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Transforming Libyan Organizations Through AI: Assessing Readiness and Strategic Pathways

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Abstract - In the recent years, Libyan business sector start to adopt technology and its business processes, with the ongoing digital transformation activities, many sectors in Libya are still struggling with the early stages of advanced technology deployments such as AI applications. There are many obstacles that handling Libyan organizations to be at the stage of deploying and using AI tools and applications for everyday activities and operations. This study ends to address the issue of AI Readiness among these Libyan organizations. The study focusing on the critical success factors that are acting as enabler and barriers to facilitate or hinder the integration and deployment of AI technology and business organizations. The study conducted case study methodology for collecting a qualitative data and develop structured survey that has been deployed for 18 participants across various sectors, including Healthcare sector, education and finance. The findings reveal group of critical barriers that influence of AI deployments, for instance, lack of digital infrastructure, limited internet access and reliability, insufficient government support, and lack of skills professionals. For managing these factors, the study developed a structured framework that outlining decisions and recommendations for organizations that willing to deploy and integrate AI application successfully. This framework elaborates the needs for assisting organizational readiness, help to set up a strategic objective, and selecting an appropriate AI Solutions. The conducting of this framework needs to be tested by a pilot process, implementing training programs and continuing improvement process. The study outline help to bridge the gap between theoretical benefits of AI applications and its practical deployments in the reality, delivering a pathway towards the future of using AI applications to increase productivity, innovation, and informed decision making. The organization need to pay attention for the important of collaboration between public and private sector to ensure sustainable and effective Ai deployments and integration within the Libyan business organization.

Keywords **– Artificial Intelligence (AI), Digital-Transformation, Readiness, Barriers, Decision-Making, Digital Infrastructure, Innovation, Productivity.**

I. INTRODUCTION

During the first growth of digital transformation process in the global digital era, AI can provide a significant support for digital transformation initiatives. AI help to establish a potential capability that are needed by the organizations to enhance and increase their effectiveness. The technology can also maintain environment of innovation, which lead to decision making improvement and enhancements (Bakeer, 2024). For the local governments, efforts have been done by the government to accelerate the digital transformation operations and activities and develop a national digital transformation plan to ensure successful of transformation. However, in Libya, digital transformation still at the early stages of the developments. Readiness are considerable one of the most critical factors that need to be sorted out. The deployment of AI could deliver significant opportunities to accelerate the digital transformation initiatives in Libya. In similar context, Saleh, (2024) investigate the barriers that incorporate with the digital transformation activities. According to the previous studies (Saleh, 2024; Bakeer, 2024) it has been discussed that there is an important urgency for the local governments to start planning for AI Technologies deployments within its infrastructure. This will accelerate the use of potential from a benefit of this technology to modernize the key sectors, and to moderate the economic recovery and the national growth. The organizations that have plan to develop their infrastructure for a digital transformation are importantly need to plan for establishing a structured strategic plan. This plan encouraged business organization to carry their AI basic technology utilization successfully. The study providing a framework that guide these organizations to overcome barriers and foster AI integration initiatives. Also, to establish a significant framework to bridge the gap between the theoretical potential of AI in transforming Libya's economy and the practical realities that organizations face in attempting to implement these technologies. Without understanding and addressing these barriers, Libyan organizations may struggle to compete in an increasingly globalized and digitized world.

II. The Research Problem

In Libya, many studies discussed local government efforts on conducting digital transformation. The ongoing efforts is to modernize its economy and infrastructure, where many sectors are still struggling by being at the early stages of digital transformation process (Göll and Zwiers, 2018; Saleh, 2024). The primary research problem centers around understanding how prepared Libyan organizations are to adopt AI technologies and what specific factors facilitate or hinder this process. According to the UN E-Government Survey 2024, despite the growing recognition of AI's potential to improve efficiency, enhance decision-making, and outgrowth innovation across sectors such as healthcare, agriculture, and public administration, there is a critical gap in assessing the readiness of Libyan organizations to

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implement AI. The evaluation of the current visibility of AI, on the assessment of the Readiness of the investigated Libyan organizations, will help to identify the most critical significant barriers that influence the deployments of this Technologies.

III. BENEFITS OF AI

Misra et al., (2023) understanding the benefits of artificial intelligence AI and the steps to implement it, and the critical needs for a strategy for deploying artificial intelligence to automate the analysis of big data quickly Information-based decision-making aspects. Aldoseri, et al., (2023) considered it as a critical factor to increase the productivity of institutions and the efficiency of their digital operational processes in Libya. Sectors such as healthcare and Education are trying hard to benefit from the capabilities provided by artificial intelligence as it can speed up daily procedures, reduce human errors and provide advanced analyses (Saleh, et al., 2024).

1. *Assessment of Organizational Readiness*

Before moving to deploy artificial intelligence technologies, institutions must work to assess their readiness. This assessment requires insights such as the current available infrastructure, data quality, Digital skills, and the digital literacy level (Uren et al., 2023). In addition, there are an external factor such as the quality and accessibility of the internet and network, and the support provided through government digital initiatives. These factors play a critical role in moving processes and procedures or integrating artificial intelligence smoothly within these institutions. (Yigitcanlar et al., 2021).

2. *Developing strategic objectives*

Reim et al., (2020) discussed the readiness of institutions for artificial intelligence technologies deployment, the study stated that, these institutions must create a deployment strategy and measurable to align the adoption of artificial intelligence applications on a large scale. The strategic goals of these objectives must take into account the challenges that are defined in these institutions in Libya. The objectives on conducting artificial intelligence tools are improving the efficiency of public sector institutions. For example, for improving healthcare institutions and their services, Artificial intelligence-supported diagnosis, as well as the process of flowing resource management. Therefore, developing a clear deployment strategy and knowing the objectives ensures that efforts to use and adopt artificial intelligence tools in a compatible manner, and the Institutional priorities must be measurable effectively (Hjaltalin and Sigurdarson, 2024).

3. *Choosing artificial intelligence solutions*

Through the study conducted by (Leone, et al., 2020) on the right choices on artificial intelligence applications, the study indicated that there are a set of critical factors that enhance or hinder the process of deploying artificial intelligence technologies according to a planned deployment strategy. Specifically, the institutions in Libya should prioritize the decision-making table planning to adopt the required artificial intelligence tools either from companies or providers of these technology, or that they are solutions that will be developed inhouse to match their specific needs (Brundage, et al., 2020).

4. *Pilot Projects for AI Integration*

Pilot projects allow organizations to mitigate the risks of large-scale implementation and finetune AI technologies before full deployment (Olutimehin, et al., 2024). However, the launching of small, controlled pilot projects that test AI's effectiveness in real-world environments is an important step. the launching of small, controlled pilot projects that test AI's effectiveness in real-world environments is an important step. In Libya, pilot projects in healthcare, urban planning, and agriculture could provide valuable insights into AI's potential to improve key sectors (Elmagdob and Aboubaker, 2024). These projects enable organizations to learn from early practices.

5. Training and Cultural Change

Jaiswal, et al., (2023) investigate the barriers of AI deployment, the study reveals that deployment of artificial intelligence technologies is not just a development of technologies within the institution, but it also needs a change in the culture of the institution. Institutions must include comprehensive training programs to equip their employees with the digital skills required and necessary to use such AI tools effectively, as well as rebuild the idea of using technology in business processes in a positive way. Thus, to ensure institution's direction towards change using artificial intelligence tools in Libya. since adopting the approach of using artificial intelligence tools, public sector institutions are still limited to use it, such specialized programs for training employees become of critical importance and specificity to ensure the process of integration and acceptance of modern technologies in business management and daily procedures. In any case, realistic navigation at the level of these skills and the change in the management culture is considered one of the important keys to increasing the process of successful deployment of artificial intelligence technology (Wynn et al., 2023).

6. Monitoring and Continuous Improvement

Follow-up and monitoring procedures and evaluation processes is very important for measuring the impact of AI technology deployment. The defined evaluation criteria and indicators ensures that the institution improves effectively and makes appropriate decisions about critical change and upgrades. The critical impacts of developing digital infrastructure must be taken into account (Bakeer and Wynn, 2014). Continuing updates of AI deployment strategies reflect the needs of technical improvements aligned with business needs, to ensure that AI technologies

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meet business needs and remain a valuable asset over time (Saleh, 2024).

IV. THE FRAMEWORK

Through the above literature review, an effective framework with key elements can be formed, as shown in Table 1. The table shows the set of elements in organizations that must be taken into consideration for successful deployment of artificial intelligence applications. It is concluded from the studies that were discussed. This framework shows the basic key steps required to ensure the success of AI application deployment initiatives, that are consistent and compatible with the strategic goals of the organization, and to address challenges, and obtain tangible benefits.

Table 1. key steps involved in successfully deployment of artificial intelligence applications

Title	Description
Assessing Organizational Readiness	Before implementing AI, organizations must evaluate their existing infrastructure, data quality, workforce skills, and external factors to ensure a smooth integration.
Setting Strategic Objectives	Once readiness is established, organizations should set clear, measurable objectives that align AI initiatives with their broader strategic goals.
Selecting AI Solutions	Organizations must decide whether to implement off-the-shelf AI tools or invest in custom-built solutions, considering their specific needs and the local expertise available.
Pilot Projects for AI Integration	Conducting small-scale pilot projects allows organizations to test AI's effectiveness in real-world environments and learn from early experiences.
Training and Cultural Change	Organizations must implement comprehensive training programs to equip employees with the skills necessary for using AI tools effectively and to foster a positive attitude toward AI-driven changes.
Monitoring and Continuous Improvement	Post-deployment, continuous monitoring and evaluation are vital for measuring AI's impact on organizational performance and ensuring that AI remains a valuable asset over time.

The table 1. shows the basic elements of deploying AI in the organization, and relies on the structured methodology to guide organizations with required procedures of AI deployment. It contains a comprehensive view of key elements and steps that affect the success of deploying these technologies, especially in organizations in Libya. The framework is based on the previous studies outlines, which is a roadmap that guides organizations through the different stages of the AI deployment procedures. Starting from ensuring the organizations' readiness assessment processes, developing AI integration strategies to the performance evaluation stage. The framework provides approach to increase the benefit of AI and identify potential challenges and risks as illustrated I the following table:

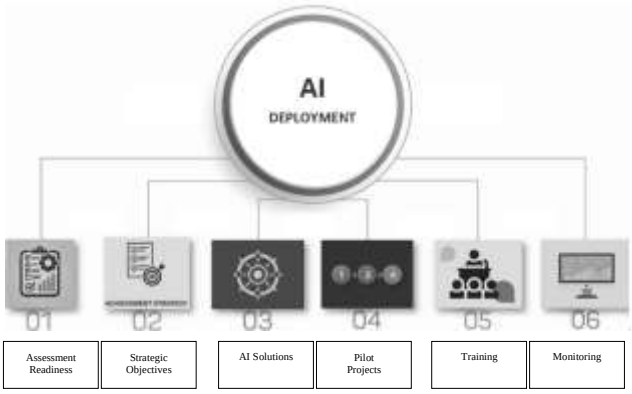

Figure 1. Structured approach Framework of AI Deployment

By being guided by this framework, organizations will be able to effectively leverage AI to achieve innovation, improve efficiency, and achieve their strategic goals. However, barriers always accompany which can discourage good performance in this case. Barriers include resistance to change, digital skills issues among employees, technical and financial barriers, all of which must be carefully considered and addressed, in order to ensure the successful and sustainable use of AI. Thus, by understanding how this model works, it gives justification for these barriers, which it considers to be critical factors to touch the larger opportunities expected from the use of AI within these organizations.

V. CHALLENGES IN AI DEPLOYMENT

Issues related to the skills gap, regulations and related legislation are barriers that organizations should consider. For example, Wynn et al., (2023) discussed these barriers and their impact on digital services in Libya. The study explored some of the challenges that hinder the deployment of some digital services, such as lack of digital skills, data quality, infrastructure and administrative changes in institutions, which resulting in loss of sensitive information that may affect the process of using AI effectively. The lack of frameworks related to data protection and the use of AI have also created challenges (Dwivedi, 2021). Addressing these barriers in advance will help Libyans in the process of AI smoothly (Saleh, 2024). These barriers highlight the urgent need for a comprehensive framework and methodology for AI deployment in Libya. The issues of skills gap and regulatory compliance are significant barriers, and organizations must address and considered as critical success factors. The interconnected challenges facing the use of AI in organizations have highlighted the need for a multifaceted framework. For example, Infrastructure and data quality are essential, and both need to be invested in to be operational and deployed effectively. Skilled labor is very important, and training is one of the appropriate

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solutions. Selecting AI solutions requires focusing on the real needs and available resources. Finally, monitoring these procedures and following up on the performance is an important process, especially since it must be aligned with the organization's strategic goals and needs. Addressing these barriers will support Libyan organizations to be able to reach the greatest opportunities available from AI-based applications to create a creative environment within the workspace, as well as improve and develop the organization and its human resources.

VI. THE METHODOLOGY

AI and digital transformation deployment studies has been conducted by several studies (Bakeer, 2024; Abdelmoneim, 2024). In the field of information system investigation studies, case of study approach has been used widely to collect and analyze the research results to ensure that deep understanding of the phenomenon is met (Yin, 2018). However, this is study use case study approach with a developing of questionnaire that has been used to collect the primary data from 18 participants in the different business sectors in Libya. The sector is including education, Healthcare, and finance. The case of study focusing on the qualitative data to evaluate the readiness of Libyan organizations in their usability of AI technology deployment (Yin, 2018). The data was collected from engagement participants who has the knowledge about the usability of ICT in the business development. The primary data supports capturing number of insights related to enablers and barriers of the AI deployments process. The questionnaire has both close-ended and open-ended questions. These questions are to maintain collecting of qualitative and quantitative data be used for result statistically and thematically analysis. However, this questionnaire was deployed to the participants via an online platform, ensuring that large number of targeted participants can be accessed to the platform, and engaging in the data collection providing insights about their experience on AI deployment and maintaining confidentiality.

VII. THE RESULTS

Data focused on an organization's experience, readiness level regarding AI deployment and utilization. The table 2 illustrates the key categories such as a usage, deployment duration, expected benefits. the organizational readiness, infrastructure conditions, employees' digital skills are also presented as a barrier. The results show the important of training programs to initiate the overcoming of the barriers face it during the implementation process. Based it on the results, the discussion of each category provides insight on the current statue of AI deployment, and highlights critical factories influencing organizations capabilities and preparedness of integrating AI technology. Following the discussions of the findings, the study developing a detailed interpretation to reflect the exploration and the implication of these results, examining the readiness levels and expected benefits of AI deployments across different sectors. The barrier and opportunities arise from this data are illustrated in table 2:

Table 2: Survey Results

Category	Findings	Implications
AI Usage	A majority of organizations are not utilizing AI, only a small percentage adopting it.	Low technology readiness
AI deployment Duration	Most organizations have been using AI for less than 6 months.	Resource availability
Benefits of AI	Common benefits reported include improved decision-making, operational efficiency, and cost reduction.	Technology and environment
AI Readiness	The majority of organizations feel unprepared for AI Deployment.	Organization readiness
Infrastructure for AI	Most organizations express confidence in their infrastructure to support AI.	Infrastructure readiness
Employee Skills for AI	Many believe their staff have the low necessary AI skills.	Human resources
AI Training Programs	A significant number believe there is a lack of adequate AI training programs.	Training and development
AI Goals	Most organizations have not established specific goals for AI deployment.	Strategic readiness
Challenges in AI Deployment	Most report no significant challenges to AI deployment.	Organization readiness and planning
Pilot Projects	A majority of organizations have not conducted pilot projects.	Innovation readiness
Effectiveness of AI Training	Most believe effective AI training programs are needed.	Continuous learning

VIII. THE DISCUSSION

According to the findings above, there are a complex landscape of organizational experience, and Readiness levels regarding to AI deployment and disability. However, the results spotlight on the opportunities and the barriers which is this organizations are struggling with when they are integrating AI based technology into their daily operations process.

1- Organizational Readiness and AI benefits

The reason is of AI usability and deployments presents significantly across participants and among organizations of different sizes. For instance, one Healthcare organization with over 250 employees, reported being will be prepared for AI deployment, specifically utilizing generative AI for text and image generation. This organization having adopted AI for 1 2 years, highlighted remarkable 200% increase of its performance alongside significant time and resource saving. The barrier presented even in this organization, including difficulties and integrating AI with existing systems, data quality issues, and worry about surrounding of data protection.

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Similarity, a financial sector organization reported a progressive impact on its decision-making capability process, they informed using Microsoft's copilot AI for less than 6 months. This initial implementation outlined an efficiency improvement, and operational facilitation. The informed that I deployment can provide tangible benefits once strategically aligned with decision making process.

2- Resistance to AI and Challenges

In the education sector participants present a different readiness levels and expected benefits has been presented. For instance, the participant from several education institutions including larger ones with over 250 employees, reported low readiness for AI integration in their institutions. Some institutions noted lake of tangible benefits, but there is one expressing that no advantages from AI have been realized it so far. Even there was indications of growing of AI usability, in particular by students and faculty members, there is absence of formal institutional efforts to integrate AI and two broader educational Frameworks. Situation ***spotlighted the missed of opportunity for AI to improve and enhance teaching and learning activities in this educational sector***. However, it has been indicated that more strategic and structured approach for AI deployment align it with institutional goals are necessity. Feedback from participants and the industrial sector indicates low readiness. With many responses reporting a minimal or no benefits from AI deployments. The Sector appears to be at early stages of conducting AI potential. Its facing challenges such as Low preparation, insufficient training, and minimal perceived impact.

3- AI Deployment Challenges and Opportunities

Table 3 emphasize the key barriers and opportunities related to the AI deployments and the Libyan organizations. Based on the results analysis, the discussion highlights the key factors influencing AI deployments and the usability of related tools and the participant organizations. Its revealing challenges and opportunities, and indicating that many organizations have yet to adopt AI, pointing to a need of understand the deployment process and decisions to be made for this plan. While those that have deployed AI are still at the early stages of the deployments, they are also facing challenges specific to the implementation of this AI Technologies. However, the organizations' usability is recognized it for enhancing the decision-making and operation efficiency within the participants organizations, but organization often still seriously struggling with lack of readiness and training required for successful integration. Although, the infrastructure is generally sufficient, a specific challenge is still remained. Finally, employees' skills are present at a basic level, which is yet significant skill Gap and a lack of comprehensive training program is it still in place. Few organizations have set clear AI goals or conducted pilot projects, underscoring the need for strategic planning. Additionally, challenges during AI implementation are common, and while many organizations find their training programs effective, there's room to further enhance these efforts to better support AI adoption.

Table 3: Key Challenges and Opportunities for AI Deployment in Libyan Organizations

Factor	Challenge	Opportunity/Action
AI Deployment	Many organizations not yet adopted AI.	Identify factors influencing deployment decisions.
Duration of AI Deployment	Most organizations are relatively new to AI.	Explore challenges associated with early-stage implementation.
Perceived Benefits of AI	AI is recognized for enhancing decision-making, efficiency, and cost-effectiveness.	Identify additional potential benefits and factors influencing their perception.
Organizational AI Readiness	Many organizations lack AI readiness.	Develop strategies to improve readiness and address underlying challenges.
Infrastructure Readiness	Most organizations have infrastructure for AI.	Identify specific infrastructure challenges and explore solutions.
Employee Skills	Most organizations believe employees possess minimum AI skills.	Identify specific skill gaps and develop training programs.
Training Programs	Many organizations lack adequate AI training programs.	Develop comprehensive training programs to address skill gaps.
AI Goals	Few organizations have established AI deployment goals.	Emphasize the importance of goal-setting for successful AI implementation.
Challenges During AI Deployment	Organizations report facing significant AI-related challenges.	Identify specific challenges and develop strategies for overcoming them.
Pilot Projects	Few organizations have conducted AI pilot projects.	Explore benefits and challenges associated with piloting AI technologies.
Training Program Effectiveness	Many organizations find AI training effective.	Identify critical factors to explore ways to enhanced training.

IX. CONCLUSION

The study provided detail its perspectives regarding the AI deployments and organizational readiness among Libyan institutions. While number of the participant organizations, notably Healthcare and finance have begun to realize AI benefits and required for the related deployment strategic plan, others, in particular the education and Industry sector, presented a struggling of substantial barriers to the deployment of this Technologies within their operational process. A structured approach that considering training programs, infrastructure development, pilot projects, and development of deployment strategy is a vital to overcoming the barriers and the obstacles for unlocking AI's potential. However, by addressing the challenges identified in this study, the organizations and Libya can be able to positively progress towards an AI-driven future that help to enhance productivity, innovation, and decision making cross various sectors. Embracing AI deployment represents both a convincing opportunity and hard challenges for organization in Libya aiming to modernize their operations process and contribute to National Developments.

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