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The Composable Enterprise Emerging in the VUCA Era

From Concept to Practice

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The spread of the Internet, which began in the 1990s, has brought about the digitization of the economy and society and is bringing about an industrial revolution through "digital disruption." Businesses, large and small, are embarking on digital transformation (DX). From the pandemic that occurred in early 2020, to the frequent occurrence of geopolitical risks such as the Ukrainian crisis, and concerns about an economic recession due to soaring inflation, the business environment has changed dramatically. We have entered the so-called VUCA era.

The great evolutionist Charles Darwin said that "The one most adaptable to change is the one that survives". In short, organizations most adaptable to change are best equipped to deal with change.

Gartner identified the issue that organizations need to dynamically adapt to change and rapidly innovate to do so and proposed the concept of "Composable Enterprise". In fact, there are other concepts that have been proposed for companies responding to changes in business needs with agility, and there are also cases where changes in corporate systems and organizations have progressed more practically than concepts. In addition, discussions on the concept of "Composable Enterprise" have become lively, and some companies have begun to take practical measures.

Composable Enterprise is moving from concept to implementation, but it also faces challenges to overcome.

1. Challenges Companies Facing in the VUCA Era

Despite fully understanding the need to respond quickly toward environmental changes both positively and defensively through digital transformation, there are several challenges that make it difficult to implement. Several issues can be identified from the perspective of enterprise systems, for example:

- While existing systems were widely adopted to address past problems, they become obstacles to new innovative business. Companies hesitate making decision converting existing systems because they face the costs and risks of changing.
- Customers and employees increasingly prefer contextualized and customized applications, but they face a dilemma due to long development times and high costs.
- The resilience and agility required to respond to changes in the environment are not just limited to the IT systems. Corporate governance system also often needs to undergo a culture change, and this often takes time and may often face internal resistance to change.

Gartner, Alibaba, and others have proposed methodologies for changes in the business environment accompanying the progress of digitization from the perspective of enterprise systems. In addition, the above issues are basically issues seen from the perspective of corporate systems, but from the perspective of promoting DX in existing industries such as the manufacturing industry, the transformation of real systems (Innovation of production facilities, etc.) is also important[1].

*1   Jianmin Jin (2022) "Digital Transformation in Manufacturing: Top Challenges CxOs Face and Proven Solutions"

2. Enterprise Architecture That Adapts to The Pace of Business Environment Change (MASA)

In the past, when efficiency-oriented strategies were pursued to maintain profits by reducing costs, inflexible monolithic applications (standard business processes implemented in packages) were widely adopted. After that, the core competence management theory was received. In applications, innovation-oriented for growth, service-oriented architecture (SOA) and function cooperation technology APIs emerged. Also, the web services technology that made SOA possible was quite advanced. After that, a microservice concept with small-grained software functions as the core was also proposed.

Figure 1 Schematic of Mesh Application and Service Architecture (MASA)
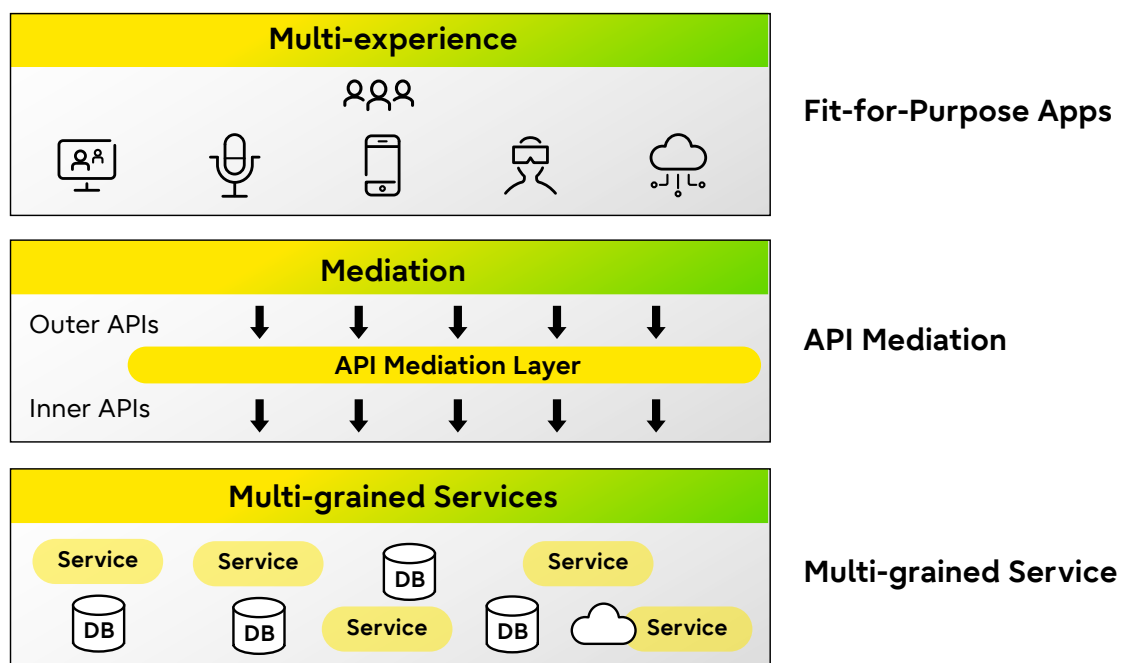
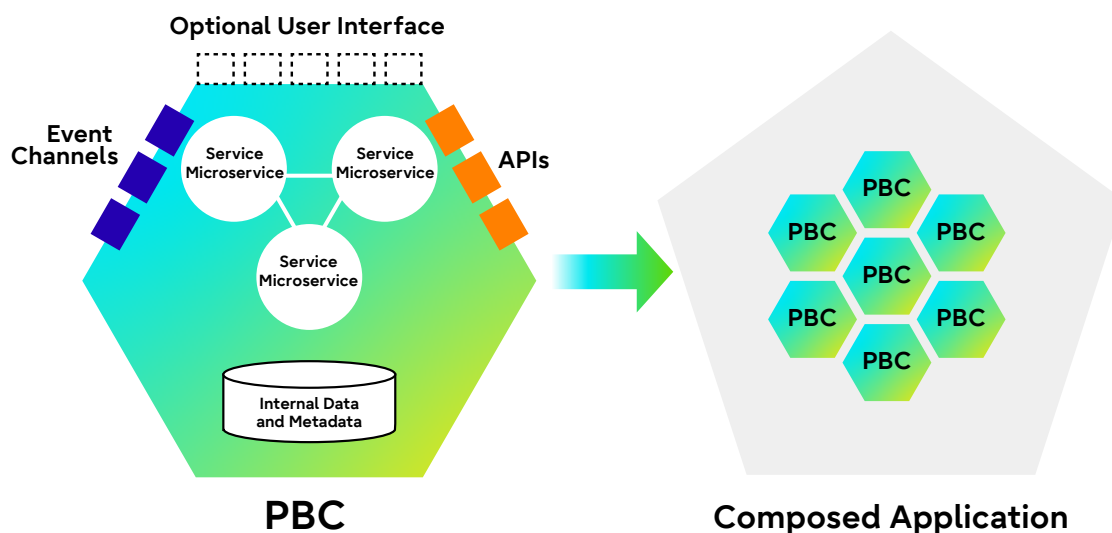Source: Created by the author with reference to Gartner materials

Recognizing the need to evolve into applications that are modular and adaptable to business changes, Gartner announced in 2016 a derivative architecture for application development and implementation called the Mesh Application and Service Architecture (MASA) (see Figure 1).

This architecture consists of a business front that develops and executes "Fit-for-Purpose" applications, a platform that provides multi-grained services, and an API coordination layer that connects the front and the service platform. In other words, it tries to encapsulate various services and expose APIs across organizational boundaries at multiple levels to maintain a balance between demand for service agility and scalability and service composition and reuse.

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3. Composable Enterprise Concept: Shifting Focus from Technology Development to Business Innovation

Gartner proposed the concept of "Composable Enterprise" based on the success factors of advanced companies that responded quickly to the pandemic in 2020. A composable enterprise is defined as an organization designed for **real-time adaptability and resilience** in the face of unforeseen uncertainties.

Figure 2 Conceptual diagram of Packaged Business Capabilities (PBCs) and Composed Applications

Source: Created by the author with reference to Gartner materials

The application is realized by assembling and combining Packaged Business Functions (PBCs). PBC is a business capability and is distinguished from the concept of Service/Microservice in the MASA concept. As Figure 2 shows, PBCs are business function modules composed of multiple microservices, so the granularity of PBCs, that can be identified by business personnel, is slightly greater than microservices. Hence, PBCs are packaged for programmatic access and are easy to handle. Applications can quickly response to market changes. In general, microservices are small-grained and highly flexible, but they do not provide identification of business functions; a single business application consists of tens or hundreds of microservices, making them too complex. In this sense, the PBC concept can be evaluated as a business-oriented concept rather than a technology-oriented concept.

Also, from the point of view of a corporate system, the architecture of this concept is based on MASA, but "real time" is required for adaptability and resilience. The response of the entire organization is also important. In other words, beyond the application architecture, the composable enterprise concept was raised to the organizational theory level of management philosophy and corporate organizational adaptability. A more detailed analysis of Gartner's concept reveals that, in addition to thorough modularization of applications and the technologies that support them, real-time sensing of changes in the external environment, design of an organizational culture with autonomy, and orchestration by leadership are essential.

It is true that the promotion of DX, which is progressing in the industrial world, aims to transform by focusing on what digital means, but it does not envision an organizational image that should be aimed at. The concept of a composable enterprise draws a strong organizational image and presents the means to realize it. The concept of a composable company can be said to be an advanced form of DX.

In addition, the composable type can reduce costs because it allows for a wide variety of component layouts depending on the combination of each internal module and can take advantage of reuse. Application development has become easier than ever, thanks to advances in development technology represented by no-code/low-code, and API development automation technology required for inter-module cooperation. We believe that this will also contribute to the inclusive spread of DX throughout society.

4. A Case Study of Challenging Composable Enterprise Transformation

In fact, there are precedents for trying to transform into a Composable Enterprise.

In 2015, Alibaba proposed a concept like the above-mentioned Composable Enterprise as a methodology for digital business innovation - the "middle platform" (see Figure 3).

Fundamental to the 'middle platform' are modularity (modularization of existing capabilities, consistent with Gartner's PBC concept), composability, and a methodology and architecture that enables composable business. Its purpose is to overcome the silos and inefficiencies caused by the duplication of IT systems within companies, overcome the lack of scalability of monolithic applications and the difficulty of modern applications, and adapt to the changing business environment.

Figure 3 Conceptual diagram of Alibaba's middle platform
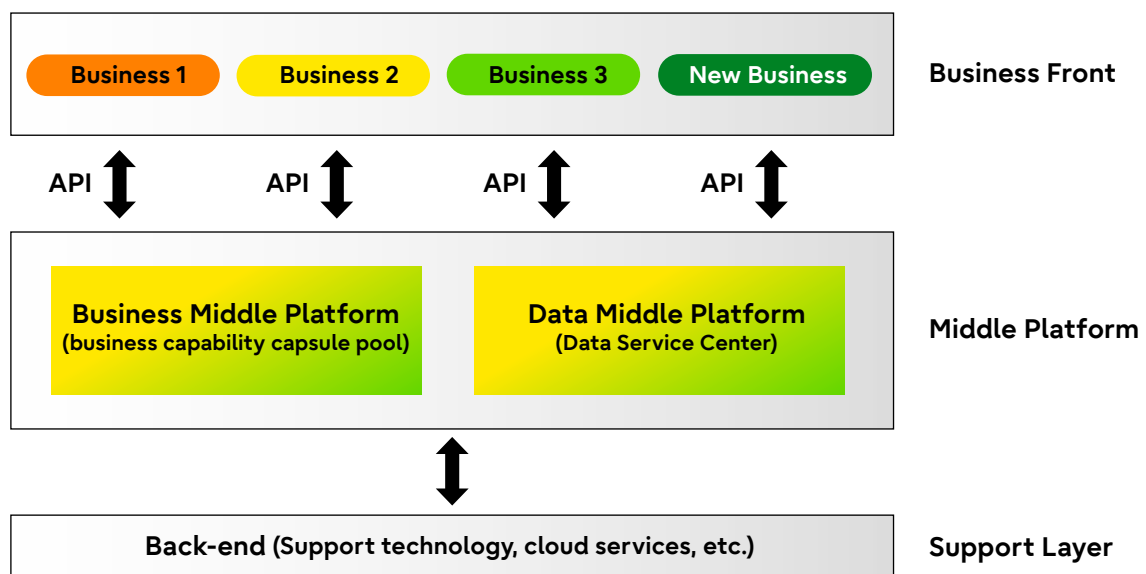

Source: Created by the author with reference to Alibaba materials

After proposing the concept of "middle platform", it became a temporary boom among leading Chinese companies. Alibaba also built a middle platform in-house, developed a composable business and provided know-how to the outside, completing more than 200 projects.

However, through several years of practice, various problems have come to light. The orchestration (technical and organizational) between the middle platform and the front does not go well, making it difficult to achieve front agility. Modularized capabilities become obsolete and cannot keep up with changes in the business environment. We believe that the concept of the middle platform is at the stage of increasing its degree of perfection through practice.

In fact, some companies are already putting them into practice. For example, in the FY2022 edition of the Fujitsu Technology and Service Vision (FT&SV), which describes Fujitsu's transformation and shares insights on building a sustainable society, Fujitsu gives insights in line with trends in composable architecture, writing that "in the future businesses will shift from creating their own new cloud-native applications to quickly connecting and combining various services" (see Figure 4). Fujitsu is also expected to try the Composable Enterprise.

**Figure 4 Concept diagram of Enabling business agility**
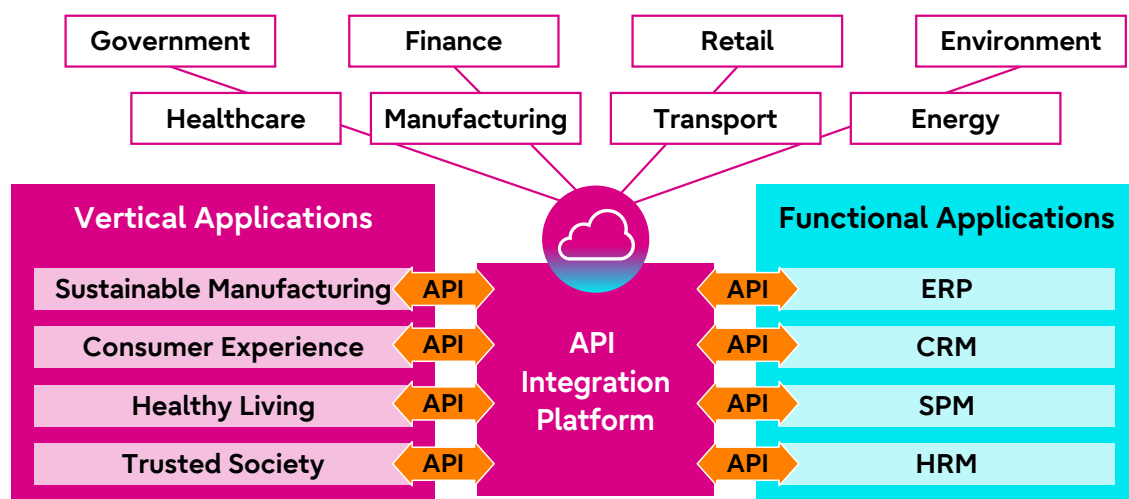
Source: Fujitsu(2022) "Fujitsu Technology and Service Vision 2022"

5. Three Proposals to Make the Composable Enterprise Work

Gartner has listed composable technology in "Top Strategic Technology Trends" for two consecutive years in 2021 and 2022. Gartner also emphasizes the impact of the Composable Enterprise transformation and encourages the business community to act. However, as seen in the Alibaba example, there are also challenges in making the Composable Business model work and deliver the desired results.

Figure 5 Conceptual Diagram of Value Chain Related to Composable Application
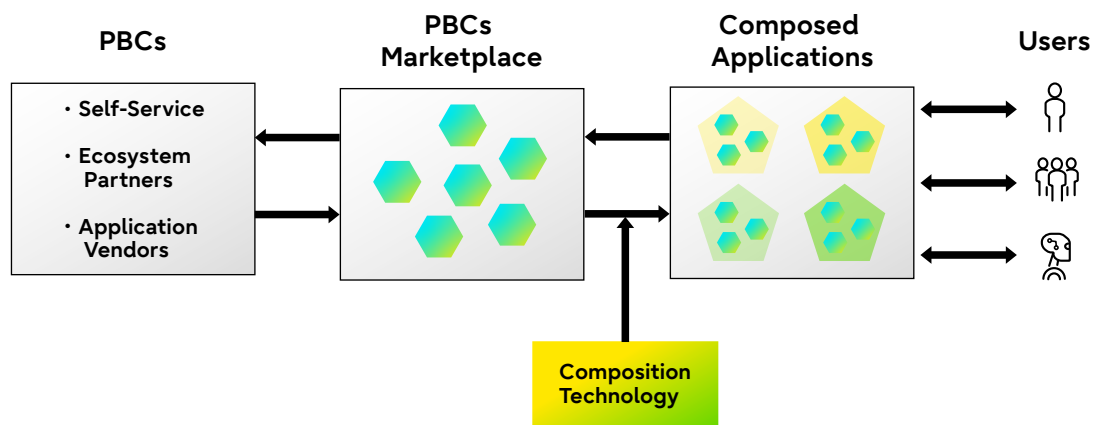
Source: Created by the author

As Figure 5 shows, the Composable Business model involves many stakeholders, and it is important to keep pace and collaborate. The author would like to make the following three recommendations regarding the value chain of the Composable Business model.

1) Formation of Front Organizational Capabilities to Utilize Packaged Business Capabilities (PBCs)

First, it is important to form the front organization's ability to realize resilience. This includes sensing changes in the market environment, leveraging packaged business capabilities to create agile and responsive solutions, seizing business opportunities, and hedging risks. Business warriors fighting at the forefront of the market are required not only to have "combat ability", but also to tell the PBCs provider what kind of "cannonballs" (PBCs) they need. This information includes when needed, what is needed, cost needed, etc.

The impetus for coming up with the concept of Alibaba's middle platform was a visit to a leading Nordic game company. Here, the business front consists of small independent teams, and there is a middle platform with components encapsulating various functions that enable these small teams. And a governance system has been built to make the composable organization function.

In this sense, governance capabilities are required along with technology to make the Composable Business model works.

2) Preparation of Attractive PBCs and Formation and Operation of an Efficient Component Marketplace

PBC is an important component of the Composable Business model. The PBC library must fit the needs of the market, have sufficient options, have high cost- performance, and be easy to use (search and procure). Also, the PBC library must grow with metabolism.

This unit is required to consider the front team as a customer, constantly strive to improve the user experience, and be a good partner who the front team likes to use the PBC library. Of course, there is also the merit of getting feedback from the front team on applications that have been verified in the market and turning them into PBCs.

3) Diversity of PBCs Supply Pipeline

Modernization and PBC conversion of company-owned applications should be promoted first. The next consideration is the development of components that meet market needs. In that case, it will be necessary to form an ecosystem with Start-ups that have special skills. Furthermore, procuring optimal components that have been verified in the market is also useful for building Composable Applications. IT vendors that provide PBCs as a service are already emerging globally. In other words, it is necessary to form a diverse supply pipeline for the supply of PBCs.

In this way, The Composable Enterprise concept was devised to quickly adapt to the VUCA era, but it may be familiar to those in the development industry who have already experienced SOA and microservices. However, The Composable Enterprise concept is more business-oriented than development-oriented, allowing more externally driven growing applications to be realized at lower cost and flexibility. However, in practice, it is important to orchestrate not only the development team or the sales team, but all stakeholders' involvement (e.g., corporate management). It is important to innovate corporate governance styles and corporate cultures that fit The Composable Enterprise.

About the author

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Dr. Jin is engaged in mega trends insights of global political, economic, social and technology (PEST), and the research and analysis of advanced cases of digital innovation / digital transformation (DX), and Dr. Jin has published the following Fujitsu Insight Paper.

- Digital Transformation in Manufacturing:
  Top Challenges CxOs Face and Proven Solutions(2022)
- Transformative 5G in the IoT Era: how to realize its potential, from verification to implementation(2021)
- Achieving Efficiency and Resilience Across Global Supply Chains with Digital Technology(2020)

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