Multiple Perspectives Co-creation Process and Human-Centered Scenario-Oriented Activity Design

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Abstract. Design is changing. The object of design has changed from users and products to customers and services, from the interface of products to the touch points of the journey, and from the interaction of digital products to activities in the digital world. In the past, the division of labor in which the designer made the design first, and then provided the design to the user after completion, will become a continuous co-creation activity between the customer and the designer in the future.

Scenario was originally a design tool, but now it has become a design object. This article explores how to carry out human-centered, Scenario-Oriented Activity Design through a multi-perspective co-creation process under such changes.

This paper proposes a framework for connecting activities and scenarios with narratives. The visual narrative combined with the guidance method of switching from multiple perspectives allows the co-creation team to generate multiple empathy, and conduct usage activities, design activities, and facilitating activities at the same time. This paper also proposes a co-creative narrative guiding structure O-S-M-C that echoes the dynamic sequence of activity theory to assist the design of innovative activities. This paper also illustrates with practical examples.

Keywords: Scenario-based design · Human-centered design · Design thinking · Co-creation · Design method · Activity theory

1 Scenario, Activity, and Narrative Empathy

Storytelling is an essential partner in the design journey. While we do design, we tell the story of design objects. Scenario-based design is a representative method, which combines people, environment, objects, activities, intentions and experiences, from problem domain to solution domain, to help us complete the work of designing good products. However, the object of design is changing from products and functions to journeys and activities, such as service design, experience design. And the use of the scenario-based description of the product function has also become an activity scenario description of the journey touch points. Scenario-based product design, also becomes Scenario-oriented activity design.

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Scenario-oriented activity design has three operational objects: activity, activity scenario, and activity narrative. In this article, we use the simplified activity schema image to represent the activity, the activity schema with the document frame to represent the activity scenario, and the dialog box to represent the activity narrative (see Fig. 1).

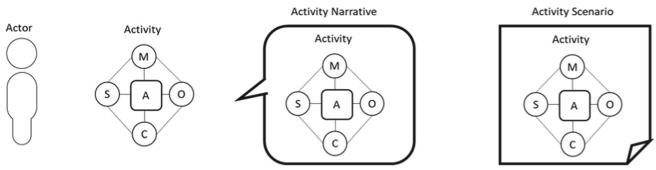

Fig. 1. Activity, activity scenario, and activity narrative.

In the field of collaborative design, an activity theory schema is a framework for describing activities. The activity schema contains four elements: subject, object, mediator and community. If the subject wants to operate the object, he will use the mediator tool or the environmental community to perform activities, and at the same time feel the tensions between the elements.

The activity scenario contains a complete description of people, environments, things, and activities. A complete set of structural scenario description methods has been provided [3], including value scenarios, activity scenarios, and action scenarios. Participants can perform activities according to its scenario data sheet.

Activity narrative is the statement of the activity by the participants of the activity, including the systematic recitation of an event or series of events, or the narration of the actions of part of the event. Sometimes, activity narrative are the emotional points that the narrator wants to convey.

Activity participants can refer to the activity scenario for activities, and express the process and experience with activity narrative. Activity participants can also generate scenarios through activity narrative. Through narrative, the scenarios of the activity can be passed on to another person to perform a similar activity (see Fig. 2).

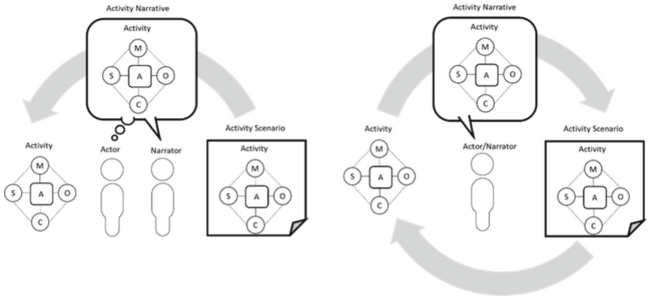

Fig. 2. Narrative is the transition key between activity and scenario.

Activities are intangible sequences, activity scenarios are specific documents, and activity narratives are the key way for people to convert scenarios into activities, or convert activities into scenarios, as well as a key tool for human-centered design.

■ "Being" narrative, "Becoming" narrative, empathy and co-creation.

Establishing two opposing states of "Being" and "Becoming" at the same time can drive innovation. People share the story of "Being" together through narrative, share everyone's expectations and their own experiences, and connect possible implementation methods and ideas to co-create a "Becoming" scenario that doesn't yet exist (Fig. 3).

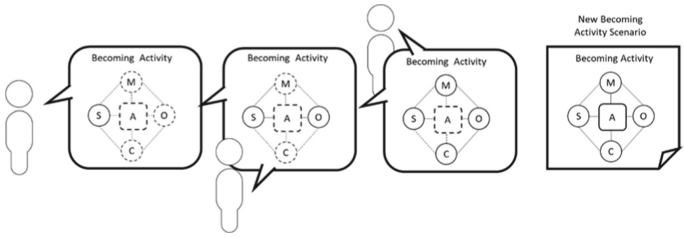

Fig. 3. Share being narratives create becoming scenarios.

Wistron's fitness magic mirror case illustrates such a process. In 2014, we assisted a Taiwanese manufacturer to discuss the future type of large-scale displays. We led a group of four to share the narrative and created a LEGO storyboard script describing a woman's fitness activities using a large smart display with her trainer and her own reflection in the mirror. And the same scene appeared in the commercial product service in 2020 (Qiaoshan Magic Mirror). The product advertisement video also featured a situational picture that was almost identical to the original concept (see Fig. 4), and the display used by the commercial product company happened to be provided by the manufacturer. This case illustrates how a small team co-created a "Becoming" script through scenario-oriented activity design to truly become a "Being" story that everyone can accept.

Fig. 4. Two sets of fitness magic mirror scenarios.

2 Scenario Combined with Narrative to Facilitate Co-creation Activities

There are three types of activities in the innovation process, Scenario-Oriented Activity Design produces user scenarios for user groups, supporting user activities and narratives. Similarly, in innovative activities, Scenario-Oriented Activity Design produces design scenarios for designer groups to assist in designing activities. It can also generate facilitating scenarios of facilitators to help guide co-creation activities. (dotted arrow in the Fig. 5 below).

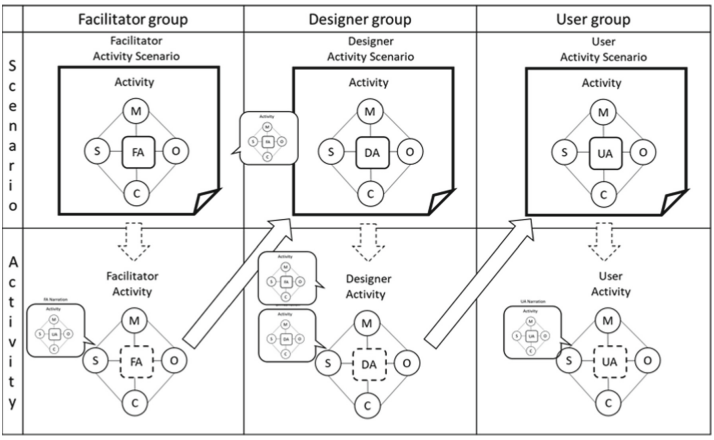

Fig. 5. Facilitating, designing, using activities and Scenario-Oriented Activity Design.

In addition to being used in the same ethnic group, Scenario-Oriented Activity Design must also cross different ethnic groups, connecting the activities of facilitators, designers, and users. The facilitator uses the facilitator scenario to carry out the facilitating activity, assists in generating the designer scenario, and guides the designer to carry out the design activity. The designer uses the designer scenario to generate the user scenario and guide the user to perform the user activity (as shown by the solid arrow in the Fig. 5 above).

Since design submissions have changed from products to current activities and interactions, Scenario-oriented Activity Design also faces a co-creation situation where facilitating, design, and using occur at the same time. Through the activity narrative to drive empathy and mirroring, the participants of innovative activities can quickly integrate into different roles such as facilitator, designer, user, and carry out corresponding activities according to different scenarios. In the image below, the designer activity scenario on the screen, with the addition of a visual facilitator activity narrative, integrates the facilitator activity with the designer activity scenario. Designers can collaborate and co-create more smoothly through dual empathy.

In the image below (see Fig. 6), on the screen, the design activity scenario plus the visual facilitator activity narrative presents two sets of activity scenarios. Designers can collaborate and co-create more smoothly through dual empathy.

Fig. 6. Visual narrative drives the dual empathy of facilitating and design.

■ Narrative perspective presentation, interaction and use of props.

Visual narration provides the positioning of the narrator, defines the empathy perspective of the reader, and drives empathy, dialogue and interaction between them. The presentation of multi-perspective narrative requires the support of narrative tools with activity descriptive power, including personnel setting, object operation and scene evolution, and the transfer of experience.

LEGO bricks, manga figures, large digital displays and smart glasses are all good materials and props. Through these narrative visualization support tools, members of the co-creation ecosystem can perform creative tasks while empathizing with the narrative. The following images are use cases for LEGO mini-figures, manga figures, and smart displays (see Fig. 7).

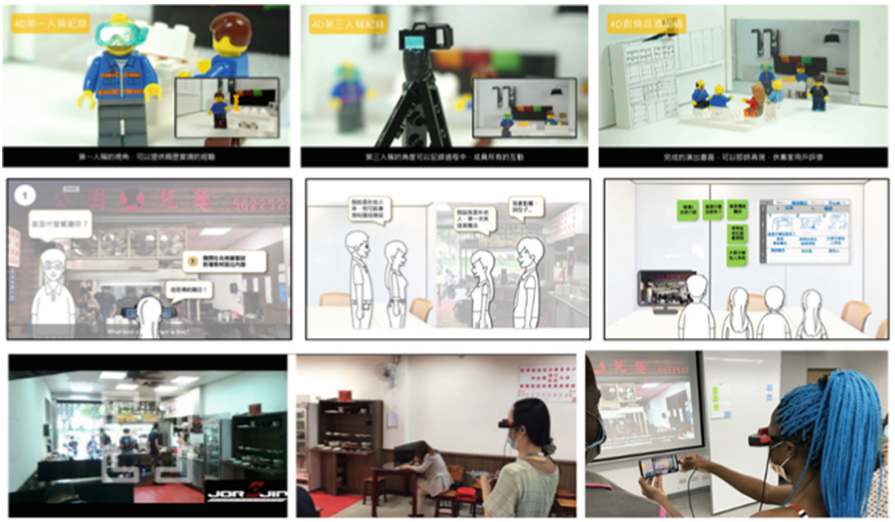

Fig. 7. LEGO bricks, manga figures, large displays and smart glasses as design props.

■ Activity schema and narrative perspective presentation.

Activity schema takes the subject as the starting point, and describes the interaction dynamics between the subject and the objects, mediators and communities in the activity system. Taking the subject as the center, combined with the position of the narrator's different perspectives, can produce different empathy as shown below (see Fig. 8).

Fig. 8. Presentation of multiple perspectives.

The first-person perspective starts from "I…", which is to watch the activities from the perspective of the subject, and the narrator himself will also strongly feel various tensions and response motives, as shown on the Fig. 8. left image.

The second-person perspective starts with "You…", you can watch the subject's activities from the opposite angle of the subject, and you will clearly feel the next interaction between the subject and yourself when narrating, as shown on the middle image.

From a third-person perspective, the subject's activities can be viewed from a bystander's perspective. The narration starts with "He…", and the narrator will feel the surroundings of the bystander, and the connection between the community and the environment. Through narratives from different perspectives, designers can better understand user feelings, object intentions, and operation appearances, as shown on the Fig. 8. Right image.

Furthermore, activity theory divides activities into activity-levels with motivation and ambiguous actions, and action-levels with goals and clear processes. Bringing innovation participants back and forth between the fuzzy motivation level and the clear execution level creates opportunities for dialogue, interaction and innovation.

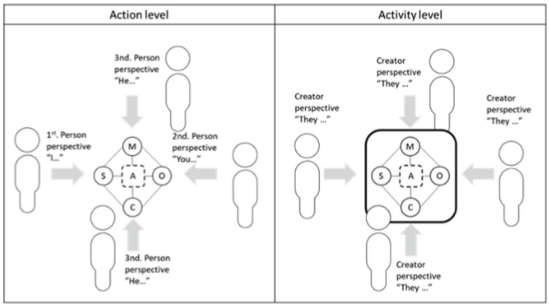

Fig. 9. Multiple perspective switching between active level and action level.

We propose a creator's perspective to assist activity-level narratives with only motives but unclear actions. The design activities from the creator's perspective are carried out

on a mini-stage mainly constructed by LEGO minifigures. The designers are like the Greek gods in Greek mythology, not only creating users, but also constructing various possible scenarios that users may experience.

With vague activity-level and clear action-level narrative presentation props, designers can freely enter and exit the two levels, and use the activity-level negative space perspective and action-level positive space perspective to make innovative connections, combining the subjective narrative of "Becoming" with the objective scenario of "Being" into a future narrative of "Become being".

The picture below shows the Taoyuan Airport team discussing the "Becoming" scenarios of Airport 4.0 digital transformation from the creator perspective. The team created the activity scenarios from the creator's perspective, and then enlarged the action scene into a life-size image. Designers can switch themselves from the creator's perspective of "Becoming" scenarios to the first-person or the third-person perspective to discuss the "Being" details of the actions, and finally get the concrete "Become being" scenarios. (See Fig. 10).

Fig. 10. Switch perspective activity in Taoyuan Airport collaborative design.

■ WOZ narrative of positive and negative spaces.

WOZ Wizard of Oz is a narrative approach to HCD (Human-Centered Design) collaborative design. WOZ has an activity state of facilitation, design and using at the same time The WOZ facilitating scenarios is to let the designer act as a product, facilitate user interaction, observe the usage status, and design at the same time. Taking ATM (automatic teller machine) as an example (as shown in the Fig. 11 below), according to the facilitating scenarios, the designer hides behind the ATM and proposes a low-fidelity prototype to facilitate the user to withdraw money in front of the ATM with a low-fidelity interface machine use.

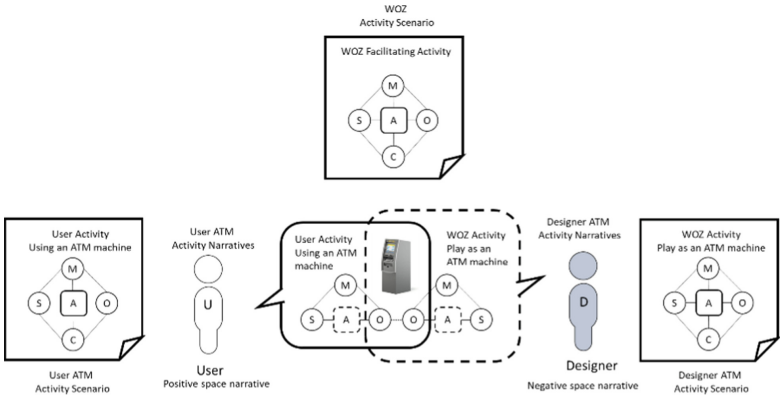

Fig. 11. ATM WOZ narrative interactions.

What the designer provides on the product side is a selective negative space narrative. The user side is a decision-making positive space narrative. Through such design co-creation activities, designers experience the activities, interactions, and even tension between user and product, and establish appropriate physical appearances of product and interfaces.

The WOZ method provides a unique product perspective, coupled with structured positive and negative space narrative interactions, facilitates the design activity groups, and uses activity groups to co-create new product activities together, resulting in human-centered outcomes.

3 The "O-S-M-C" Narrative Process

The feature of WOZ is that the designer plays the product and interacts with the user from the product perspective. However, if the design object becomes an abstract activity, how can we use the activity perspective to carry out the WOZ co-creation activities? We propose to use the four basic elements of activity schema as the entity of WOZ perspective. This entity is like an assemblable transformer robot of Japanese manga, which is activated individually from subject perspective, object perspective, mediator perspective, and community perspective, and can become a whole activity perspective finally. This four-in-one composite entity is more responsive to the challenges of designing journey-style activities.

Let's break down the process of changing the perspective of WOZ facilitation. WOZ first stands on the perspective of the object product, narrates from the perspective of "you", understands the interaction between me (the product) and you (the user), and then stands on the subject user's perspective. From the perspective of "I", establish a common sense with the user, and finally observe the activities of the subject user from the perspective of mediator or community, and narrate from the perspective of "he", producing methods that can assist the subject. The WOZ process completely echoes the execution order of O-S-M-C (Object-Subject-Mediator-Community).

Because the "O-S-M-C" activity schema elements have the characteristics of dynamic response and mutual enabling, combined with the narrative guidance sequence of "O-S-M-C", and the perspective variation of "you-me-he-them", "O-S-M-C" narrative facilitating mechanism will become an effective structure to drive co-creation activities:

1. Narrate from the perspective of "Object", establish a common sense of "you", and understand your "Becoming" goals and interactions.
2. Tell the story from the perspective of "Subject", establish a empathy of "I", and understand my "Becoming" feeling.
3. Finally, watch the subject's activities from the perspective of "Mediator" or "Community", start with "him", empathize and understand, and produce the "Becoming" assistance he needs.
4. Finally, watch the subject's activities from the perspective of the creator, starting from "them", empathizing with and understanding their "Becoming" scenarios, and producing methods to assist the subject. (See Fig. 12).

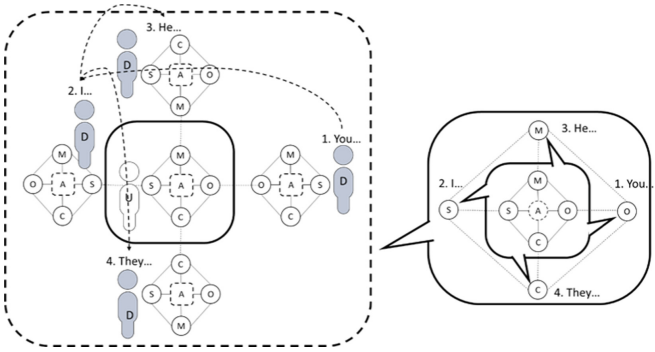

Fig. 12. The "O-S-M-C" narrative process.

4 Two Case Studies

Finally, we analyze the service design course of Tsinghua University and the bilingual training system of Providence University from the perspective of "O-S-M-C" four-in -one mechanism, and the facilitating design of the two human -centered co-creation activity cases.

Case 1: Service Design Self-taught and Cocreation Process
Tsinghua University's service design course faces the challenge of doing co-creating and learning design methods at the same time. We decided to use a co-creation system that could simultaneously support facilitation activities, design activities, and use activities to assist in the course. This course is completely self-study by the students, five weeks and 15 h without teachers' teaching, and the collaborative innovation output has been

rated positively by each other. We analyze the interaction between students and learning activities from the perspective of "O-S-M-C" as a service design course activity entity:

1. The design activities will be carried out by the "Object" perspective to guide "you"::

The service design facilitating activity entity stands in the position of Object, faces the designer with the prompt of "You becoming", and allows the designer to expand into a series of states to be completed. As shown in the Fig. 13, the facilitator in this service design program is a cartoon character, providing appropriate design tools, such as customer journey map, and assisting design students to complete collaborative work by themselves through the dual empathy of guiding activities and design activities.

Fig. 13. The "Object" perspective guides the design activities via customer journey map.

2. The design activities are conducted by the "Subject" perspective, "I"::

The service design facilitating activity entity stands in the position of the Subject, and makes the designer becoming aware of the dilemma or need of each target to be accomplished by the prompting method of "I becoming". The service design program is transformed into a guiding comic character, providing empathy tools for service exploration, cool hunting, persona, etc. Assist student groups with empathic research work. (See Fig. 14).

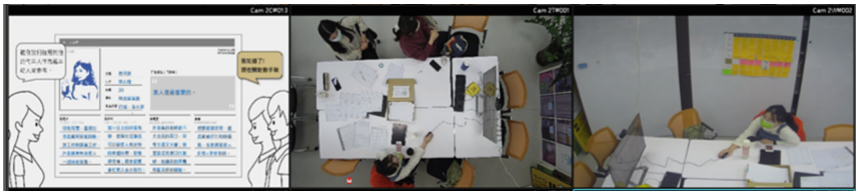

Fig. 14. The " Subject " perspective guides the design activities via persona.

3. The design activities will be facilitated by the "Mediator" perspective to guide the creator to find the user's need":

The service design facilitating activity entity stands in the perspective of "he", with the prompt of "helping him in the way…", so that the designer "Becoming" can find the solution of mediating ideas or concepts.

This stage will use innovative tools such as Brain writing 653, Innovation Matrix, Storyboards, Paper Prototypes, etc. The guided narrative here will include the first and second person perspectives of the comic book characters, as well as the creator's perspective established in the context of the LEGO story, guiding the designer in and out of the usage and design activities.

The left side of the image below (See Fig. 15)shows the space the design team travel between the first and second-person perspectives and the creator's perspective.

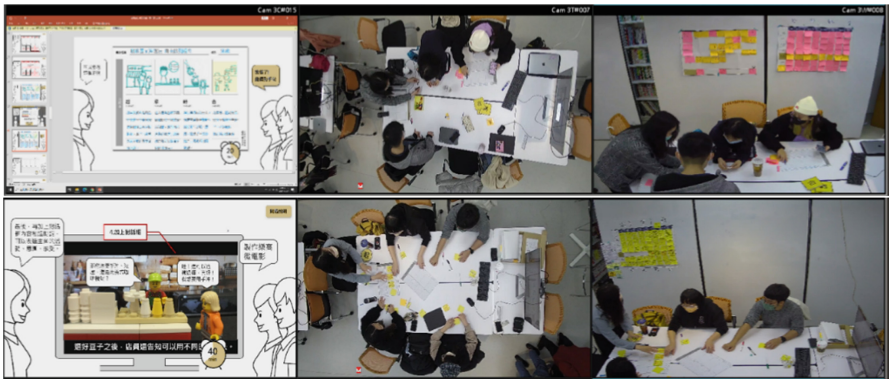

Fig. 15. The "Mediator" perspective guides the design activities via story boards.

4. The design activities will be incorporated by the "Community" perspective to assist the creator in finding "their" needs:

The guidance service design activity entity is prompted from the perspective of "they", so that the designer "Becoming" can complete the design output that is commonly recognized in the way of separate and co-constructed stories for the ultimate goal of the whole. The methods used include mini-figure micro-movies, service blueprints, and more.

The left side of the Fig. 16 below shows the narrative space of the LEGO Storyboard, which provides the design team with the co-creation of the stories of mortal characters from the perspective of Greek gods.

Case 2: Co-creation Activity of Bilingual Development System

Taiwan has been promoting bilingualism in recent years, and in a short period of time,

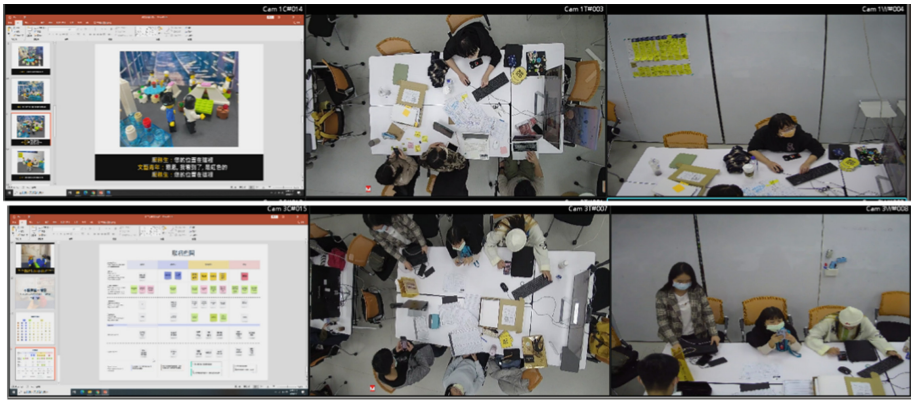

Fig. 16. The " Community " perspective guides the design activities via LEGO movie and service blueprint.

the narrative ability will become both Chinese and English. From the perspective of co-creation activities, it is to transform a field that used to be activities in the mother tongue into a field that "will become a field for activities in bilinguals": The content of the activity must becoming bilingual, the people involved in the activity must becoming bilingual, the tools of the activity must becoming bilingual, and the community related to the activity must becoming bilingual, as shown in the Fig. 17 below.

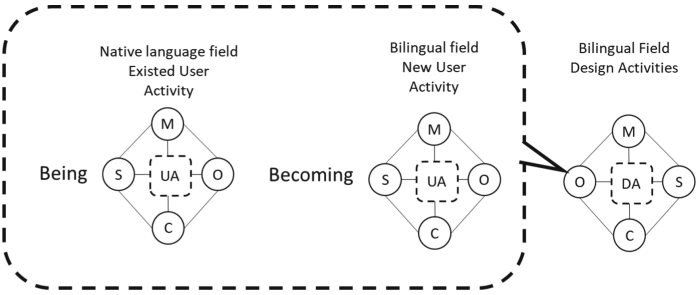

Fig. 17. Bilingual field design activity

At Providence University, we have developed a bilingual development system that includes collection, production, practice and sharing through cross-team co-creation. The entire bilingual co-creation service can be explained by the "O-S-M-C-you-me-he" activity-facilitated perspective narrative.

1. The "Object" perspective, standing in the position of the Object, lists key activities based on what you will do in the field that requires bilingualism, and drives the subject's perspective to externalize these activities.

Actual design and operation: Combined with smart glasses, conduct field tours in the first-person way, and record with the mobile phone in the third-person way, and collect the field activities that the field stakeholders will carry out. (See Fig. 18).

Fig. 18. The collection activity of first person view.

2. From the perspective of "Subject", stand in the position of Subject, experience how users can use bilingualism, and understand the difficulties that users will face, such as not knowing how to translate into English, unable to express in English, and not knowing what the other party needs.

Actual design and operation: We use the collected audio and video records to create bilingual key images and interactive narratives, and invite bilingual users to experience and narrate from a first-person perspective and a third-person perspective to understand their usage behaviors and obstacles. (See Fig. 19).

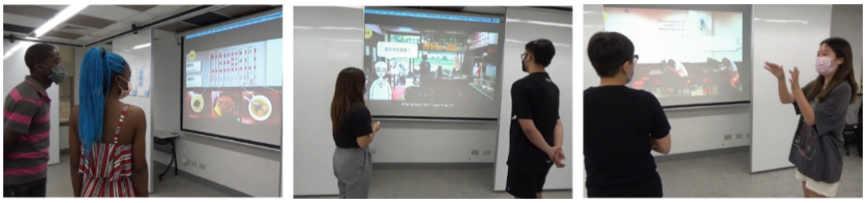

Fig. 19. The interaction of bilingual learners.

3. The "Mediator" perspective, standing in the Mediator's position, assists the system to establish the possibility of bilingual interaction and the "Becoming" method. How does the object in the bilingual activity system establish bilingual content, how does the subject establish bilingual ability, and how does the mediator assist bilingualism? In response to such needs, various prototypes of mediating methods or tools are proposed.

Actual design and operation: We build smart AR glasses and a large display screen to carry bilingual learning content. We also provide learners with different usage scenarios and bilingual dialogue interactions from different perspectives. These scenarios can be recorded and played repeatedly for learners to practice. (See Fig. 20).

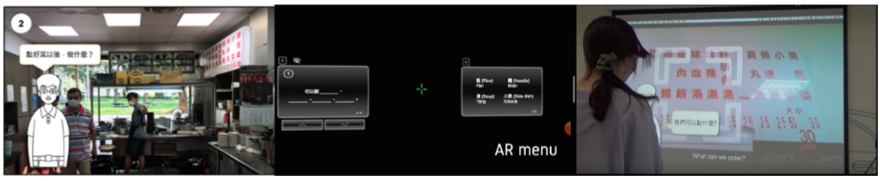

Fig. 20. The interaction of bilingual learning through mart display.

4. The "Community" perspective, from the creator's perspective, establishes activity scenarios for different subjects and objects, and convert it into an action script, enrich the program, and continue to expand bilingual activities.

Actual design and operation: Build a minifigure storyboard, provide basic activity concepts, and guide the team to complete innovation based on the creator's perspective. We guide the field users (including hosts and customers) to externalize the key activities of the field; we look for foreign language students to collaborate on the production of bilingual textbooks; we help field stakeholders through mediator innovation to establish key field activity scenarios. (See Fig. 21).

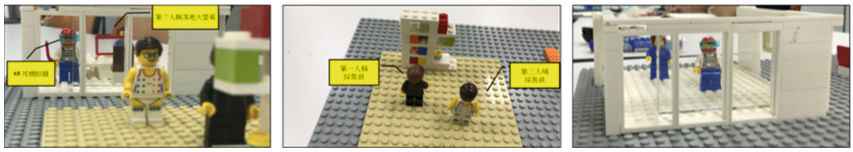

Fig. 21. The creator perspective scenarios for communities.

This case shows how to design activities, from the guiding perspective of "Object- Subject- Mediator- Community", to establish different activities to form a bilingual environment to guide the field and related people, from the old scenarios of Being's native language, Becoming to bilingual new scenarios. Through the mediation tools of new display technology and smart glasses, the new possibility of multi-perspective narrative and multi-activity crossing has been brought forward.

5 Conclusion and Finding

The system dynamics of Activity Theory is to initiate activities under the mutual contradictions of system elements and to interact until the contradiction disappears.

Through the O-S-M-C facilitating structure, a human-centered scenario-oriented co-creation system will encounters obstacles to its goals, and will choose to mediate innovative solutions or call the community for assistance according to the rules of the participants. Then from an existed being scenario to a becoming scenario that meets the needs of the participants.

The bilingual training case in Providence University, such as the on-site collection of target activities, to user obstacles, and the visual narrative guidance method of bilingual ability improvement, echoes the innovative activity dynamics of the bilingual activity system. The Tsinghua University service design self-learning case is to provide a self-learning and co-creation environment to support innovation teams to shuttle between design, use, and guiding activities, carry out self-learning and cooperation, and complete innovation activities.

This paper proposes a framework for connecting activities and scenarios with narratives allows the co-creation team to generate multiple empathy, and conduct usage activities, design activities, and facilitating activities at the same time. This paper also proposes a co-creative narrative facilitating structure O-S-M-C that echoes the dynamic sequence of activity theory to assist the design of innovative activities.

Such co-creation activities are connected by the narrative of the participants, guided by the changes of perspective, and carried out with the assistance of visual scenario tools. Thanks to better displays and smart glasses, it will be easier to switch perspectives and visualize narratives, making the aforementioned human-centered co-creation more possible.

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