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Digitalization in practice: the fifth discipline advantage

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Abstract

Purpose – The purpose of this paper is to provide advice to organizations on how to become successful in the digital age. The paper revisits Peter Senge's (1990) notion of the learning organization and discusses the relevance of systems thinking and the other four disciplines, namely, personal mastery, mental models, shared vision and team learning in the context of the current digitalization megatrend.

Design/methodology/approach – This paper is based on content analysis of essays from international organizations, strategy experts and management scholars, and insights gained from the author's consulting experience. A comparative case study from the health and social sector is also included.

Findings – With the current digitalization megatrend sweeping across the globe, the practice of systems thinking would certainly become more crucial for organizations seeking to develop new digital ecosystems. In addition, the application of the other four disciplines of the learning organization would also help to nurture a digital culture for organizations to stay ahead of the competition.

Practical implications – Organizations and digitalization practitioners could benefit from applying systems thinking to develop digital ecosystems, and the other four disciplines to nurture a digital culture.

Originality/value – This paper contributes to the existing literature by offering a relook and justifications on the relevance of the five disciplines, in particular systems thinking, in the present times. It offers advice to organizations on how to become successful as part of the digital transformation journey.

Keywords Digital culture, Systems thinking, Digital competencies, Digital ecosystem

Paper type General review

Introduction

The world has entered into a new digital era characterized by rapid shifts in the way we live, transact and relax. These shifts are enabled by accelerating technological innovations. In this Fourth Industrial Revolution, emerging technologies such as artificial intelligence (AI) and the internet of things (IoT) dominate the micro and macro environments and create far-reaching impacts to industry, government and society (Omar, 2019; Schwab, 2017). While this digitalization megatrend has created tremendous opportunities in improving the status quo, it has also caused many disruptions across sectors (Lichtenthaler, 2018). Many organizations seek to overcome these challenges by embarking on a journey of digital transformation.

The year 2020 is a special one because it marks the 30th anniversary of the publication of Peter Senge's (1990) book, *The Fifth Discipline: The Art and Practice of the Learning Organization*. Since the early propagation of systems thinking and the other four disciplines, namely, personal mastery, mental models, shared vision and team learning, the world has witnessed unprecedented changes brought about by emerging digital technologies. Thus, this is an opportune time to reflect on the relevance or usefulness of these practices or competencies in the current digital age. The occasion calls for a more thorough and detailed discussion on how the digitalization megatrend has influenced the way organizations to operate today and how a decades old idea such as systems thinking could help shape the



way industry, government and society conduct business as part of their digital transformation journeys.

The main purpose of this article is to provide advice to organizations on how to become successful in the digital age. The article revisits [Senge's \(1990\)](#) original notion of the learning organization and discusses the relevance of the five disciplines, in particular systems thinking, in the context of the current rapidly growing digitalization megatrend. The article is organized under the following sub-headings: digitalization megatrend and digital competencies, five disciplines of the learning organization, digital ecosystem and systems thinking, digital culture and the four disciplines, case illustration, and finally, the conclusion.

In essence, the article advances the view that with the current digitalization megatrend sweeping across the globe, the practice of systems thinking would certainly become more crucial for organizations seeking to develop new digital ecosystems. In addition, the application of the other four disciplines of the learning organization would also help to nurture a digital culture for organizations to stay ahead of the competition.

Digitalization megatrend and digital competencies

The beginning of the twenty-first century is characterized by the rapid growth of the global economy powered by digital technologies ([Bienhaus and Haddud, 2018](#)). Key factors that help shape this digitalization megatrend include the pervasive adoption of computing technology and the use of massive data for analysis. In a volatile, uncertain, complex and ambiguous world, such a global technological trend exerts tremendous pressures on the way organizations operate and do business and further exacerbates the disruption across industries ([Kaivo-oja and Lauraeus, 2018](#)). Beyond the private sector, the effects of digitalization are also felt in the public sector. There is a symbiotic relationship between the digital economy and e-government where the promotion of one influences the growth of the other ([Ali *et al.*, 2018](#)).

Digitalization involves more than just the mere conversion of documents from paper to an electronic format – digitization ([Gobble, 2018](#)). Broadly, digitalization means adopting a broader change mindset or perspective that encompasses data, digital technology and human-centered design to transform the business model ([Følstad and Kvale, 2018](#); [Ghobakhloo, 2018](#); [Komulainen and Saraniemi, 2019](#); [Lin *et al.*, 2018](#)). It includes embracing new ways of doing business, using new capabilities to serve customers and designing organizational processes to become more agile ([Dörner and Edelman, 2015](#)). Technology-wise, digitalization may invoke a whole suite of digital technologies such as cloud computing, mobile devices, IoT platforms, smart sensors, big data analytics, augmented reality, wearables and three-dimensional printing to enable business transformation ([PricewaterhouseCoopers, 2016](#)).

At the organization-level, digitalization results in major changes to the traditional ways of doing business and new innovations to doing things differently. Digitalization helps to foster business model innovation by enabling multiple actors to create value across companies in an ecosystem ([Dellermann *et al.*, 2017](#)). New digital business models are being created through a shift in mindset regarding how information and communications technology (ICT) could move as an enabling function to become a key driver of business ([Remane *et al.*, 2017](#)).

Many companies have embarked on digitalization initiatives to extend their edge over competitors ([Ringel *et al.*, 2018](#)). For example, Alibaba, Amazon, eBay and Rakuten use multi-sided digital platforms to differentiate themselves from other retail competitors ([Hänninen *et al.*, 2018](#)). Instead of managing the supply chain from end-to-end, these digital platforms merely take care of the intermediate relationship between buyers and suppliers by transforming the transaction logic. Small- and medium-sized enterprises have also been

deploying digital technology for marketing purposes leading to better competitiveness (Molinillo and Japutra, 2017). Thus, successful digitalization initiatives require a skillful blend of strategy development and technology application. Of course, clever execution in the form of people engagement and processes change are also crucial factors to be considered.

A recent *Organization for Economic Co-operation and Development* (OECD) report highlights the wide-ranging impact of digitalization, in particular to jobs and productivity, across all economic sectors and society (OECD, 2018). To plug the various gaps in the implementation of digital initiatives, various policy measures such as enhancing access to communications infrastructures, services and data that allow governments and key stakeholders to bring about digital transformation are proposed (OECD, 2019). While digitalization may yield many benefits, it also brings about many challenges.

According to the *World Economic Forum* (2018), technological risks such as cyberattacks and data fraud rank among the top five global risks besides environmental risks. In addition to financial losses and damage to reputation, the consequences of confidential personal data following into the wrong hands in the event of a hacking attempt are dire. The International Monetary Fund (IMF) also recognizes the impact of the digital economy and mentions that some challenges associated with digitalization include trading of products on online platforms, a sharing economy and data gaps (IMF, 2018).

Many companies report that digitalization has affected the workforce and there are technology-related skill gaps (Smit, 2018). Unfortunately, many companies are not able to address the issue of skills upgrade for their employees. One aspect of the problem is the identification of required digital competencies for future-proof careers. With the rapid proliferation of digital technologies such as big data, blockchain, cloud computing, IoT, machine learning and mobile applications, the *International Telecommunication Union* (ITU) (2018) has published a list of required digital skills to fill the competency gap. Some of the advanced digital skills include digital entrepreneurship, cybersecurity and IoT. The *United Nations Conference on Trade and Development* (UNCTAD) has also proposed a framework on a variety of digital competencies to enable digital transformations (UNCTAD, 2019).

There is an urgent need to bridge the digital competency gap. Such a digital competency gap requires more than just technical skills but must include competencies for the organizations to be able to see the “big picture” as part of the digital ecosystem and engage people to embrace a digital culture.

Five disciplines of the learning organization

The learning organization concept was popularized by Senge (1990). The main idea involves bringing together different parts of the organization to see things as a whole for growth. It is associated with five key disciplines or characteristics, namely, personal mastery, mental models, shared vision, team learning and systems thinking. Personal mastery refers to the improvements of one’s competencies. Mental models are the basic assumptions held in the organization. A shared vision is the united common goal. Team learning means group sharing of knowledge and systems thinking refers to the understanding of the interdependence of various parts. Essentially, a learning organization seeks to harness the power of groups of individuals to solve complex problems.

Over the years, the concept has evolved and been further developed by researchers and practitioners (Garvin, 1993; Marquardt and Reynolds, 1994; Watkins and Marsick, 1993). For example, Örtenblad (2018) proposes four versions of the learning organization, namely, learning at work, climate for learning, organizational learning and learning structure. In addition, many other studies on the learning organization have been conducted, which

linked it to management variables such as innovation and leadership (Allouzi *et al.*, 2018; Delić *et al.*, 2017).

Specifically, Senge's (1990) approach to problem solving is to investigate the issue from a holistic perspective instead of dividing it into smaller parts. The "fifth discipline" or systems thinking encompasses three levels of explanations, namely, structure, behaviors and events. An overall structure or system leads to certain behaviors, which can lead to certain events. Therefore, the best way to influence events is to change the system. Systems thinking looks at why a system behaves in a certain manner whenever an action triggers feedbacks – reinforcing and balancing processes. A reinforcing loop increases an aspect of the system component part while a balancing loop helps to maintain equilibrium. In practice, such analyses are usually conducted with a system diagram consisting of causality loops such as actions, feedbacks and delays. Senge also describes nine archetypes or patterns of behavior such as "shifting the burden" and "escalation" that illustrate common system issues. In addition, Senge (1990) identifies seven conditions such as "fixation on events" and "the boiled frog parable" as common learning constraints in organizations. The former condition happens when one's focus on events and single obvious cause prevents one from seeing longer term patterns. For the latter condition, just like the frog that is sitting in a slow boiling pot of water, one may be excellent at reacting to immediate threats but fails miserably at recognizing gradual dangers.

An interesting view of the learning organization is that it has a cultural aspect of learning that exists at different levels of the enterprise (Senge *et al.*, 1994; Sidani and Reese, 2018). Such a perspective provides support in the application of the other four principles, which constitute the learning organization in shaping desired behaviors to meet organizational goals. The four practices – personal mastery, mental models, shared vision and team learning – are useful in the development of an organizational culture that is supportive of digitalization as they could be applied at the individual, group and organizational levels to inculcate values and behaviors with a digital theme.

While it is evident that there are many different views and interpretations of Senge's (1990) learning organization model, a more direct method adopted in this article is to reconnect with the original five key disciplines or characteristics proposed and relate their relevance in the present times where the digitalization megatrend is sweeping across the globe. A key benefit of using this method is remaining faithful to the initial conception of the idea but the downside is that it ignores the many developments that have been added to the concept over the years (Örtenblad, 2007).

To examine the relevance of Senge's five disciplines, it is imperative to take into consideration the digitalization megatrend, which impacts the world today. There is a suite of associated digital competencies that are required to make the enabling technologies work. The two "proposed" digital competencies, namely, developing a digital ecosystem and nurturing a digital culture, may, broadly, be mapped to the five disciplines. For simplicity sake, the main argument in this article on the relevance of the learning organization is put forth based on the five seminal disciplines, in particular, systems thinking, as suggested by Senge (1990) to understand and develop digital ecosystems, which are crucial for survival in a digital world. In addition, the other discipline such as personal mastery, mental models, shared vision and team learning may be very useful to develop a digital mindset as part of an organization's digital culture.

Digital ecosystem and systems thinking

Digitalization is disrupting the traditional industry boundaries resulting in the formation of new cross-boundary ecosystems (Atluri *et al.*, 2017). Large companies rely on ecosystems to

develop products and services that span traditional boundaries (Bailey *et al.*, 2019; Fuller *et al.*, 2019). The successes of many global technology giants such as Alibaba are based on building an ecosystem that is linked to buyers and sellers (Zeng, 2018). There is a proliferation of business ecosystems fusing the digital and physical worlds with a need for multiple stakeholders to co-evolve (Reeves *et al.*, 2017). In these new business models, there are many “players” in the market environment, which one could collaborate with to provide goods and services that are faster, cheaper and better all at the same time. Leading organizations must be able to connect data, AI and automated delivery with as little human interference as possible (Reeves and Whitaker, 2018). The keyword is to “connect” and achieve greater synergy by combining different disparate parts to meet customer needs.

The ecosystem phenomenon demonstrates the importance of systems thinking. The current business, political and social landscape today may be described as being unstable, unclear, and having many interconnected parts, which causes much confusion. One way to deal with these complexities is to apply systems thinking to study how the problems and challenges may be tackled holistically at the structure-level and with other stakeholders. Systems thinking allows organizations to make sense of the disparate parts and link up different stakeholders to overcome complex issues. This is of particular importance in the digital world where true customer value may be better delivered through collaboration across boundaries among partners. Many digitalization strategies fail because they overlook the ecosystems (Bughin *et al.*, 2018).

Without a doubt, any digitalization initiative calls for a combination of competencies in digital technology application, data analysis and human-centric design. Thus, while there may be a strong emphasis on using digital technology to enable the transformation, the strategy aspect such as ecosystem development must not be overlooked. Very often, only the former is highlighted and discussed extensively because ICT vendors tend to push and market it relentlessly to win more customers. From a strategic standpoint, the building of ecosystems and similar ideas such as developing new networks, partnerships and communities should be the cornerstone for digitalization. Therefore, the main proposition is for organizations to develop the competency of being able to “join the dots” in solving complex social and economic issues. The answer appears to be in applying systems thinking approach to better understand the external and internal environments.

Digital culture and the four disciplines

Digital transformation initiatives should focus on the people and processes and not just technology (Kane *et al.*, 2019). There is definitely a cultural dimension for organizations undergoing digitalization. This involves guiding people toward embracing a digital culture at the individual, team and organization level. Digital technology adoption and adaptation ultimately rely on the people within the organization (Kane, 2017). Personal mastery, mental models, shared vision and team learning could be the key principles applied to inculcate values and desired behaviors in going digital.

One way of articulating the digital transformation narrative in organizations in applying the four disciplines could be as follows:

- (1) Firstly, there is a great need to ensure that digital competency gaps are addressed at the individual level – personal mastery in digital skills from basic, intermediate and advanced levels such as managing privacy settings, digital graphic design and AI. Thus, the modern worker is expected to demonstrate personal mastery in some of these skills. The leaders and senior management should encourage and institutionalize the personal mastery of digital skills, both technical and non-technical, among employees. This could be achieved through structured training

and development courses to equip all levels of staff with digital knowledge, skills and mindsets.

- (2) Secondly, as digital disruption changes the status quo by challenging existing assumptions on the way one works, existing mental models need to be challenged to enable new ways of framing problems and creating digital solutions. To thrive in the digital revolution, mental models or thought processes need to be “rewired” to help one rethink and redesign digital strategies. For example, one aspect of changing the current mental model is to move away from a techno-centric to a human-centric way of design – creating digital solutions from a human instead of a technology perspective. Doing so requires having an empathetic attitude and adopting a design thinking approach for innovations. This calls for managerial interventions to “walk the talk” in demonstrating and executing such shifts in paradigms in day-to-day operations and meetings.
- (3) Thirdly, in a digital world full of opportunities and challenges, the ability to align diverse interests and commitment to achieve the “big picture” is fundamental. A shared vision fulfills this role by focusing on the human side of an organization, bringing together different parties and providing a guide to the desired future state. Thus, management should champion and inspire the rest of the organization toward a “digital future” beyond departmental and company boundaries.
- (4) Finally, diverse teams play a critical role within the organization to create digital solutions (McDonald and Rowsell-Jones, 2012). Having a “silo mindset” is a major barrier to innovation in the digital world (Goran *et al.*, 2017). Thus, internal collaboration is essential and this calls for team learning. In addition, the teams need to be agile so as to be able to respond more quickly to the rapidly changing market conditions. Management must nurture an environment where individuals could work collaboratively and learn from one another.

Case illustration

Recent studies suggest that learning organizations could be found across different cultures (Kim and Marsick, 2013; Voolaid and Ehrlich, 2017). These organizations span across many industries such as manufacturing and services (Delić *et al.*, 2017; Palos and Stancovici, 2016) and health (Akhniif *et al.*, 2017; Kumar *et al.*, 2016). Systems thinking is often used to better understand how stakeholders are constantly responding to changes and interacting with each other in a dynamic health system (Rusoja *et al.*, 2018). In some cases, it is applied to identify improvement areas for the implementation of patient safety initiatives in complex healthcare organizations (Brimble and Jones, 2017). To illustrate the relevance of systems thinking and the four disciplines of the learning organization to enable an organization’s digitalization efforts, a comparative case study is used. This method is very helpful in highlighting social phenomena in an actual context or scenario (Small, 2009).

A reference is made to the case of two Singapore-based organizations in the health and social sector. A collaborative project initiated by both the organizations exhibits how systems thinking as suggested by Senge (1990) helps to solve a complex problem that transcends traditional organizational boundaries. By building an ecosystem and applying digital technology to deliver integrated care to seniors, those of 65 years old and above, these two organizations manage to deliver better services to the customer resulting in an enhanced health outcome. The main problems, which these two organizations are trying to address are the repeat admissions to the acute and community care hospitals by seniors

because of medication non-compliance and social isolation. Such problems could not be solved if each organization tackles the issues individually without the involvement of the other stakeholders.

A community hospital (CH) and social service agency (SSA) are currently conducting a pilot experiment to deliver holistic care for seniors from the point of admission to the community hospital and discharge, to the “befriending” services offered by the voluntary welfare organization. CH provides intermediate care for recuperating patients who do not require the intensive services of an acute care hospital. The acute care hospital and CH belong to the same health cluster within the community. SSA is a non-profit social service organization that provides friendship and care for seniors to age in place with community participation. The other partners in the project include a local university and a platform provider for the digital services. The initiative involves a diverse team of personnel such as physicians, nurses, quality managers, medical social workers, volunteers, home care providers, researchers and digital services providers.

The initial problem arose because of an increasing trend in the number of seniors from the neighborhood being admitted to an acute care hospital. Most of these patients are “repeat cases” – readmission because of the same medical episode. An analysis of the issues suggests that these seniors who stay alone generally do not take their medication after discharge and tend to injure themselves from falls at home. Consequently, they are readmitted to the acute care hospital and then referred back to CH for recuperation and rehabilitation before going home.

At the same time, SSA also faces some challenges in engaging early seniors who are socially isolated and require home visits. Traditionally, SSA would only follow-up with potential seniors one or two days before they are discharged from CH. As time is quite short for seniors to become familiar with SSA staff and volunteers, they mostly decline to participate in the “befriending” program. Consequently, they would return home and continue to lead a solitary life with minimal social interactions.

Through a community meeting session with a local university, both CH and SSA became aware of the issues confronting the seniors in the neighborhood. Both organizations agreed to work jointly to improve the situation. By adopting systems thinking approach to solve the problems across organizational boundaries, CH and SSA integrated both the organizations’ work processes, which enabled early identification of elderly patients that are admitted to CH from the acute care hospital who may require “befriending” services. SSA staff are introduced to the seniors weeks before they are discharged. Doing so allowed the building of trust and rapport between the seniors and SSA staff over a longer period of time. The seniors become more familiar with SSA staff and relate better to them socially. As a result, the seniors are more open to participating in SSA’s social program. The integrated process also enabled the early sharing of important patient information between CH and SSA so that the latter can better serve the seniors when they return to home care.

Fundamentally, CH and SSA developed an ecosystem, which is centered on the seniors to ensure that seniors who are admitted to CH for recuperation could transit smoothly into SSA’s social programs, which include home visits when they are discharged. Pertinent information related to seniors such as care plans and available social activities “follow” the senior’s home. As a result, the medical social workers and SSA volunteers who visit the seniors are better equipped in the recovery and social integration process because all the information is constantly shared and updated among the authorized support personnel.

Once the ecosystem has been developed, a digital technology component in the form of a digital platform is added to augment the services provided. The digital services involve the inclusion of the care plan to remind the seniors when to take their medications and updates of

social activities that are happening around the neighborhood using a virtual assistant or “chatbot” placed in the seniors’ homes. All these features are hosted on a digital platform and the services made available to the SSA home visit team and medical social workers on demand via an internet-enabled tablet. The addition of the digital platform adds the final touch to the digitalization journey. Overall, the results of the pilot are expected to alleviate the issue of overcrowding in hospitals, medication non-compliance and social isolation of seniors.

In addition, it may also be reasonable to extrapolate that CH and SSA have applied the other four disciplines as part of the digital transformation journey. It is fair to assume that the acute care hospital, CH and SSA have a “shared vision,” and collaborated through diverse teams to challenge the existing models of integrated care for seniors. This patient-centric model is a departure from the traditional way of treating patients, which focuses on just medical care. It is a multi-prong approach to address healthcare and social issues of hospital readmission, well-being and social isolation of vulnerable seniors. In addition, through the personal mastery of different specializations such as healthcare, social care and digital technology of the various stakeholders, they are able to review the current mental models to do things differently to achieve a shared vision of aging healthily, purposefully and gracefully for a rapidly greying Singapore population. In the process, CH and SSA have to set aside any preconceived notions of integrated care of the seniors and learn as a team to very responsively make adjustments on what works best on the ground.

This simple case illustrates the relevance of the five disciplines, in particular systems thinking, in the present digital age. Digital technology alone would not have been able to achieve the desired outcomes. It was the development of an ecosystem by two organizations to support the seniors and made more effective through a digital services platform that results in a successful outcome for this digital transformation journey. In addition, nurturing a strong digital culture based on other disciplines.

Conclusion

In retrospect, the learning organization was developed at a time when learning was a fashionable and popular management idea (Vince, 2018). It sought to provide an answer to what was needed at that time. Moving forward, organizations practicing the five disciplines should continue to be a strong foundation for innovation to happen (Park *et al.*, 2014).

With the current digitalization megatrend sweeping across the globe, organizations could stay ahead of the competition by developing digital ecosystems and nurturing a digital culture. Applying systems thinking would provide organizations with a more holistic perspective on the interdependence of different parts of the market, thereby, strengthening the digital ecosystem. Furthermore, in using personal mastery, mental models, shared vision and team learning disciplines, organizations could inculcate values and desired behaviors with a digital theme to engage people as part of digital transformation journey. Therefore, organizations and digitalization practitioners would certainly benefit from adopting these practices to become even more successful in the digital age.

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