



# The Concept and Logical Framework of Digital Scenario Innovation

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**Abstract.** As the entry point and landing point of integrating digital technology and real economy, digital scenario has been widely noticed and utilized, but the problems of inconsistent elemental concepts and unclear innovation logic widely exist in enterprise practice, which hinder the development of digital scenario and the promotion of demonstration scenario. This paper starts from the definition of key concepts such as digital scenario, digital transformation scenario and digital scenario innovation, and clarifies the basic features of digital scenario innovation, including combining perception and architecture, emphasizing abstraction and essentiality, presenting dynamization and continuity, and taking into account value orientation and problem orientation. The enterprise architecture theory is applied to the scenario level, giving the logical framework under different perspectives, such as scenario identification and definition, scenario description and analysis, scenario design and construction.

**Keywords:** digital scenario; scenario innovation; enterprise architecture.

## 1 Introduction

With the deepening of the new scientific and technological revolution and industrial change, digital transformation has become an inevitable trend. Cluster breakthroughs and large-scale applications of new-generation digital technologies have made possible the digitization, networking and intelligence of objects, processes and rules in traditional business scenarios. China's 14th Five-Year Plan proposes that it should give full play to the advantages of massive data and rich application scenarios, promote the deep integration of digital technology with the real economy, empower the transformation and upgrading of traditional industries, give rise to new industries and new business models, and grow a new engine of economic development<sup>[1]</sup>.

Scenarios have always played an important role in traditional innovation, especially in the early stages of disruptive innovation to map the innovation path<sup>[2]</sup>, or in the design of corporate strategy to gain insights into potential innovation opportunities<sup>[3]</sup>, or in the development of actual business processes<sup>[4]</sup>, the advantages of scenario-based innovation will be fully utilized. Scenarios drive innovation through customer-centered needs

analysis<sup>[5]</sup>, practice-based innovation discovery<sup>[6]</sup>, communication and learning for innovation<sup>[7]</sup>, and scenario-based design<sup>[8]</sup>. In general, scenarios not only drive the application of existing technologies in new scenarios, but also excel in creating new technologies, products, channels, and even new business models based on future trends<sup>[9]</sup>.

However, in this driving process, problems such as confusing concepts and unclear logic of digital scenarios have restricted the role of scenarios and the implementation of scenario policies. In the descriptions of different departments, there are deviations in the definition of scenarios, especially in the definition of the scope of scenarios, the disassembly of elements and the description of dimensions, which show large differences, leading to the confusion of the various efforts in different language systems. In this paper, we solve the problem of high complexity of scenarios by means of architecture, and draw on the analysis method of enterprise-level architecture in TOGAF to restore the systematicity of scenarios, so as to realize identifiable, descriptive, and developable<sup>[10]</sup>.

## **2 Concept Of Digital Scenario Innovation**

Understanding digital scenarios requires starting at 3 conceptual levels.

### **2.1 Digital Scenario**

The digital scenario is the mapping of the scenario from the physical world to the digital world, and the digital scenario can comprehensively deconstruct the business, data, application and technology in the scenario, and enhance the value effectiveness of the scenario through digital means.

### **2.2 Digital Transformation Scenario**

Digital transformation scenario is a dynamic optimization process of digital transformation, optimization, or reshaping of traditional business processes, business objects, and business rules at the departmental and unit levels of an enterprise using a new generation of information and communication technologies to achieve value addition.

### **2.3 Digital Scenario Innovation**

Digital scenario innovation is the optimization of scenarios by mapping them from the physical world to the digital world, using various digital technologies and management practices, combined with expertise specific to the scenarios, and through innovative pathways.

### **3 Essential Characteristics of Digital Scenario Innovation**

There are four key features that can be acquired from the concept of digital scenarios and their innovations.

#### **3.1 Digital Scenarios are a Combination of Perception and Architecture**

The value path positioning of scenarios dictates the need for perceptual thinking. The main advantage of solving problems on the scenario lies in the perception of needs. Perception is different from feeling, and emphasizes both the process of "sensing" and the process of "knowing". The process of "sensing" emphasizes the critical position of the "people" and revolves around the most direct actions and feelings. The process of "knowing" emphasizes knowledge-based understanding and requires a specialized knowledge base at the departmental and unit levels.

The complexity of scenarios and digitization dictates the need for architectural thinking. "Although the scenario is small, all the organs are complete", if the five organs are incomplete, such as an action, a piece of information, does not have the basic elements of the digital scenario, and can not be analyzed using the scenario innovation approach. Scenarios should have business, data, application, and technology levels internally, inheritance, synergy, and combination externally, and requirements, design, implementation, and governance in the lifecycle, as well as considering their development and trends<sup>[10]</sup>.

#### **3.2 Digital Scenarios are Abstract and Intrinsic in Nature**

The abstract and essential nature of scenarios can be compared with the concrete and superficial nature of cases. Scenarios are the abstract description and essential kernel of various business activities of an enterprise, focusing on the refinement of general laws and common needs; cases are the description of personalized needs for business activities.

Scenario is similar to the concept of "object", which is a fictional situation used to abstract real-life situations, usually based on extensive research and data analysis to ensure that they are representative and reproducible. Case is similar to the concept of "instance", which describes an actual event or situation that occurred, and contain more detailed information to help understand practices and decision-making processes in a particular field.

Therefore, the abstract and essential nature of scenarios allows them to be designed and innovated for use in research and construction, as opposed to the established outcomes and specific references of cases.

#### **3.3 Digital Scenario Innovation Process is Dynamic and Continuous**

As shown in Figure 1, based on the characteristics that scenarios can be designed and constructed, the design and construction process of scenarios is mostly presented as a

dynamic and continuous state. From the single-cycle process of a single scenario, it can be divided into the demand analysis stage, scheme design stage, implementation and construction stage, operation and evaluation stage, application promotion stage and optimization and iteration stage. From the viewpoint of the multi-cycle process of a single scenario, the channels for demand solicitation are continuously open, there is cross-cycle feedback and precipitation between design, implementation, operation, and promotion, and the process of optimization and iteration is realized by agility. From the viewpoint of the overall digital change process of the enterprise, scenario innovation occurs in every change, in the form of alternating innovative projects and generative operations, gradually realizing the overall development goals.

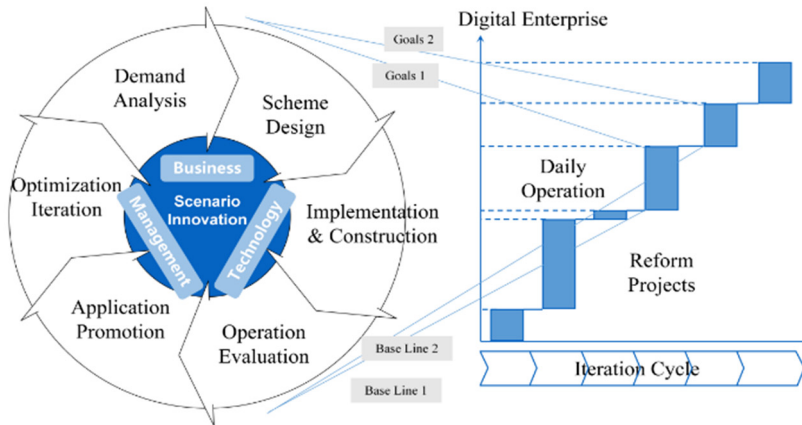


Fig. 1. Iteration and evolution of the digital scenario innovation process

### 3.4 Digital scenario Innovation Balances Value-Oriented and Problem-Oriented

Based on the dual characteristics of scenario perception and architecture, in the process of carrying out scenario innovation, it will also take into account the specific problems perceived and the overall value on the architecture. Forward scenario innovation takes value creation as the goal, takes business analysis and capacity building as the means, effectively connects the supply and demand sides, accomplishes value creation, transmission and release, and implements strategic goals such as enterprise innovation and transformation. Reverse scenario innovation, on the other hand, is a direct entry point for solving specific problems, discovering capability defects and change opportunities from problems, and realizing more efficient overall improvement by breaking through local bottlenecks. At the same time, problems that are too systematic and large-scale are often difficult to detect, analyze, and even more difficult to start. "Letting the bullets fly for a while" means waiting for problems to present themselves as intuitive scenarios in complex systems before solving them efficiently.

## 4 A Logical Framework for Digital Scenario Innovation

The logical framework for understanding digital scenarios also includes 3 levels.

### 4.1 Logical Framework for Digital Scenario Identification and Definition

The logical framework for digital scenario identification and definition is an understanding of the overall picture of digital scenarios.

As shown in Figure 2, the logical framework mainly includes eight elements of scenarios, namely people, events, things, fields, goals, boundaries, environments, and evaluations. The element of "people" is the soul of digital scenarios, as every digital scenario must serve people and someone benefits from providing this service in the process. The element of "events" is the core of digital scenarios, as long as there are "events", a scenario can be formed and its digitalization should be considered. "things" are the carriers of value, as the realization of various values often comes with the formation or transformation of products. "fields" are the carrier of digital scenarios, as digital scenarios operate in this place, which can be physical or digital places. "goals" are the reasons for the existence of scenarios, inheriting the expectations and tasks of the organization for this scenario. "Boundaries" determine the scope of scenarios and are crucial in understanding and transforming scenarios. "environment" is a collection of multiple parties that play a role in this scenario, including both internal conditions and external environments. "evaluation" is not only the value performance decomposition of goals, but also the evaluation of environmental transformation capabilities, which is an important supplement to grasp the value and state of scenarios.

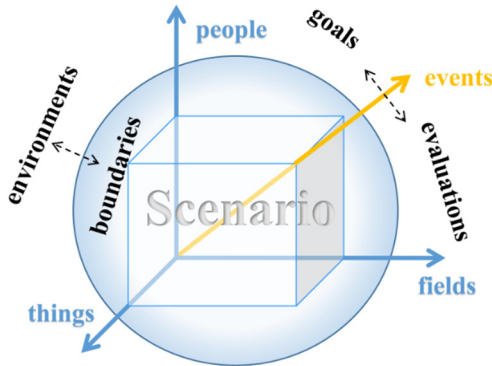


Fig. 2. Logical framework for digital scenario identification and definition

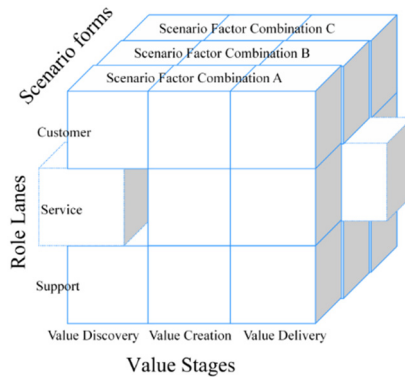
### 4.2 Logical Framework for Digital Scenario Description and Analysis

The logical framework for describing and analyzing digital scenarios is an important grasp of the key value realization process and its forms from the perspective of key actors.

As shown in Figure 3, firstly, each scenario involves multiple stakeholders, some of which are the triggers of scenario value, while others are participants and beneficiaries of scenario value. Analyzing the value realization process of scenarios requires prioritizing the identification of value realization lanes based on different actor perspectives. Among them, the customer journey is the most important actor lane in the scenario, and scenario analysis and design for the customer journey are important elements of active marketing and service-oriented operations.

Secondly, digital scenarios are dynamically a process of value realization, which can be described from large to small as scenario value flow, value stage, value project, value touchpoint, etc. Among them, the more common value stages include value discovery, value creation, and value delivery.

Finally, the actual occurrence of scenarios will be presented in a specific form. This is related to the basic characteristics of scenarios, which are different from cases and have abstract and essential nature. In the process of describing scenarios, it is necessary to make them more specific to a certain extent in order to achieve intuitive presentation. Each scenario has key scenario factors that affect its presentation form, and each scenario factor has more than one optional variable. Different combinations of scenario factor variables form different scenario forms. The important role of scenario form is to turn uncertain "things" into determined and analyzable "things", and it is associated with specific processes and is an important tool for exploring opportunities for change.



**Fig. 3.** Logical framework for digital scenario description and analysis

### 4.3 Logical Framework for Digital Scenario Design and Construction

The logical framework for digital scenario design and construction uses a more specific perspective to understand scenarios. This perspective cuts across strategy, business, data, application, and technology, and can meet the needs of scenario design and construction.

As shown in Figure 4, digital scenario innovation inherits the multilevel architecture elements of enterprise digital transformation, and deepens within the scope of scenarios

to ensure that digital scenarios serve as a bridge between enterprise digital transformation strategies and the realization of digital systems. Enterprise digital transformation is a complex systems engineering, and scenarios are small systems within a larger system, preserving necessary systemic features while also presenting unique intuitive features. Under this logical framework, in addition to layer-by-layer analysis from strategy to technology, it also includes the gradual refinement of strategy, business, data, application, and technology, as well as the gradual realization of the process from planning to construction and operation.

This framework requires that the construction of digital scenarios be closely coordinated with the overall corporate strategy, public infrastructure, and related scenario elements: scenario strategies should align with corporate overall strategies, inheriting goals and performance; scenario technologies should match public infrastructure resources as much as possible, avoiding duplication of construction and information silos; this scenario should achieve strategic collaboration and business collaboration with surrounding scenarios, realizing data interconnection and unified governance, enabling capacity sharing and technology sharing.

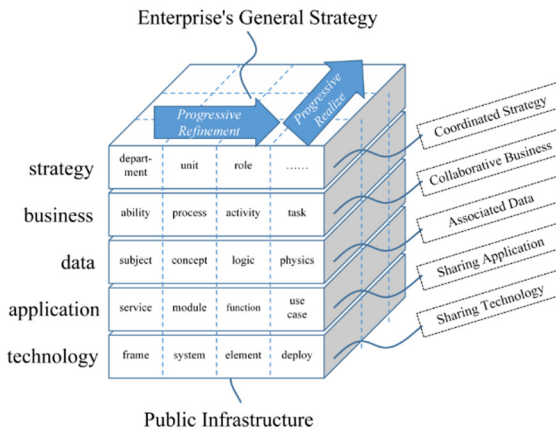


Fig. 4. Logical framework for digital scenario design and construction

## 5 Conclusion

The concept of digital scenario is different from general scenarios, emphasizing the deconstruction of the physical world through the digital world, which leads to more opportunities for innovation and transformation. Digital scenarios combine perception and architecture, emphasize abstraction and essence, present dynamic and sustained, and take into account value orientation and problem orientation. Drawing on the idea of using architecture to solve complex system problems, the identification and definition of digital scenarios can be carried out from eight elements including people, events, things, fields, goals, boundaries, environments, and evaluations; the description and

analysis of digital scenarios can be carried out by defining role lanes and value processes, forming specific scenario forms, and then making specific analysis; the design and construction of digital scenarios should run through all levels of strategy, business, data, application, and technology, and based on the scenario architecture to make systematic planning and implementation. This article aims to address the current problems of unclear concepts, vague logic, and lack of theory in digital scenario innovation. By clarifying the concept of digital scenario innovation, identifying the characteristics of digital scenario innovation, and combing the logic of digital scenario innovation itself, it provides new ideas and perspectives for researching digital transformation through scenarios.

This study is only a starting point for digital scenario research from the concept, and there are still more in-depth contents to be completed. For example, based on the eight elements of digital scenarios, provide analysis methods to help enterprises clearly define the scope and goals in transformation practice; based on the specific forms of scenarios, provide relevant methods for value stream analysis, capability analysis, and gap analysis to help enterprises make more accurate directional judgments; based on the scenario architecture, provide specific operational methods for scenario design and construction to help enterprises really take action to realize their vision.

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