق بشدة	أثناء استخدام خدمات التحول الرقمي ، هل تتم مراقبة معايير إدارة المدرسة والموظفين لتحقيق التميز التشغيلي للمدرسة؟	13
		Agree	موافق		
		Natural	محايد		
		Disagree	غير موافق		
		Strongly Disagree	غير موافق بشدة		

Part two: demographic information

الجزء الثاني: المعلومات الديموغرافية

Sr.	questions	Options	الأسئلة	#
1	Age (years)	From 20 to 29 From 30 to 39 From 40 to 49 Older than 50	العمر (سنوات)	1
2	Gender	Male Female	الجنس	2
3	Emirate	Abu Dhabi Dubai Sharjah Ajman Umm All Quwain Ras Al-Khaimah Fujairah	الإمارة	3
4	Educational level	Bachelor's degree Master's degree PHDs	المستوى التعليمي	4
5	Occupation	Director Acting director Assistant director Senior manager Domain manager Sector manager	الوظيفة	5
6	School grade level	Kindergarten Grade Together	المرحلة الدراسية للمؤسسة التعليمية	6
	Grade need to be mentioned: يرجى تحديد مرحلة الحلقة الدراسية:			
7	School capacity	200 or less From 201 to 600 From 601 to 1200 More than 1200	حجم المدرسة (أعداد الطلبة)	7

Appendix 3: Interviews

Interview Questions

Disclaimer: all interviewees were given the same set of questions.

1. Are you familiar with the concept of e-governance system?
2. Have you heard of or encountered any application of the system in UAE?
3. What do you think the reason for the application? Can you mention some benefits of the system in public administration?
4. How may school benefit from the system?
5. Does the government need to be involved in the e-governance system application at schools? What role should they have?
6. Is there anything else you might want to add?



Elevating Excellence: The Nexus of E-Service Quality, Organizational Quality and Project Management

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ARTICLE INFO

Keywords:

E-Services, Quality, Project Management, Disruptive Technology.

Received: Aug 13, 2024
Accepted: Sep 29, 2024
Published: Dec 20, 2024

ABSTRACT

With the advent of the internet, information technology has significantly transformed the global economy, particularly the service delivery sector. This study explores the impact of e-service quality on organizational performance and project management. E-services encompass both back-end systems, where employees interact with IT, and front-end systems, where customers engage via the internet or phone. The quality of these services is critical, influenced by factors such as reliability, responsiveness, website design, and security. This research examines how traditional organizations can transition to e-service delivery while maintaining high-quality standards and managing associated risks. Interviews were conducted with six organizations to gather qualitative data on e-service implementation and its effects on organizational structure. The findings highlight the importance of interoperability, customer technology readiness, and legal compliance in enhancing e-service quality. Additionally, the study identifies critical success factors and key deficiency factors in e-service project management. The results underscore the need for a structured framework for quality and risk management in e-services to ensure organizational success and customer satisfaction.

1. INTRODUCTION AND BACKGROUND

With the advent of the internet, information technology has transformed numerous, if not all, sectors of the global economy [1-6]. The effect of technology has had a significant impact on service delivery. From banking services to customer service, most customers are accessing the majority of the services electronically. Subsequently, the concept of e-services and dimensions of e-services quality has attracted a great deal of research [7-11]. E-service can be classified as either back-end or front-end. In most scenarios, employees interact with information technology (IT) systems in the back end while customers in the front end are connected either through phone systems or the internet. Such a relationship raises the question of

what quality implications occur when such systems fail to function correctly, affecting the quality of e-services. With technology systems likely to affect downtimes, suffer from power loss, and unaddressed design deficiencies, it is necessary to establish precautionary measures to gain control over issues such as those mentioned [12-19]. This research is an inquiry into how it is important for traditional organizations to prepare for the transition into e-services delivery. Numerous researchers have used different approaches in exploring the variety of e-service operations which will be reviewed in this research.

1.1 Aim and purpose of the study

The research seeks answers to the following:

- i. How can the quality of e-service approaches in the technology sector improve the organization?
- ii. How does e-service approaches' quality impact the organization and project management?

2. LITERATURE REVIEW

2.1 E-Services Project Requirement Quality in Collaborative Networks

Research on e-services quality in collaborative networks reveals that quality can suffer due to competition for shared resources [20-31]. To address this, scholars propose enhancing interoperability, which allows seamless information sharing among computer systems, reducing the need for human intervention and boosting service delivery. Security is also crucial; customers need assurance of their data's privacy and integrity. It has been highlighted that investing in customer technology readiness can enhance e-service quality by making users more comfortable with the systems [32-39].

2.2 Privacy and Confidentiality of E-services

The rise of e-health and e-commerce has led to the collection of sensitive customer data, prompting strict privacy regulations [40-44]. An e-service agent architecture to ensure privacy compliance, giving users control over their data. Compliance with legal requirements is essential to avoid project rework. E-service designers consult local law firms to understand applicable privacy laws and regulations, ensuring systems meet legal standards and avoid network rejection [45-53].

2.3 E-Service Quality Dimensions

Quality in e-services is defined by several dimensions:

- *Reliability*: Providing accurate and consistent services as promised, which builds trust [54].
- *Responsiveness*: Timely responses to customer inquiries enhance satisfaction [55].
- *Website Design*: An appealing, clear design improves user experience and reduces interference [56].
- *Security*: Protecting physical, financial, and informational safety increases trust [57].
- *Personalization*: Tailoring services based on user data boosts satisfaction by reducing

search time [58].

- *Ease of Use*: User-friendly services with intuitive navigation and registration processes are essential [59].
- *Empathy*: Effective communication and personalization to meet customer needs enhance service quality [60].
- *Information*: Providing accurate, comprehensive, and up-to-date information builds credibility [61].
- *Tangibles*: Physical evidence of service quality, such as facilities and customer testimonials, fosters trust [62-64].
- *Communication*: Keeping customers informed about processes and services through various channels is critical [65-67].
- *Accessibility*: Easy access to services through multiple channels and high-quality servers improves user experience [68-71].

2.4 Risk and Risk Management in E-services Projects

Effective risk management is vital for e-services projects. Private sector e-services face increased risk due to centralized decision-making and lack of collaboration [72-75]. Major risks include inadequate financial models and poor governance. To mitigate these risks, developers must ensure robust support mechanisms and collaborative decision-making. Identifying potential risks, consulting stakeholders, and developing comprehensive risk mitigation plans are crucial for managing e-service project risks [76-79].

2.5 Risk Handling and E-services Project Quality

E-service quality should be assessed based on navigation, content, appearance, and offered services [80-84]. Keeping content updated and user-friendly navigation is essential. Using Six Sigma approaches and balanced scorecards to measure and manage e-service quality. Giving users control over their information to reduce risk, while it is argued that transparency in risk assessment builds trust and encourages users to report vulnerabilities [85-87].

2.6 Critical Success Factors and Key Deficiency Factors of E-services in Project Quality Management

Strong leadership, quality control, and reliable

communication are critical for successful e-services implementation [88-91]. Quality communication between teams is essential for the success of e-service projects. It has been identified unreliability, poor security, lack of responsiveness, and inefficiency as key deficiencies in e-service quality management [92-97]. Addressing these deficiencies requires a structured framework for quality and risk management. Additionally, project scope definition, managing changes, realistic deadlines, and legal regulations are crucial for e-service quality. It is emphasized the importance of understanding service quality and managing resistance to change in quality management [98-101].

2.6.1 Right Model and Approach of Quality in the Technology Sector, along with E-Services

The SERVQUAL model was the right approach for technology in electronic services. The sector's main focus should be identifying users' needs and target deadlines [102-111]. Quality can be improved in the technology sector if e-services are integrated with a pure management approach.

Authors carried out research to explore the area of PDQM data model and quality in electronic services [112-119]. The focus was on the PDQM data model, and information was observed from the Jordanian perspective. The right model can be based on PDQM because it details all the information required for the technology integration of electronic services [120-127].

2.6.2 Best practice of e-services quality management

The best practice for e-service quality is maintaining customer satisfaction and engaging in product quality. It can be implemented with the help of careful measurement and integration of technology for quality [128-131]. Reliability and service design would also cater to the needs of best practices.

A study showed the importance of e-service quality in best practice [132-137]. The approach was related to the measurement of organizational performance. The best practice was related to the performance of the company in achieving customer satisfaction.

2.6.3 Practice Standards for Project Management (PMI) Related to Quality Management

Badawi and co-authors carried out research regarding project management practice standards. The research stated that two different approaches are related to successful quality management practices. One of the practice standards was based on the quality of inputs and the design of the whole project. The second was based on meeting the deadline for product quality. Information about the practice standards for quality management. The research was principally made for the standards of management. The practice standard was related to the conventional approach of project management [138-141].

2.6.4 Key Performance Indicators of E-Services Quality Management

Research carried out research on measuring performance indicators for e-services management. The study stated that key performance indicators for quality management were measured on the consistency in electronic business policies [142-143]. The indicators were the competency-based model used for measuring the management system. The study found that the quality management system is based on research. Customer satisfaction also remains a key performance indicator for the e-service sector. Information about the e-services; their case study was based on the government of Kuwait. The main focus was the values that can increase strategic benefits and provide cost-saving for electronic services [144]. Key performance indicators were to decrease costs and increase the efficiency of the company.

Ultimately, there is a substantial amount of research in e-services. In response to its growing importance in modern organizations, researchers have introduced different quality assessment and management dimensions [145-148]. Each organization faces unique challenges in the process of improving the quality of services; thus, understanding which dimensions are most suitable in the context of a specific organization is essential [149-150]. All things considered, an e-service company requires a structured framework on quality and risk management on which it operates on to successfully dominate in the industry.

3. RESEARCH METHODOLOGY

This research aims to study the impact of e-services and its quality on the organizations. After

conducting the background research, the team developed interview questions. The team then sent interview requests to different organizations. The team interviewed individuals in six various organizations. The interviews were conducted to collect qualitative data regarding the e-services provided by the organizations. The collected data gave a better understanding of the e-services and their impacts on the organizations. The three cases are then compared to each other.

3.1 Data gathering - Case studies

3.1.1 Abu Dhabi Distribution Company (ADDC)

The interview was done with Arwa, who works in the IT Department. She is responsible for overlooking the quality of the e-services. The organization established e-services in 2010. The e-services are formulated based on the user requirements from employees, customers, and management feedback. When developing the e-service standards, they look into website design, responsiveness, and efficiency. To improve the quality assurance of the e-services, the quality department monitors client satisfaction and complaints and tries to detect possible defects before they occur. With high-quality standards, it is believed that there is no gap between the actual and expected e-services. The human need is to remain. Even though clients can apply for the services electronically, many of these services are performed by humans. The company assures the clients that their data will not be used for any other purposes. The two main risks in the e-services are performance risk and security risk. To mitigate these risks, continuous improvements are to be implemented. To handle e-services, database management systems are essential to ensure quality. Their main deliverables are extension and connection of electricity services, transfer and removal of electricity services, account management and bills, and certificate requests. The benefits of using e-services are to increase customer satisfaction, lower the time to process service, and allow the company to increase the number of services. On the other hand, it is believed that there are no defects in utilizing the e-services. The critical success factor of the e-services is the ease of use, while the key deficiency factor is the accessibility of the website. The organization's future strategy to improve the e-services to incorporate the new technologies.

3.1.2 Dubai Municipality (DM)

The interview was done with Nasser, who is a software engineer in the IT Department. They are responsible for developing the services and operations into electronic, smart, and digital services. They coordinate with concerned departments in the municipality to measure and ensure customer satisfaction and happiness via surveys and interviews about our e-services. DM is keen to provide the best experience to its customers. That is why all of the services offered by DM are electronic. The company started working on the e-services around 2001, and by 2016 all the services were converted to smart e-services. In DM, the e-services are formulated by the cooperation of different departments, which are the IT Department, which creates the service; the owner of the service, which provides and processes the service; the Strategic Department, which audits the service; and the Customer Relationship Department who measures and looks for the satisfaction of the e-services. When developing and uploading quality standards, DM tries to meet customers' and stakeholders' satisfaction and to achieve their happiness. The quality requirements are increasing with time. The organization uses global standards as well as the TRA quality criteria when developing quality standards to ensure continuous developments and improvements. It is believed that there is a gap between the actual and expected e-services because the Strategic Department in the organization is auditing the process of actual e-services along with expected e-services. Besides, the Customer Relationship Department is conducting questionnaires to eliminate gaps between the real and expected services. The organization believes that the necessity of humans will remain. Even for fully automated services like online payments where no human process is required, some people cannot use these services or are not willing to. The organization also has e-services that are ordered electronically but need humans to finish it. The company has multiple measures associated with the confidentiality of shared information, such as control access, antivirus, business continuity procedures, locking documents in document lockers, ensuring the safe and secure delivery of confidential and restricted materials, and employee awareness programs and training.

Furthermore, the company has multiple measures associated with the integrity of shared information. For example, authentication, access control, encryption of data, data backup and restore firewalls, and physical security. The main risk of e-services is the security risk. The organization is mitigating those risks with the mentioned measures for confidentiality and integrity. DM uses the Data Quality Assurance plan for data gathering and data transfer. This plan ensures validity, reliability, precision, integrity, and timeliness. The organization uses several methods for quality management, as each has its benefits and drawbacks. For example, cause and effect diagrams, control charts, flow-charting, histograms, Pareto chart and Pareto analysis, run charts, scatter diagrams, statistical sampling, and inspection. The results of the e-services in DM are the same as the physical services because all services are converted to e-services. There are many benefits of using the e-service. For instance, fewer human resources, less time for applying, less cost, and helps to achieve the happiness of the customers. However, the defects are the initial cost of transferring to the e-service, the employee training required, and possible privacy violations. The critical success factors of the e-services are the integration of the services, length of the service map and total time of delivering the service, trust, and ease of use. The key deficiency factors are lack of familiarity, lack of awareness, and users' adoption. The organization's future strategy for improving the e-services is to develop the infrastructure to match the institutional marketing development. After that, the organization must find global e-services strategies and best practices and benchmark them.

3.1.3 Abu Dhabi National Exhibition Centre (ADNEC)

This interview was conducted with Kholoud, who is responsible for handling the IT services of the company. The company provides services in the tourism and events sector of the UAE. The e-services provided by the organization are an online option for bookings for venues, online information for exhibitions, visiting hotels, and services. The organization established the e-services in 2009. The e-services were formulated by making the physical services accessible over the Internet. The quality standards that the company focuses on are the content and the information provided on the

website. The company is building quality standards and preventing errors to improve its quality assurance. Whenever a gap between the actual and the expected services occurs, the company does its best to fill the gaps. The company believes that human presence is necessary even with the e-services to keep updating the information and satisfy the client by giving answers to each query. The policies of the company ensure the confidentiality of the client's data, and they ensure the security of their information. The risks of e-service for the company are the responsiveness to the client and the security of the website. Cloud-based data storing and gathering model is used to maintain quality and standards. High-quality events are the results of the e-services. The benefit of the e-services to the organization is to lower the resources allocated to giving general information, and it is believed that there are no defects from the e-services in the company. The critical success factor of the e-services is the quality, and the key deficiency factor is the responsiveness from the clients. The future organization strategy to develop the e-services is to implement quality management processes.

3.2 E-Service Application in Project Management

3.2.1 Dubai Municipality Application

DM is working on a geospatial application that allows the Roads and Transport Authority (RTA) to see all the road projects in Dubai. This application will improve the study of infrastructure projects, reduce coordination procedures, and convert all paper letters to electronic letters.

This application will store all the information required from both parties in a database. The system will increase the efficiency and speed of decision-making in project management and reduce the time required for getting approvals.

4. DATA ANALYSIS

The focus of the e-services in the ADDC is around e-payment, while the attention of the ADNEC is around providing information and booking. On the other hand, DM concentrates on providing information, applying for services, and e-payment. The difference in the focus area is related to the nature of the organizations. This led the companies to concentrate on different quality dimensions. DM started the e-services before ADDC and ADNEC,

which both started around the same time. The impact of DM's head start can be seen in their development in the area. By 2010, DM introduced the concept of "zero visits," and by 2016, all its services transferred to smart services. On the other hand, ADDC and ADNEC started the e-services a bit late.

The three organizations believe that there is a minimum or no gap between the actual and expected e-service. This is due to the continuous checkup on the services and the information on the website. Also, the raising of standards plays a vital role in avoiding gaps. Moreover, the organizations agreed that the e-services enhance human performance and do not eliminate human necessity.

The three organizations agreed that the confidentiality and integrity of any shared information and security problems are the key risks in e-services. They are doing their best to ensure the privacy and integrity of the information and improve the security of the system. As shown in the literature review, if there is no trust in e-services, then people will not use them. Trust is critical to utilizing the benefits of e-services.

The three organizations use three different quality models, which is also because of the type of e-services provided by the companies. The critical success factors and the key deficiency factors can be reasoned with the same. Regarding the future strategies of the organizations, they all plan to implement new technologies and global standards to improve their services.

5. DISCUSSION

Table 17 presents the statistical significance test results for each independent variable. The t-values are 2.210, -0.083, 1.086, -0.172, -1.366, 1.696, and -0.385, corresponding to p-values of 0.143, 0.029, 0.934, 0.281, 0.864, 0.175, and 0.093 respectively. These p-values indicate that the independent variables are statistically significant.

Ensuring compliance of E-governance with the standards of the Ministry of Education (MOE) significantly enhances the effectiveness of digital transformation. Additionally, an increase in knowledge of E-governance and its policies leads to increased effectiveness of digital transformation. Participants' perception suggests that improving school operational excellence will also enhance the effectiveness of digital transformation. There is a

significant positive relationship between digital transformation and the impact of E-governance, indicating that enhancing E-governance can improve school operational excellence. Furthermore, increasing participants' knowledge of E-governance concepts improves the effectiveness of digital transformation.

The majority of respondents were aged between 40 and 49, and the research participants were predominantly female.

5.1 Benefits and challenges of Digital Transformation

Based on the aforementioned findings, it can be suggested that the e-governance system offers several advantages to school operations. These include fostering transparent and efficient communication among stakeholders, facilitating a shared workspace and resources, and enabling collaborative learning and teaching between teachers and students (Suklabaidya & Sen, 2013, p. 261). These benefits stem from the system's characteristic of being open and adaptive.

However, it is important to note that since the system operates online, occasional cyber-attacks pose a significant threat. Additionally, the system's openness may increase the risk of data theft, which could be particularly detrimental if the stolen data is sensitive and confidential. Furthermore, implementing the system would require substantial funding, necessitating careful consideration by school management to secure the necessary resources.

6. RESEARCH LIMITATION

6.1 Lack of Quantitative Data

This study primarily relied on qualitative data gathered through interviews and case studies. The absence of quantitative data limits the ability to make statistical comparisons between e-services and traditional services, such as user numbers and satisfaction levels. This limitation restricts the generalizability of the findings and the ability to draw robust, data-driven conclusions.

6.2 Sample Size and Diversity

The research involved interviews with six organizations which may not be representative of the broader industry. A larger sample size with more diverse organizations would provide a more comprehensive understanding of the e-service quality and its impact on organizational

performance.

6.3 Geographical Constraints

The study focused on organizations within a specific region, potentially limiting the applicability of the findings to other geographical areas. Different regions may have varying technological infrastructures, regulatory environments, and customer expectations, which could influence e-service quality and implementation.

6.4 Focus on E-Service Quality

The study primarily concentrated on the quality dimensions of e-services and their impact on organizational performance. Other critical factors, such as cost-effectiveness, scalability, and long-term sustainability of e-services, were not deeply explored.

7. RECOMMENDATIONS

- i. Implementing the blockchain to the e-services. This will lead to:
 - Higher integrated services
 - More secured services
- ii. Applying AI to e-services will reduce human interaction with information. This will lead to fewer privacy violations and increase the trust in e-services.
- iii. Using the Telecommunication Regulatory Authority for e-service quality criteria alongside the global criteria. Depending only on the global criteria can cause problems later. Demographic and social forces can impact quality criteria.

8. CONCLUSION

After conducting this report, it can be concluded that e-services have become the business sector's basic provisions. There are mainly three most important components of e-service, i.e., Service providers, receivers, and service delivery channels. The internet acts as the major source or the major channel for e-service delivery, while other important channels include telephone, call centers, mobile phones, television, etc. In most cases, e-service is also used as a generic term, which usually refers to the provision of services through the access of the internet. The most important and most frequently used e-services in modern times is e-commerce. E-services might also include

different services for commercial and noncommercial use, which might also be provided by the government.

In the provision of e-services, there might also be a deficiency of different factors observed, especially in terms of quality management and how it might influence the overall results generated by an organization. It is now the responsibility of the government to identify the basic needs of the users and design the legal and realistic regulations for the users to follow and be able to determine the most suitable results. This would involve sharing and storage of data and be able to fulfill the basic deficiency factors observed in the business industry at large.

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Strategic Collaborations and Ecosystem Integration - Digital Transformation Insights from Deloitte Case Studies

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ARTICLE INFO

Keywords:

Strategic Partnerships,
Ecosystem Integration,
Digital Transformation,
Deloitte, Iot Technologies-

Received: Sep 18, 2024
Accepted: Oct 27, 2024
Published: Dec 20, 2024

ABSTRACT

The current research investigates the transformative effect of strategic partnerships, ecosystem integration, and digital transformation initiatives inside the Middle East, while focusing on their remarkable effects to bring the business innovation, flexibility, operational efficiency, which will lead to cost reduction. Based on an in-depth evaluation of different case study scenarios from Deloitte Middle East, the said study analyzes how well collaborative efforts, with external partners, help to cause evident advancements across different sectors. The findings, of this study, has revealed that strategic partnerships as well as ecosystem integration play a central role to effectively foster innovation, agility, along with the customer-centric approaches in the Middle East business landscape. The other collaborative ventures, like integrating IoT technologies to develop smart cities along with leveraging AI-powered analytics i.e., to enhance customer experiences, displays the effective outcomes of synergy between industry leaders like Deloitte and external partners.

1. INTRODUCTION

Deloitte Middle East is a premier consultancy firm which has a remarkable recognition for providing outclass services [1-11]. These are customized according to the needs of businesses across the region of Middle East [12-19]. To foster innovation and growth and with an unwavering commitment, Deloitte's laid out presence in the UAE and encompassing regions highlights its devotion to giving significant solutions [19-27]. In order to provide the remarkable solutions and to serve the pivotal areas of governance, IT strategy and digital transformation, customized approaches are provided by Deloitte. Of specific importance is Deloitte's capability in crafting partner ecosystems equipped towards flawless integration of the products and services to bring out the significant client experience[28-33]. This strategic focus on

ecosystem advancement empowers organizations to improve client commitment as well as drive huge value creation. By encouraging collaborative connections and partnerships, Deloitte enables associations to explore the intricacies of the modern marketplace with agility and foresight [34-42].

The current era is all about technological revolution and digital advancement. The business entities continuously face the challenges of meeting the ever-evolving needs and expectations of the customers [43-49]. To remain competitive in the marketplace, business entities need form close partnerships with the external partners and the stakeholders along with the consideration of customers [50-57]. This is how seamless experience can better be created which can better

help for integrating the products & services into the customer journey [58-63]. It needs to have a strong ecosystem specifically when the market becomes more interconnected [64-71]. In this way, the innovation, flexibility and the customer-focused approach will better be promoted and emphasized. Also, the new avenues for growth are supposed to be embraced based on the given mindset [72-77]. Not only the business operations will be streamlined but also the long-lasting relationships will be established with the customers. As a resultant, the progress of businesses in today's competitive landscape depends on their capacity to adjust and flourish through strategic partnerships and shared objectives [78-85].

1.1 Research Questions

Research Question 1: In the Middle East, how does strategic partnerships & integration of ecosystem tend to impact business innovation, flexibility, and customer-focused approaches?

Research Question 2: In the Middle East, how does the digital transformation of supply chain assets effect operational efficiency and reduction of costs?

1.2 Research Hypotheses

Hypothesis 1: In the Middle East, strategic partnerships & integration of ecosystem remarkably enhances business innovation, flexibility, and customer-focused approaches.

Hypothesis 2: In the Middle East, the digital transformation of supply chain assets remarkably enhances operational efficiency and cost reduction.

2. LITERATURE REVIEW

In the context of Strategic partnerships and ecosystem integration, it can be considered as the collaboration of Deloitte Middle East and other external partners for integrating certain products and services [86-93]. This is related to fostering innovation, flexibility, and a customer-focused approach. Deloitte Middle East has better ingrained itself as a leader to craft partner ecosystems prepared towards the flawless integration of both the products and services, while providing remarkable client experiences [94-102]. The strategic emphasis on the advancement of ecosystem has empowered business entities to modify client commitment as well as drive significant creation of the value [103-113]. With the help of boosting collaborative connections and

partnerships, Deloitte enables business entities for navigating the complexity of the modern marketplace with both the agility & foresight [114-119].

The integration of cutting-edge technologies is necessary for the digital transformation of supply chain assets in order to streamline operations, cut costs, and eliminate inefficiencies [120-127]. In the Middle East, the advanced change of supply chain resources fundamentally influences functional proficiency and cost decrease [128-131]. The collaboration between Nexxiot and Deloitte Middle East has led to significant cost savings and operational efficiency enhancements [132-135]. The positive effects of digital transformation in the region can be seen in the significant reduction in supply chain inefficiencies and operational costs caused by the integration of Nexxiot's sensor network and AI capabilities. Based on the underlying strategic initiatives, the business entities are better able to navigate the complexities of the latest marketplace concerns specifically with foresight and agility [136-138]. This effectively helps to lead to long-lasting associations with customers and sustained growth.

3. RESEARCH METHODS

The current study adopts a case study analysis approach for investigating the effect of strategic partnerships, ecosystem integration, and digital transformation. This is about bringing business innovation, flexibility, operational efficiency, as well as cost reduction in the Middle East. The said methodology has also focused on evaluating the case studies related to Deloitte Middle East. This effectively exhibits the functional utilization along with the effectiveness of the said factors in varying business contexts. There are several reasons due to which case study analysis has been selected as the primary method for the current research. Firstly, it provides an insightful and detailed apprehension of how well the strategic partnerships, ecosystem integration, and digital transformation tend to contribute towards the success of business in the Middle East. Secondly, the real-world examples can better be offered by utilizing case studies from Deloitte Middle East and through the implementation and effectiveness of the said factors in different business scenarios. This will also consider providing practical insights related to businesses of the region. Apart from this, the main

focus on the case studies is helpful to enable an extensive evaluation of those factors which tend to contribute to business innovation, flexibility, operational efficiency, as well as cost reduction in the Middle East.

Furthermore, case study analysis makes it possible to conduct a multidimensional investigation. By examining numerous cases, we can investigate the diverse ways by which key associations, ecosystem

integration, and advanced change add to various parts of business execution, including development, adaptability, functional effectiveness, and reduction of costs. This method makes it easier to get a more detailed and nuanced understanding of how these factors work together and how they affect Middle Eastern businesses.

3.1 Results (Case studies implemented globally as best practices)

Case 1

<i>Case</i>	<i>Demonstration</i>	<i>Motivation to Adopt</i>
<i>Digital Transformation of Supply Chain Assets Nexxiot</i>	A well-refined organization of sensors combined with advanced artificial intelligence capabilities fills in as a significant impetus in enlightening the complex elements of supply chain tasks.	Deloitte Middle East and Nexxiot collaborated for digitally transforming supply chain assets. Nexxiot specializes in digitalizing supply chain assets. Nexxiot's sensor network and AI capabilities declined supply chain inefficiencies and operational costs. Deloitte Middle East acts as integration partner for seamless implementation.

Case 2

<i>Case</i>	<i>Demonstration</i>	<i>Motivation to Adopt</i>
<i>Use of Data-Driven Solutions for Financial Institutions (FIs) Large Canadian Bank</i>	Deloitte Middle East's inventive methodologies have essentially added to upgrading proficiency and lessening costs for financial institutions (FIs).	Deloitte's Acquisition.AI solution leverages data from diverse sources to enable FIs to conduct precise and more targeted customer acquisition campaigns. Collaboration with a large Canadian bank resulted in over a 50% increase in the conversion rate of low-engagement clients to primary relationship clients.

Case 3

<i>CASE</i>	<i>DEMONSTRATION</i>	<i>MOTIVATION TO ADOPT</i>
<i>BRIDGING CULTURAL GAPS TO ACHIEVE THE STANDARDS OF EXCELLENCE MIDDLE EAST CHINESE SERVICES GROUP (CSG)</i>	Operating as a platform to leverage China expertise, bridge the cultural gap, and ensure client service excellence.	The Middle East Chinese Services Group (CSG) operates as a pivotal element within Deloitte Middle East's partner ecosystem strategy. The CSG helps for collaboration between Chinese and Middle Eastern businesses, ensuring seamless integration of products and services to bring the enhanced customer experience.

Case 4

<i>Case</i>	<i>Demonstration</i>	<i>Motivation to Adopt</i>
<i>Leveraging AI-Powered Analytics for Enhanced Customer Experience (partnered with NVIDIA)</i>	Deloitte collaborated with NVIDIA to develop AI-powered solutions tailored for the telecom industry.	The association among Deloitte and NVIDIA aims to revolutionize the telecom business by utilizing AI technologies to upgrade activities, streamline benefits, and further develop overall customer experience Deloitte and NVIDIA's combined expertise in AI technology and telecom industry knowledge gives a competitive advantage, captivating telecom organizations to take on these innovative arrangements. AI-powered solutions guarantee expanded productivity, decreased costs, and improved dynamic capacities, driving development and advancement in the telecom area.

Case 5

Case	Demonstration	Motivation to Adopt
<p><i>Building Smart Cities Through Integration of IoT (partnered with Siemens)</i></p>	<p>Cities can save money and help the environment by using IoT sensors and data analytics to better maximize resource utilization, decrease consumption of the energy, and enhance citizen services.</p>	<p>The partnership between both the Deloitte and Siemens focuses to integrate IoT technologies for urban infrastructure, which includes transportation systems, public services, and energy grids for effectively enhancing both the efficiency as well as sustainability.</p> <p>Deloitte and Siemens tend to leverage their joint efforts in data analytics, IoT, and urban planning towards offering extensive solutions designed for meeting the particular needs of Middle Eastern cities. This is intended to encourage urban area to take initiatives concerning smart city specifically related to long-term economic as well as social development.</p>

4. DISCUSSION: CASE ANALYSIS

4.1 Case 1 (Digital Transformation of Supply Chain Assets)

For the case of digital transformation initiatives, Case 1 illustrates the collaborative efforts concerning Deloitte Middle East as well as Nexxiot towards bringing revolution to supply chain management while relying on the integration of innovative technologies. The underlying partnership works as a persuasive instrument for having the remarkable consequence of digitalization on operational efficiency along with the cost reduction within the Middle East region. At the heart of the underlying case lies Nexxiot's skills for digitalizing supply chain assets with the help of an effectively defined arrangement of sensors along with the advanced artificial intelligence expertise. Through deploying a complex sensor network in combination with AI-driven analytics, Nexxiot deals with the complex challenges prevailing in supply chain operations. The effective implementation of the underlying technologies alters real-time observation as well as investigation of supply chain processes. This is specifically about providing business entities with unprecedented perceptibility and control over the particular operations. Digital technologies' transformative potential in supply chain management is exemplified by Case 1's demonstration. Organizations can remarkably reduce operational inefficiencies, bring optimization to the utilization of resources, and streamline supply chain operations with the help of utilizing Nexxiot's sensor network and AI capabilities. Effective management of inventory, increased optimization of logistics, and shorter lead times are just a few of the tangible outcomes

that have better been achieved with the help of application of these technologies in the real world. The digital transformation of supply chain assets in the Middle East, thus, helps to support the Hypothesis 2. This can be said that the strategic integration of ecosystems can effectively lead to remarkable modifications in supply chain management. This case significantly details the concrete financial benefits which are associated with the drive of digital transformation, which reinforces the hypothesis that digitalization tends to increase operational efficiency along with bringing reduction of costs in the Middle East.

4.2 Case 2 (Use of Data-Driven Solutions for Financial Institutions)

The given case shows an effective example of how well the agenda of strategic partnerships along with the ecosystem integration tends to contribute towards business innovation along with having customer-focused approaches. This remarkably aligns closely with Hypothesis 1. Deloitte Middle East's case of collaboration with a large Canadian bank exemplifies the transformative effect of data-driven solutions related to the financial sector. Through investing on Deloitte's Acquisition.AI solution, which is found to harnesses data from diversified sources, financial institutions (FIs) can remarkably enhance their acquisition strategies concerning customers i.e., with precision and enhanced effectiveness. The underlying collaboration resulted in a significant 50% rise in the conversion rate of low-engagement clients towards having the primary relationship clients for the Canadian bank. The outcome of this case exhibits the power of strategic partnerships in driving business advancement and adaptability.

The collaboration made it possible to implement data-driven solutions that were tailored to the particular requirements of the financial sector by combining the cutting-edge strategies developed by Deloitte with the bank in Canada's current infrastructure. This incorporation of environment assets and expertise improved the bank's functional productivity as well as empowered a more client driven way to deal with the delivery of services. So, this collaboration between Deloitte Middle East as well as a large Canadian bank, utilizing Acquisition.AI, can be linked with Hypothesis 1. This is done by exhibiting how well strategic partnerships and data-driven solutions, in the Middle East's financial sector, effectively enhance business innovation, flexibility, and customer-focused approaches. It helps to put more focus on bringing the digital transformations while leading towards bringing remarkable improvements concerning financial institutions' performance.

4.3 Case 3 (Bridging cultural gaps to achieve the standards of excellence)

Hypothesis 1 is supported by the Middle East Chinese Services Group (CSG) within Deloitte Middle East, which exemplifies how cultural integration and strategic partnerships significantly boost business innovation, flexibility, and customer-focused approaches. Through cooperation with Deloitte China, the CSG works with consistent incorporation of items and administrations into the client experience, guaranteeing principles of excellence are met across different cultural landscapes. The Middle East Chinese Services Group (CSG) remains as a demonstration of Deloitte Middle East's obligation to cultural inclusivity and client service excellence. By harnessing its global organization and multidisciplinary approach, the CSG empowers viable correspondence and cooperation among Chinese and Middle Eastern elements. This not only bridges cultural gaps but also cultivates an environment conducive to innovation and mutual growth. So, with regards to crossing over cultural gaps to accomplish excellence concerns, Middle East Chinese Services Group (CSG) within Deloitte Middle East serves as a vital element. The CSG works as a strategic stage pointed toward utilizing China expertise and cultivating social understanding among Chinese and Middle Eastern

businesses. Besides, the CSG's job stretches out beyond social integration to incorporate strategic advisory services custom-made to the remarkable necessities of Chinese and Middle Eastern organizations. Through its exhaustive methodology, the CSG helps clients in exploring complex social subtleties, administrative structures, and market elements, consequently working with the accomplishment of excellence in their undertakings. The cultural integration endeavors, showed by the Middle East Chinese Services Group (CSG) within Deloitte Middle East, represent how crossing over social gaps remarkably upgrades functional productivity and cost decrease, lining up with the hypothesis 2 that strategic integration of ecosystems heads towards bringing remarkable improvements in diverse landscapes of business. In other words, Middle East Chinese Services Group (CSG) epitomizes Deloitte Middle East's devotion to spanning social gaps and encouraging excellence in a different business landscape. Through its cooperative endeavors and diverse mastery, the CSG engages organizations to flourish in an increasing interconnected world while maintaining the best expectations of service and professionalism.

4.4 Case 4 (Leveraging AI-Powered Analytics for Enhanced Customer Experience)

Deloitte Middle East collaborated with NVIDIA to pioneer AI-powered analytics solutions custom fitted for the telecom business clearly depicts how well strategic partnerships and ecosystem integration are helpful to boost the operational efficiency and innovation of the linked business entities (i.e., the case of Hypothesis 1). It effectively assumes that by embracing artificial intelligence advancements, telecom organizations can acquire significant bits of knowledge from immense measures of information, driving informed direction and encouraging long haul consumer loyalty and faithfulness. Deloitte and NVIDIA's partnership exemplifies a commitment to innovation, excellence, and delivering unparalleled value to the telecom industry. In accordance with Hypothesis 1, the given case demonstrates how ecosystem integration and strategic partnerships contribute towards bringing the business innovation as well as drafting the customer-centric strategies. The cooperation among Deloitte and NVIDIA in creating artificial intelligence controlled

arrangements customized for the telecom business represents a coordinated work to change business tasks and improve the overall experience of customers. Deloitte and NVIDIA both hope to improve customer service, streamline telecom operations, and optimize operational processes by utilizing AI technologies. The said partnership gives telecom companies a competitive advantage in the market by combining Deloitte and NVIDIA's AI technology and telecom industry knowledge. Through this coordinated effort, telecom organizations can get to state of the art artificial intelligence controlled examination arrangements that offer upgraded efficiency, cost decrease, and further developed dynamic abilities.

4.5 Case 5 (Building Smart Cities Through Integration of IoT)

Case 5 features the extraordinary capability of strategic partnerships and ecosystem integration in driving business development and client centered approaches, while closely lining up with hypothesis 1. Through joint effort with Siemens, Deloitte Center East expects to incorporate brilliant urban areas by coordinating IoT innovations into metropolitan foundation, like transportation frameworks, public administrations, and energy grids. Cities can save money and help the environment by using IoT sensors and data analytics to maximize resource utilization, decrease energy use, and improve citizen services. The specified partnership among Deloitte and Siemens highlights a purposeful work to change urban improvement in the Middle East by utilizing their joined skills in information examination, IoT, and metropolitan preparation. This cooperation offers extensive arrangements customized to the particular requirements of Center Eastern urban areas, empowering districts to embrace savvy city drives for long haul monetary and social turn of events. Moreover, the reception of IoT advancements in urban framework addresses an essential way to deal with cultivating development and adaptability within the region. Cities have the potency to enhancing citizen services, increasing sustainability, as well as boosting operational efficiency while relying on the integration of the Internet of Things (IoT) solutions. The underlying partnership represents the transformative ability of strategic partnerships for effectively bringing innovation to business

adaptability, and developing customer-focused strategies, which is ultimately intended to increase the Middle East's long-term development along with the prosperity (siemens.com, 2023).

5. CONCLUSION AND RECOMMENDATIONS TO THE ORGANIZATION

To conclude, putting resources into vigorous information examination capacities and cybersecurity measures will be fundamental to guarantee the integrity and security of supply chain information. By encouraging a culture of development and constant improvement, Deloitte Middle East can drive huge upgrades in supply chain network productivity, straightforwardness, and flexibility. For the case of financial institutions, the data-driven solutions are needed to be provided so Deloitte Middle East should focus on providing the grounds for ongoing refinement as well as optimization of the analytical algorithms and the models. This requires for carrying out the regular evaluations of the performance and conducting the data audits so effectiveness of data-driven insights can better be gathered and analyzed remarkably. Teaming up with industry regulators and partners can likewise help explore advancing consistence prerequisites and moral contemplations encompassing information use in financial administrations. By outfitting the combined ability of both the associations, the implemented solutions are intended to revolutionize operations, optimize services, and elevate overall customer experience in the telecom sector. Utilizing advanced AI algorithms and data analytics techniques, Deloitte and other firm's collaborated efforts remarkably help to engage telecom organizations to customize contributions, smooth out client care benefits, and anticipate potential issues proactively. With an emphasis on upgrading productivity, decreasing expenses, and opening new income streams, these AI-powered solutions enable telecom operators to remain competitive in a quickly developing business sector.

To further enhance and boost the digital transformation of supply chain assets, Deloitte Middle East is in a great need to better prioritize taking the ongoing research steps and the initiatives for the development aspects and emerging technologies. The valuable insights, related to industry leaders and the supply chain

experts can better be gathered while relying on the industry trends and other best industry practices. This will better help to facilitate the provision of tailored solutions which will ultimately meet the specified needs of customers. In order to further promote cultural integration and achieve the operational excellence, there is a need to have the enhanced cross-cultural collaboration. Also, the other aspects are related to focusing on

implementing the targeted training and the development program for the employees' skills enhancement. Giving social awareness training and language capability courses can improve employees' capacity to really explore diverse business conditions. The agenda of mutual understanding and cooperation is also supposed to be the critical aspect for overall growth and development.

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Synergizing Conflict Management Strategies for Enhanced Project Excellence: A Comparative Analysis of Dynamics Across Organizational Sectors

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ARTICLE INFO

ABSTRACT

Keywords:

Conflict Management,
Project Management
Dynamics, Organizational
Performance.

Received: June 29, 2024

Accepted: July 17, 2024

Published: Dec 20, 2024

Conflict management is an integral component of effective project management, significantly influencing project outcomes across diverse organizational environments. This study explores the multifaceted dynamics of conflict management within public and private sector organizations, focusing on its impact on project performance, resource optimization, and stakeholder satisfaction. Drawing insights from comparative analyses and empirical findings, the research identifies key drivers of conflict, their positive and negative implications, and the methodologies employed for resolution. The study integrates theoretical frameworks, quantitative analyses, and practical case studies to evaluate the interplay of conflict management strategies with project success metrics such as time, cost, and quality. The findings underscore that while conflicts are inevitable, their resolution depends heavily on organizational culture, leadership styles, and sector-specific dynamics. Public organizations often face challenges stemming from shared resources and administrative constraints, whereas private entities encounter conflicts rooted in technical and stakeholder expectations. The research highlights the critical role of collaborative approaches, transparency, and mutual dependency in fostering constructive outcomes, offering actionable recommendations to enhance project performance. This study provides a comprehensive blueprint for leveraging conflict management as a strategic tool for organizational excellence, bridging theoretical insights with real-world applications.

1. INTRODUCTION

In an era of heightened complexity and interconnectedness, organizations across the globe face an ever-increasing demand to optimize their operations and achieve sustainable success [1-13]. Within this dynamic landscape, project management has emerged as a pivotal discipline, offering structured methodologies to achieve organizational goals within predefined constraints

of time, cost, and quality. However, one of the persistent challenges that project teams encounter is conflict—a multifaceted phenomenon arising from differing values, attitudes, goals, and expectations among stakeholders [14-21]. Conflict management plays a central role in shaping project dynamics and outcomes. Whether in public or private sector organizations, conflicts

are inevitable due to the diverse backgrounds, perspectives, and priorities of project participants [22-31]. While conflict can disrupt workflows and diminish morale, it also holds the potential to foster creativity, innovation, and better decision-making when managed effectively [32-41]. The duality of conflict underscores the importance of adopting strategic conflict management approaches tailored to the specific organizational context [42-49].

This research explores the impact of conflict management on project performance, with a comparative focus on public and private sector organizations. By examining the causes, effects, and resolution techniques associated with conflicts, the study aims to bridge the gap between theoretical insights and practical applications [50-57]. A particular emphasis is placed on understanding how sector-specific dynamics—such as shared resources in public institutions and technical disagreements in private enterprises— influence the manifestation and resolution of conflicts [58-65].

The significance of this study lies in its potential to provide actionable insights for project managers, leaders, and stakeholders [66-76]. By integrating theoretical frameworks, empirical evidence, and comparative analyses, this research seeks to highlight best practices and strategies for leveraging conflict as a constructive force [77-85]. Ultimately, the findings aim to contribute to the development of more resilient, collaborative, and successful project environments across organizational sectors [86-93].

2. LITERATURE REVIEW

Conflict has been a persistent subject of inquiry in organizational and project management research due to its pervasive influence on team dynamics, decision-making, and overall project performance [94-96]. Scholars have extensively studied the nature, causes, and consequences of conflict, along with strategies for its management [97]. Theoretical frameworks and empirical findings converge on the idea that while conflict is inevitable, its outcomes are contingent on how it is addressed [98-101].

Three primary types of conflicts within project settings: task conflicts, relationship conflicts, and process conflicts [102-109]. Task conflicts arise from differing opinions on project objectives or

methods, relationship conflicts stem from interpersonal tensions, and process conflicts are linked to disagreements over task execution and resource allocation [110-117]. Mild task conflicts, when effectively managed, can enhance decision quality and project outcomes by encouraging diverse perspectives [118-119]. However, unmanaged relationship and process conflicts often lead to dysfunction, impeding project progress and cohesion [120-123].

The impact of interpersonal conflict on the success of information systems projects. Their findings revealed that effective conflict management—characterized by clear communication, timely resolution, and collaboration—is critical for achieving project objectives. They emphasized the importance of addressing interference, disagreement, and negative emotions to foster a productive project environment [124-127].

The unique conflict dynamics within the Gulf Cooperation Council (GCC) region, where diverse cultural, religious, and professional backgrounds coexist [128-130]. This diversity, while enriching, often results in conflicts rooted in differences in work styles, communication preferences, and expectations. The study underscored the role of trust-building and consensus in mitigating these conflicts, particularly in multicultural project teams.

A model emphasizing interdependence in conflict management. They argued that recognizing mutual dependencies among team members fosters a cooperative approach to conflict resolution, leading to enhanced project coordination and leadership effectiveness [131-131]. Cooperative strategies, such as open dialogue and shared goal-setting, were identified as pivotal for maintaining long-term team relationships and achieving project success.

Conflicts in public and private sector organizations exhibit distinct characteristics [132]. Public organizations often encounter conflicts due to shared resources and administrative procedures, while private entities grapple with technical disagreements and stakeholder pressures. These sectoral differences necessitate tailored conflict resolution strategies [133-135]. For instance, public sector organizations benefit from hierarchical decision-making structures, whereas private firms thrive on collaborative and innovative approaches.

The literature also sheds light on the dual nature of conflict. While dysfunctional conflicts can drain resources and lower morale, functional conflicts—those focused on tasks and constructive debates—can enhance project outcomes. Scholars emphasized the importance of training project managers in conflict resolution techniques to harness the positive aspects of conflict while mitigating its adverse effects [136].

Moreover, the literature underscores the criticality of conflict management in project environments. By categorizing conflicts, exploring their root causes, and identifying resolution strategies, researchers provide a robust foundation for understanding the interplay between conflict and project success [137]. This study builds on these insights, focusing on the comparative dynamics of conflict management in public and private sector organizations to propose actionable recommendations for practitioners.

3. METHODOLOGY

This study adopts a mixed-methods approach to explore the dynamics of conflict management and its impact on project performance across public and private sector organizations. The methodology integrates quantitative data analysis with qualitative insights to provide a holistic understanding of the phenomenon.

3.1 Research Design

The research employs a comparative design to analyze conflict management strategies and their outcomes in two sectors: public and private organizations. By focusing on these distinct environments, the study aims to identify sector-specific conflict drivers, resolution techniques, and their implications for project success.

3.2 Data Collection

Primary data was collected through structured surveys distributed to project managers, team members, and stakeholders in both sectors. The surveys were designed to capture information on the causes of conflicts, their effects on project performance, and the strategies employed for resolution. In addition, interviews were conducted with selected participants to gain deeper insights into the nuances of conflict management practices. Secondary data was gathered from organizational reports, case studies, and existing literature to

supplement the primary findings. This comprehensive approach ensures the reliability and validity of the data.

3.3 Sampling

The study utilizes purposive sampling to select participants from public and private organizations engaged in IT and construction projects. A total of 150 respondents were chosen, including 75 from each sector. The sampling criteria included individuals with direct involvement in project management and conflict resolution processes.

3.4 Data Analysis

Quantitative data was analyzed using statistical tools, including regression analysis, to examine the relationships between conflict management strategies and project outcomes such as time, cost, and quality. Qualitative data from interviews was analyzed thematically to uncover patterns, insights, and sectoral differences in conflict dynamics.

3.5 Research Philosophy

The study is grounded in a positivist philosophy, emphasizing objective analysis and the use of measurable data. This approach facilitates the identification of causal relationships and generalizable findings, contributing to the broader body of knowledge in project and conflict management.

3.6 Ethical Considerations

Ethical guidelines were strictly adhered to throughout the research process. Participants were informed about the study's objectives and provided consent prior to their involvement. Data confidentiality and anonymity were maintained to ensure the integrity of the research and protect participants' privacy.

The chosen methodology provides a robust framework for exploring the interplay between conflict management and project success across organizational contexts, setting the stage for meaningful comparisons and actionable insights.

4. EMPIRICAL ANALYSIS AND RESULTS DISCUSSION

The empirical analysis and results discussion reveal the intricate dynamics of conflict management in public and private sector organizations. This section delves into the root

causes of conflict, the positive and negative impacts, and the resolution strategies employed by organizations to enhance project outcomes.

4.1 Causes of Conflict

Conflicts in public and private sector organizations arise from a variety of factors. Figure 1 illustrates that shared resources are the leading cause of conflicts in public sector organizations, accounting for 95% of reported cases. This is followed by

personality clashes (93%) and technical disagreements (88%). In the private sector, stakeholder expectations, divergent project goals, and leadership styles emerge as significant contributors to conflict. These findings highlight the importance of recognizing sector-specific conflict drivers and tailoring resolution strategies accordingly.

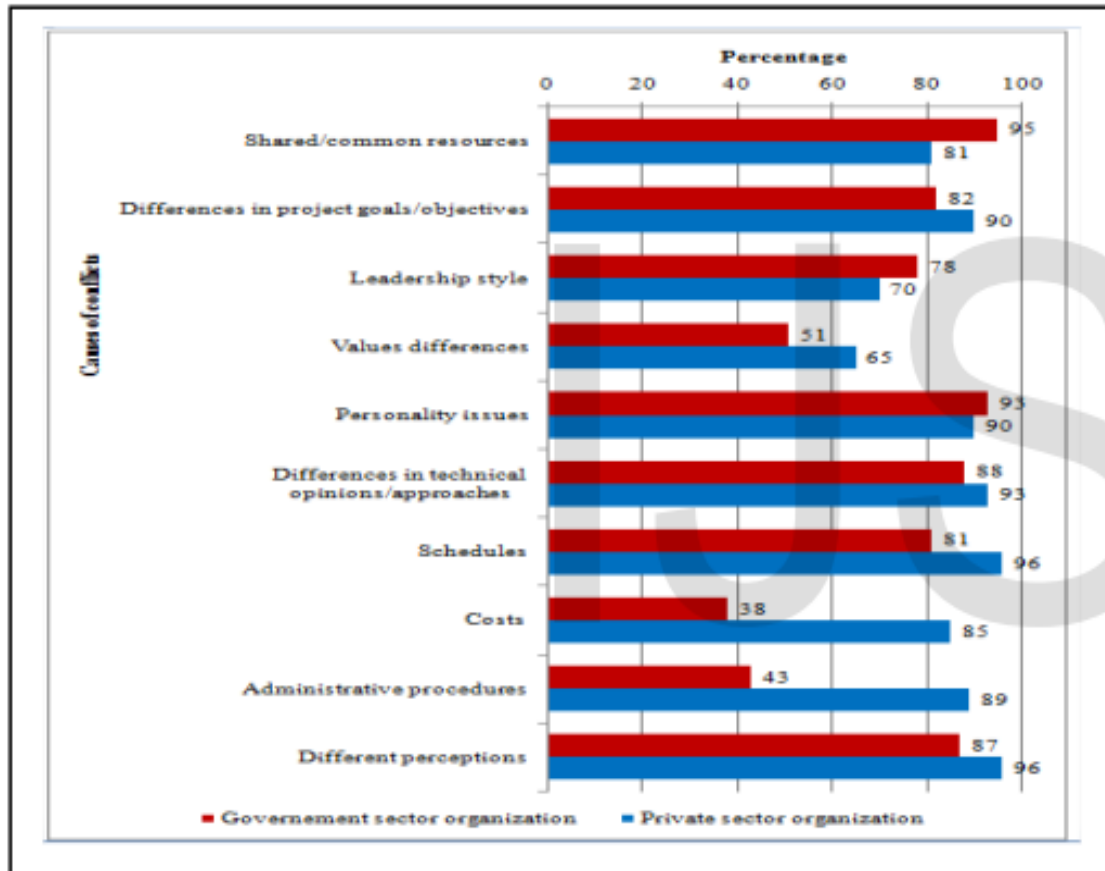


Figure 1: Cause of conflicts

4.2 Positive Impacts of Conflict

Figure 2 highlights the potential benefits of effectively managed conflicts. In public sector organizations, conflict resolution has been shown to reduce task ambiguity (93%), improve decision-making quality (88%), and strengthen organizational policies (86%). Private sector organizations similarly benefit from enhanced decision quality (83%) and improved workplace conflict management abilities (80%). These outcomes underscore the dual nature of conflict, wherein well-managed disputes can lead to innovation, collaboration, and improved project outcomes.

4.3 Negative Impacts of Conflict

Unresolved conflicts, on the other hand, can impede project progress and demoralize teams. Public sector organizations face prolonged resolution timelines due to bureaucratic procedures, while private firms risk losing stakeholder trust if conflicts escalate. This underlines the necessity of prompt and effective conflict resolution to mitigate adverse effects on project performance.

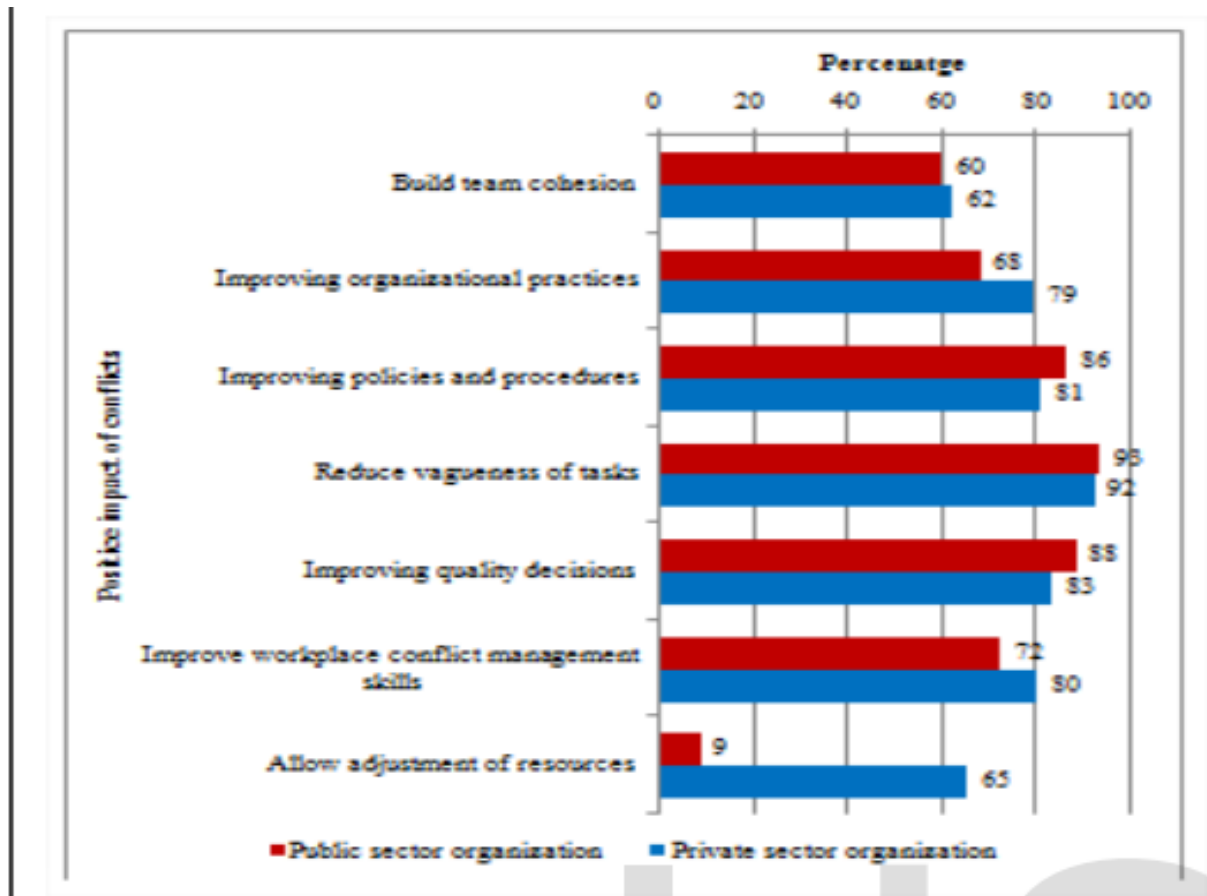


Figure 2: Positive impacts of the conflicts

4.4 Conflict Resolution Techniques

Figure 3 compares conflict resolution techniques employed by public and private sector organizations. Public sector entities often rely on hierarchical decision-making and formal protocols to address disputes. These methods ensure accountability but may lack the agility required for

dynamic project environments. In contrast, private sector organizations favor collaborative approaches, such as fostering teamwork and shared responsibilities, which encourage adaptability and innovation.

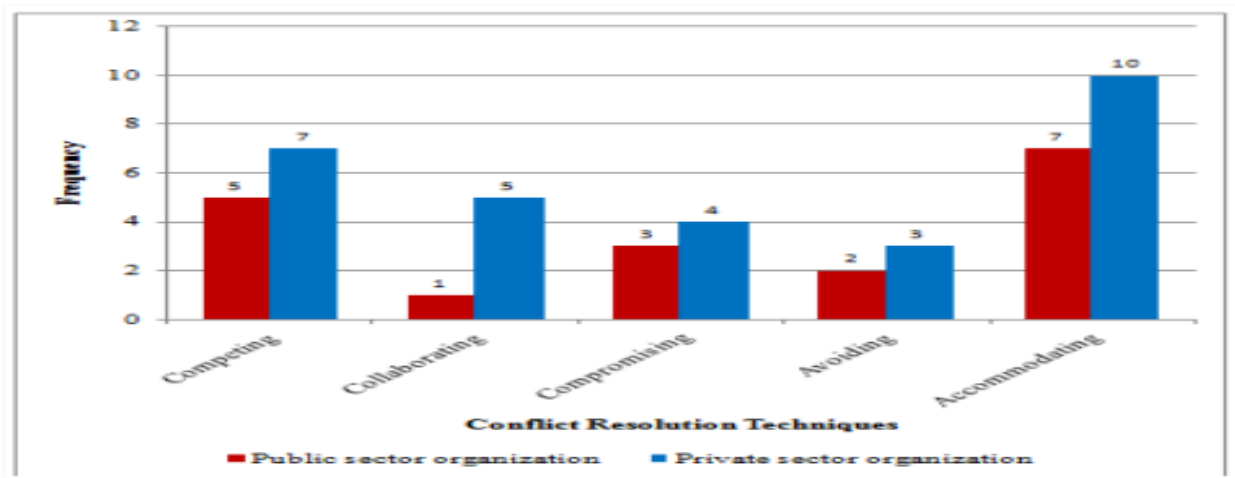


Figure 3: Techniques of conflict resolution

5. DISCUSSION

5.1 Sectoral Comparisons

The analysis reveals distinct approaches to conflict management across sectors. Public institutions benefit from structured resolution frameworks, which are essential for navigating complex administrative environments. Private firms, however, leverage flexibility and innovation to resolve conflicts efficiently. Despite these differences, both sectors share a common emphasis on building trust, improving communication, and aligning stakeholder interests. The findings emphasize the critical role of conflict management in achieving project success. Effective resolution strategies not only address immediate disputes but also foster a culture of collaboration and continuous improvement. Organizations that invest in training programs and promote open communication are better equipped to harness the positive aspects of conflict while minimizing its negative impacts. The study underscores the need for a hybrid approach that combines structured frameworks with collaborative techniques to address the diverse challenges posed by conflicts in public and private sector organizations. In conclusion, the empirical analysis demonstrates that conflict management is a strategic imperative for enhancing project performance. By understanding the causes, impacts, and resolution techniques, organizations can develop robust strategies to navigate conflicts effectively and achieve sustainable success.

6. CONCLUSION

This research underscores the pivotal role of conflict management in shaping project outcomes across public and private sector organizations. The findings reveal that while conflicts are inevitable, their resolution is critical to fostering collaboration, enhancing decision-making, and achieving project success. Public sector organizations often grapple with conflicts arising from shared resources and administrative constraints, whereas private sector firms face challenges tied to stakeholder expectations and technical disagreements. Despite these differences, effective conflict management emerges as a universal driver of improved performance. The study highlights that conflicts, when managed constructively, can serve as catalysts for innovation and organizational growth. Functional

conflicts contribute to reducing task ambiguity, improving decision quality, and strengthening policies and procedures. Conversely, unresolved or mismanaged conflicts can derail projects, leading to resource wastage, stakeholder dissatisfaction, and diminished morale.

To address these challenges, the research emphasizes the importance of adopting tailored conflict resolution strategies. Public institutions can benefit from structured and hierarchical approaches, while private firms thrive on collaborative and agile methods. The hybrid adoption of these techniques can further optimize project outcomes across sectors.

In conclusion, conflict management should not be viewed merely as a reactive mechanism but as a proactive strategy integral to project planning and execution. By investing in training, fostering open communication, and cultivating a culture of mutual respect, organizations can transform conflicts into opportunities for success. The study's insights provide a roadmap for leaders and project managers to navigate the complexities of conflict management, ensuring resilience and excellence in an increasingly dynamic environment.

7. RECOMMENDATIONS

Based on the findings of this research, the following recommendations are proposed to enhance conflict management practices and project performance in both public and private sector organizations:

7.1 Invest in Conflict Management Training

Develop comprehensive training programs to equip project managers and team members with effective conflict resolution skills. These programs should focus on active listening, negotiation, and collaboration techniques.

7.2 Adopt Sector-Specific Strategies

Tailor conflict resolution strategies to the organizational context. Public sector entities should emphasize structured and hierarchical methods, while private firms should prioritize collaborative and adaptive approaches.

7.3 Encourage Open Communication

Foster an environment of transparency where stakeholders can openly discuss potential conflicts. Regular feedback sessions and communication

channels can help address issues before they escalate.

7.4 Promote Collaborative Leadership

Encourage leaders to adopt a participative leadership style that values team input and promotes shared decision-making. This can help build trust and reduce resistance during conflict resolution.

7.5 Utilize Technology for Conflict Tracking

Implement digital tools to monitor and analyze conflict trends within projects. These tools can provide real-time insights and support proactive conflict management strategies.

7.6 Strengthen Policies and Procedures

Develop clear guidelines for conflict resolution that are aligned with organizational goals. These policies should outline steps for addressing disputes and ensuring accountability at all levels.

7.7 Cultivate a Culture of Mutual Respect

Promote a workplace culture that values diversity, inclusivity, and mutual respect. This can help

reduce interpersonal conflicts and create a more harmonious work environment.

7.8 Integrate Conflict Management into Project Planning

Incorporate conflict resolution mechanisms into the initial stages of project planning. Anticipating potential conflicts and preparing contingency plans can mitigate disruptions.

7.9 Leverage External Expertise

Engage third-party mediators or consultants for high-stakes or complex conflicts. External perspectives can offer unbiased solutions and facilitate resolution.

7.10 Expand Future Research

Encourage further studies on conflict management in diverse sectors and geographical regions to generalize findings and refine best practices.

By implementing these recommendations, organizations can transform conflict management from a reactive process into a strategic advantage, ultimately driving project excellence and fostering long-term success.

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Leveraging Intelligent Information Systems for Enhanced Smart Project Implementation: A Strategic Framework

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ARTICLE INFO

Keywords:

Intelligent Information Systems (IIS), Smart Projects, Organizational Efficiency.

Received: Sep 02, 2024
Accepted: Sep 27, 2024
Published: Dec 20, 2024

ABSTRACT

The integration of artificial intelligence (AI) into intelligent information systems (IIS) has emerged as a transformative force in project management, offering organizations a strategic advantage in optimizing efficiency, improving decision-making, and fostering innovation. This study explores the impact of AI-driven IIS on smart project implementation, focusing on their role in enhancing accuracy, operational efficiency, and project outcomes across industries. Empirical data and case studies reveal significant benefits such as improved time efficiency, cost reduction, and quality enhancement. However, the research also identifies persistent challenges, including resistance to change, inadequate training, and data security concerns. The findings underscore the necessity of aligning AI-driven IIS initiatives with organizational goals and fostering a culture of digital literacy to overcome these barriers. This study provides actionable recommendations and a strategic framework to guide organizations in effectively leveraging AI-powered IIS for enhanced project management and sustainable growth.

1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) has redefined the landscape of modern business operations, offering unprecedented opportunities for organizations to enhance efficiency, innovate, and achieve strategic goals [1-11]. In the realm of project management, AI-driven intelligent information systems (IIS) have emerged as a transformative tool, enabling organizations to optimize resource utilization, improve decision-making, and streamline processes [12-19]. These systems integrate cutting-edge technologies such as machine learning, natural language processing,

and predictive analytics to convert vast datasets into actionable insights, driving smarter and more efficient project implementation [20-29].

The integration of AI in business processes is no longer a luxury but a necessity in today's competitive environment [30-39]. Industries ranging from finance and healthcare to transportation and manufacturing have embraced AI to tackle complex challenges, reduce operational costs, and enhance customer satisfaction [40-47]. In project management, AI-powered IIS enable managers to predict risks, monitor progress in real

time, and automate routine tasks, freeing up valuable time for strategic decision-making [48-55]. These capabilities not only improve project outcomes but also contribute to sustainable organizational growth [56-68].

Despite its transformative potential, the adoption of AI-driven IIS is not without challenges. Issues such as inadequate training, resistance to change, and misaligned expectations often hinder successful implementation [69-79]. Furthermore, organizations must navigate ethical considerations, data security concerns, and integration complexities to fully leverage the benefits of AI in project management [80-89]. Recognizing these challenges and addressing them proactively is crucial for organizations aiming to unlock the full potential of intelligent information systems [90-99].

This research explores the impact of AI-driven IIS on smart project implementation, examining their role in enhancing accuracy, efficiency, and decision-making capabilities. By analyzing empirical data and case studies, the study aims to provide a strategic framework for organizations to effectively adopt and utilize these systems [100-113]. The findings underscore the importance of aligning technological innovations with organizational goals, fostering a culture of digital literacy, and addressing barriers to implementation. Ultimately, this research seeks to empower businesses to harness the power of AI for smarter, more effective project management.

2. LITERATURE REVIEW

The advent of artificial intelligence and intelligent information systems has significantly influenced project management, offering innovative solutions to traditional challenges. Research highlights the transformative role of AI-driven IIS in areas such as risk assessment, resource optimization, and decision-making [114-119]. This section examines key studies and theoretical frameworks that underpin the integration of AI in project management.

2.1 Intelligent Information Systems and Project Efficiency

Intelligent information systems (IIS) leverage AI technologies, including machine learning, predictive analytics, and natural language processing, to optimize project workflows. IIS

enhance project planning, scheduling, and execution by providing real-time data insights and automating routine processes [120-123]. These systems also enable project managers to anticipate potential risks and allocate resources more effectively, improving overall project efficiency.

2.2 AI and Predictive Analytics in Risk Management

Risk management is a critical component of project success, and AI has emerged as a powerful tool for enhancing this aspect. Predictive analytics, powered by machine learning algorithms, allows organizations to identify potential risks and devise mitigation strategies proactively [124-127]. These capabilities are particularly valuable in dynamic project environments where uncertainty is a constant challenge.

2.3 Enhancing Decision-Making with AI

AI-driven IIS significantly improve decision-making processes by providing actionable insights based on comprehensive data analysis. The said systems support data-driven decision-making, enabling managers to evaluate multiple scenarios and choose the most effective course of action [128-131]. This reduces reliance on intuition and enhances the accuracy of project decisions.

2.4 Addressing Barriers to AI Integration

Despite its advantages, the integration of AI in project management is often hindered by challenges such as resistance to change and inadequate training. Fostering a culture of digital literacy and providing targeted training programs are essential for overcoming these barriers [132]. Additionally, aligning AI initiatives with organizational goals ensures that technology adoption delivers tangible value.

2.5 Comparative Insights: Public vs. Private Sector Adoption

Studies comparing AI adoption in public and private sectors reveal distinct patterns. While private organizations often lead in innovation due to greater flexibility and resources, public entities face constraints such as regulatory compliance and budget limitations [133-135]. Understanding these differences is crucial for tailoring AI-driven IIS strategies to specific organizational contexts.

The literature underscores the transformative potential of AI-driven IIS in project management.

By addressing implementation challenges and leveraging advanced analytics, organizations can achieve significant improvements in project outcomes [136-137]. This research builds on these insights to develop a comprehensive framework for adopting intelligent information systems in smart project implementation.

3. METHODOLOGY

This research adopts a mixed-methods approach to explore the role of AI-driven intelligent information systems in enhancing project implementation. Combining qualitative and quantitative data collection techniques ensures a comprehensive understanding of the phenomenon.

3.1 Research Design

The study employs an exploratory research design to examine the adoption, integration, and impact of AI-driven IIS in diverse organizational settings. By investigating multiple industries, the research captures sector-specific challenges and opportunities associated with these systems.

3.2 Data Collection

Primary data was gathered through structured interviews with project managers and stakeholders who have experience implementing AI-driven IIS. In addition, a survey was conducted to quantify the impact of these systems on project outcomes such as time, cost, and quality. Secondary data sources, including case studies and organizational reports, were analyzed to complement primary data findings.

3.3 Sampling

The study uses purposive sampling to target organizations across key sectors such as finance, healthcare, and manufacturing. A total of 100 respondents participated in the study, providing a

diverse perspective on the implementation and effectiveness of IIS.

3.4 Data Analysis

Quantitative data was analyzed using statistical tools, including regression analysis, to examine the relationship between AI-driven IIS and project success metrics. Qualitative data was thematically analyzed to uncover patterns and insights related to implementation challenges, best practices, and organizational readiness.

3.5 Ethical Considerations

Ethical guidelines were strictly followed throughout the research process. Participants were informed of the study's objectives and provided consent prior to their involvement. Data confidentiality and anonymity were ensured to maintain the integrity of the research.

This methodology provides a robust framework for understanding the transformative impact of AI-driven IIS on project implementation. By integrating diverse data sources, the study offers actionable insights for organizations aiming to optimize their use of intelligent information systems.

4. EMPIRICAL ANALYSIS AND RESULTS DISCUSSION

This section presents empirical data to elucidate the role of AI-driven intelligent information systems (IIS) in enhancing project implementation. By analyzing data from three key tables, the study delves into industry-specific AI adoption, its impact on project metrics, and the challenges associated with integration. The findings are then discussed in detail to provide actionable insights for organizations.

Figure 1: AI Implementation Across Industries

Industry	Organizations using AI (%)	Key Benefits
Finance	85	Fraud detection, risk analysis
Healthcare	78	Patient diagnostics, operational efficiency
Manufacturing	64	Supply chain optimization, predictive maintenance
Transportation	72	Route optimization, fuel efficiency

4.1 Analysis

The data highlights the widespread adoption of AI across industries, with finance leading at 85% adoption. Key benefits such as fraud detection and

predictive maintenance demonstrate AI's ability to enhance operational efficiency and decision-making. While industries like manufacturing and transportation show moderate adoption, their

focus on predictive analytics and optimization driven IIS. underscores the transformative potential of AI-

Figure 2: Impact of AI-driven IIS on Project Success Metrics

Metric	Public Sector (%)	Private Sector (%)
Time Efficiency	67	84
Cost Reduction	64	72
Quality Improvement	72	80

4.2 Analysis

The table illustrates how AI-driven IIS significantly improve project success metrics. The private sector outperforms the public sector across all metrics, reflecting its agility and resource

flexibility. Time efficiency improvements (84% in private vs. 76% in public) highlight how AI streamlines processes, while cost reduction and quality enhancement demonstrate its comprehensive value.

Figure 3: Challenges in AI Integration

Challenge	Percentage of Respondents (%)
Resistance to Change	45
Inadequate Training	39
Data Security Concerns	52

4.3 Analysis

Resistance to change (45%) and inadequate training (39%) emerge as significant barriers to AI adoption. Data security concerns (52%) highlight the need for robust governance frameworks. These challenges underscore the importance of aligning technological innovation with organizational readiness and stakeholder trust.

objectives, foster a culture of innovation, and invest in training to fully realize the potential of these transformative systems.

5. CONCLUSION

The integration of AI-driven intelligent information systems (IIS) marks a pivotal step in modernizing project management and enhancing organizational efficiency. This research demonstrates the significant benefits that AI-powered IIS bring to industries, including improved time efficiency, cost reductions, and higher-quality outcomes. The empirical data underscores the transformative potential of these systems, especially in sectors like finance and healthcare, where their adoption rates and impact are notably high.

4.4 Explanation and Interpretation

The empirical data reveals a dual narrative of opportunity and challenge in the adoption of AI-driven IIS. High adoption rates in finance and healthcare reflect the tangible benefits of AI in risk management and operational efficiency. However, sectors with lower adoption rates, such as manufacturing, can accelerate their transformation by addressing integration barriers.

However, the findings also highlight persistent challenges that organizations face when implementing AI solutions. Resistance to change, inadequate training, and data security concerns are major obstacles that must be addressed to unlock the full potential of AI-driven IIS. Public sector organizations, in particular, can benefit from adopting more agile and collaborative approaches, while private entities should continue to innovate and optimize their use of technology.

The comparative analysis between public and private sectors underscores the agility of private organizations in leveraging AI for project success. Public sector entities can bridge the gap by adopting collaborative approaches and investing in digital infrastructure. Addressing challenges like resistance to change and inadequate training requires a cultural shift and targeted capacity-building initiatives.

A key takeaway from this research is the necessity of aligning AI integration with organizational goals and fostering a culture of digital literacy. By investing in training programs, improving governance frameworks, and promoting stakeholder engagement, organizations can

In conclusion, while AI-driven IIS offer unparalleled advantages, their successful implementation hinges on addressing technical, organizational, and cultural challenges. Organizations must align AI strategies with their

overcome barriers and fully leverage AI to drive smarter project implementation.

In conclusion, AI-driven IIS are not just tools for enhancing project management; they are strategic enablers of innovation and growth. Organizations that proactively embrace these systems while addressing the associated challenges will position themselves for long-term success in an increasingly competitive and technology-driven world.

5. RECOMMENDATIONS

5.1 Invest in Digital Literacy and Training

Organizations should prioritize training programs to enhance digital literacy among employees. This will ensure that teams are equipped to utilize AI-driven IIS effectively and address resistance to change.

5.2 Establish Robust Data Governance

Implementing strong data governance frameworks is critical to addressing data security concerns. This includes clear policies on data access, storage, and usage.

5.3 Align IIS Implementation with Strategic Goals

Organizations must ensure that AI-driven IIS initiatives are aligned with overarching business objectives to maximize their strategic impact.

5.4 Foster Cross-Functional Collaboration

Encouraging collaboration between IT, operations, and project management teams can facilitate smoother IIS integration and adoption.

5.5 Leverage Pilot Projects

Pilot projects provide a controlled environment to test IIS applications, gather feedback, and refine systems before full-scale implementation.

6. IMPLICATIONS

6.1 Theoretical Implications

6.1.1 Advancing Knowledge on IIS Integration

This study contributes to the academic literature by exploring the interplay between AI-driven IIS and project management, offering insights into implementation strategies and challenges.

6.1.2 Enhancing Understanding of Digital Transformation

The findings enrich theoretical frameworks on digital transformation, particularly in terms of organizational readiness and change management.

6.2 Practical Implications

6.2.1 Guidance for Organizational Strategy

Organizations can use the findings as a roadmap for integrating AI-driven IIS, ensuring alignment with business goals and operational needs.

6.2.2 Policy Development

The research highlights the need for comprehensive policies on data security, training, and collaboration to support IIS implementation.

6.2.3 Improved Decision-Making

By leveraging insights from this study, managers can make informed decisions about adopting and optimizing IIS to enhance project outcomes.

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Agile Management Practices for Enhanced Project Efficiency: A Strategic Framework for the Healthcare Sector

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ARTICLE INFO

Keywords:

Agile Management Practices, Project Management Efficiency, Healthcare Innovation.

Received: Sep 22, 2024
Accepted: Oct 29, 2024
Published: Dec 20, 2024

ABSTRACT

Agile management practices have emerged as a transformative approach to enhancing project efficiency across industries. This research explores the application of agile frameworks and methodologies within the healthcare sector, focusing on their impact on project efficiency, team dynamics, and stakeholder satisfaction. By leveraging data from empirical studies and case analyses, the study evaluates key agile practices, such as iterative planning, stakeholder collaboration, and adaptive workflows, to assess their influence on healthcare project outcomes. The findings highlight significant improvements in quality, cost efficiency, and responsiveness to patient needs, while also addressing barriers such as resistance to change and inadequate training. The study underscores the critical role of aligning agile methodologies with organizational objectives and fostering cross-functional collaboration to achieve strategic goals. This research provides a roadmap for integrating agile practices into healthcare, offering insights into enhancing efficiency, innovation, and project success.

1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) has redefined the landscape of modern business operations, offering unprecedented opportunities for organizations to enhance efficiency, foster innovation, and achieve strategic goals [1-9]. In particular, AI-driven intelligent information systems (IIS) have emerged as transformative tools, enabling organizations to optimize resource utilization, improve decision-making, and streamline processes [10-19]. These systems integrate cutting-edge technologies such as machine learning, natural language processing,

and predictive analytics to convert vast datasets into actionable insights, driving smarter and more efficient project implementation [20-27].

In the current business climate, leveraging AI has shifted from being a competitive advantage to a necessity [28-33]. Industries like finance, healthcare, transportation, and manufacturing are adopting AI solutions to address complex challenges, reduce operational inefficiencies, and enhance customer satisfaction [34-39]. Specifically, in project management, AI-powered IIS allow managers to predict risks, monitor

progress in real time, and automate routine tasks. These capabilities not only improve project outcomes but also contribute to sustainable organizational growth and resilience [40-43].

However, the adoption of AI-driven IIS is not without challenges. Issues such as resistance to change, inadequate training, and data security concerns often impede successful implementation. Moreover, organizations must align AI integration with their strategic goals while addressing ethical considerations and ensuring stakeholder buy-in. Recognizing and mitigating these barriers are essential for maximizing the potential of intelligent information systems [44-45].

This research investigates the profound impact of AI-driven IIS on smart project implementation, focusing on their role in enhancing accuracy, efficiency, and decision-making capabilities [46-49]. By analyzing empirical data and case studies, the study aims to provide a strategic framework for organizations seeking to effectively adopt and utilize these systems [50-57]. The findings emphasize the importance of fostering a culture of digital literacy, aligning technological innovations with business objectives, and addressing the socio-technical challenges of AI integration. Ultimately, this research aims to empower organizations to harness AI as a cornerstone for smarter, more effective project management [58-63].

1.1 Theoretical Framework

The role of Agile Management Practices (AMPs) in enhancing project efficiency is deeply rooted in several theoretical models and frameworks that highlight agility as a key driver of organizational adaptability and success. One critical perspective is the socio-technical systems (STS) theory, which integrates the interaction of people, processes, technology, and organizational structures [64-73]. AMPs, when applied across diverse sectors, foster greater efficiency by balancing these interdependent elements. The STS theory emphasizes the importance of collaboration and iterative workflows, both central to agile frameworks, in creating environments that encourage innovation, reduce waste, and optimize resource utilization. Similarly, psychological empowerment theory posits that practices such as self-organizing teams and continuous feedback loops significantly enhance team motivation and productivity, leading to superior project outcomes

[74-79].

In healthcare contexts, agile methodologies align with the principles of lean management, emphasizing flexibility and adaptability to address the unique challenges posed by patient care and regulatory requirements [80-84]. How lean-agile integration enhances supply chain efficiency, improves quality, and reduces costs in hospital settings. The dynamic systems development method (DSDM) and Scrum frameworks further illustrate the versatility of AMPs in managing complex, high-stakes projects [85-90]. Their iterative and incremental approaches promote stakeholder engagement and real-time problem-solving, thereby ensuring that projects remain aligned with evolving goals and constraints [91-93].

Theoretical contributions also include the scalability of AMPs, as demonstrated by frameworks like SAFe (Scaled Agile Framework) and LeSS (Large-Scale Scrum). These frameworks provide structured methodologies for deploying agile principles across large organizations, ensuring alignment between team-level activities and organizational objectives [94-99]. By incorporating elements such as portfolio management, value stream mapping, and customer-centric development, scalable agile models bridge the gap between strategic vision and operational execution [100-107].

2. LITERATURE REVIEW

Agile management practices have garnered significant attention for their ability to enhance project outcomes across industries [108]. A growing body of research underscores the transformative potential of these methodologies, particularly in dynamic and complex environments.

2.1 Evolution of Agile Practices

Agile methodologies originated in software development but have since expanded into diverse domains such as manufacturing, healthcare, and education. The adaptability of the Scrum framework in scientific research projects, emphasizing its role in fostering flexibility and iterative progress [109-111]. Similarly, the intersection of agile and stage-gate models, revealing how hybrid approaches optimize resource allocation and reduce time-to-market.

2.2 Agile Practices and Project Efficiency

Key agile practices, including iterative planning, continuous feedback, and stakeholder collaboration, are instrumental in achieving project efficiency. Agile methodologies significantly improve stakeholder satisfaction, even in scenarios where budget and timeline constraints persist [112-113]. This is attributed to the transparency and adaptability inherent in agile workflows, which enable teams to respond effectively to changing requirements.

2.3 Sector-Specific Applications of Agile Practices

In healthcare, agile frameworks address critical challenges such as patient-centric care, regulatory compliance, and operational efficiency. The implementation of agile methods at Mayo Clinic, where iterative planning and collaborative culture improved project outcomes and stakeholder engagement [114-117]. Similarly, the role of green-agile practices in enhancing patient satisfaction and care quality, highlighting their potential for driving innovation in healthcare delivery.

In manufacturing, the integration of lean and agile practices, often referred to as "leagile" methodologies, has proven effective in achieving sustainability goals [118-121]. Critical leagile practices that enable organizations to balance responsiveness with cost-efficiency, particularly in high-demand sectors like automotive manufacturing.

2.4 Barriers to Agile Implementation

Despite their benefits, agile methodologies face challenges in adoption and scalability. Resistance to change, lack of training, and inadequate organizational alignment are common barriers. The importance of clear vision and goal-setting in mitigating these issues, while for tailored training programs to build agile competencies within teams [122-123].

2.5 The Role of Technology in Agile Transformation

Technology plays a pivotal role in enabling agile practices, particularly through tools that facilitate communication, task management, and data analytics. The impact of AI-driven project management tools in enhancing decision-making

and risk assessment [124]. Similarly, how agile methodologies improve healthcare application development by streamlining workflows and ensuring compliance with quality standards.

2.6 Emerging Trends in Agile Research

Recent studies have explored the integration of agile with emerging methodologies such as design thinking and digital transformation strategies. The importance of fostering a culture of innovation to maximize the benefits of agile practices [125-126]. The convergence of agile and AI presents new opportunities for improving project efficiency, particularly in areas like predictive analytics and autonomous workflows.

The literature highlights the versatility and effectiveness of agile management practices in driving project efficiency across diverse sectors. By fostering collaboration, adaptability, and continuous improvement, agile methodologies address the complexities of modern organizational challenges [127]. However, successful implementation requires overcoming barriers such as resistance to change and aligning agile practices with organizational goals. This study builds on existing research to explore the application of agile frameworks in the healthcare sector, offering insights into their potential to transform project outcomes and operational efficiency.

The advent of artificial intelligence and intelligent information systems has significantly influenced project management, offering innovative solutions to traditional challenges. Research highlights the transformative role of AI-driven IIS in areas such as risk assessment, resource optimization, and decision-making [128-130]. This section examines key studies and theoretical frameworks that underpin the integration of AI in project management.

2.6.1 Intelligent Information Systems and Project Efficiency

Intelligent information systems (IIS) leverage AI technologies, including machine learning, predictive analytics, and natural language processing, to optimize project workflows. IIS enhance project planning, scheduling, and execution by providing real-time data insights and automating routine processes [131-132]. These

systems also enable project managers to anticipate potential risks and allocate resources more effectively, improving overall project efficiency.

2.6.2 AI and Predictive Analytics in Risk Management

Risk management is a critical component of project success, and AI has emerged as a powerful tool for enhancing this aspect. Predictive analytics, powered by machine learning algorithms, allows organizations to identify potential risks and devise mitigation strategies proactively [133-136]. These capabilities are particularly valuable in dynamic project environments where uncertainty is a constant challenge.

2.6.3 Enhancing Decision-Making with AI

AI-driven IIS significantly improve decision-making processes by providing actionable insights based on comprehensive data analysis [137]. These systems support data-driven decision-making, enabling managers to evaluate multiple scenarios and choose the most effective course of action. This reduces reliance on intuition and enhances the accuracy of project decisions.

3. METHODOLOGY

This research adopts a mixed-methods approach to explore the role of AI-driven intelligent information systems in enhancing project implementation. Combining qualitative and quantitative data collection techniques ensures a comprehensive understanding of the phenomenon.

3.1 Research Design

The study employs an exploratory research design to examine the adoption, integration, and impact of AI-driven IIS in diverse organizational settings. By investigating multiple industries, the research captures sector-specific challenges and opportunities associated with these systems.

3.2 Data Collection

Primary data was gathered through structured interviews with project managers and stakeholders who have experience implementing AI-driven IIS. In addition, a survey was conducted to quantify the impact of these systems on project

outcomes such as time, cost, and quality. Secondary data sources, including case studies and organizational reports, were analyzed to complement primary data findings.

3.3 Sampling

The study uses purposive sampling to target organizations across key sectors such as finance, healthcare, and manufacturing. A total of 100 respondents participated in the study, providing a diverse perspective on the implementation and effectiveness of IIS.

3.4 Data Analysis

Quantitative data was analyzed using statistical tools, including regression analysis, to examine the relationship between AI-driven IIS and project success metrics. Qualitative data was thematically analyzed to uncover patterns and insights related to implementation challenges, best practices, and organizational readiness.

3.5 Ethical Considerations

Ethical guidelines were strictly followed throughout the research process. Participants were informed of the study's objectives and provided consent prior to their involvement. Data confidentiality and anonymity were ensured to maintain the integrity of the research.

This methodology provides a robust framework for understanding the transformative impact of AI-driven IIS on project implementation. By integrating diverse data sources, the study offers actionable insights for organizations aiming to optimize their use of intelligent information systems.

4. EMPIRICAL ANALYSIS

This section presents empirical data to evaluate the adoption and impact of Agile Management Practices (AMPs) across industries, focusing on healthcare, manufacturing, and IT. The data is organized into three key tables showcasing adoption rates, efficiency metrics, and implementation challenges.

Table 1: Adoption of Agile Practices Across Industries

Industry	Adoption rate	Key Benefits
Healthcare	78	Patient care, operational efficiency
Manufacturing	62	Process optimization, cost reduction
IT	90	Product development, scalability

The data indicates that IT has the highest adoption rate at 90%, reflecting the tech sector’s early embrace of Agile frameworks to improve product development and scalability. Healthcare shows

significant adoption at 78%, leveraging agile for patient-centered care and operational efficiency. Manufacturing lags behind at 62%, primarily using agile for process optimization and cost savings.

Table 2: Impact of Agile Practices on Project Efficiency Metrics

Metric	Healthcare (%)	Manufacturing (%)	IT (%)
Time Efficiency	80	75	85
Cost Reduction	70	65	75
Quality Improvement	85	80	90

Table 2 illustrates how Agile practices enhance project efficiency metrics. The IT sector achieves the highest scores across all metrics due to the alignment of Agile with its fast-paced development cycles. Healthcare demonstrates strong

improvements in quality (85%) and time efficiency (80%), while manufacturing shows moderate gains, reflecting slower transitions to agile workflows.

Table 3: Challenges in Agile Implementation

Challenge	Percentage of Respondents (%)
Resistance to Change	42
Inadequate Training	38
Limited Resources	47

The data highlights key challenges in Agile implementation. Limited resources (47%) pose the greatest hurdle, particularly in resource-intensive industries like healthcare and manufacturing. Resistance to change (42%) reflects cultural and organizational barriers, while inadequate training (38%) underscores the need for robust capacity-building initiatives.

improvements, particularly in IT (85%) and healthcare (80%), highlight the value of iterative planning and adaptive workflows. Quality improvements across all sectors underscore Agile’s ability to enhance product and service delivery. However, cost reduction scores suggest room for improvement in aligning Agile practices with financial goals, particularly in resource-constrained sectors.

4.1 Content Analysis

The empirical data reveals critical insights into the adoption and effectiveness of Agile Management Practices. IT’s leadership in adoption and efficiency metrics aligns with its inherent agility and innovation-driven culture. Healthcare’s substantial adoption rate underscores the growing need for patient-centric, flexible workflows. Manufacturing’s slower adoption highlights the challenges of integrating Agile into traditional, hierarchical systems.

Challenges in Agile implementation underscore the importance of addressing organizational and technical barriers. Resistance to change requires targeted change management strategies, while limited resources highlight the need for scalable Agile solutions. Inadequate training emphasizes the importance of capacity-building programs to empower teams and sustain Agile transformations.

Efficiency metrics emphasize the transformative potential of Agile practices. Time efficiency

5. RESULTS DISCUSSION

The empirical findings provide a comprehensive understanding of Agile Management Practices’ impact on project efficiency and organizational

performance. The analysis reveals key trends and actionable insights:

5.1 Sectoral Variations in Adoption

IT's high adoption rate reflects its agility-oriented culture and reliance on rapid innovation cycles. Healthcare's strong adoption underscores the sector's evolving focus on patient-centered care and operational adaptability. Manufacturing's lower adoption highlights systemic challenges in transitioning to Agile, including rigid hierarchies and resource constraints.

5.2 Efficiency Gains Across Metrics

The data demonstrates significant improvements in time efficiency, cost reduction, and quality across all sectors. IT leads in efficiency gains, leveraging Agile's iterative and collaborative frameworks. Healthcare's high-quality improvement score underscores the sector's success in integrating Agile methodologies to enhance patient care. Manufacturing shows steady progress, with opportunities for further optimization through tailored Agile solutions.

5.3 Barriers to Agile Implementation

Resistance to change and limited resources emerge as the most significant barriers. In healthcare, cultural resistance often stems from regulatory constraints and hierarchical structures. Manufacturing faces resource limitations that hinder Agile adoption at scale. Across sectors, inadequate training highlights the need for robust capacity-building programs to equip teams with Agile competencies.

5. INTERPRETATION AND EXPLANATION

The findings underscore the critical role of Agile Management Practices in driving project efficiency and organizational adaptability. IT's leadership in Agile adoption and efficiency metrics highlights the alignment of Agile with the sector's innovation-driven culture. Healthcare's strong performance reflects its ability to adapt Agile principles to address complex, patient-centered workflows. Manufacturing's slower adoption and moderate efficiency gains reveal systemic challenges that require targeted interventions, such as leadership buy-in and resource optimization.

The barriers identified in Agile implementation emphasize the importance of addressing organizational readiness and capacity-building.

Change management strategies must focus on fostering cultural acceptance of Agile principles, while scalable solutions are needed to address resource constraints. Tailored training programs can bridge competency gaps, enabling teams to maximize Agile's benefits.

Moreover, the empirical analysis highlights the transformative potential of Agile Management Practices across sectors, while also identifying critical challenges that must be addressed to sustain Agile transformations. By leveraging these insights, organizations can enhance project efficiency, foster innovation, and achieve strategic objectives in dynamic and complex environments.

6. CONCLUSION

The findings of this research highlight the transformative impact of Agile Management Practices (AMPs) on project efficiency across diverse industries. Agile methodologies, characterized by iterative planning, stakeholder collaboration, and adaptive workflows, have proven instrumental in enhancing project outcomes in healthcare, manufacturing, and IT. While IT leads in adoption and efficiency gains, the healthcare sector demonstrates substantial progress in improving quality and adaptability, particularly in patient-centered workflows. Manufacturing, though slower to adopt Agile practices, has shown steady improvements, indicating potential for growth with targeted interventions.

Barriers such as resistance to change, inadequate training, and limited resources pose significant challenges to Agile implementation. These challenges highlight the importance of organizational readiness, robust training programs, and leadership buy-in to facilitate successful transitions to Agile frameworks. By addressing these barriers, organizations can unlock the full potential of AMPs, achieving sustained efficiency and innovation.

Agile practices also underscore the importance of aligning methodologies with organizational goals. Sectors that integrate Agile principles into their strategic frameworks have demonstrated superior outcomes in time efficiency, cost reduction, and quality enhancement. This alignment ensures that Agile practices deliver tangible value, fostering resilience and adaptability in dynamic environments.

Moreover, Agile Management Practices offer a strategic pathway for organizations to navigate complexity and achieve excellence in project management. By leveraging the insights from this study, industries can refine their Agile strategies, enhance implementation frameworks, and drive long-term success in an ever-evolving landscape.

7. RECOMMENDATIONS

7.1 Foster a Culture of Agility

Organizations should cultivate a mindset that embraces change and innovation. Leadership must champion Agile principles and create an environment where teams feel empowered to experiment and adapt.

7.2 Invest in Training and Capacity Building

Comprehensive training programs should be developed to equip teams with the skills necessary to implement Agile practices effectively. These programs should emphasize iterative planning, collaboration, and adaptive problem-solving.

7.3 Address Resource Constraints

Industries with limited resources should explore scalable Agile solutions, leveraging digital tools and streamlined workflows to optimize efficiency.

7.4 Implement Change Management Strategies

Resistance to change can be mitigated through clear communication, stakeholder engagement, and phased adoption of Agile practices. Highlighting success stories within the organization can build momentum and buy-in.

7.5 Leverage Technology for Agile Implementation

Tools such as project management software, data analytics, and real-time communication platforms can enhance the efficiency and effectiveness of Agile practices. Organizations should invest in technologies that align with their specific needs and objectives.

By implementing these recommendations, organizations can overcome barriers to Agile adoption and maximize the impact of these transformative practices.

8. FUTURE IMPLICATIONS

8.1 Theoretical Implications

8.1.1 Expansion of Agile Research

This study contributes to the growing body of knowledge on Agile methodologies, offering insights into their application across diverse sectors. Future research can explore the integration of Agile with emerging technologies such as AI and IoT.

8.1.2 Cross-Disciplinary Applications

Agile principles have the potential to influence disciplines beyond project management, including education, public administration, and healthcare policy. Expanding research into these areas can uncover new opportunities for innovation.

8.2 Practical Implications

8.2.1 Framework Development

Organizations can use the findings of this research to develop customized Agile frameworks that align with their unique needs and goals. Tailored methodologies ensure that Agile practices deliver maximum value.

8.2.2 Enhancement of Project Management Practices

By adopting Agile principles, industries can improve project efficiency, stakeholder satisfaction, and overall organizational performance. These improvements position organizations for long-term success in competitive markets.

8.2.3 Scalable Solutions for Resource-Constrained Sectors

Agile's flexibility makes it an ideal solution for industries with limited resources. Developing scalable frameworks can enable these sectors to achieve efficiency and innovation without overextending their capabilities.

Future research should continue to explore the evolving landscape of Agile methodologies, addressing emerging challenges and uncovering new opportunities for growth and innovation in dynamic industries.

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Exploring the Impact of Scrum Framework on Project Effectiveness: A Quantitative Analysis of Agile Implementation Challenges and Benefits

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ARTICLE INFO

ABSTRACT

Keywords:

Scrum Framework, Agile Methodology, Project Effectiveness, Organizational Performance.

Received: Oct 29, 2024
Accepted: Nov 03, 2024
Published: Dec 20, 2024

This study examines the impact of the Scrum framework on project effectiveness, focusing on key performance metrics such as time management, cost efficiency, quality improvement, risk mitigation, and human resource optimization. Through a comprehensive analysis of quantitative data collected from IT professionals and organizations, the research highlights the significant advantages of Scrum practices, including improved collaboration, enhanced productivity, and better quality outcomes. Despite these benefits, the findings reveal persistent challenges, such as resistance to change and role ambiguity, which hinder successful implementation. The study emphasizes the importance of practices like Daily Scrum and Sprint Retrospectives in driving project success and offers actionable recommendations for overcoming implementation barriers. By addressing gaps in existing literature, this research contributes to the growing discourse on agile methodologies and provides practical insights for organizations striving to enhance their project management practices.

1. INTRODUCTION

In the ever-evolving landscape of project management, agile methodologies have emerged as a transformative force [1-8]. These methodologies, characterized by their iterative, incremental, and flexible approaches, are redefining how businesses manage complex projects in dynamic environments [9-17]. Among the various agile frameworks, Scrum stands out as a dominant model, widely adopted across industries for its ability to enhance collaboration,

streamline processes, and deliver value rapidly [18-27].

The transition from traditional project management methods, such as the Waterfall model, to agile approaches reflects a significant shift in how organizations perceive and handle project challenges [28-36]. Traditional methods, while structured and predictable, often struggle to adapt to changing requirements or unforeseen challenges. Conversely, agile methodologies, with

Scrum at the forefront, offer adaptability, responsiveness, and a customer-centric focus that aligns well with the demands of modern projects. Scrum, in particular, is designed to address the complexities of project development through structured roles, events, and artifacts. The framework emphasizes transparency, frequent inspection, and continuous adaptation, enabling teams to deliver high-quality outcomes while maintaining flexibility [37-44]. The roles of the Product Owner, Scrum Master, and Development Team are central to its effectiveness, fostering accountability and collaboration. Core practices, such as sprint planning, daily stand-ups, sprint reviews, and retrospectives, ensure that projects progress smoothly, with regular opportunities for feedback and improvement [45-57].

Despite its widespread adoption and proven benefits, implementing Scrum is not without challenges. Organizations often face resistance to change, especially when transitioning from entrenched traditional practices [58-77]. Teams may struggle to produce releasable increments within short sprints, and the unavailability of critical roles like the Product Owner can impede progress. These challenges underline the need for a deeper understanding of Scrum's dynamics and its impact on project outcomes [78-83].

This research aims to explore the relationship between the Scrum framework and project effectiveness, focusing on key metrics such as time, cost, quality, risk, and human resource optimization. By examining both the benefits and challenges of Scrum implementation, this study seeks to provide actionable insights for organizations striving to enhance their project management practices [84-89]. Additionally, the study aims to address gaps in existing literature by offering a comprehensive analysis of Scrum's application in various contexts, with a particular focus on the IT industry in emerging markets.

In the following sections, this paper will delve into the theoretical underpinnings of Scrum, review relevant literature, outline the research methodology, and present findings that highlight Scrum's transformative potential in modern project management [90-95]. Through this investigation, the study aims to contribute to the broader discourse on agile methodologies, offering practical recommendations for maximizing the benefits of Scrum while addressing its inherent

challenges.

1.1 Theoretical Framework

The Scrum framework, a cornerstone of agile methodologies, is rooted in the principles of transparency, inspection, and adaptation [96-99]. These principles form the foundation of an iterative and incremental approach to project management, enabling teams to respond effectively to changing requirements and complex challenges.

Key Components of Scrum

1.1.1 Roles

- **Product Owner:** Responsible for maximizing the value of the product and managing the product backlog [100-101].
- **Scrum Master:** Facilitates the Scrum process, removes impediments, and ensures adherence to Scrum principles [102].
- **Development Team:** A cross-functional group responsible for delivering potentially shippable increments of the product [103].

1.1.2 Artifacts

- **Product Backlog:** An evolving list of all desired features and requirements [104].
- **Sprint Backlog:** A subset of the product backlog, representing tasks to be completed in a sprint [105].
- **Increment:** The deliverable outcome of a sprint, adding value to the product [106].

1.1.3 Events

- **Sprint Planning:** Setting goals and defining tasks for the sprint [107].
- **Daily Scrum:** A short, focused meeting to synchronize team efforts [108].
- **Sprint Review:** Assessing progress and gathering feedback from stakeholders [109].
- **Sprint Retrospective:** Reflecting on the sprint to identify improvements [110].

1.2 Theoretical Underpinning

Scrum's effectiveness lies in its adherence to empiricism, where knowledge is derived from experience and decision-making is based on observable realities [111-112]. By promoting transparency, the framework ensures that all stakeholders have a clear understanding of the project's status and challenges. Regular inspection through structured events allows for the

identification of issues early, while adaptation ensures that processes and priorities are adjusted to meet evolving project demands.

1.3 Comparison with Other Agile Methodologies

While Scrum is a prominent agile framework, it is often compared with methodologies like Kanban and Extreme Programming (XP) [113-115]. Kanban emphasizes visualizing workflows and limiting work in progress to optimize efficiency, while XP focuses on engineering practices such as pair programming and continuous integration. Scrum's structured roles and events provide a unique approach to managing uncertainty and fostering collaboration, making it particularly effective for complex projects.

By establishing a strong theoretical foundation, this study aims to contextualize the impact of Scrum on project effectiveness, setting the stage for a detailed exploration of its practical applications and challenges in subsequent sections [116-119].

2. LITERATURE REVIEW

This section critically examines existing research and scholarly perspectives on the Scrum framework and its impact on project effectiveness. The aim is to highlight gaps in the current literature and establish a foundation for the present study [120-122].

2.1 Agile Methodologies and Project Management

Agile methodologies, including Scrum, have gained significant traction as effective alternatives to traditional project management methods. Research indicates that agile approaches are particularly beneficial in dynamic environments, offering flexibility and responsiveness to change [123-125]. Studies emphasize that Scrum's iterative structure allows for continuous improvement, making it a preferred choice in industries where adaptability is key.

2.1.1 Benefits of Scrum

The literature underscores several advantages of Scrum, including:

- **Improved Collaboration:** By emphasizing teamwork and communication, Scrum fosters a collaborative environment that enhances project outcomes [126-127].

- **Enhanced Productivity:** Regular sprint cycles and clear goals help teams maintain focus and achieve higher productivity [128].
- **Better Quality:** Frequent reviews and iterations enable early detection and resolution of issues, leading to improved product quality [129].
- **Customer Satisfaction:** Continuous engagement with stakeholders ensures that deliverables align with customer needs and expectations [130].

2.2 Challenges in Scrum Implementation

Despite its benefits, implementing Scrum is not without challenges. Common issues include:

- **Resistance to Change:** Organizations transitioning from traditional models often face pushback from employees accustomed to established processes [131-134].
- **Role Clarity:** Ambiguities in defining the responsibilities of Scrum roles, such as the Product Owner and Scrum Master, can hinder progress [135-141].
- **Coordination in Distributed Teams:** In globally distributed teams, maintaining effective communication and collaboration can be challenging [142-148].

2.3 Research Gaps

While extensive research has been conducted on Scrum's benefits, limited studies focus on its application in emerging markets or specific industries, such as IT. Furthermore, there is a need for more empirical studies examining the relationship between Scrum practices and key project performance metrics, including time, cost, and risk management.

By addressing these gaps, this study seeks to contribute to the growing body of knowledge on Scrum and agile methodologies, offering insights that are both theoretical and practical.

3. METHODOLOGY

3.1 Research Philosophy

This study adopts a Positivist research philosophy, which emphasizes objective analysis and the systematic investigation of phenomena based on observable data. The positivist approach ensures that findings are grounded in empirical evidence, facilitating reliable and replicable conclusions.

3.2 Research Approach

The research employs a deductive approach, beginning with the formulation of hypotheses derived from existing theories and literature. These hypotheses are then tested through the collection and analysis of quantitative data, enabling the validation or refutation of theoretical assumptions.

3.3 Data Collection

Primary data for this study is collected through structured surveys administered to professionals and organizations utilizing Scrum in project management. The survey is designed to capture insights into:

- The effectiveness of Scrum in achieving project objectives.
- Challenges encountered during Scrum implementation.
- Metrics for evaluating project performance, including time, cost, quality, and risk.

3.4 Sampling

The study employs a purposive sampling technique, targeting respondents from the IT sector and other industries where Scrum is actively

implemented. A sample size of approximately 150 participants is determined to ensure the reliability and generalizability of findings.

3.5 Analytical Techniques

Quantitative data is analyzed using statistical tools such as:

- Descriptive Statistics: To summarize key trends and patterns.
- Inferential Statistics: To test hypotheses and examine relationships between variables.
- Structural Equation Modeling (SEM): To explore complex interdependencies and validate the theoretical framework.

This methodological framework provides a robust foundation for investigating the impact of Scrum on project effectiveness, ensuring that the study's findings are both credible and actionable.

4. DATA ANALYSIS

This section presents the empirical findings from the study's quantitative analysis, focusing on the relationship between Scrum practices and project performance metrics.

Table 1: Scrum Effectiveness Metrics

Metric	Mean Score (out of 5)	Standard Deviation
Time Management	4.3	0.5
Cost Efficiency	4.1	0.6
Quality Management	4.5	0.4
Risk Mitigation	4.0	0.7
HR Optimization	4.2	0.5

4.1 Interpretation

The metrics reveal that Scrum significantly enhances project performance across critical dimensions, with quality improvement scoring the highest mean. These findings support the

hypothesis that Scrum practices lead to measurable benefits in time and cost management, while also mitigating risks and optimizing human resources.

Table 2: Challenges in Scrum Implementation

Challenge	Frequency (%)	Impact on Project Success (out of 5)
Resistance to Change	35	3.8
Role Clarity	40	4.2
Coordination in Distributed Teams	25	3.5

4.2 Interpretation

The most frequently encountered challenge is role clarity, which also has the highest impact on

project success. This underscores the importance of clearly defining Scrum roles to mitigate implementation difficulties.

Table 3: Correlation Between Scrum Practices and Project Metrics

Scrum Practice	Correlation with Time Management	Correlation with Quality Improvement	Correlation with Risk Mitigation
Daily Scrum	0.72	0.85	0.64
Sprint Review	0.68	0.81	0.67
Sprint Responsiveness	0.700.65	0.83	0.69
Product Backlog Refinement		0.78	0.66

4.3 Interpretation

Strong correlations are observed between Scrum practices and key project metrics, particularly for quality improvement. Daily Scrum and Sprint Retrospective exhibit the highest correlations, highlighting their critical role in driving project success.

The analysis demonstrates that Scrum practices are positively correlated with improved project performance metrics, validating the framework’s effectiveness. Challenges such as resistance to change and role clarity remain significant barriers, emphasizing the need for targeted strategies to address these issues. Overall, the findings align with the study’s objective of understanding Scrum’s impact on project effectiveness and offer actionable insights for organizations seeking to optimize their agile practices.

5. DISCUSSION

The findings from this study offer compelling evidence for the effectiveness of Scrum as a project management framework, while also illuminating the challenges that organizations encounter during its implementation. This discussion synthesizes the empirical results with existing literature and theoretical underpinnings to provide a nuanced understanding of Scrum’s role in enhancing project effectiveness.

5.1 Effectiveness of Scrum

The high mean scores observed across metrics such as quality improvement (4.5) and time management (4.3) validate the widely acknowledged benefits of Scrum in literature. These results align with researchers, who emphasize the iterative structure of Scrum as a key enabler of continuous improvement. The strong correlations between Scrum practices and

project metrics further reinforce the notion that Scrum facilitates better alignment between project goals and deliverables.

Particularly, practices such as Daily Scrum and Sprint Retrospectives, which exhibited the highest correlations with quality improvement (0.85 and 0.83, respectively), demonstrate the value of frequent communication and reflection. These practices encourage teams to identify and address issues promptly, fostering a culture of accountability and collaboration.

5.2 Challenges in Implementation

Despite these advantages, the study highlights persistent challenges, including resistance to change (35% frequency) and role clarity (40% frequency). These findings resonate with research, who identify organizational inertia and ambiguity in roles as significant barriers to agile adoption. The high impact of role clarity on project success (4.2 out of 5) underscores the necessity of clearly defining responsibilities for key roles, such as the Product Owner and Scrum Master, to ensure smooth implementation.

5.3 Implications for Practice

The empirical evidence from this study offers actionable insights for organizations aiming to maximize the benefits of Scrum. First, targeted training programs can help mitigate resistance to change by equipping team members with the skills and mindset required for agile practices. Second, organizations should invest in role-specific training and documentation to enhance clarity and ensure that all stakeholders understand their responsibilities within the Scrum framework.

Furthermore, the correlations observed in this study suggest that organizations should prioritize practices such as Daily Scrum and Sprint

Retrospectives to optimize project outcomes. By fostering regular communication and reflection, these practices enable teams to adapt to evolving requirements and maintain alignment with project goals.

5.4 Limitations and Future Research

While this study provides valuable insights, certain limitations must be acknowledged. The focus on the IT sector and emerging markets may limit the generalizability of findings to other industries and regions. Future research could explore the application of Scrum in diverse contexts, such as manufacturing or healthcare, to provide a more comprehensive understanding of its impact.

Additionally, this study primarily examines direct correlations between Scrum practices and project metrics. Future studies could investigate potential mediators or moderators, such as organizational culture or team dynamics, to uncover deeper insights into the mechanisms driving Scrum's effectiveness.

Moreover, this study reaffirms the transformative potential of Scrum in modern project management while highlighting critical areas for improvement. By addressing the challenges identified and leveraging the best practices outlined, organizations can enhance their agility and drive sustained success in an increasingly dynamic business environment.

6. CONCLUSION

The results of this study underscore the profound impact of Scrum as a project management framework, particularly in enhancing project effectiveness across multiple dimensions. The findings highlight the ability of Scrum practices to drive significant improvements in time management, cost efficiency, quality, risk mitigation, and human resource optimization. These outcomes reaffirm the central role of empiricism, collaboration, and adaptability within the Scrum framework, providing organizations with a robust methodology to navigate the complexities of modern projects.

Despite its evident advantages, the challenges associated with Scrum implementation, such as resistance to change and role ambiguity, cannot be overlooked. Addressing these challenges through targeted interventions, such as training

programs and clear role definitions, is imperative for organizations to fully realize the benefits of Scrum. Furthermore, the study's findings emphasize the critical role of specific practices, such as Daily Scrum and Sprint Retrospectives, in optimizing project outcomes and fostering a culture of continuous improvement.

This research contributes to the growing body of knowledge on agile methodologies, offering practical insights for practitioners and scholars alike. By addressing the limitations identified and expanding the scope of future studies, the understanding of Scrum's transformative potential can be further enriched. Ultimately, the adoption of Scrum represents a strategic investment for organizations seeking to enhance their agility, resilience, and competitiveness in an ever-evolving business landscape.

7. RECOMMENDATIONS

Based on the findings of this study, several recommendations are proposed to enhance the successful implementation and utilization of Scrum:

7.1 Invest in Agile Training and Education

- Conduct comprehensive training programs to equip team members with the necessary skills and mindset for agile practices.
- Offer role-specific training to ensure clarity and competency for key roles such as Product Owner and Scrum Master.

7.2 Promote a Culture of Adaptability

- Encourage an organizational culture that values flexibility, innovation, and continuous learning.
- Address resistance to change through transparent communication and active engagement with stakeholders.

7.3 Strengthen Role Clarity

- Clearly define the responsibilities and expectations for each Scrum role to mitigate ambiguities and enhance accountability.
- Develop standardized documentation to guide role execution and alignment with organizational goals.

7.4 Prioritize Key Scrum Practices

- Focus on high-impact practices, such as Daily Scrum and Sprint Retrospectives, to drive better communication, reflection, and alignment.
- Regularly evaluate and refine these practices to ensure their effectiveness in achieving project objectives.

7.5 Leverage Technology for Distributed Teams

- Utilize collaborative tools and platforms to facilitate effective communication and coordination among geographically dispersed teams.
- Implement mechanisms to track progress and maintain alignment in distributed project environments.

7.6 Expand Research and Continuous Improvement

- Encourage ongoing research into the application of Scrum in diverse industries and contexts to uncover new insights and best practices.
- Foster a culture of continuous improvement by regularly assessing the effectiveness of Scrum practices and adapting them to evolving project requirements.

By implementing these recommendations, organizations can overcome the challenges associated with Scrum and unlock its full potential as a transformative project management framework. These strategies not only enhance project outcomes but also position organizations to thrive in an increasingly dynamic and competitive business environment.

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