



EVALUATION OF TECHNOLOGY TRANSFORMATION OF TELECOM SECTOR IN OMAN

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Abstract - Cultural difficulties have been a big barrier for Oman in its digital development. Transforming the digital platform necessitates process re-engineering and the removal of multiple authorities. The transition may result in organizational mergers and the emergence of new organizations. It is difficult to find a decision-maker in the community who is willing to embrace the cultural change. All network operation centers (NOCs), service operation centers (SOCs), and digital operation centers must undergo technological transformation (DOCs). Oman's telecom sector aspires to digitalize operation centers in order to provide the best technological services to its citizens and the Middle East as a whole. The selected leading telecom company is the country's first telecommunications provider. It has played an important role in improving Oman's telecom industry technology. The study project's principal focus is on the most current breakthroughs in changing technology in the telecom industry. The project's objectives were to increase knowledge of how transformation occurs in the telecom sector in Oman, examine the advantages of NOC and the necessity for the transformation to SOC within the Oman telecom sector, identify the difficulties encountered with SOC that force the Oman telecom sector to advance to DOC, and evaluate and examine the advantages of technology transformation to DOC in the Oman telecom sector. Most market-based fundamental requirements are based on the most recent technology advancements,

which can increase connectivity speeds and stability during the course of service use. As a result, it is said that businesses in the telecom sector must stay up with technological advancements in order to gain greater consumer confidence.

I. INTRODUCTION

Over the past few decades, Oman has focused on technological growth, investing in technology to assist the country's telecommunications sector advance by completely revamping the industry. Making technology tools and services more easily accessible to people is one of the transformation tactics now being used. Although other parts of the world have adopted technological trends, Oman's telecoms industry is required to use the most recent trends in service delivery. Technology transformation refers to a complete revamp of the hardware, data, network architecture, and software that make up technology systems that may be made available to people for processing inside businesses or sectors [4]. The telecom industry is made up of businesses in charge of transmitting data and other types of information throughout the world. Wireless communication, telecom services, and telecom equipment make up the three main subsectors of telecommunications. When services are optimized across the system of establishing a changed telecom sector in a region, the technology transformation products may be more agile, efficient, and automated. In Oman,

where the telecom industry is better positioned for future growth, the development of information and communication technology (ICT) has acquired priority. The Oman ICT Group was established in 2019 to manage cybersecurity, next-generation technology, cloud & data services [7], and smart applications, which increased the demand for the ICT industry to be developed.

II. LITERATURE REVIEW

5G Network – A network for the present and future

The papers suit the research since it focuses on how technological transformation may be utilized by the telecom sector in Oman. Zhang et al. polled users on how secure 5G networks can be, however the answers ended up highlighting the benefits of using 5G networks, as seen in Figure 2.1. The security associated with the 5G network must be recognized, and the present study will focus on developing a knowledge of the 5G network and bringing it to the attention of telecom sector businesses in various countries, including Oman [3]. However, the speeds and storage capacity have not been defined in terms of whether they can be executed across a network or within communication devices. A variety of performance measures, including as uplink and downlink, outage probability, latency, delay, number of active users, handover rate, and so on, were computed and must be implemented into the system. According to Shayea et al. [10], 5G will be positioned in the future as the standard application for mobile communications technology by the majority of telecom operators throughout the world. The new approach of employing 5G networks will increase mobile network connectivity, capability, and speed up to 100 times quicker and over 1,000 times storage capacity as compared to what telecom firms employed in earlier generations.

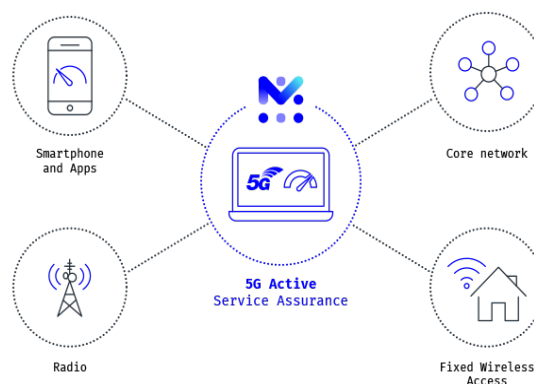


Figure 1: 5G Network Operation

Wi-Fi 6

There are additional criteria for using Wi-Fi 6, which necessitates more expenses to customers rather than making owned devices interoperable. The expense of acquiring new gadgets that can be utilized on Wi-Fi 6 connections will cause people to remain on previous versions of Wi-Fi in order to avoid incurring additional expenditures for experiencing higher internet connection speeds [5]. The Wi-Fi 6 research failed to produce a feasible solution for connecting current devices without purchasing new devices with specified specs that may ensure quicker connections and high speeds. The present research will concentrate on how to make place in existing internet and communications equipment for Wi-Fi 6 without requiring device updates [8]. Faster internet connections are always in demand for gaming, video streaming, and other bandwidth-intensive applications. Wi-Fi is designed to link users to the internet with extra technologies that improve efficiency, such as faster user connections. Telecom firms throughout the world have worked hard to become industry leaders by developing and providing the fastest internet speeds. According to Salih Hasan and Mahmood Wi-Fi 6 is not just about having fast internet but also about being able to interact and enhance the network. Regardless of the number of devices linked to a network, making room for new devices to join is critical in handling and advertising telecommunication services in order to build consumer trust [6].

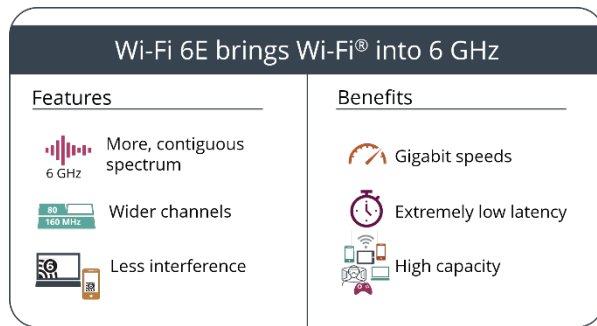


Figure 2: Wi-Fi 6 Features and Benefits

Artificial Intelligence

Artificial intelligence (AI) is the replication of human intellect by computer systems to execute tasks in the same way as humans do. There are customers with impairments who cannot deal with the type of handling operations required to make communication a success among users of telecommunication equipment and instruments. Due to these concerns, Chen et al. [8] investigated how people can perform various telecommunication operations without engaging in stressful situations. Because numerous human actions must be undertaken for AI to be effective, its acceptance across diverse sectors remains uncertain. However, Chen et al. failed to show how AI may use common knowledge to grasp new instructions or gestures. Identifying and interpreting human commands was not properly done in the author's experiments, which calls for a critical examination of the technology transition employing AI. Investigate the integration of cloud computing with AI and its influence on the telecom sector as a factor to consider when developing simple methods of providing telecommunication solutions. Despite the usage of AI in telecommunications, the majority of sector organizations can apply it in a variety of ways [13]. Due to a lack of other supporting technologies related to information conveyance, AI cannot operate in the telecom sector without cloud computing. Despite recommending a dynamic and updated technical telecom industry, no methods of achievement were provided.

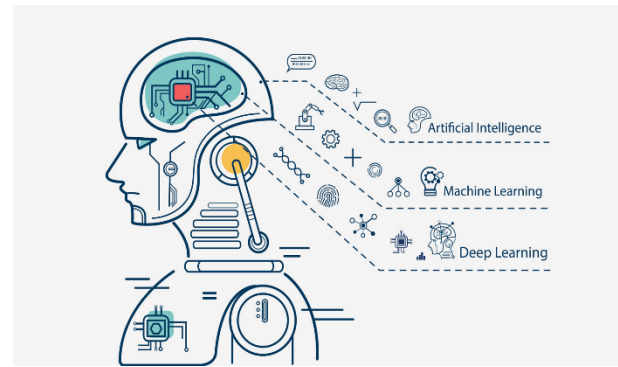


Figure 3: Artificial Intelligence

Internet of Things (IoT)

The Internet of Things (IoT) is an interconnection and embedment of devices via the internet of computing in everyday activities to enable send and receive data. When additional devices or laptops are joined to a dedicated network connection, telecom providers have seen a slowing of internet speeds. Perwej et al. [9] proposed that new and modern methods of sending data under a transparent and secure platform would be necessary, but no solution was provided. The present study will look at how telecom firms will use IoT to protect the security of data exchanged across linked devices while avoiding malicious attacks. Despite the necessity to employ IoT in the telecom sector, Mahmood and Munir [11] investigated strategies for telecom businesses to foresee and prevent maintenance using IoT. Telecom firms strive for network enhancement, with hardware and software serving as constant transformation forces. The Internet of Things has evolved into a solution for widespread application in households and businesses. There are concerns that IoT has introduced new dimensions for connecting smart items [4]. Despite the fact that the number of networked devices under IoT is projected to expand in the future, the paper did not consider how to maintain connection and speeds on the increasing devices connected to a server. Because telecom networks are made up of radio nodes and switches, among other equipment, maintenance is required; however, determining it ahead of time saves time and other resources [12]. Instead of using current and predictive data, the author relied on

historical data, which cannot be replicated due to technological advancements over time.

Big Data

In the telecommunications business, telecom firms employ big data analytics to execute operations and satisfy customer expectations. However, since the amount of data available for collection and analysis is restricted, additional factors must be examined and monitored to address numerous client issues. As previously discussed, IoT plays a role in the use of big data analytics, which necessitates the use of the internet in completing the defined operations and activities within the telecom industry [2]. The study proposed an open-source solution for telecom providers to employ, which would be applied to all clients. Instead of developing a safe application, open source was intended to be utilized by anybody, hence it lacked the standards of security required in the telecom business. The Customer Relationship Management (CRM) strategy model was established to help us identify distinct behaviors. The behaviors may be conducted by a massive data collection and evaluated to produce summaries. Wassouf et al., on the other hand, failed to address the bulk of the specifics that required to be noticed and connected to the methods of developing telecom expectations and vision.

III. RESEARCH METHODOLOGY

The study applied a survey method of obtaining qualitative and quantitative data for analysis whereby a chosen sample size from the case study company will be surveyed to give responses to the asked questions. The obtained qualitative data is aimed at creating an impact of satisfaction and the worth it can create on the chosen company of study. The selected case study company, which is one of the leading telecom service provider, has a population of approximately 2,690 employees. A simple random sampling technique was applied in data collection exercise where a sample of 44 respondents from one of the company staff were required to fill the Google form questionnaires.

IV. DISCUSSION

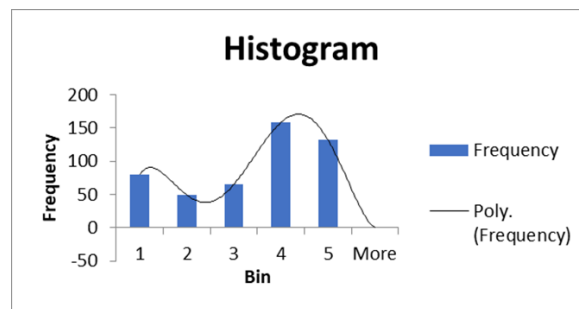


Figure 4: Histogram

The collected data was valid and reliable because the shape of the histogram came out as a bell. Such a shape in a histogram is an indication of a perfectly collected data which can yield expected results.

	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Q5	1							
Q6	0.476588	1						
Q7	-0.01619	0.157626	1					
Q8	0.512289	0.333829	-0.05534	1				
Q9	0.476908	0.443391	0.126886	0.601784	1			
Q10	0.435133	0.31483	0.014607	0.345411	0.456038	1		
Q11	0.41958	0.163092	0.101315	0.261808	0.333974	0.417602	1	
Q12	0.621605	0.17319	-0.39575	0.404125	0.455272	0.377739	0.305447	1

Figure 5: Correlation

The obtained correlation which was high indicate that the few challenges faced by telecom companies' Network Operation Center (NOC) and Service Operation Center (SOC) in digital transformations make it easier to improve service delivery to customers and when customers receive a better service delivery from telecom companies, the companies get assured of the customer confidence and retention that promote business had a correlation of 0.0512289.

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Sample	0	0	65535	65535	2.32E-47	2.343813
Columns	339.3887	6	56.56478	58.58529	2.04E-47	2.129473
Interaction	0	0	65535	65535	2.17E-47	2.384571
Within	283.8605	294	0.965512			
Total	623.2492	300				

Figure 6: ANOVA

The most important result of an Anova test result is the p-value that is supposed to be <0.05 for research to reject a null hypothesis. Based on the results obtained from the performed data analysis, the p-values obtained were 2.32E-47,

2.04E-47, and 2.17E-47. The values were less than the recommended p-value of 0.05 which means that the results were statistically significant. Technology transformation in the telecom sector is important, the reason why the collected data was signifying the importance of telecom companies embracing technology transformations within their operations.

V. CONCLUSION

Telecom firms must improve their use of technological trends in order to make way for the revolutions occurring in the world of communication. Company is entitled to continue one of the leading the Oman telecom industry if it can continue to undertake cutting-edge telecom changes. Companies in the telecom business must stay up with technological revolutions in an environment where client confidence must be established. Company is recommended to unlock data, embrace change, always start from somewhere when implementing technology change, build up capabilities, and gain top management support.

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