

Organizational Readiness for Artificial Intelligence Adoption

Marta PALADE¹, George CARUTASU^{2,3}

Abstract – Technology evolves with a rapid speed and organizations are facing the need to adopt AI technologies to keep up with innovation. Although new compared to other technologies, AI readiness adoption can and should be normalized under an existing model for digitization.

Keywords: AI Readiness, Digitization, Innovation

I. INTRODUCTION

AI adoption necessitates a significant level of implementation complexity [1]. This is due to the design specifications and intellectual obstacles associated with AI, aspects which differentiates it from other digital technologies that are often simple to use and install [2]. Despite its complexity, its nature as general-purpose technology [2] allows to assign it under the digitization and innovation adoption within organizations. Studies [3, 4] suggest that organizations are not able to successfully adapt new technologies.

In this sense, this study proposes that the wheel does not need to be reinvented, but rather organizations can learn and adapt from previous digitization adoptions. Based on literature review, this study aims to develop an AI readiness model starting from already defined factors needed for digitization and innovation adoption. Based on prior academic and industrial research, each of these factors encompasses several sub-factors.

II. ORGANIZATIONAL READINESS FOR DIGITAL INNOVATION

Technology advances at a breakneck pace, making it challenging for both individual and organizations to stay up with digital innovation. Multiple components, such as top management support for adopting an innovative culture, IT infrastructure preparedness, and human resources openness to change management, are

required for digital innovation adoption in a business. Previous research [3, 4] suggests that companies continue to fail into innovation adoption, regardless the digital technologies easiness to use and implement [5].

Because the organization are not ready and do not pursue to implement new technologies, fresh ideas do not materialize into products or services. “Readiness” and “innovation” terms have two connotations [6]:

- a) the new technologies adoption capacity and
- b) fostering and facilitating innovation.

This study aims to describe organization’s readiness to deliver innovation through AI and adopts a previous definition of organizational readiness [6], namely “an organization’s assessment of its state of being prepared for effective production or adoption, assimilation and exploitation of digital technologies for innovation”.

The literature contains a vast number of restudies on organization’s readiness for digitization and innovations. However, the scope of this research is not to present a literature review on the readiness of organizations to adopt innovations and digitization, but rather use an already existing model on organizational readiness for innovation and from there adopt some of the factors which, based on the literature, can be relevant for AI adoption. A recent study on the topic was conducted by Lokuge et al. [6].

The structure of this article is split into the following parts:

(a) A qualitative study aiming to develop a prior model based on interviews conducted within nine organization, more exactly with the chief information officers (CIOs) based on the ‘readiness theory’ [7, 8, 9];

(b) The developed prior model is tested with a group of 26 top IT executives that attended a monthly CIO business seminar series. According to the model, the below areas must be considered when questioning the organizational readiness for digitization and innovation adoption.

¹ Politehnica University of Timisoara, Romania, marta.palade@student.upt.ro

² Faculty of Computer Science for Business Management, Informatics, Statistics, Mathematics Department Romanian-American University, Bucharest, Romania, george.carutasu@rau.ro

³ Doctoral School of the Politehnica University of Timisoara, Romania, george.carutasu@upt.ro

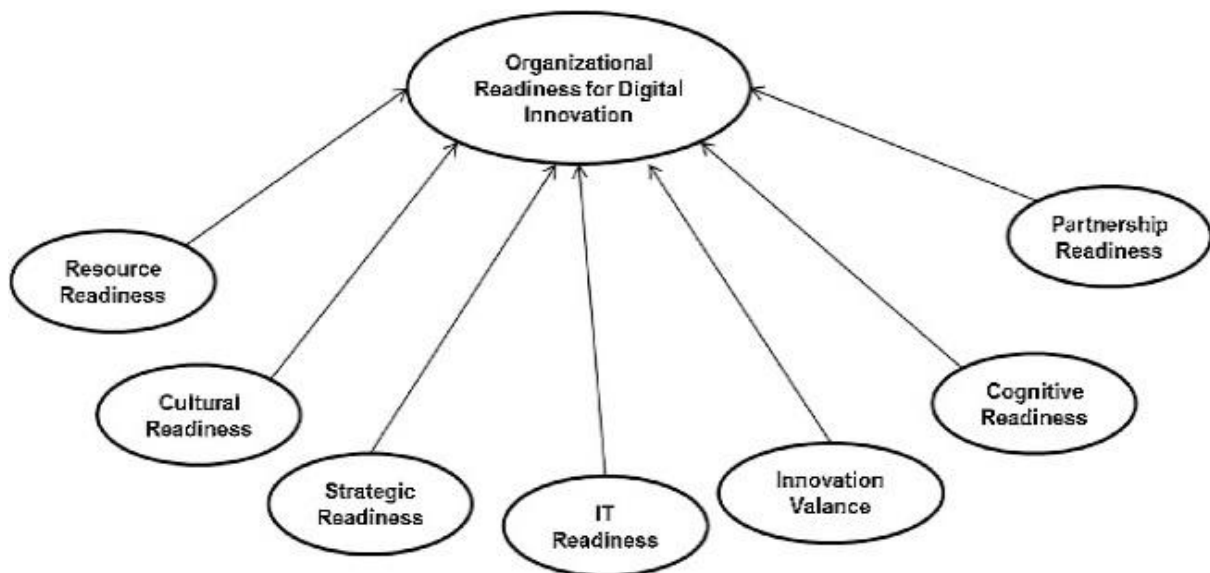


Fig. 1: Digitization Readiness in organizations [6].

As AI technologies are also under the digitization and innovation umbrella, this study will use the same factors as a starting point for aspects which need to be looked at to define an organizations readiness for AI adoption. The detailed factors chart is presented in the below section “Organizational *readiness for AI adoption*”.

III. AI ADOPTION

The need for AI adoption in organizations

In its simplest form, an AI model is a tool or algorithm that is trained on a certain data set, and it can make a judgment – all without human participation. AI models are becoming increasingly valuable in most business due to their capacity to perform a wide variety of problem-solving tasks.

The rising usage of modern digital technologies is revolutionizing industrial processes and product development activities [10, 11]. AI adoption represents an important topic in the organizations. According to the McKinsey & Company [12], in 2021 AI adoption had a rise to 57 percent from 47 percent in 2020 according to the respondents. These were the case of organizations with headquarters in emerging economies such as China, the Middle East and North Africa. According to the study [12], the most common scenarios for the AI adoption were in the below areas:

- Service-operations optimization
- New AI-based enhancements of products
- Contact-center automation
- Product-feature optimization
- Predictive service and intervention
- Customer-service analysis

By having a highly flexible and efficient manufacturing system, such adoptions enable enterprises to make customized items under mass production economic conditions [13]. This is especially relevant for AI, one of the most frequently mentioned in this context, which although not long ago

was considered a futuristic approach, the fast-forward availability of Big-Data and more powerful computers had an immersive impact on AI evolution as well. The three aspects are closely related since AI algorithms need large amounts of data to be trained against, data being available due to Big-Data and powerful computers allowed a shorter time for training the algorithms on the now available data.

AI adoption in organizations is also supported by the decision-making theory. As mentioned above, the management makes repeated decisions and with time it tends to use their instinct instead of using the pure processed data. One of the reasons for such behavior can be the large amount of available data and the lack of a system that supports in presenting it in a systematic form. Cost savings is yet another need for organizations to adopt AI and can become a competitive advantage. According to [12], although the revenue benefits remained steady compared to the previous survey done in 2020, AI adoption represented a great tool in decreasing the costs in areas such as product development, marketing and sales, strategy and corporate finance.

AI adoption readiness

Considering the AI’s complex nature, before designing usage scenarios, the comprehension of the new technology is mandatory [14]. This represents one of the reasons why most of the organizations remain in the interest or piloting phase and not adopt AI in its core activity. AI readiness and adoption research are still in their immaturity. As a result, researchers and practitioners lack direction on how to implement AI.

One of the studies on this topic was described in [13]. The authors of this paper address five separate categories of AI preparedness aspects and the actionable signs that accompany each of them. In this study 25 AI experts were interviewed, and the results have been cross-checked using the scientific and

practitioner best practices. The results were drawn into a schematic fashion (Fig. 2).

They demonstrate that readiness is a natural aspect of the adoption process, rather than a pre-requisite condition [16]. As a result, they argue that creating preparedness once prior to technology adoption is unsustainable because the two concepts are inextricably linked and mutually reinforcing. To enhance the perspective over the company, as a whole, it

should reinforce the investigation, by inquiring together the readiness and the adoption of the new technologies.

From the interviews, the authors found out that there are five assessments areas on the organizational level, namely: *Strategic alignment, Resources, Knowledge, Culture, Data*. A detailed definition of each factor that have an impact on the AI adoption readiness can be found in the specific study.

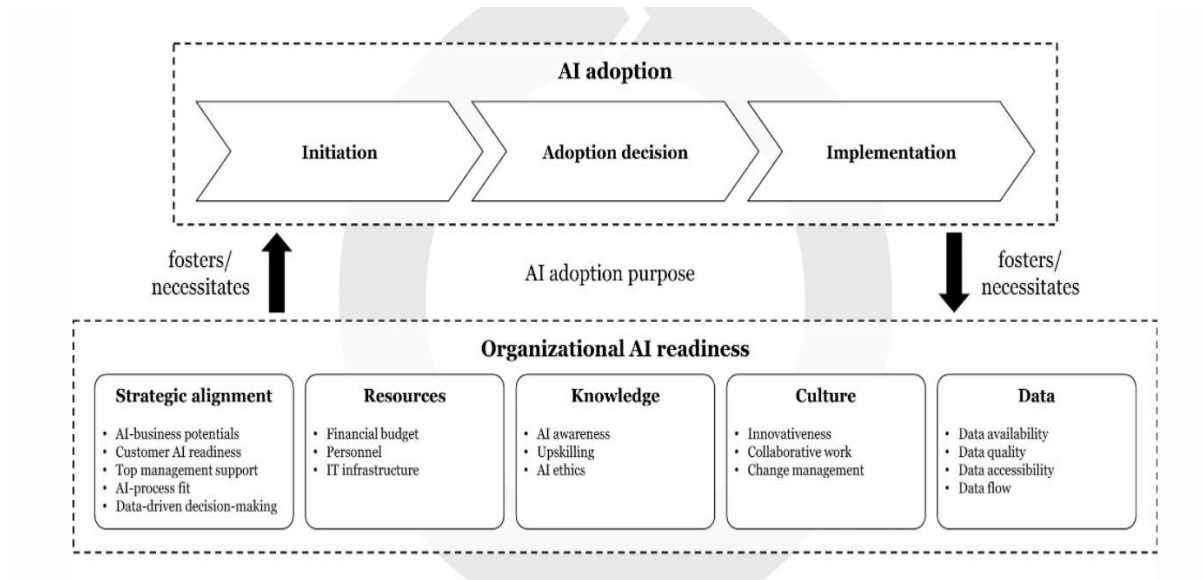


Fig. 2: Integrating AI Readiness in the AI Adoption Process [15].

Organizational readiness for AI adoption

Adoption of Artificial Intelligence is relatively new idea for most of the organizations. Although this technology's adoption is visible in a vast number of academia researches or large consulting companies reports, the lack of a proper framework for AI readiness represents an impediment for companies in seeking to include AI models in their operations or to define what are the missing pieces that represent a blocker for such a system to be adopted.

An earlier study [17] noticed that, because of a lack of preparation, around 90 percent of ideas never make it to the clients. It's worthwhile to know that forty years later another research undertaken by Gartner [18], a technology consulting firm, derives very similar conclusions, emphasizing the fact that firms miss out on significant possibilities due to a lack of preparation.

As above mentioned, AI readiness is deeply connected to digitization and innovation readiness in an organization. Previous research [15] suggests a model in which AI readiness concept is part of the entire adoption process. This is however isolating AI technologies adoptions and putting a complexity stamp on them. While it is important to always come back and improve the process through the adoption phase, it is beneficial to have some factors which can be checked when discussing an organization's readiness for AI adoption. Also, although AI technologies have some properties which differentiate them from other digitization projects (e.g., CRM or ERP adoption), for

organizations would be easier to embrace a process with which they are already familiar. Organizations (should) adopt always to new technologies and having the possibility to determine the affected areas in the business which should receive attention when contemplating the organization's position towards AI adoption would increase the percentage of companies which enroll in testing its readiness.

In this sense, this study makes use of the template for digitization and innovation readiness developed by previous literature [6]. Using these factors as main areas towards which organizations should turn their attention to check its readiness for AI adoption, to each of these factors several sub-factors that should be considered are added. The sub-factors are collected from literature such as [15] and combined with the output of the research conducted by the consulting company McKinsey & Company [12]. The last study is important because it is not so much based on the literature review as the first one, but rather conducted among 1843 organizations from different regions, industries, company sizes and occupations. Moreover, it showcases approaches which make the difference for a company in becoming an AI outperformer.

The proposed model has six factors [6], each of them containing other sub-factors:

- **Resource Readiness:** focuses on the company's "flexibility" in designing and reconfiguring its resources to meet the needs of digital innovation. Broadly speaking, resource

readiness illustrates how relevant resource flexibility is, when it comes to changing the configuration of IT [19, 20]. The resources also include human capital and information technology infrastructure, both of which are considered factors of innovation

- *AI processes fit*: it explains how an organization’s AI strategy and practices must work together to improve AI readiness. As per [10, 11] high performance companies adopt process such as “Protocols in place to ensure data quality” and “well defined processes for data governance”.
- *Financial budget*: refers to the amount of money that companies put into AI adoption.
- *Change Management*: aids employees in comprehending and adapting to AI-induced organizational change
- **Cultural Readiness**: is described as having strong enough fundamental values to support digital innovation in an organization. For example, Google, Apple, and Facebook all have robust corporate cultures that foster creativity [21, 22]:
 - *Decision making mechanism* - AI adoption is more welcome in an environment where Data Driven Decision making is encouraged [15];
 - *AI ethics*: presents novel ways for avoiding unethical AI outputs due to biased learning or incoming data.
- **Strategic Readiness**: consists of a collection of managerial activities carried out by a company to promote digital innovation:
 - *AI business potential* - the fit and compatibility of an organization with AI developments is described by AI-business potentials. Because AI technologies are highly connected to data, data availability and data quality support this potential, as the first is a fuel to the AI solution, whereas the second characteristic determines the accurate outcome;
 - *Top management support in adopting AI*: indicates a willingness to begin AI projects from the top down while simultaneously supporting bottom-up initiatives.
- **IT Readiness**: is the IT portfolio’s ability to foster digital innovation in a firm. Companies that use information technology to support core capabilities will have more strategic flexibility, which could lead to increased innovation and performance, according to the literature [19]:
 - *Create artificial data to train models when there isn’t the possibility to generate enough genuine data sets*;
 - *Take a full life-cycle approach to developing AI models*;
 - *Capacity to refresh the AI/ML tech stack*

at least annually to take advantage of the latest tech;

- *IT infrastructure*: should enhance the AI integration and to be prone for data intensive training.
- **Partnership Readiness**: refers to the degree to which an organization’s digital innovation is supported by external stakeholders. Customers and users play complementary roles in fostering digital innovation, according to previous study [23]:
 - *Customer and other stakeholders AI readiness Innovation valence* - when considering AI adoption, discussing customers and other stakeholders’ capacity to positively react to the new technology adoption;
 - *Capability to teach users how the models work*;
- **Cognitive Readiness**: established as a company’s ability to promote digital innovation through its knowledge base. Personnel knowledge, skills, and adaptability are emphasized in previous work [24, 25] as essential ready components for digital innovation:
 - *AI awareness* – cognitive AI capabilities such as perception, prediction, and generation should be understood conceptually by personnel.
 - *Have well-defined AI capability* – building programs to develop personnel’s AI skill capabilities.

For visual convenience, the model is captured in Fig. 3.

IV. LIMITATIONS OF THE STUDY AND FURTHER RESEARCH

This study aimed to create a readiness model for AI adoption in organizations. The goal has been achieved but with some limitations which can be conquered in future research. Although the proposed model has a strong base, having as steppingstone findings from the previous research, it has not been tested in the industry yet. Hence, the first step in improving this study is to conduct interviews with organization ‘s CTOs/CIOs and understand if this model is indeed something they can use when discussing the organization ‘s readiness for AI adoption. In addition, finding the order in which these factors should be discussed can improve this research. Another further study could be done by looking at what readiness for each of the sub-factors means in a more detailed perspective (e.g., the economics of AI adoption - the investment which needs to be done versus the benefits brought by AI adoption).

Next, modalities to embed AI models into other already adopted digitization projects (e.g., adding AI on top of an Enterprise Resource System) represents a topic which could be discussed.

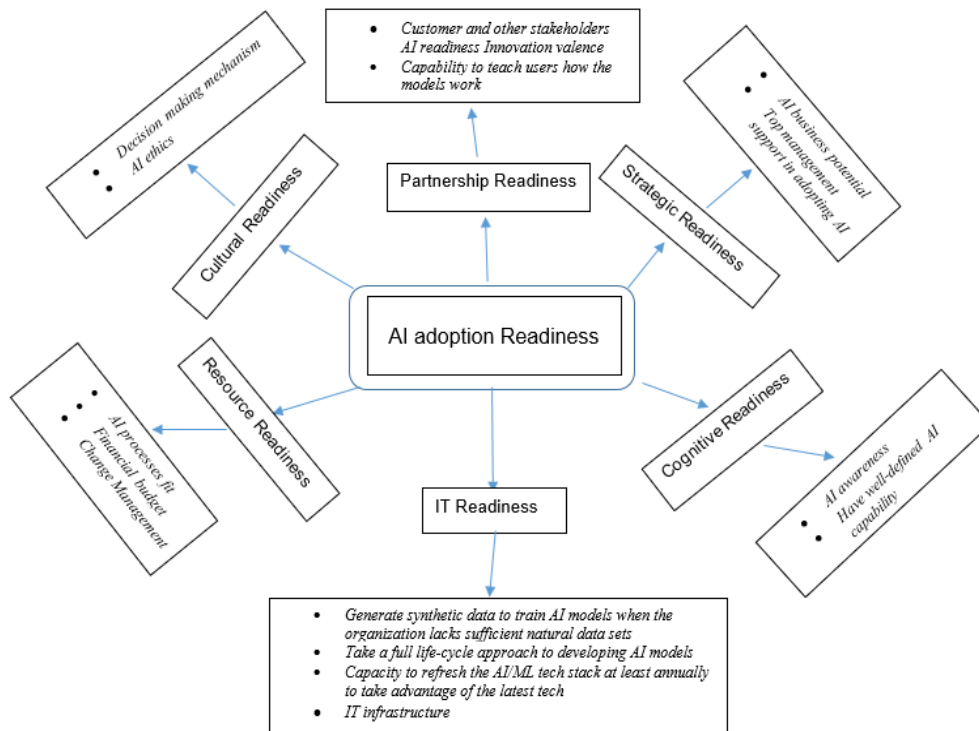


Fig. 3: Organizational Readiness for AI adoption Source: Self – made

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