Digital Maturity: Theory and Models Applied to Businesses in Vietnam

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Abstract. Factually, digital transformation has become an inevitable trend for businesses in the world as well as in Vietnam. However, to gauge the extent of businesses' digital transformation, we need to know how digital maturity is. This article introduces the concepts of digital maturity, the relationship between digital maturity and digital transformation, as well as digital maturity assessment models that already exist in the world, and offers a model that can be applied in Vietnam.

Keywords: Digital Maturity · Digitalization · Maturity Model · Digital Transformation

1 Introduction

Technical transformation is one of the hot issues of enterprises in the current period. The 4.0 technology revolution has created pressure on businesses to change to adapt to the rapid development of technology. Enterprises are forced to apply new and modern technologies in business activities to create competitiveness. Along with digital transformation comes the concept of digital maturity. Digital maturity is not only simply an assessment of the existing technical or technological aspects of the business, but it is also a holistic assessment of all activities and parts of the business.

Around the world, many authors have come up with the concepts of digital maturity. However, in Vietnam, this concept is still quite new and strange to many people.

"Digital maturity is about integrating your organization's operations and human capital in digital processes and vice versa" - WalkMe pioneered the Digital Adoption Platform (DAP) for organizations to utilize the full potential of their digital assets.

"Digital maturity-integration of organizational operations and human capital into digital processes and Vice versa-digital processes into organizational operations and human capital" [1].

"Digital maturity – how organizations systematically prepare to adapt consistently to ongoing digital change. Digital maturity draws on a psychological definition of "maturity" that is based upon a learned ability to respond to the environment in an appropriate manner" [2].

"The term "digital maturity" is closely related to digital transformation. We can say that digital maturity is the final stage of digital transformation, which companies aspire

to achieve, those companies that have achieved such digital maturity, have now witnessed important improvements in the operation of the company, and have also increased customer satisfaction" [3].

Digital maturity (DM) is a new field so there is no standardized concept. Through the concepts put forth by many authors, we can also see the commonalities of digital maturity. It can be said that digital maturity is the implementation of digital achievements into business processes. We can see, that digital maturity is closely associated with digital transformation (DT). However, it is important to understand that digital maturity is not digital transformation or digitizing. It can be understood that "digitizing" is the process of modernizing and converting conventional systems to digital systems (such as converting paper documents to soft files on computers, digitizing television and converting them to digital formats) [4], from analog broadcasting to digital broadcasting…); On the other hand, "digital transformation" is about exploiting the data obtained from the digitization process, and then applying technologies to analyze and transform that data and create new values. "Digitizing" can be viewed as part of the "Digital Transformation" process. Meanwhile, digital maturity is a measure of the level of digital transformation of a business. The higher the level of digital maturity, the more successful the business is in digital transformation and its ability to meet the needs of the market. Digital maturity is the process of gradually integrating and implementing organizational processes, people, and other resources into digital processes and vice versa.

The term "mature" implies a state of complete development and is the result of the continual development of a system. Digital maturity represents the state or position of digital transformation that a business has achieved and how they are prepared to adapt to create competitive advantage opportunities in the marketplace. Therefore, digital maturity is not only the use of modern technology or the application of information technology systems, but also manifests itself in digital management in aspects of reshaping products, services, and processes, skills, culture and strategies. Therefore, DM is an overall concept related to the technology aspect and also the management field of DT. The different levels of digital maturity reflect the state of an organization's digital foundation and its strategy in developing a business advantage. Furthermore, DM is dynamic and tends to change with the constant flow of the digital landscape, which requires companies to evaluate DMs at specific intervals.

Put simply, Digital Maturity is the ability of an organization to respond and take advantage of technological developments that change how the market functions. A company that is digitally mature will be able to respond to technological innovations and changes in a market, whether it has initiated those changes itself, or whether it has no control over them at all.

2   Digital Maturity Models (DMMs)

We will first look at digital maturity models (DMMs) that already exist around the world. From there, we will consider and select digital maturity assessment models suitable to the conditions of enterprises in Vietnam, especially suitable for small and medium-sized enterprises.

Digital Maturity Models are considered as a toolkit to assess the status of DT, thereby providing information on potential growth paths for businesses. DMM will help managers navigate what an organization needs to focus on during digital transformation. DMM uses sets of criteria in each defined area to evaluate the ability of a business to digitally transform. Through that set of criteria, the DMM describes aspects of an organization's operations and measures them at different levels, then systematically shapes the digital transformation process to achieve that level. The highest is digital maturity [4]. A model will have many sets of criteria that describe the factors which businesses need to measure and impact. Criteria are specific, distinct, and measurable factors. Criteria set represent important and independent aspects of the DM process. Maturity also indicates an organization's digital maturity, including progress in improving overall digital maturity. Digital maturity can be seen as an expression of a business's performance and ethos and serves as the "foundation" of digital transformation. There are many different models in the world, such as:

2.1 The MIT and Capgemini Digital Maturity Model [6]

This is the oldest model, launched in 2011, and has a matrix form, divided into only 2 large sets of criteria: conversion management and digital adoption. At the same time, the model outlines four levels of organizational digital maturity, including

a. Beginner level: low level of digitization and managers not ready for changes
b. Fashionistas - digitize businesses at a high level, but managers have not met the needs of digital transformation
c. Conservatives - managers have a high degree of willingness to change, but a low degree of digitization
d. Digirati - high degree of digitization, managers fully meet the needs of businesses during digital transformation.

The model is relatively easy to apply but needs to depend on expert opinion. Especially, when the information is incomplete or inaccurate, it cannot be evaluated (Fig. 1).

2.2 ODM3 - Open Digital Production Maturity Model of the Moscow School of Management Skolkovo

This model is given by the authors of the corporate training center of the Moscow School of Management Skolkovo [5]. This model offers three sets of criteria:

a. Design and prepare technology
b. Manufacture
c. Manage

Each set of criteria will include many specific criteria for each stage. As can be seen, the model is only suitable for large-scale export enterprises. Although this model is simple in application, it requires a lot of time to evaluate because it has to perform in
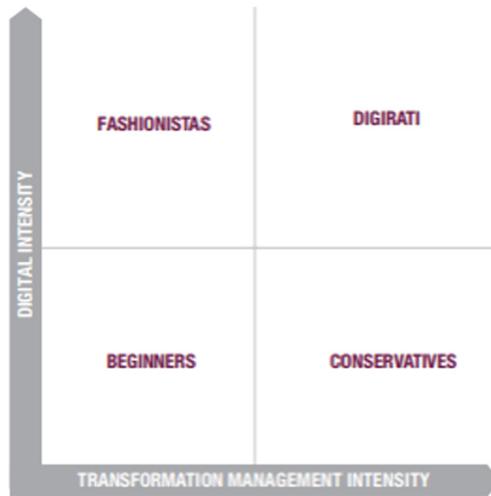
Fig. 1. The level of digital maturity

detail each set of criteria. Also, the downside of this model is that it doesn't take into account the characteristics of each level of digital maturity.

2.3 TM Forum's Digital Maturity Model

The model includes the following components:

a. Customers
b. Strategy
c. Technology
d. Operation (operational process)
e. Organizational culture and people

The model consists of five components with 175 specific criteria, especially suitable for the needs of private enterprises. The biggest advantage of the model is that it can help businesses analyze in detail the level of digitization and digital maturity, and the application is quite business. However, the model is not publicly available, but it is indicative only (Fig. 2).

2.4 Open Digital Maturity Model (ODMM)

The model evaluates the current digital maturity of the business against the set goals. The model is represented by a pie chart. The main sets of indicators include:
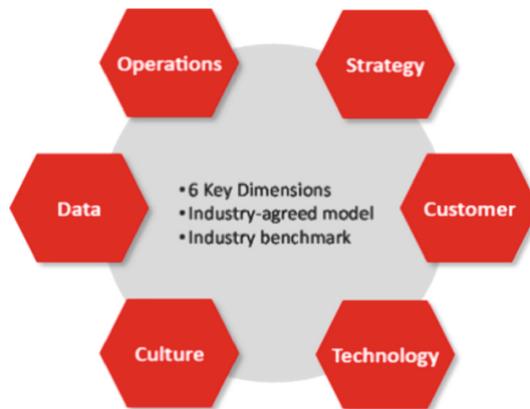
a. Strategy
b. Customers
c. Culture

Fig. 2. TM Forum's digital maturity model [8].

d. Innovation and lean manufacturing
e. Big Data and AI
f. Technology

This model can be applied flexibly to many types of businesses, but it is still best suited for businesses in the digital and information technology sectors rather than man-ufacturing and services [9]. The model has the advantage of a fairly detailed assessment of the digital maturity of the business in many different aspects, but it takes a lot of time with the evaluation criteria and it also does not provide a full methodology.

2.5 Model of Digital Maturity Universität St. Gallen [7]

This is a model with nine components, each component is evaluated based on surveys with a total of 64 specific indicators [10].

a. Customers
b. Products
c. Strategy
d. Organization
e. Digitization process
f. Cooperation
g. Information technology
h. Culture
i. Conversion Management

This is one of the open, publicly available models for businesses and organizations to refer to. The evaluation model is conducted through surveys and is relatively easy to apply. However, the model does not give specific levels of digital maturity of an enterprise, so it is difficult to be fully and accurately assessed.

In addition to the above five models, there are many other models to assess the digital maturity of enterprises. But in general, models are evaluated by themselves or through a third party. Through the models, we can see about 55 sets of criteria, and each set of criteria includes 5 to 6 specific criteria.

The most common set of criteria in DMMs is technology, which is natural since digital transformation cannot be without modern technology. Criteria for organizational performance, digital applicability, and flexible IT systems appear in most DMMs. A set of leadership criteria is also emphasized in many models, which show how influential leadership is in digital maturity. Strategic and customer factors are also used a lot by the models.

Each model has its own characteristics, both strengths and weaknesses. Some detailed criteria in one model are the main criteria of another model and vice versa. Models are consistent on some sets of criteria but may differ on detailed criteria [11]. For example, Forrester and Gartner point out that culture is a key dimension, while PWC considers it as a cost criterion which details in the set of organizational criteria.

3   Digital Transformation and Digital Maturity in Vietnam

According to Huawei's GCI statistics in 2020, Vietnam ranks 55 out of 79 countries in digital transformation with 41 points. The 79 countries assessed for digital transformation contribute to 95% of the total global GDP. Countries in the Starters position in the digital maturity model – including Vietnam – have the highest compound annual growth rate (CAGR) at 4.95%. Starters are also the fastest growing telecommunications services, with broadband phone network usage increasing 2.5 times; a number of countries in this group achieve nearly 100% of nationwide coverage. Average 4G usage also increased sharply from 1% in 2015 to 19% in 2019. Some countries have 30% of the population with access to 4G bandwidth speeds.

Vietnam is aiming to raise the level of digital maturity by one level. In particular, in the current COVID-19 situation, countries with a higher level of digital maturity will have an advantage in responding to challenges at this time, reducing losses to GDP by about 50%. Organizations in countries with higher GCI scores also have a faster response to COVID-19 through the use of digital technologies and services amid zoning and social distancing regulations. Thanks to high-speed bandwidth, cloud services, AI, and other technology solutions, countries with a high degree of digital maturity can shift to e-commerce platforms and digitalize processes, business processes to continue organizational activities.

According to APAC's Digital Maturity in SMEs study, Vietnam is also becoming more digital, with a high focus on investment in cloud technology (18%), and IT software and hardware upgrades (10.7%). However, these businesses show that there is a shortage of digital and talent, a lack of a solid IT foundation for digital transformation, and a lack of digital thinking leading to cultural challenges for businesses organization. Which, more than 60% of SMEs in Southeast Asia have applied digital transformation, reflected in the enhancement of the Internet and the increase in smartphone use.

In summary, although Vietnam's economy has recently become active, especially in the private sector, small and medium enterprises, which accounted for a very large

proportion in Vietnam. Digital transformation has taken place as a natural need of many businesses, especially digital transformation in business activities to meet the changing consumption behavior of customers. As for digital transformation in corporate governance, although the transformation is still slow, there is a relatively large percentage of enterprises that have digitally converted their management and internal operations at a basic level. In addition to the activities of transforming sales, marketing, management and operation models, many businesses see digital transformation as an opportunity to create new products and services, towards changing their nature enterprise quality. Although these activities have just started in Vietnam, they have attracted great attention from the business community. It is expected that in the near future, many businesses with breakthrough business models will appear completely shifting to a business model in the digital environment.

Up to the present time, the Government of Vietnam is only oriented to build a digital government, however, there is still no guidance on assessing the maturity level to help agencies and organizations determine the location and goals of the digital government … development of digital government. Therefore, the issue of assessing the maturity model of digital government should be mentioned in topics, seminars, conferences… related to digital government to help agencies, the organization understands its maturity level. The assessment of digital maturity is also a necessary factor for Vietnamese enterprises to have a defined basis and a theoretical foundation for strategic orientation for common development.

4 Proposed Model

In Vietnam today, the majority of enterprises are small and medium-sized. For these small-sized Vietnamese enterprises, applying too many sets of criteria can lead to inadequate implementation costs, people and time. But providing only a few sets of criteria will not help businesses appreciate the true level of their digital maturity. Therefore, the proposed set of criteria needs to ensure that all key aspects of a business's digital maturity are fully assessed, while at the same time ensuring that the business is capable of doing it.

The authors propose that five sets of criteria for the DMM framework can be applied to many industries and fields for small and medium-sized enterprises, including Strategy, Technology, Organization and Culture, Customers and Operations. This is a set of criteria that will have a great and long-lasting impact on the digital maturity of businesses (Fig. 3).

Customer   Strategy   Technology   Operations   Organisation & Culture

Fig. 3. Recommend digital maturity model

4.1   Strategy

Having a vision and strategy towards what are the "outcomes" of digital transformation is essential to assessment. This guides the overall transformation direction.

Sustainable businesses are processes driven and having technology integrated within these processes; significantly enables digital transformation. The scientific literature has analyzed the theoretical concepts involved in strategy and pointed out the importance of formulating a sophisticated digital strategy for successful digital transformation.

When building a strategy for a business, it is necessary to simultaneously build a digital transformation strategy. The more clearly formulated the digital transformation strategy, the greater the likelihood of achieving a high level of digital maturity. It is important to note that a digital transformation strategy should not "overturn" an existing strategy in the organization, but should be built to bring about positive changes in technology and resources to create growth and improvement, improve business operations.

A comprehensive digital maturity strategy should include aspects of strategic management, brand management, ecosystem management, finance and investment, smart markets, product and service portfolio innovation, and business assurance.

4.2   Technology

Understanding the existing systems and technology infrastructure is important to assess the maturity of existing digital systems against global organizations. For example - Global power generation companies are moving towards using multiple technologies like RPA, Blockchain, Artificial Intelligence within their business operations sustained by cloud and 5G Infrastructure [10, 12].

Technology is a key driver of digital transformation. High digital proficiency means that employees who are involved in digital transformation will be highly digitally competent.

The paper proposes a technology framework for assessing digital maturity including aspects of management policy, the technology of application architecture, applications & platforms, connectivity and computing, and security.

4.3   Operations

Operational Process forms the backbone of digital technologies and is a critical success factor for the success of the digital transformation.

How effectively are implemented systems being governed and how is the data generated by the organization being managed and used is extremely important to assess for planning sustainable digital transformation.

Operational Processes in DMM are the implementation and development of processes and tasks using digital technology to promote strategic management and improve business efficiency and effectiveness. Operations with agile change management can seamlessly collaborate on the synchronized transformation of business requirements with technical change requirements (Deloitte). Quality assurance for services is also an important factor, where the issue of proper service design and a standard operating

model are also very important aspects to ensure the operation of the process in the service mature number. Additionally, real-time feedback insights are an essential element of data management to analyze and optimize digital processes.

Therefore, the operational process in digital maturity requires elements of operational policy, service design and improvement, service transition/deployment, and service operation.

4.4 Organization and Culture

Technology by itself cannot succeed. It needs enough champions and savvy users who can drive the adoption of digital technologies.

Hence human aspect forms a critical success factor of sustainable digital transformation. If there is a culture of change and digital adoption at working levels pushed by senior leadership; digital transformation is more likely to succeed.

A key ingredient to achieving digital maturity is the management team's readiness for changes in organizational culture, restructuring business processes, and improving management skills.

Therefore, the set of organizational and cultural criteria in the DMM needs leadership and culture, standards and governance, employee support, digital capabilities, structure and management, and the ability to organize quickly.

4.5 Customer

Changing customer behavior and the growing popularity of digital channels force organizations to embrace the digital world by providing seamlessly integrated channels of interaction. This means that customers must be able to interact with organizations across communication channels, and so organizations must ensure the right content and design for the customer experience across all communication channels. Customers today not only expect organizations to respond to their needs, but they also expect to anticipate future needs before they define them themselves.

Therefore, the customer dimension of DMM can focus on customer engagement, customer experience, customer understanding and behavior, and customer beliefs and perceptions.

5   Conclusion

Digital maturity is a concept that requires organizational change along with the implementation of digital technologies. To confirm the important aspects of successful digital transformation, the paper introduced the model and described different aspects of the digital transformation strategy. The most mentioned sets of criteria are strategy, organization/culture, technology, and customer. The article proposes sets of criteria to be suitable for businesses in Vietnam. These sets of criteria should be discussed and used in the digital transformation strategy of enterprises in Vietnam, especially SMEs.

The final digital maturity model discussed and analyzed includes five sets of criteria: Strategy (Strategy), Technology (Technology), Organization and culture (Organization & Culture), and Customer and Process. Operations to suit many fields and industries in Vietnam's conditions.

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