

# TRENDS

## Digital Technology Is More than Just a Tool

### Keita Nishiyama

Visiting Professor, Institute for Future Initiatives, the University of Tokyo  
Senior Executive Fellow, Industrial Growth Platform, Inc.

#### Digital Technology Will Change Organizational Principles

It has already been several years since the term digital transformation (DX) became popular. When I published my book on DX in 2021, some people told me that DX might be just another buzzword, and therefore, no one would be mentioning it anymore after the new year. But they were mistaken.

Why? Because digital technology is more than just a tool.

People often say, “digital technology is just a tool and nothing more.” I can understand their sentiment. They mean that digital technology itself or the use of digital technology is not the realization of the values that society and individuals are aiming for. However, I have a somewhat different opinion.

This is because realizing DX by making the best use of digital technology is inextricably linked to changing the existing organizational principles of companies and society. And the degree of change required is significant in Japan. This is precisely the reason why we use the term “transformation.” If digital technology were to drastically change the structures of organizations and the way we work,

we would certainly not consider it as just a tool. But why do digital technologies change organizational principles?

Digital technology has certain characteristics. It exhibits a structure consisting of multiple horizontal layers. The idea of a ‘computer’ came from the inspiration that it would be possible to solve mathematical problems not one by one, but by finding a methodology to solve those problems. Likewise, the developed digital technologies were not directly linked to specific applications, such as the development of vaccines, the provision of new financial products, or beating Go masters. (They can help overcome such challenges when applied.)

What is astonishing about ChatGPT\* is that it can handle any conversation (even a professional one) with anyone by learning enormous amounts of data using a training model that incorporates a huge number of parameters. Of course, there is still much that it cannot handle, and there are also risks. But the important thing here is that an artificial and transversal training model, whose design is unrelated to any specific discipline, is now performing intelligent tasks, including those that, up until now, we have assumed only experts with highly specialized knowledge could address. These artificial intelligence (AI) models are

\* ChatGPT is a trademark or registered trademark of OpenAI, L.P.

also called ‘foundation models’ to emphasize their cross-disciplinary and infrastructural nature.

Hence, the key to DX is to replace the existing ‘vertical’ organizational principles with a horizontal layered structure. But how can this be done? We will address the issue from three angles. Abstract thinking, replacement of stove-piped models, and architecture.

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## Abstract thinking

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In the world of business, we tend to underestimate abstract thinking as something that is detached from the reality of business. However, such a view neglects the power of abstraction. Since abstract thinking has its own depth, it is useful to appreciate it step by step.

The starting point of abstract thinking would be to simplify the subject, i.e., to express only what is essential in a straightforward manner. Adding more and more information will not give you a clue to solving problems. Problems should be simplified first. Secondly, there is more than one way to simplify. When you try to describe your business in a simple way, you will find that there are several ways of doing it. That makes you see your business

from different perspectives. If you get to this point and pay attention to one of these viewpoints, you will realize the similarities between your business and apparently different types of businesses. Those who can come up with analogies with ease are good at these exercises. And here is the most important point. ‘Abstraction’ is often regarded as the opposite of reaching concrete solutions. But this is not correct. Abstraction is a way of thinking that unbundles an object into multiple factors and then replaces some of them with alternatives to explore something new. (Japanese-style pasta with natto and smartphones are product of these exercises.) In other words, abstraction is a way of conceiving particulars that are not with us here and now.

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## How can we turn silos into flat organizations?

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To avoid silos and make your organizations open, you need to convert their vertical structure into a horizontal structure. But where should we start? This is a question that many DX leaders struggle with. I recommend thinking from the question of ‘what are the things that are currently vertically split.’ In my view, organizations are vertically split according to three aspects.

Keita Nishiyama is a Visiting Professor at Institute for Future Initiatives of the University of Tokyo, where his work focuses on data governance and digital transformation. Before taking an academic position, Nishiyama was Director-General of Information and Commerce Policy Bureau of Ministry of Economy, Trade and Industry (METI) from 2018 to 2020. In that capacity, he led the international initiatives of “Data Free Flow with Trust” and “Governance Innovation” and contributed to building consensus among the member countries on those topics when Japan took the presidency of the G20 Summit in 2019. He served a wide range of positions in the public and private sectors including Director and Executive Officer of Tokyo Electric Power Company (TEPCO) from 2015 to 2018. He is currently a Senior Executive Fellow of Industrial Growth Platform, Inc., an Executive Advisor of Japan Deep Learning Association (JDLA), and an Industry Advisor of Kohlberg Kravis Roberts (KKR). Nishiyama received an LL.B. from the University of Tokyo in 1985 and a B.A. in Philosophy, Politics and Economics (PPE) from the University of Oxford in 1992.



The first is communication channels. If a staff member wants to communicate important information to the CEO, he or she is expected to communicate it through a line manager. (If you fail to comply with this, you attract unfavorable judgement from your superiors.) If you want to ask a neighboring department to do a job for your team, you are told that things should be first discussed between managers, which hampers quick action. This is the vertical division of communication. This was an efficient way of conducting business in the days without digital technology, but it is entirely different now. And if communication remains stove-piped, it is difficult to organize new teams and develop new services flexibly.

The second is the split of operating procedures. This refers to the fact that the procedures for handling work differ from company to company and department to department. In the past, procedures regarding reimbursement of travel expenses, requests for approval, accounting in general, personnel evaluation, customer management, production planning, etc., have all been devised by each department and company. However, various horizontal digital tools are now beginning to replace these unique procedures, and as one aspect of DX is mastering these tools, it is useful to think about replacing your company's unique procedures with horizontal tools.

The third is the lack of alignment between products and services. Until now, many products and services have been developed individually even within companies, not to mention across companies. Hence, they are not easily combined with each other. It was assumed that customers would devise their own combinations. It was also believed that value was created by improving the functions of individual products and services and offering a lower price through cost reductions. However, this is not the case in the digitalized world. Value is created by the seamless experiences between products and services, and profit is generated where seamless experiences are offered. Cloud service is a good example of this.

In many successful cases of DX, the company started by eliminating the communication stove pipes. This is probably because, in order to get more people actively involved in

the company's DX, it is quintessential to fix communication stove-piping. Without doing so, and, for example, starting from utilizing data and AI for specific cases, they would often end up as PoCs and do not make further progress. Lacking skills and shared context among members of the organizations, the use of data tends to become a burden for the members rather than making their lives easier. This is a topic that I would like you to consider for yourselves in light of your own business.

One point should be made regarding what I mean by 'horizontal.' For example, in Japanese Government, the use of common IT systems is promoted to avoid spreading of incompatible systems of individual ministries. But there is often a misunderstanding of what we mean by 'common.' Using a common system does not mean "doing things exactly the same way across the ministries." It means standardizing the fundamentals to absorb room for adjustment in individual cases. Consider the case of the payment system of subsidies, which caused many problems and attracted attention during the COVID-19 crisis. Eligibility and the amount of benefits all differ from subsidy to subsidy. The true meaning of common systems is to look for common features even though the specific parameters may change in individual cases. Which brings us back to the topic we discussed, namely, breaking down the process of providing subsidies into layers.

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## Architecture

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Architecture is a subject that is related to the above story. Herbert Simon, who won the Nobel Prize in Economics and the Turing Prize, wrote a paper in 1962 entitled 'The Architecture of Complexity.' His basic argument is that complex systems, while they are diverse and subject to the analysis of different disciplines, share common characteristics. (A company is a complex system.) And those characteristics can be synthesized as architecture. One of the common features of complex systems is their layered structure (Simon called it a hierarchic structure, emphasizing that the higher up in the hierarchy, the more it

corresponds to practical problems.) Simon continued his inquiry on architecture with reference to computers and AI as an embodiment of such architecture. Simon died in 2001 without witnessing the current stage of advanced AI. His thinking of architecture is becoming increasingly relevant today, with the rapid progress of AI and the permeation of digital technology across industries.

At the beginning of 2020, when I was still a government official, I asked Mr. Hiroaki Nakanishi, the Chairman of Japan Business Federation (Keidanren) at the time, to give a lecture on architecture at the seminar we organized. I received three messages from his lecture. First, architecture used to refer to a certain aspect of computers, such as the instruction set, but now it is becoming a framework for industry and society. Second, to realize it, it is necessary

to change organizational principles. (He vividly conveyed this message using an example from his own experience with the railway control system.) Thirdly, Japan should take the lead in presenting the new architecture to the world. I consider these to be his will for us and hold them close to my heart. And you will also notice that the late Mr. Nakanishi's thoughts are in line with Simon's ideas.

What, then, could the complex systems representing this architecture offer to us? They provide customized solutions to a variety of problems and meet unique demands, although the mechanisms are common. Hence, architecture is closely related to the realization of diversity and inclusion. When it comes to 'diversity' and 'inclusion', many companies set these as their goals. And this is another reason why I believe that digital technology is more than just a tool.