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Original Article

Challenges of Implementing Industry 4.0 in Financial Sector of Oman

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Abstract *- The Fourth Industrial Revolution has become a trend of future manufacturing industries, information technology, banking, etc. Industry 4.0 is a new industrial paradigm that consists of essential characteristics like cyber-physical systems, cloud manufacturing, big data, Internet of things. Due to the emerging financial and banking sector, there needs to be an effective technique for making the process quickly. IR4.0 includes all computerization and automation companies to enhance the production cycles and completes all work aspects into the unique digital ecosystem. While deploying these technologies in the financial sector of Oman, some challenges persist in it. This paper reviews the challenges of implementing Industry 4.0 in the financial industry of Oman.*

Keywords - *IR4.0, Industry 4.0, Financial sector, Challenges, Automation, Oman.*

I. INTRODUCTION

Currently, young and medium-sized people with different aspirations and interests are a large portion of bank clients than the previous generation. Established banking models will no further fulfil these expectations, and preferences have become possible through IR4.0 tools, processes and techniques. To enter Industry 4.0 has two distinct characteristics: first, by meeting emerging requirements with new goods and procedures; and secondly, by implementing process improvements by increasing efficiency. To implement IR4.0 of consumers and do businesses through the Transition, current banking products and services need to be thoroughly rethought. Innovation and technological growth are the main challenges of a sustainable solution. The new global economy is rapidly evolving. Thanks to its latest technology, the industry can be seen as a great chance. The principal goal of Industry 4.0 is to achieve greater operational efficiency and Productivity while at the same time increasing automation levels. The Internet of Things (IoT), Industrial Internet of Things (IIoT), cloud production and intelligent manufacture, both significantly contribute to the transformation of the production process, have also been pointed out by many experts, who are significantly contributing to the entire digital and smart processing.

Corporations want to satisfy the needs of their clients' needs and gain valuable knowledge from customers that can be used for advancement. Industry 4.0 has a great need for the financial system. Amongst the most central banking strategies is the use of technology from the industry to digitize properties, create a digital identity, offer specialization, etc. For instance, after the United States and Japan, South Korea is the third-largest economy in cryptocurrencies [1]. Through this partnership, a blockchain-based framework has been created. The banking sector has long been responsible for interaction and customer support. In generational Banking, the consumer determines the optimum combination of contact. This means that banks must rethink their business strategy.

Furthermore, several investors and startups are actively pursuing ideas that reflect the essence of the Fourth Industrial Revolution. Al Amri said that we encourage banks and investors in Oman to take advantage of the 4th Industrial Revolution's potential and explore its horizons by applying new concepts to boost efficiency and Productivity in the sector [2]. The Executive President had previously emphasized the importance of financial intermediation in the country's ongoing economic growth. Financial intermediation plays a vital role in ensuring our economy's long-term viability and inclusiveness. As a result, the Omani banking industry has constantly been implementing new methods and technologies to strengthen the financial intermediary's process and expand required financing to all sectors, including SMEs, thereby fostering business opportunities in Oman. Although their position as financial intermediaries, Omani banks face several risks, which affect their lending decisions and overall investment activities in the Sultanate. He said, "Maturity transition when expanding funding to ventures with long gestation periods is one such danger. Likewise, banks and financial sectors face risk challenges when borrowing to SMEs due to a variety of factors such as a lack of capacity, insufficient credit details, a lack of collateral, insufficient cash flows, poor record-keeping, and poor management to name few. These types of obstacles tend to be impeding funding for major projects as well as SMEs, which hurts the country's

overall capital investments," emphasizing the importance of cooperation between the private sector, academics, and policymakers in brainstorming possible solutions to these issues [2]. Many financial sectors of Oman experience some risks in deploying IR4.0. The study focus on highlighting the challenges of implementing IR4.0 in the financial industry of Oman.

II. IR4.0 IN THE FINANCIAL SECTOR

In the financial sector, particularly in the banking industry, there is dynamic and intense competition for their products and services. It results in the banking striving to grow continuously or transform to avoid their outperformance with competitors. In the past, matches occurred on the first evolution of mobile banking applications, ATM, telephone banking, and internet banking in the market. Currently, the banking structure allows services through digital channels [3]. In the late 1990s, financial transactions were realized and started with the help of the Internet. Hence, smartphone entry represents the real accelerator for access to the Internet permanently. Therefore, the crisis of 2008 realized adverse effects on outstanding bank loans accumulated, which urge to face some primary threads, and this has been recovered with the invention of new technology sources in the financial services [4]. In I.T., Application Programming Interface (API) is used for an interface that allows the one system to function while using other applications together and acts as remote control by providing all set of functions to facilitate the applications to interact with each other concerning exchange the services or data on either side. For example, Google Maps API allows people to access Google's geolocation data to attract customers to reach the banks near internet branches, ATMs, and mobile branches. It is also enabling the functions of both external and internal I.T. governance and also offer value-added service in an outside closed environment.

A. Replacing Banks

Banks serve as the substitute for managing the changing liquidity for consumers like borrowers depositors and are recognized as financial firms that make depositing products on the market and provide loans. To maintain economic growth, the banking system should be adequate. Substantial authorization by the global financial system sets out clear ideals for the steady growth of financial institutions' resources in other countries. These institutions do not comply with banking system rules. Many other organizations spend much of their funds improving banking and financial technology processes [6]. Both the availability of techniques could lead to greater effectiveness and creativity. As a result, banks will be considered an essential financial body of big countries in the coming years. Still, small and medium-sized commercial banks will be responsible for other banking system micro-tasks. These institutions will achieve more consumers with higher support for easy access using banking technologies in the future [7]. Fintech replaces the banks by offering practical solutions to the customers.

B. FinTech

Financial technology (FinTech) evolves rapidly and is seen as a new advancement for the financial sector and has led to shared economic aid, information technologies and good regulation [7]. FinTech's platforms support sophisticated business models, including crowdfunding, B2B and P2P, using interruptive technologies and conventional banking models. FinTech advances are conveyed as a continuous financial and technological procedure that has developed rapidly inside developmental technology. FinTech is proposing a new redevelopment for the financial sector by improving the financial quality of service, cost savings, and a sustainable and varied economic landscape. PwC (2017) reports that 83% of banking firms are subject to different financial aspects and are at high risk due to startups from FinTech. The FinTech ecosystem has five components.

- Start-ups of FinTech (e.g., loans, payments, management of wealth, Fintech health coverage, fundraising and financial markets);
- developers of technology (for example, cloud computing, big data analytics, social networking sites and crypto-monetary systems)
- Government (for example, legislative authorities and regulatory agencies)
- Financial clients (for example, persons and institutions)
- traditional financial institutions (e.g., health coverage insurance agencies, conventional financial banks, venture capitalists and stock brokerage organizations) [9].

After the Industrial Revolution, the FinTech entrepreneurial organizations, situated at the heart of the ecosystem, portrayed better performance [8]. The core industries have focused better on wealth management, monetary aggregation, lower operating costs, transaction creativity, loaning, financial markets and customized services, and the market niche for conventional enterprises.

C. FinTech Development in Banking

FinTech plays a significant role in the fiscal and political system, acting as a deflector of order in currency exchange, micropayments, assessment maintenance, insurance policy comparison and Internet sales, and increase in capital [6]. The industrial sector destroyed a slew of online solutions for all types of financial transactions, including those posing a threat to conventional banking and management of the portfolio. FinTech is also an excellent framework for the sharing economy and fundraising to put ideas into action. As a result, according to Ernst and Young (2016), customers value FinTech solutions because they offer better rate increases (15.4 per cent), the simple opening of the account (43.3 per cent), access to a range of products and services (12.4%), higher quality of service (10.3 per cent), better online experience and performance (11.2 per cent), and much more innovative technologies over conventional products (1.8 per cent).

III. COMPONENTS OF IR4.0

Components of IR4.0:

Some main components exist in the fourth industrial revolution, which played a significant role in contemporary life.

Big data analytics: Big Data analytics is used to address the activities or processes involved in finance and accounting, mobile services, physical science, life science and also retail services and manufacturing work.

Smart Factory system: Smart Factory system deals with the direct replacement of traditional automation to the flexible work that controls on the stream of data referred to all operations and production systems are connected to allow developing or learning the new demand system for obtaining new products dependent.

Cyber-Physical System: Cyber-Physical System (CPS) is defined as a collection of data from multiple systems with different natures. Still, the main objective is to control and maintain all physical processes, networking and integration of computation which would adapt the essential requirements with the effect of new conditions purely depending on the collective feedback obtained from previous work.

Internet of Things: Internet of Things (IoT) refers to connective items networking that maintains relationships between people-to-things, people-to-people, and things-to-things. IEEE described that IoT means a network of objects containing each item has to be embedded with sensors interconnected to the Internet. It is to be expected that end of 2020, based on the concept of IoT moreover 26 billion devices would be connected together. Interoperability works with connective network systems of such humans and smart factories along with cyber-physical systems communicating altogether with the help of the IoT principle.

Interoperability: Interoperability helps to share knowledge and information quickly and effectively without any error. It also provides efficiency, reliability, and accuracy in a manufacturing feature of integrated components that could exchange the acquired information connectively [5].

IV. RISKS

In the financial sector of Oman, digital networking through the Internet causes risks. It focuses on exchanging data through the Internet, I.T. security and cloud-based storage to outside attacks. The bet includes stolen data, system structures being paralyzed, and interactions being distracted. Employee activities will be tracked and recorded [9]. It affects the privacy of humans and employees. The employees become transparent and securing data become complex. The financial sector implemented Chatbots and blockchain technology to solve the data issues.

V. SOLUTIONS

A. Chatbots

In the financial sector, artificial intelligence helps avoid false cheques and allows the issuance of low-risk cheques. By having this system, firms that go bankrupt do not prefer the remaining cheque holidays. For the last ten years, artificial intelligence has taken longer in customer relations and financial institutions. Chatbot stands out first in the latest application of artificial financial assistant. In Oman, chatbot applications are used in the banking process. API is used in I.T. solutions that enable the application to share services and communicate. It has a set of functions that anticipates through programming language and access to the application services. Google Maps API is the best example that offers access to Google's geolocation features and data [10]. Banks can reach the customer through mobile and internet branches and ATMs. It allows banks to provide customers with high value over a closed environment. Banks think they could not enhance without mobile applications or websites, but today they can use API. The API implementation enhances the agility of the banking information system [13]. API is created within the boundaries of banking information systems and used by internal applications. It is significant to implement Chatbots technology in the financial sector for creating high value with customers.

B. Blockchain

Blockchain can transform defined financial institutions by increasing faster execution of transactions and reducing costs[11]. Blockchain creates specific circumstances for publicly or privately institutions by rendering transparent, secure, dependable, and quick solutions. The application of this technology is critical in IR4.0 the usage of numerous smart devices in the world allows for transparent, stable, rapid, and perfect transactions in the distributed device without the need for human intervention [12]. Blockchain's activity is about financial products and is focused on digital training established in IR4.0 based on automated processes. This concept's activity is leading organizations and establishing a trustworthy, independent relationship among industrial automation, distributors, and consumers. This blockchain technology has to be implemented in the financial sector of Oman to avoid human intervention and make automation.

C. Robotics

Robotic process automation influences how many banking and finance companies do business (RPA). RPA uses technology with artificial intelligence (A.I.) and machine learning abilities to automate high-volume, replicable tasks [14]. It is an easy way for banks to automate different processes. For example, PayPal and credit card companies prefer robots to deliver services to their clients. PayPal's own software uses the robot to transfer money from one human to another. PayPal also works with robots from Uber and other firms. MasterCard, too has created a robot for both its customer service department and its Masterpass program. For its cardholders, Bank of America has also built a Facebook robot. Similarly, the financial sector of Oman has to develop a robot for managing financial activities. The purposes of implementing robotics in the financial sector are as follows,

- Enhance the back-office processes by making effective coordination between various systems
- Offer better customer experiences
- Increase the processing of large data
- make way for a new shift towards
- Reduce compliance requirements with high transparency

VI. CONCLUSION

To conclude, both banks and FinTechs have worked for years before finding areas of agreement. FinTechs has decided to increase market share and has been effective in infusing new approaches into financial services. But they found it difficult to obtain many businesses to process and attract potential customers. Also, experience some challenges in implementing IR4.0 in their process and activities. Banks were sceptical and distrustful about FinTech initially but have since lauded its entrepreneurial mindset. Banks must change their way of thinking and keep up with technological innovations. In addition, the first emphasis is the improvement and delivery of services from the customer's viewpoint to achieve the best possible outcome for customers.

Consequently, the basis for assessing banks of IR4.0 is the development of cooperation between the financial institution and customers. Financial institutions will be closely related to technology firms and desperately have to work with them to enhance the transition and company structural transformation. From an Industry factor perspective, a strong economy is most active in digitalizing its assets, and the technology perception is unique, that much worldwide. That being said, technological and cultural constraints and the form of view of customers about the essence of banking are the most critical restrictions of study. A survey of the composition of various industry sectors and insufficient attention to necessary infrastructure by financial services in different nations for the advancement of information technology demonstrates that far more research should be carried out in other financial services and industrial companies on technological innovations.

REFERENCES

[1] Sander, Chances and Risks of Industry 4.0 - NORMA Group Blog, NORMA Group Blog, (2017). [Online]. Available: https://blog.normagroup.com/en/chances-and-risks-of-industry-4-0/. [Accessed: 13- Mar- 2021].

[2] Vision 2040: Blossoming future for Oman, Oman Observer, (2021). [Online]. Available: https://www.omanobserver.om/vision-2040-blossoming-future-for-oman/. [Accessed: 13- Mar- 2021].

[3] X. He, D. Xiong, W. Khalifa and X. Li, Chinese banking sector: A major stakeholder in bringing a fourth industrial revolution in the country, Technological Forecasting and Social Change, 165 (2021) 120519, Available: 10.1016/j.techfore.2020.120519.

[4] A. Botha, Innovating For Market Adoption In The Fourth Industrial Revolution, South African Journal of Industrial Engineering, 30(3) (2019). Available: 10.7166/30-3-2238.

[5] M. Aqeeq, Islamic Banking in Oman Today & The Way Forward, SSRN Electronic Journal, (2014). Available: 10.2139/ssrn.2577369.

[6] Nair, Why hasn't fintech embraced the Fourth Industrial Revolution?, World Economic Forum, (2019). [Online]. Available: https://www.weforum.org/agenda/2019/03/its-time-for-financial-services-to-embrace-the-fourth-industrial-revolution-heres-why/. [Accessed: 13- Mar- 2021].

[7] Bandara, Oshadhi, KasuniVidanagamachchi, and Ruwan Wickramarachchi, A Model for Assessing Maturity of Industry 4.0 in the Banking Sector,. Paper presented at the International Conference on Industrial Engineering and Operations Management, Bangkok, Thailand, (2019) 5–7.

[8] Babiceanu, Radu F., and RemziSeker, Big Data and virtualization for manufacturing cyber-physical systems: A survey of the current status and future outlook. Computers in Industry, 81 (2016) 128–37.

[9] PwC, Global FinTech Report, (2017). Available online: https://www.pwc.com/fintechreport [Accessed: 13- Mar- 2021].

[10] Ernst and Young, FinTech on the Cutting Edge, (2019). Available online: http://www.ey.com/uk/en/industries/financial-services/banking--capital-markets/ey-uk-fintech-on-the-cutting-edge [Accessed: 13- Mar- 2021].

[11] Hofmann, Erik, and Marco Rüsch, Industry 4.0 and the current status as well as future prospects on logistics. Computers in Industry, 89 (2017) 23–34.

[12] Lu, Yang, Industry 4.0: A survey on technologies, applications and open research issues. Journal of Industrial Information Integration, 6 (2017) 1–10

[13] Ooi, Keng-Boon, Voon-Hsien Lee, Garry Wei-Han Tan, Teck-Soon Hew, and Jun-Jie Hew, Cloud computing in manufacturing: The next industrial revolution in Malaysia?Expert Systems with Applications, 93 (2018) 376–94.

[14] Romao, Mário, Joao Costa, and Carlos J. Costa, Robotic Process Automation: A Case Study in the Banking Industry, 2019, Paper presented at 14th Iberian Conference on Information Systems and Technologies (CISTI), Coimbra, Portugal, June 19–22, (2019) 1–6.

[15] Zambon, Ilaria, Massimo Cecchini, Gianluca Egidi, Maria Grazia Saporito, and Andrea Colantoni, Revolution 4.0: Industry vs. agriculture in a future development for SMEs Processes 7 (2019) 36

[16] Stock, T.; Obernaus, M.; Kunz, S.; Khol, H. Industry 4.0 as an enabler for sustainable development: A qualitative assessment of its ecological and social potential. Process Saf. Environ. Prot. 118 (2018) 254–267,doi:10.1016/j.psep.2018.06.026.

[17] Saxena, P.; Papanikolaou, M.; Pagone, E.; Salonitis, K.; Jolly, R. Digital manufacturing for foundries 4.0. InLight Metal 2020- The Minerals, Metals & Materials Series; Tomsett, A., Ed.; Springer: Berlin/Heidelberg, Germany, (2020) 1019–1031.

[18] Stock, T.; Seliger, G. Opportunities of sustainable manufacturing in industry 4.0. Procedia Cirp., 40 (2016) 536–541, doi:10.1016/j.procir.2016.01.129.

[19] Fitzgerald, M.; Kruschwitz, N.; Bonnet, D.; Welch, M. Embracing digital technology: A new strategic imperative. MIT Sloan Manag. Rev., 55 (2014) 1–12.

[20] Zhou, K.; Liu, T.; Zhou, L. Industry 4.0: Towards future industrial opportunities and challenges. In Proceedings of the 12th International Conference on Fuzzy Systems and Knowledge Discovery (FSKD2015), Zhangjiajie, China, (2015) 15–17.

[21] Roblek, V.; Meško, M.; Krapež, A. A complex view of industry 4.0. Sage Open (2016) 6.

[22] Bahrin, M.A.K.; Othman, M.F.; Azli, N.N.; Talib, M.F. Industry 4.0: A review on industrial automation and robotics. J. Teknol. 78 (2016) 137–143.

[23] Witkowski, K. Internet of things, big data, industry 4.0–innovative solutions in logistics and supply chains management. Procedia Eng. 182 (2017) 763–769.

[24] Schuh, G.; Potente, T.; Wesch-Potente, C.; Weber, A.R.; Prote, J.P. Collaboration Mechanisms to increase Productivity in the Context of Industrie 4.0. Procedia Cirp 19 (2014) 51–56.

[25] Gorecky, D.; Schmitt, M.; Loskyll, M.; Zühlke, D. Human-machine-interaction in the industry 4.0 era.In Proceedings of the 12th IEEE International Conference on Industrial Informatics (INDIN 2014), Porto Alegre, Brazil, (2014) 27–30.