Featured Articles

Collaborative Creation with Customers Establishment of NEXPERIENCE

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OVERVIEW: The transformation of manufacturing into a service industry is growing. In its Social Innovation Business, Hitachi is required to create acceptable service businesses by analyzing and evaluating the profitability and feasibility of multiple stakeholders. However, a holistic investigation of complex issues is difficult with conventional methodologies and tools. Therefore, NEXPERIENCE has been systematized to conduct collaborative creation for service businesses while visualizing ideas in multiple perspectives based on knowledge from customers and partners. NEXPERIENCE covers a wide range of phases from discovering business opportunities and designing business models, to simulating business value in order to satisfy customers' goals. Through methodologies and tools that promote a series of collaborative creations, it is capable of accelerating the Social Innovation Business and increasing the ratio of promising service businesses by carrying out intensive and high-quality discussions in a short period of time.

INTRODUCTION

THE transformation of manufacturing into a service industry is growing. Many industrial products have involved low-price competition in which services that increase customer satisfaction have become opportunities for manufacturing to shift its source of profit[(1)]. Innovations in information technology (IT) and sensors, and the advancement of how services are provided have accelerated the shift to services.

To conduct planning for service businesses requires careful consideration of acceptability, profitability, and achievability. The Social Innovation Business involves multiple stakeholders, and this means its business planning must satisfy each stakeholder's expectations for profitability and achievability. However, the numerous challenges include the following.

(1) It is necessary to investigate intensively and holistically.

(2) It is possible that there are business fields in which Hitachi does not have deep knowledge.

The Global Center for Social Innovation has been accumulating achievements in the shift to services, with in-depth research into collaborative creation methodologies by utilizing both design thinking and service engineering[(2)]. Currently, the work has shifted to systematizing Hitachi's collaborative creation, NEXPERIENCE, to accelerate the Social Innovation Business. The purpose of NEXPERIENCE is to conduct collaborative creation while visualizing ideas from multiple perspectives based on knowledge from customers and partners.

NEXPERIENCE covers a wide range of phases for satisfying customers' goals (see Fig. 1). The phases are "NEXPERIENCE / Opportunity Discovering" for sharing visions with customers to discover business opportunities, "NEXPERIENCE / Ethnography" for uncovering on-site issues and "NEXPERIENCE / Business Analysis" for analyzing management challenges, "NEXPERIENCE / Service Ideation" for creating service ideas, "NEXPERIENCE / Business Model Designing" for designing business models and simulating business value for validating developed business models. Through the methodologies and tools that promote a series of collaborative creations, it is possible to accelerate the Social Innovation Business and increase the ratio of promising service businesses by carrying out intensive and high-quality discussions in a short period of time.

Among those phases, ethnography is used as a method for discovering business opportunities[(3)]. Furthermore, the article on "Development of Methods

Fig. 1—A Flowchart of Collaborative Creation and Systematized NEXPERIENCE.
The methodology covers a range of phases based on the customer's objectives, from discovering business opportunities to designing business models and simulating business values. Hitachi has established a Collaborative Creation Space to support the practical implementation of NEXPERIENCE.

for Visualizing Customer Value in Terms of People and Management" in this issue describes the analysis of management challenges. This article will give an overview of the tools and impacts of the methodologies of "NEXPERIENCE / Opportunity Discovering," "NEXPERIENCE / Service Ideation," "NEXPERIENCE / Business Model Designing," "NEXPERIENCE / Cyber-Proof of Concept (Cyber-PoC)," and introduce the Collaborative Creation Space that is supporting the activities of NEXPERIENCE.

DISCOVERING BUSINESS OPPORTUNITIES

Hitachi has been conducting an extensive number of studies into social trends through the perspectives of politics, economy, society, and technology (P.E.S.T.) to generate qualitatively anticipated content on the value perception of people in the future[4]. This content includes the value perceptions of people in the future and the background social trends.

The approach to discovering business opportunities is to conduct workshops with customers using this content. Based on this content, the fields of business opportunity in the future will be organized through repeated discussions about business challenges in the future and the direction of business planning.

Expansion of Content on Social Trends

In the workshops, the content is first shared with participants. The content is a booklet that describes content as stories. Due to the limitations of paper and concerns about readability, not all the social trends for those stories are included in the booklet. This requires the researcher who composed the content to attend the workshop and provide details of those social trends to participants in order to fully engage in discussions and, at the same time, to prevent any differences in interpretation among participants.

To solve the problem, the social trends that serve as background to the content are presented as the cause and effect of each social phenomenon by using causal loop diagrams (CLDs)[5] (see Fig. 2). This has two impacts.

(1) People other than the researcher who composed the content can properly explain the social trends.
(2) People other than the researcher who composed the content can thoroughly discuss the social trends.

In addition, the quantitative information from the social trends can be examined in discussions persuasively. In particular, an interactive graph of statistical data with a timeline is used to indicate the social trends that are described in each node of the CLD (such as the "number of environmentally conscious products" in Fig. 2). Furthermore, the result of predictive analysis based on correlations and causal relations can also be indicated.

Future Development

NEXPERIENCE / Opportunity Discovering Tool, an IT tool, has been developed for the purpose of exploring content that has been extended using CLDs and graphic presentations. The tool integrates

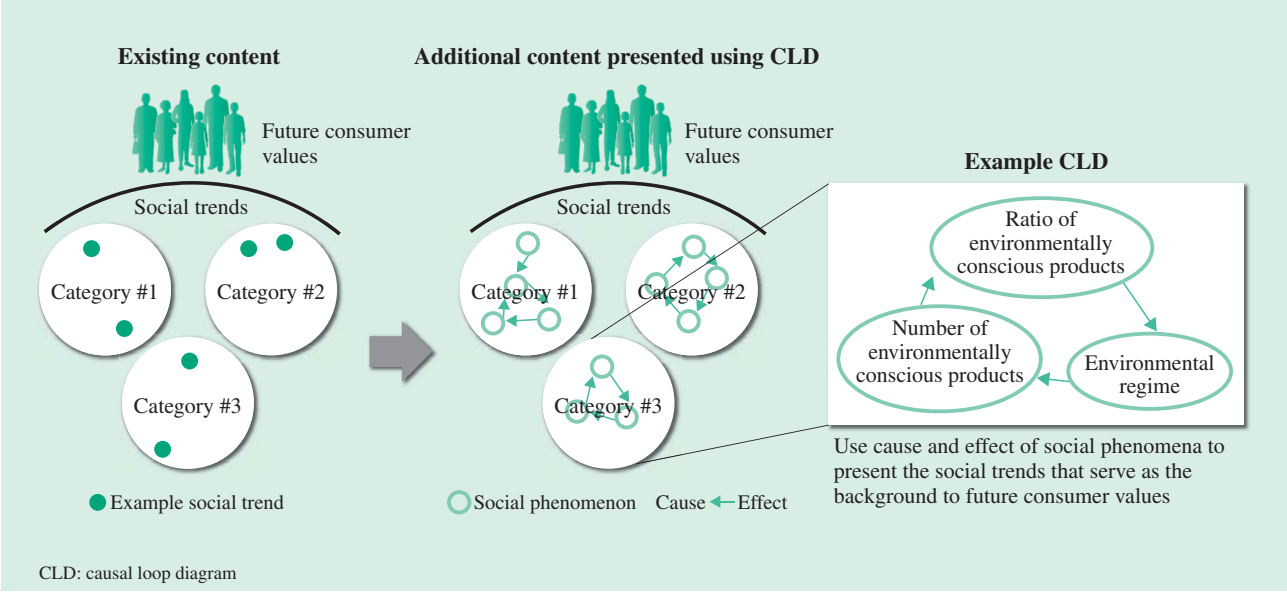

Fig. 2—An Example Use of CLD to Represent Social Trends.
By expressing the causes and effects of social phenomena in terms of cause and effect relationships (including examples of social trends that could not be included in the booklet), the background social trends can be presented accurately, even by presenters other than the person who produced the content, and comprehensive discussion can take place.

conventional memo-style discussions with IT creating a function for automatic digital memo categorization. This has shortened the time taken for workshops and made it easy to repeat the discussions (see Fig. 3).

The next step is to refine the methodologies and the tool further, and apply the developed tool to various business fields and accumulate more detailed content according to each field at the same time.

Fig. 3—A Workshop in Progress.
Tablets are used to post opinions on things like business challenges or measures for the future, with reference to statistical data on social trends expressed as CLDs and the social phenomena indicated on CLD nodes.

CREATING SERVICE IDEAS

Framework of Service Idea Creation

To expand service businesses, it is necessary to create innovative service ideas to provide customers with new values. The important task is to create "knowledge fusion" ideas that involve collaboration with experts from various fields such as targeted business know-how and advanced technology while accurately capturing business opportunities in the future, and current operational issues[6].

Hitachi has developed a framework of service idea creation with this concept of "knowledge fusion" to accelerate innovation (see Fig. 4). This framework is used in workshops where customers and partners participate with Hitachi's experts. The method of this framework for accelerating service idea creation is to use service knowledge from multiple fields of industry to identify suitable products and IT technology from Hitachi's wide range of products and IT technologies in addition to clarifying customers' values and operational issues from customers' expertise in their business fields.

Idea Creation by Framework

The procedure and perspectives that are indicated in each space in the framework are provided based on the following three approaches. They enable idea creation according to the identified purposes of the project.

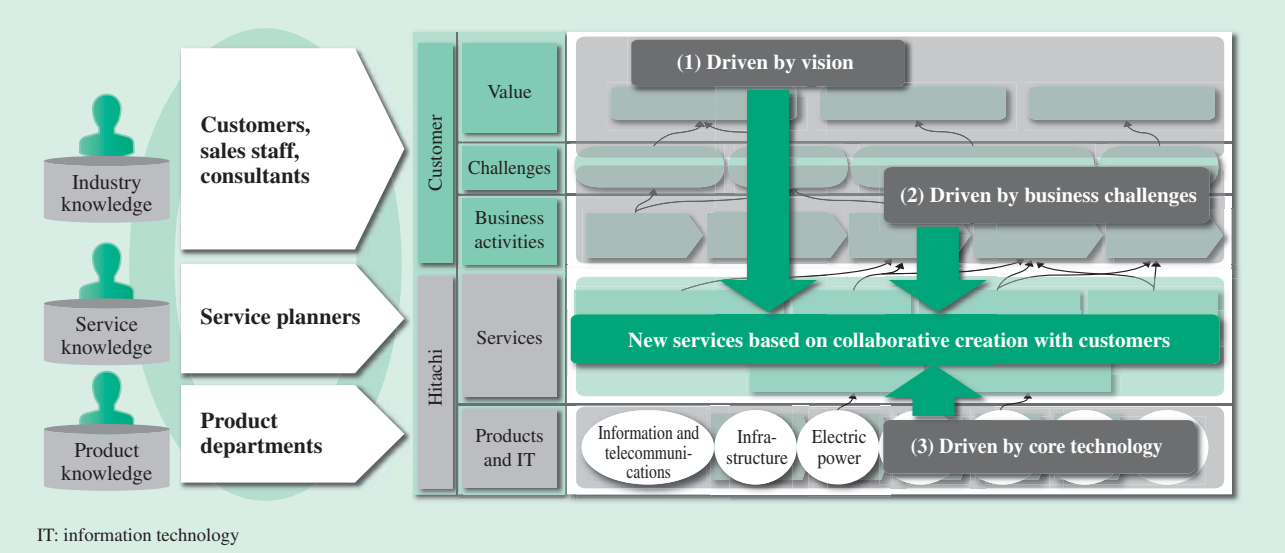

Fig. 4—A Framework for Generating Service Ideas.
This framework is used in workshops attended by customers and other partners as well as experts from Hitachi to encourage every stakeholder to come up with service ideas by providing an overview of: (1) the ideal values for customers, (2) the business challenges faced by customers, and (3) the associated IT and other products.

(1) Driving vision in order to realize ideal images in the future.
(2) Driving operational challenges in order to solve current issues.
(3) Driving core technologies in order to foster the utilization of unique technologies.

For example, there are four typical processes and perspectives for idea creation to realize the ideal images in the future described in approach (1).
(1) Clarifying values that will be demanded by customers' businesses in the future through the use of NEXPERIENCE / Opportunity Discovering, described above.
(2) Listing operations that achieve customers' values and their issues in detail.
(3) Determining effective products and IT technologies for solving challenges.
(4) Creating service ideas to solve challenges by combining products and IT technologies.

This framework is capable of promoting the creation of service ideas to examine every detail with a focus on services. One example is the creation of service ideas through collaboration by multiple operations. Furthermore, it is possible to create service ideas by utilizing resources strategically, such as transforming operations by integrating core technology.

Future Development

Currently, there are many projects that are utilizing this framework in different industries. The framework will be refined along with accumulating case studies of services. Also, the NEXPERIENCE / Service Ideation Tool, an IT tool, was developed to perform knowledge construction through the collection of service case studies in a database. At the same time, a recommendation function is being developed for related case studies in various industries using knowledge. This is aimed at utilizing "cross-industry analogies" to create ideas from case studies in different industries by applying Hitachi's superiority in many business domains[7].

Mechanisms for accelerating service idea creation and creating innovative service ideas will continue to be developed.

DESIGNING BUSINESS MODELS

After obtaining an innovative service idea, the business model is explored in detail. Hitachi developed NEXPERIENCE / Business Model Designing Tool, an IT tool, for designing business models with workshops in which Hitachi staff from multiple backgrounds can participate[8].

Business Model

There is no exact definition of a business model, but here the definition is a set of concepts that indicate an approach for increasing profits continuously in a service that consists of multiple stakeholders. This set of concepts is identified as the following four perspectives on the features of services.

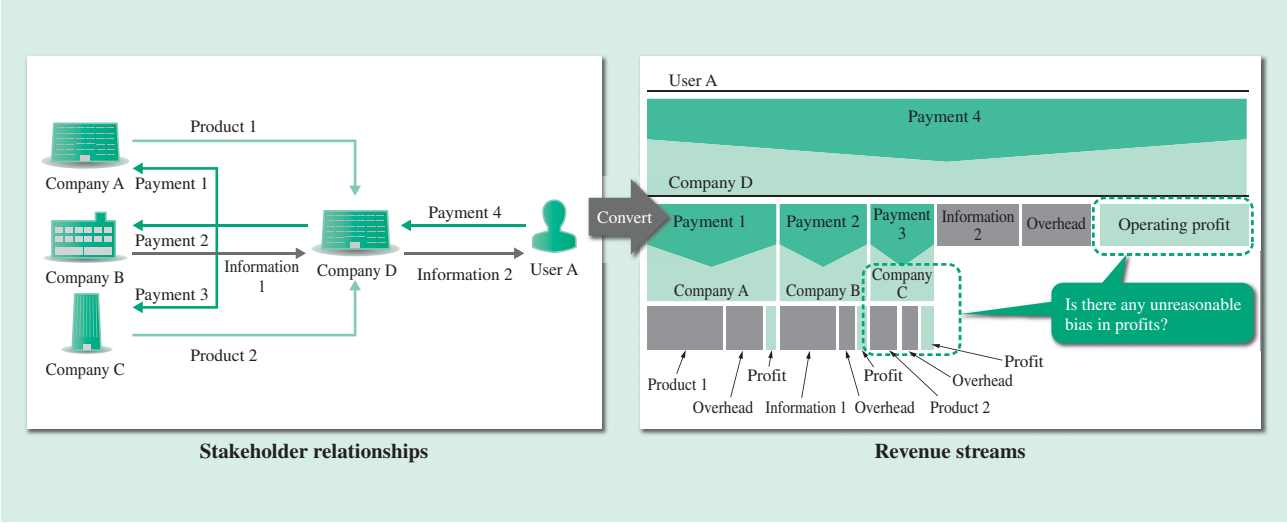

Fig. 5—The Conversion of Stakeholder Relationships into Revenue Streams.
This shows how the flow of money is identified from the stakeholder map (left), which uses arrows to represent the interactions between stakeholders. The contents of this flow are converted into revenue streams (right). The revenue streams are used to study the monetary amounts for each item and ensure the profitability of each stakeholder (such as identifying any unreasonable bias in how benefits are shared).

(1) "Stakeholders' correlations" as an overall design blueprint of the service.
(2) "Individual business strategy" to indicate a structure for businesses that participate in the service to create profits continuously.
(3) "Service user stories" to indicate the details of planning for service users so they will recognize the need for the service and use it continuously.
(4) "Revenue stream" to confirm the profitability of each stakeholder from the money flow and amount of money in the service.

By investigating service ideas from these perspectives, business models can be designed with a consideration for balancing the maximized value for both users and providers.

Conventional Approach and Challenge

Several frameworks have been developed for investigating the features of services from the four perspectives described above. The purpose was to enhance the effectiveness of investigating business models in a workshop. These developed frameworks have been applied to several projects. They include a stakeholder map[9] for investigating "stakeholders' correlations" and a template for co-creating customer journey[10] for investigating service users' "service user stories." In addition, an investigative tool for "individual business strategy" with the business model canvas[11], which was proposed by Alexander Osterwalder, and a new visualization tool for investigating "revenue stream" were developed. These have all been applied to workshops in order to design business models.

The advantage of utilizing these frameworks from those four perspectives is that the investigation can be accurate without missing any point by clearly identifying all items that should be discussed and their correlations. On the other hand, each framework has been discussed independently because the large number of frameworks makes it time consuming to cover all of them.

Framework Collaboration Tool

Extending the advantage described above, IT was integrated with the frameworks to overcome the challenges. Content studied under one framework can also be translated into other frameworks. Due to the ease of switching between frameworks during a workshop, it is easy to notice whether the "revenue stream" is acceptable and appropriate during the discussion process instead of the conventional focus on investigating "stakeholders' correlations" (see Fig. 5). This shortens the time required for switching frameworks. By repeatedly switching back and forth between frameworks during the discussion, a win-win service business can be created with multiple stakeholders.

In the future, business model design will be enhanced from a holistic perspective, such as by applying strategies from competitors.

SIMULATING BUSINESS VALUES

It is important to share an overview and value of a business with customers at the very earliest phase of the system implementation investigation to promote the Social Innovation Business that is illustrated by Hitachi's collaborative creation methodology. NEXPERIENCE / Cyber-Proof of Concept is a simulation tool for assessing business value. It is capable of verifying the return on investment (ROI) of the developed system while changing parameters interactively.

Features and Application of NEXPERIENCE / Cyber-Proof of Concept

NEXPERIENCE / Cyber-Proof of Concept presents a simulation of the degree to which the issues facing society and customers could be solved by inputting a system for solving those issues and its specifications. At the same time, it also can simulate management key performance indicators (KPIs) such as initial cost, operating cost, and ROI. The simulation can be conducted with different conditions by interactively changing things such as the system to be implemented and the attributes that will be the key drivers of KPI (see Fig. 6).

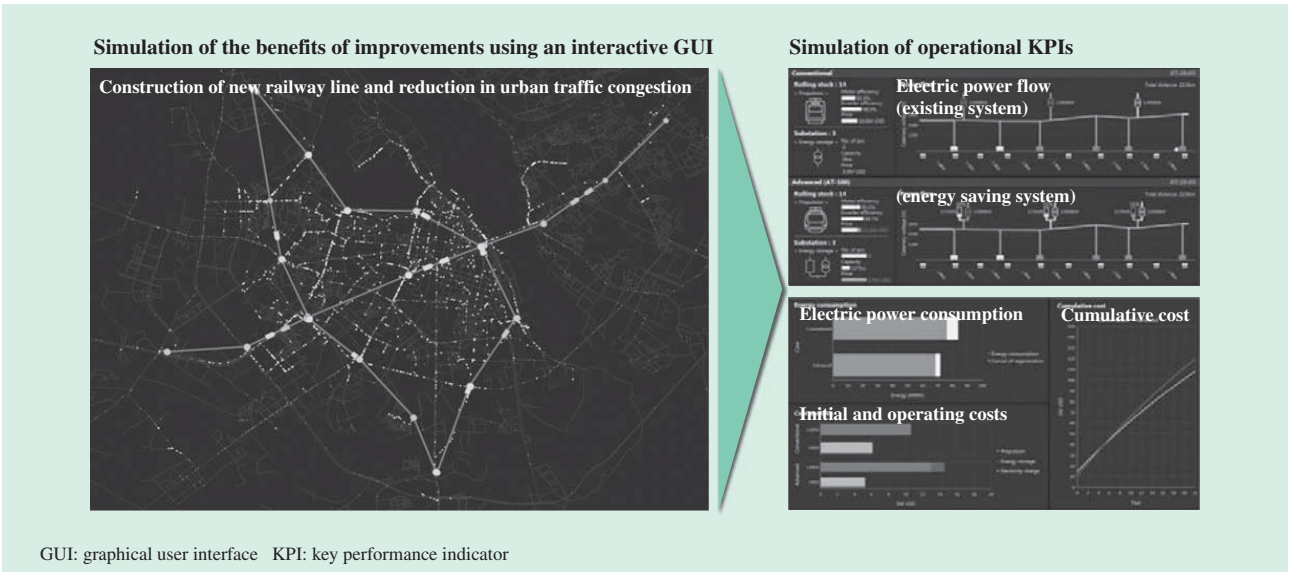

Fig. 6—The Screens Displayed by NEXPERIENCE / Cyber-Proof of Concept (Cyber-PoC) for Railway and Transportation Solutions. The screen on the left shows a visualization of the extent to which the construction of new railway lines will reduce urban traffic congestion. The top half of the screen on the right shows the results of a simulation of electric power supply planning for the railway line from the screen on the left. The bottom half of the screen on the right shows the results of a simulation of the corresponding electric power use, initial cost, operating costs, and cumulative cost. Different conditions can be simulated by interactively making changes to the railway line on the left.

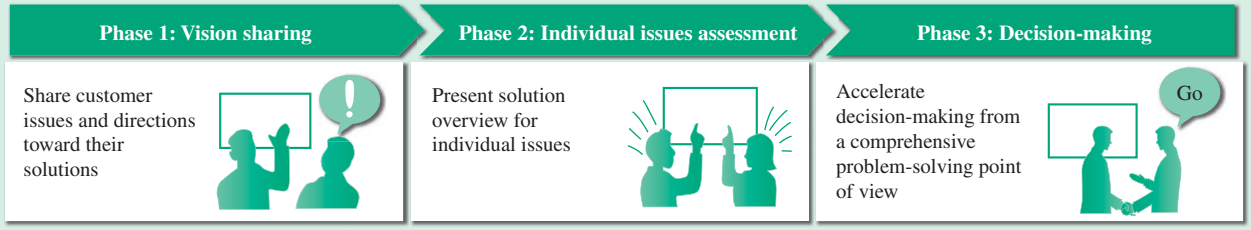

Fig. 7—The Cyber-PoC Phases.
The phase of sharing a vision with the customer involves Hitachi presenting the customer with a simulation based on available data to enable an in-depth discussion of the issues. The phase of considering the individual issues uses detailed data from across the customer's organization to look at an overview of the issues. The final phase is to perform a comprehensive simulation of the issues facing each customer department to facilitate decision-making.

Fig. 8—A Collaborative Creation Space that Facilitates Use of IT Tools.
To enable multi-faceted discussion, Hitachi has built a facility where people can focus on collaborative creation, creating opportunities for collaborative creation and presenting the results of such collaborations.

From these features, Hitachi's proposed system and business values can be accepted by the customer in the vision sharing with customers phase, investigating individual issues facing customers phase, and decision making phase to accelerate the final investment decision by corporate executives (see Fig. 7).

Future Expansion

Currently, Hitachi is developing NEXPERIENCE / Cyber-Proof of Concept for the fields of railways, transportation, and electric power by integrating its analysis technologies accumulated from a vast number of research achievements in many fields. Extending NEXPERIENCE / Cyber-Proof of Concept to the fields of urban development and healthcare will be undertaken by working with business divisions.

COLLABORATIVE CREATION SPACE

The collaborative creation methodology[2] that has been building up effectiveness through actual application uses multiple individual tools for investigation, with holistic discussion using multiple tools at one time. For example, if one developed service is discovered to have difficulty in its profitability, the investigation can be conducted again for an alternative service.

In this situation, NEXPERIENCE / Space (see Fig. 8) was established to facilitate the use of IT tools that can provide holistic investigation to support NEXPERIENCE applications.

CONCLUSIONS

This article has given an overview of NEXPERIENCE, including its methodologies and tools and their impacts, and described the Collaborative Creation Space that supports NEXPERIENCE activities.

To expand the Social Innovation Business, it is essential to understand NEXPERIENCE methodologies and tools, increase the number of people able to use them, and apply them on actual business projects. Training programs and cooperative practices with related business divisions are an on-going process. Furthermore, expanding NEXPERIENCE to locations outside Japan has been planned to foster the Social Innovation Business globally.

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