

Digitalization Adoption in Shipping Business Services.

Case study: Libya

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Abstract – In last decade, the increasing number of failing digitalization initiatives is alarming, and the insufficient attention paid to the risks of electronic business (e-business) issues and their management continues to be a key element of these project failures. While number of practical developments in e-business applications is increasing, the increase of implementation processes failures continues to be at an alarming level. This process requires a clear plan to ensure the successful implementation of e-business applications. The study aims to analyses the necessary progress and steps needed for successful digitalization processes implementation in business organizations. The main scope is the minimization of e-business risk. The approach taken is to identify and minimize the potential risks and to define a strategy of pre-arrangement progress in digitalization projects based on Frank's Model. A unified framework and empirically tested using collected data from field study involved participants from Shipping Service Enterprise in Libya, represented by senior managers in core company management processes. The case findings suggest that people, process and technology dimensions are considered to be the key issues of digitalization adoption in the shipping services sector in Libya. An implementation strategy developed centered on HEEK's model concluded with suggestions as to how digitalization processes can better support e-business management and implementation. The contributions of this paper include the identification and description of critical digitalization barriers and develop an implementation strategy for organizations grounded on the understanding of different roles of key dimensions with strategic alignment role of technology, people and processes.

Keywords – Information systems, e-business, strategy, Libya, shipping services, Process, Innovation.

I. INTRODUCTION

Most organizations in developing countries are struggling to realize the benefits of successful digitalization processes implementation and better management performance [1]. Furthermore, Argue that the outcome of successful implementation plan depends on several issues: one of the most important fundamental issues is to develop an implementation strategy that should be formalized in a unified framework, this approach can confidently support the concept of e-business innovation [2]. The organizations adopting digitalization strategy in order to minimize the risk of e-implementation failure [3]. Within the scope of this paper, the aim to focus on the significant role of key digitalization dimensions in ensuring a scientific involved approach in e-business implementation to support major limitations faced by current daily process [4]. The remainder of this paper is organized as follows; begin with a literature review of digitalization based on e-business, organizations and e-business deployment, explain the research methods, which uses a case study methodology. Next the cases are described and analyzed based on an HEEK's framework. The findings are presented through a discussion of the different roles of key implementation dimensions. The paper concluded with

contributions for current research. The addressed question is seeking how do shipping companies in Libya identify and manage activities that are the root cause of failure problems in digitalization projects?

II. THEORETICAL BACKGROUND

The wider concept of digitalization process that including all electronically facilitated information connections, both within an organization and with external stakeholders, for a range of business processes support [5]. The term therefore is taken to include the use of all information systems and related technologies, irrespective of whether they use the internet or is accessed via web technologies. The design of digitalization projects in the developing world stated that circumstances of developed world organizations may not meet an organization's requirement in developing world [6]. The results of IT/IS application implementation in developing world context suggests to focus on organization's key transformation dimensions[6] [7]. The key dimensions are mainly linked to technology, which represents infrastructure, ICT/IS and existing information; processes and management method; people capabilities and so on. There is still no agreement on a single specific approach that has been carefully chosen for digitalization projects in organizations in the developing world [9]. For example, e-business project among organizations in the developing world still seeking specific models based on requirement meets the nature of local organizations' environment [10]. However, there is a need to identify and map the potential risks of digitalization processes implementation as well as innovative tools for foundation and investigative tool for potential success implementation strategy and demand for appropriate evaluation models to be in place[11]. However, this variety of technologies and their applications makes it conceptually challenging to define digitalization. Building on prior definitions and adopted understanding of the field, the study will adopt the digitalization definition as 'use of digital technologies to innovate a e-business model and provide new revenue streams and value-producing opportunities in industrial ecosystems'. This definition holds at its heart the view that digitalization is much more than just the application of various digital technologies[12].

III. THEORETICAL FRAMEWORK

Frank's model argued that the development of e-business strategy could begin with the assessment of the actual organization's circumstances; the framework helps to support the assessment of an organization to capture its digitalization implementation barriers, drivers and readiness to accept new potential digitalized solutions. A fundamental is needed for the classification of three main elements for digitalization opportunity. These key elements are: Process, Technology and People Figure 1. Illustrates the elements of frank's model.

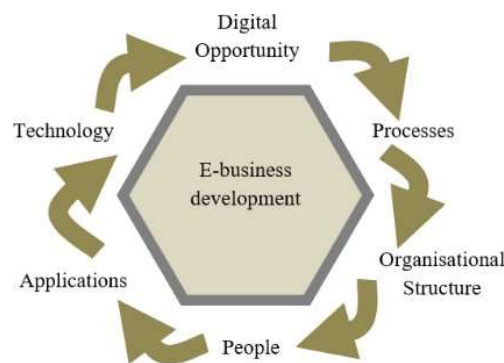


Figure 1 Digitalization Framework based on Key elements development processes Adapted by the authors from Frank (1997)

The Frank's model also supported by Heek's model [6], who argued that approaching an appropriate decision of digitalization implementation is depended on an organization's capacity to perform it and to an analysis several core key dimensions. The standard nature of the Heek's theory is based on technological aspect for the evaluation of current and designed systems in an organization's attempts to transfer to e-business processes. It is comparatively easy to measure the organization's existing technology state, which is stated as "the actuality". The outcome categories were identified as following: Total Failure where the initiative fails soon after the deployment is completed or later; Partial Failure when some benefits have been achieved but the central goals of the initiative are unachieved, or there may be unwanted outcomes; the last is Success of an Initiative situation of most significant desirable outcomes and the expected key goals are achieved. Heek's theory investigated and shaped the understandings into what often drives

deployment initiatives' success or failure as a blueprint for digitalization processes implementation. Aligning with Frank model theory, Heeks mode, formed the transformation between the professional knowledge (design) and the (actuality) organization's current circumstances as illustrated in figure 2.

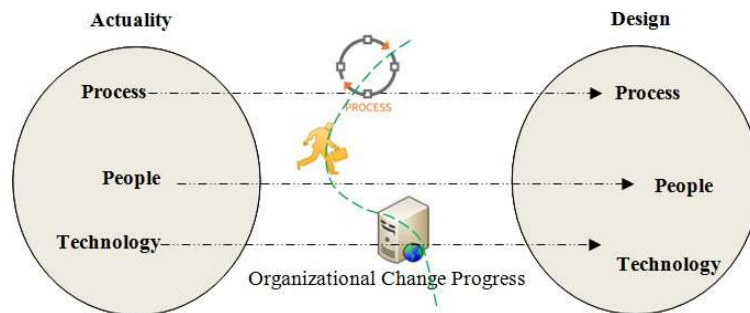


Figure 2 key dimensions of Digital Transformation Adapted from Heeks model [6]

Even with appropriate time for planning, analysis and design work, the initiative may not be applicable in a business environment designed to work in Heek's model [6]. However, to achieve the targeted goals of a transformation plan, several stages were indicated at the level of current e-business process. There is a growing interest in the analyses needed to track the details of risk that can lead to the failure of implementation process. In the case of Libya, currently, the failure keeps organizations in shipping services sector in Libya on the incorrect side of e-business. Thus, implementation success possibilities emphasis the way of how e-business can be designed and implemented within the daily companies' work processes framework [1]. However, a number of Business models have been developed to establish how an organization can move to an advanced level of comprehensive ICT/IS applications towards digitalization approach.[13], thus, there is no single proofed strategy for organization advantage achievement on the digital application. However, the shipping companies in Libya need to assess its current particular business process environment, identifying opportunities, overcoming barriers, and could also designing and implementing digital tools and applications that advantage to the organization itself, their business partners and their stakeholders [14].

IV. THE PROPOSED MODEL

Number of studies argue and developed models for assessment of the elements of digitalized business change in a developing world context; the model has been used for empirical studies on e-business maturity assessment in organizations in particular higher education sector in Libya based on joined critical factors [15]. The model will be adopted in this study and centered on three key concepts of digitalization which are: Technology; People; and Process concepts describes the footsteps of implementation strategy in shipping business sector in Libya. The transaction stages are involved in review of significant digitalization dimensions as key concern in implementation strategy. The study will adopt the model [15] which presents five stages of implementation phases contributing to continuous organizational readiness, people skills, and process and technology enhancement as illustrated in figure 3.

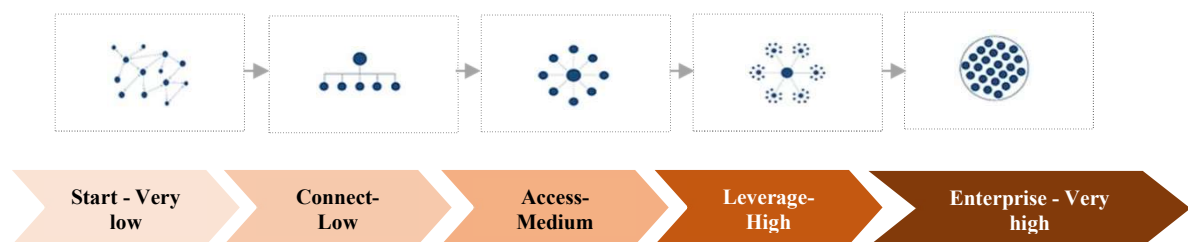


Figure 3 Framework of Digitalization progression assessment among shipping sector in Libya

From the above discussion, the strategy scenarios are based on two concepts: firstly, from the digitalization dimensions in each business process (dimensions harmonization), and targeting the lowest level of digitalization maturity which is considered as key critical processes for implementation development process. Secondly, once the allocated core organization process which is

considered as the most valuable process by the top managers, the implementation progression should focus the company's most valuable processes, and ensure that e-business development efforts should be taken at an organizational level, not at an individual or departmental level. However, the engagement of both above scenarios could support digitalization processes harmonization that could lead to better development of digital transformation in less risk of failure and generate initial e-core process implementation activities. Both scenarios will be performed and demonstrated on shipping services company in this study.

V. METHODOLOGY

A case study approach was adopted to scope detailed and intensive knowledge about digitalization in the selected case in context of shipping services sector. The approach aims to provide opportunity to gain a rich understanding of the research context and enabling answers of research question [16]. In addition to provides a deeper insight and understanding of the conceptual relations in explaining the existing situation. A key participant selected to be a person knowledgeable about current ICT and business processes in the RWD case shipping company and key process managers such as IT manager, records operation manager, and finance manager are the interviewees. However, for the present implementation strategy development research, RWD company was the selected case for data analysis, and in particular focusing on the development of CRM, business records management process as an established important process in this paper. However, based on the data collected from the study, a primary study was developed and conducted between the periods of (September 2020 to December 2020) in to selected case.

The Case study: RWD Case Shipping Agency is one of the largest companies operating in Libya in the field of maritime shipping and has four branches distributed in four Libyan cities with the largest sea ports in Libya. The company has been working in this field for more than 20 years. And it has more than 150 employees for various jobs. The company seeks to develop the quality of its services through digital transformation and the automation of its procedures. The main operations on which the company's system relies are summarized in operating and financial operations and tracking and following up the movement of containers.

VI. FINDINGS:

The study investigated how do shipping companies in Libya identify and manage activities that are the root cause of failure problems in digitalization projects? While there is evidence of satisfactory digital application readiness level and awareness at staff's management level of the importance of digitalization development, the implementation framework has already helped classify a number of issues which affect most process areas to some degree that need to be addressed at RWD company. Based on the case outcome, the emerged issues of critical digital implementation strategy barriers have been defined.

Based on the analyses of the Frank's and Heek's models outcomes, the emerged issues of critical digital implementation barriers have been defined. The barriers were based on the dimensions categories. Process barriers; (1) lack of clear reliable plan for digitalization processes management; (2) lake of clearly defined allocated budget; (3) lack of electronic based process and lack of top-level enforcement; (4) fragmented company's geographical location based on sea ports locations. Technology barriers are; (1) instability of the power electricity; (2) lack of reliable internet connection; (3) lack of reliable networks and infrastructure; (4) lack of structured electronic data and web-applications. People barriers are; (1) lack of training programs; (2) lack of people's e-skills; (3) lack of awareness of digitalization benefits; and (4) lack of digital strategy knowledge and interest.

However, the general manager shows high interest in adopting digital applications and readiness for starting digitalization strategy, but with lack of knowledge on the implementation approaches, the RWD company seriously need to adopt clear plan and take into account the above barriers for potential maximum benefits of digitalization project. These barriers were taken into consideration during the development of implementation framework strategy to be feed to an implementation plan of digitalization in RWD shipping company. The finding outcomes illustrated the possible high success of digital implementation at RWD shipping by identifying and managing the activities that possibly cause failure problems in digital implementation projects. While the most valuable processes assigned by the top-level managers at RWD shipping agency, operation management process has been selected for the demonstration of the digitalization strategy. Based on the assessment findings and, the highest level of implementation at the operation processes management was at the stage three (Access) in terms of Technology deployment and clarity of procedures, but, no clear plan for documentation was in place. The lowest potential digitalization level was at second phases (connect) as the company's staff and employees e-skills and awareness are still not enough for the high success adoption of the digitalization process. However, the proposed urgent implementation action should be started on the people dimension first and to be aligned with the process and technology available in the current situation. The required digitalization implementation phases in RWD operation

management process in are illustrated in figure 4.

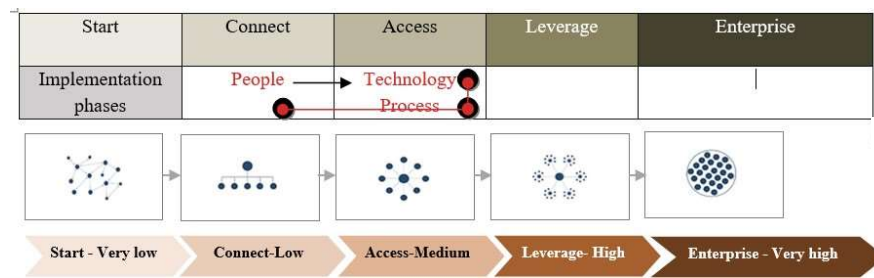


Figure 4 Digitization phases at Business Record Management (BRM) in RWD case



People Skills Development



Technology and Processes development

According to the RWD case results, the potential risk was in the people dimension. Therefore, the targeted development priority for digitalization should focus on the people domain where lower digitalization impact and skills were low compared to other two dimensions in order to maintain the harmonization. This progress is part of the whole development of implementation strategy process for starting a digital business development. As a result, the priority scenario for BRM process in RWD case is to develop its business domains harmonization starting from the view of people dimension. Figure 4 emphasizes the assessment of e-business maturity in the six key UOMS process based on scale framework.

VII. CONCLUSION AND IMPLICATIONS

The study has identified risks that threaten the success of digitalization adoption approach and has highlighted its effects on business development strategy decision. The study framework can be adopted as a useful analytical tool to study digitalization risks and its emergence, as well as demonstration of how the impact of digital business dimensions and related barriers are mediated through decisions or actions taken to solve risk problems. Future studies could focus on other contexts in organizations in the sector to release other internal and external dimensions and aspects related to digital applications adoption and successful implementation strategy.

REFERENCES

- [1] ALhawamdeh, M. A. (2007). The role of knowledge management in building e-business strategy. *organization*, 9, 20.
- [2] A. Trad and D. Kalpić, "The E-Business Transformation Framework for E-Commerce Architecture-Modeling Projects," *Encycl. E-Commerce Dev. Implementation, Manag.*, pp. 733–753, 2016, doi: 10.4018/978-1-4666-9787-4.ch052.
- [3] E. D. Seeman and M. O'Hara, "Customer relationship management in higher education: Using information systems to improve the student-school relationship," *Campus-Wide Inf. Syst.*, vol. 23, no. 1, pp. 24–34, 2006, doi: 10.1108/10650740610639714.
- [4] G. M. G. Adamantia G. Patel, "16 th Bled Electronic Commerce Conference eTransformation A Framework For Understanding and Analysing e-Business Models," *Bled Electron. Commer. Conf.*, vol. 2003, no. July 2008, pp. 329–348, 2003, [Online]. Available: <http://ais.bepress.com/cgi/viewcontent.cgi?article=1073&context=bled2003>.
- [5] D. Chaffey, "E-Business & E-Commerce Management," *D-Lib Mag.*, p. 722, 2011.
- [6] R. Heeks, "Information systems and developing countries: Failure, success, and local improvisations," *Inf. Soc.*, vol. 18, no. 2, pp. 101–112, 2002, doi: 10.1080/01972240290075039.
- [7] C. Avgerou, "Information systems in developing countries: A critical research review," *J. Inf. Technol.*, vol. 23, no. 3, pp. 133–146, 2008, doi: 10.1057/palgrave.jit.2000136.
- [8] F. Tamoradi, "Factors influencing the alignment of accounting information systems of accepted manufacturing firms in Tehran Stock Exchange," *Manag. Sci. Lett.*, vol. 4, pp. 429–438, 2014, doi: 10.5267/j.msl.2014.1.028.

- [9] R. Culpan, "The challenges and prospects of open innovation through strategic alliances," *Open Innov. Through Strateg. Alliances Approaches Prod. Technol. Bus. Model Creat.*, pp. 293–322, 2014, doi: 10.1057/9781137394507_14.
- [10] M. S. Nikabadi and A. Jafarian, "Effect of necessary factors for deploying e-business models on business performance and supply chain performance in auto industry," *Technol. Solut. Sustain. Bus. Pract. Asia*, pp. 153–174, 2015, doi: 10.4018/978-1-4666-8462-1.ch008.
- [11] N. Nikitakos and M. A. Lambrou, "Chapter 12 Digital Shipping: The Greek Experience," *Res. Transp. Econ.*, vol. 21, no. 07, pp. 383–417, 2007, doi: 10.1016/S0739-8859(07)21012-1.
- [12] V. Parida, D. Sjödin, and W. Reim, "Reviewing literature on digitalization, business model innovation, and sustainable industry: Past achievements and future promises," *Sustain.*, vol. 11, no. 2, 2019, doi: 10.3390/su11020391.
- [13] T. Murphy, "Achieving Business Value from Technology: A Practical Guide for Today's ...," *Acta Univ. Agric. Silvic. Mendelianae Brun.*, vol. 53, no. 9, pp. 1689–1699, 2015, [Online]. Available: <http://publications.lib.chalmers.se/records/fulltext/245180/245180.pdf><https://hdl.handle.net/20.500.12380/245180><http://dx.doi.org/10.1016/j.jsame>
<https://doi.org/10.1016/j.jsame>
<https://doi.org/10.1016/j.gr.2017.08.001><https://doi.org/10.1016/j.precamres.2014.12.0>.
- [14] R. Čiarnienė and G. Stankevičiūtė, "Theoretical Framework of E-Business Competitiveness," *Procedia - Soc. Behav. Sci.*, vol. 213, pp. 734–739, 2015, doi: 10.1016/j.sbspro.2015.11.528.
- [15] A. Bakeer and M. G. Wynn, "ICT Utilization in Libyan Universities: A Report on Case Study Research. The Ninth International Multi- Conference on Computing in the Global Information Technology 165-170. ICT Utilization in Libyan Universities: A Report on Case Study Research," vol. 6079, pp. 0–1, 2014, [Online]. Available: <http://www.iaria.org/conferences.html><http://www.thinkmind.org/index.php?view=instance&instance=CENTRIC+2014>
http://www.thinkmind.org/index.php?view=article&articleid=iccgi_2014_8_20_10133.
- [16] R. K. Yin, "Validity and generalization in future case study evaluations," *Evaluation*, vol. 19, no. 3, pp. 321–332, Jul. 2013, doi: 10.1177/1356389013497081.