

Apply Humanity-centered Design Process to Envision the Future Learning Experience of Public Area – Use “Redesign Shanghai Library Innovation Space Project” as an Example

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This study attempts to redefine the traditional human-centered design thinking method, and coins the term—“humanity-centered” design approach, which consists of an inclusive framework, co-creation methods and a comprehensive way of viewing the creative research process. In short, the purpose of the approach is to design with care. The whole research and design process took minority groups including the elderly, the children, the disabled as well as the target/majority users into key considerations and designed relevant layers of their engagement accordingly. This study utilizes the example of envisioning the future learning experience of public area - redesign Shanghai Library Innovation Space as a real go-to market project based on humanity-centered design approach that covers every aspect of the Shanghai Library Innovation Space (the Space), from the individual, product, organization, and space to the service and experience it offers. The purpose of the redesign lies in making knowledge accessible and flow freely so that users can experience in the Space what extends beyond the library. A more enriching learning experience for readers/users, in turn, helps to highlight the role of the librarian, and leads to a more enriching experience for users. The Space has always been the benchmark in the exploration of innovation space for Chinese libraries. Yet in the face of market change, consumer trade-up, industrial transformation, and technological advances, it has to reposition itself in order to maintain its leading role in the practice of library innovation by delivering better experience for both its users and librarians through culture rebuilding, while in the meantime following the Shanghai Library's mission of "providing excellent knowledge services". A survey of users and librarians highlights the need to establish a more distinctly defined value proposition, to deal with the incompatibility and interaction between different areas or sections, to improve the design to meet the actual needs of users/librarians, to enhance services offered by librarians and to interact with users in more varied forms. A humanity-centered approach has enhanced design elements in space so much so that knowledge, education and innovation opportunities can be found everywhere and come in the context of dialogues rather than just existing in the physical environment. The knowledge-based services provided by the Space feature diverse and customized innovation education courses suited to users' needs in the forms of lecture, speech, and workshop, in order to better connect with the users. The Space has also nurtured an innovation-oriented culture and knowledge-based community with a more positive influence on society.

Keywords: *Humanity-centered Design; Human-centered Design; Design Thinking; Design for Social Impact; Shanghai Library; Participatory Design; Innovation Space*

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1. Introduction

It is common to hear designers, clients or people who work in the creative industry talk about human-centered design and design thinking. Both terminologies are not new concepts, frameworks, or theories. In the study, we introduce a concept of humanity-centered design, which is based on the structure of human-centered design by adding three engaging layers: individual layer, community layer, and society layer. In this paper, we provide a brief history of “human-centered” design in order to contrast it to our concept, “humanity-centered design”. Then, we discuss the importance of humanity-centered design in the context of traditional design thinking processes. We use a case study – Redesigning the Shanghai Library Innovation Space – to operationalize the concepts we discuss in this paper and give readers insight into selected processes and design outcomes of humanity-centered design.

2. Literature Review

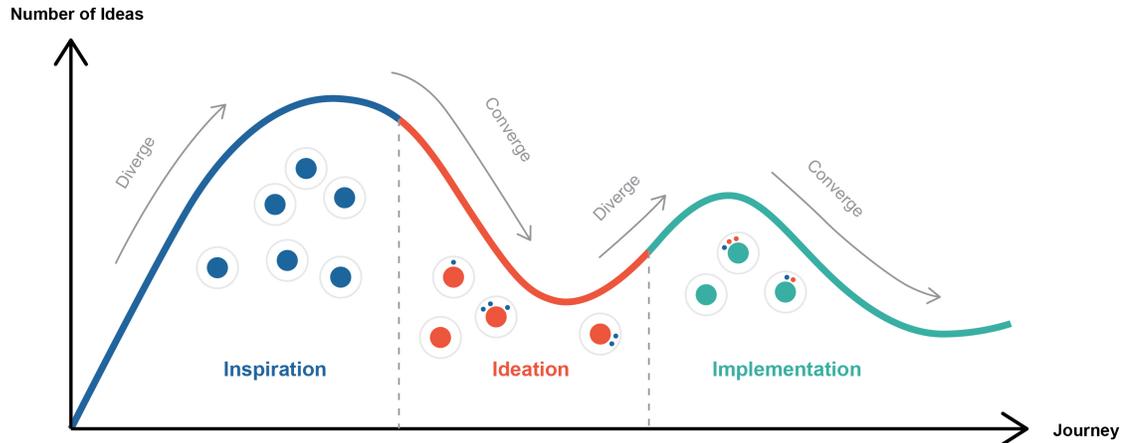
2.1 Human-centered Design

According to IDEO’s definition, human-centered design is about cultivating deep empathy with the people you’re designing for; generating ideas; building a bunch of prototypes; sharing what you’ve made with the people you’re designing for; and eventually, putting your innovative new solution out in the world (IDEO, 2018). The Field Guide to Human-centered Design by IDEO.org stated ‘The process is designed to get you to learn directly from people, open yourself up to a breadth of creative possibilities, and then zero in on what’s most desirable, feasible, and viable for the people you’re designing for’ (IDEO, 2015). Besides directly learning from people, the cornerstone of human-centered design is about building empathy, which means seeing the world in the lens of their perspectives, not only from the research team or designers (Sklar & Madsen, 2010). Since sometimes the main design challenge of the project comes from lacking of a voice of the people/users (Cooper, 1999). Even more there are some design researchers have strong opinion that design will not exist without the user (Kazmierczak, 2003).

Human-centered design has many forms and definitions. Some research also called user-centred design (UCD) approach can satisfy the desirability of the targeted or potential end-users in the product development process to achieve a strategic and innovative goal of an organization (Liem & Sanders, 2011). It is a human mental model, a mindset, connected to design thinking process e.g. an iterative diverging and converging journey, as revealed in the Double Diamond Framework by British Design Council in 2004. Applying human-centered design doesn’t mean the process should only start with people, but also other aspects the project team needs to consider. Bill Moggridge, Director of Cooper Hewitt, National Design Museum said ‘If you think of innovation as being depicted by a Venn diagram, human-centered design is the overlap between technology, business, and people’ (Millman, 2011).

In the study, the team adapted the model created by IDEO.org (Figure 1). The X-axis represents a timeline of the project; the Y-axis represents a number of ideas, and the curve represents the diverging and converging project journey, including three interdependent phases: inspiration, ideation, and implementation. The phase is a mix of mindset and design thinking process. In the study, the team defined it as a mindset, which concludes that some key considerations need to be paid attention to in the process of the project.

In short, the inspiration phase is the stage where relevant information and data around the target user group are gathered, including user/ethnography research, analogous examples, inspiration activities. It is strongly connected with the desirability of the people such as “Why do people have a motivation for this product?” and “What is the reason behind the user behavior?” The ideation phase is the stage where the information and data from the inspiration stage are translated into the concepts to reflect the needs and expectations of the user group. It contains the activities such as brainstorming and co-working workshops. It relates to the topic including “What are the design solutions about?” and “What are the other possibilities of the concepts?”. The last stage is the implementation phase, where the selected concepts are realized in the market. It takes feasibility and viability into consideration including “What is the manufacturing part of the design?” and “How to integrate the technology and business model into design?”. Table 1 provides a brief definition of each phase.



[Figure 1] Typical Human-centered Design Process (Diagram was adapted from IDEO.org)

[Table 1] The Human-centered Design Process Phase

Process Phase	Inspiration Phase	Ideation Phase	Implementation Phase
A Brief Definition	The inspiration phase is the stage where relevant information and data about the target user group are gathered.	The ideation phase is the stage where the information and data from the inspiration stage are translated into concepts to reflect the needs and expectations of the user group.	The implementation phase is the stage where the selected concepts are put to the market.
Key Considerations	<ul style="list-style-type: none"> Consider the desirability of the target user groups Why do the target users have a motivation for this product? What is the reason behind the target user behavior? 	<ul style="list-style-type: none"> What are the design solutions about? What are the other possibilities of the concepts? 	<ul style="list-style-type: none"> Consider the feasibility and viability of the project. What is the manufacturing part of the design? How to integrate the technology and business model into the solution?

2.2 Humanity-centered Design

In the study, the assumption is that the three phases of inspiration, ideation, and implementation are interdependent, which means that the diverging and converging process will home down the ideas to generate a series of suitable concepts in the end. Humanity-centered design starts with people. Through observation and field research of the target group/people and their environment to understand their behavior as a foundation to have better clarity of their desirability and challenges (Belliveau, Griffin, & Somermeyer, 2002).

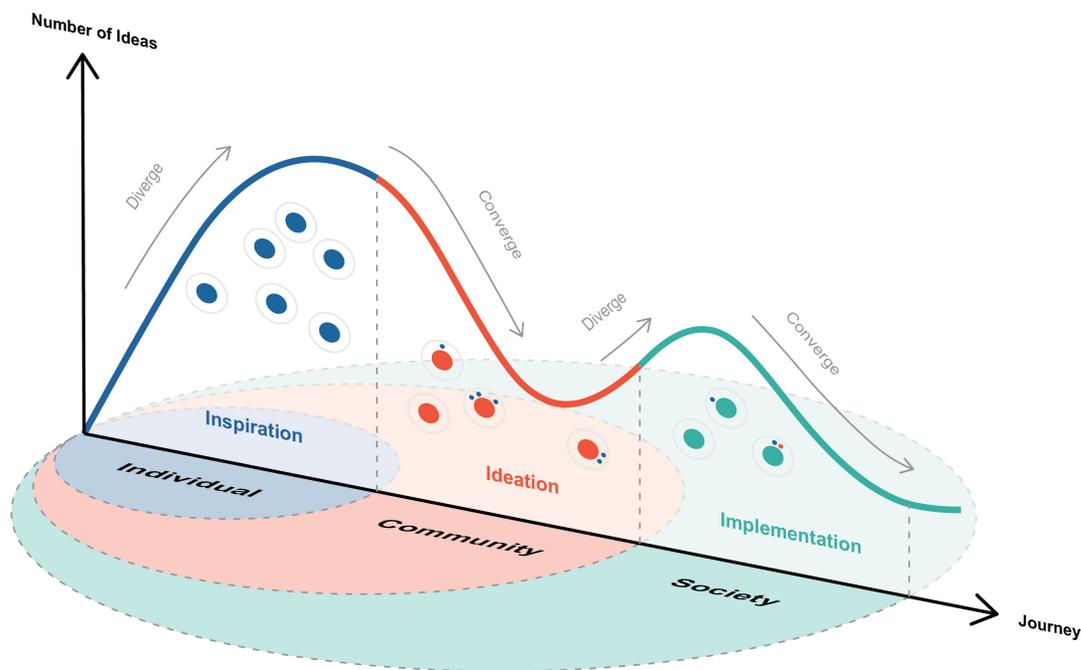
The intention of humanity-centered design is close to the concept of inclusive design. Microsoft has shared its work-in-progress definition: ‘A methodology that enables and draws on the full range of human diversity, including and learning from people with a range of perspectives’ (Holmes & Maeda, 2018). According to Susan Goltzman, her definition of inclusive design is ‘Inclusive design doesn’t mean you’re designing one thing for all people. You’re designing a diversity of ways to participate so that everyone has a sense of belonging.’ She had applied inclusive design to the children’s playground to create an inclusive play environment that naturally

integrates the needs of all children into the design (Goltsman, 2011), which was one of relevant examples connecting to this study.

Humanity-centered design focuses on different layers of user engagement. According to the research of user engagement, it can be categorized into at least three types: sensory, physical, and emotional engagement in the context of people’s reaction (Chou & Conley, 2011). However, building upon the structure of human-centered design (Figure 1), humanity-centered design (Figure 2) introduces the concept of three engaging layers—individual layer, community layer, and society layer to form a new framework. Engaging layers are valuable and provide a great way to understand how people participate in some of the key activities of each layer that is connected to each phase of the design journey accordingly.

‘We must design products starting from the Human not as a single, but as part of a whole. Adding a layer to the typical dualism Product/User, and changing the perspective to Product/User/Society’ (Donelli, 2017). As a start for the project, the team engages with people in the inspiration phase and requires them to put themselves in the user’s shoes individually: understanding their demographics, needs, existing pain points, their values towards life, and expectations. Respect and empathy for the target group/people are a critical step to enrich the following design process (Liem & Sanders, 2011). The team needs to truly empathize with the life of the target users in order to develop fruitful and meaningful ideas in the next phase.

In the ideation phase, the team starts to translate the observation, research into insights and concepts, which needs to take aspects to a broader extent into consideration in the context of the community layer. Target users include the elderly, the handicapped, the children and other minority groups. Humanity is about being kind and generous to people, therefore the ideas generated in this phase need to be inclusive to cater to most people’s needs. In the implementation phase where the concepts are realized in the market, the team should think beyond the community layer in terms of the influence and the value. One angle to define humanity is to respect and care for human beings as a collective in society. It is critical to make a social impact to serve our society during the implementation phase.



[Figure 2] Humanity-centered Design Process

[Table 2] The Humanity-centered Design Engaging Layer

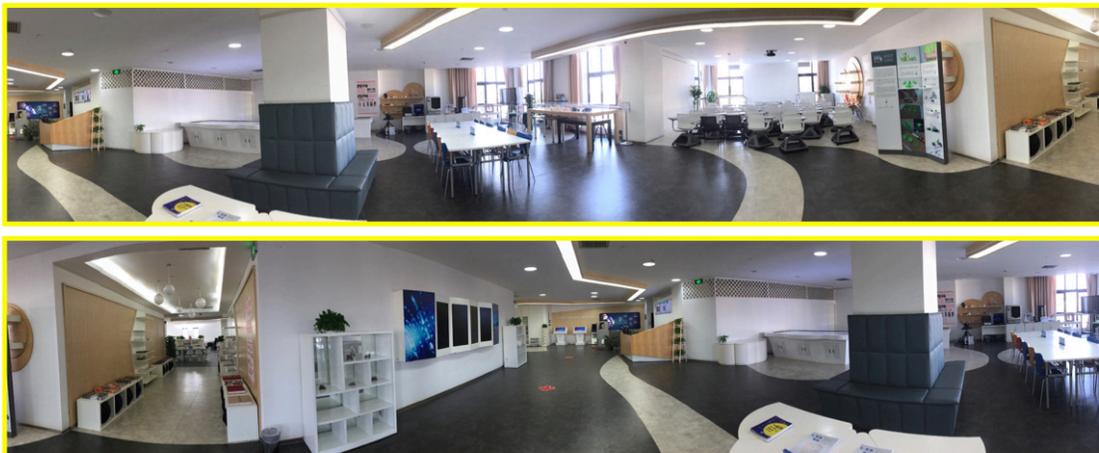
Engaging Layer	Individual Layer	Community Layer	Society Layer
A Brief Definition	The individual layer represents the target group of the project, focusing on the existing consumers, potential target users, and key stakeholders.	The community layer consists of target groups as well as minority groups of the project including the elderly, the handicapped and the children.	The society layer cares about human beings as a collective, expanding the coverage of the target groups in the project.
Key Considerations	<ul style="list-style-type: none"> Analyze the needs and pain points from existing consumers. Identify potential target groups and their needs in order to learn from them. 	<ul style="list-style-type: none"> Incorporate the needs and voice from minority groups in the project. Consider other elements and experience about the people: space, facility, service, culture. 	<ul style="list-style-type: none"> Envision the next step for the project in multiple aspects: short-term, middle-term, and long-term and consider its users’ needs, expectation and desire accordingly through the lens of inclusiveness.

3. Case Study – Shanghai Library Innovation Space Design

3.1 Project Overview

Since its opening to the public in May 2013, the Shanghai Library Innovation Space has been in service for over seven years. During its operation for the last few years, the Readers' Service Center of Shanghai Library has always been attentive to what the users want by adjusting the literature configurations, adding various kinds of software and improving the content of the activities in accordance with their needs.

The Shanghai Library Innovation Space has always been the benchmark in the exploration of innovation space for Chinese libraries. Yet in face of market change, consumer trade-up, industrial transformation and technological advances, it has to reposition itself in order to maintain its leading role in the practice of library innovation by delivering better experience for both its users and librarians through culture rebuilding, all the while following the Shanghai Library's mission of "providing excellent knowledge services". A survey of users and librarians highlights the need to establish a more distinctly defined value proposition, deal with the incompatibility and interaction between different areas or sections, improve the design to meet the actual needs of users/librarians, enhance librarians' services and interact with users in more varied forms. In the case study, the project is to redesign user experience at Shanghai Library Innovation Space, which covers three design activities related to humanity-centered design (Table 3).



[Figure 3] What Shanghai Library Innovation Space Used to be Like

[Table 3] Key Activities Demonstrated in the Project by Applying Humanity-centered Design

Phase Activity Layer	Inspiration Phase	Ideation Phase	Implementation Phase
Individual Layer	Conducting user research and interview with librarians and readers.		
Community Layer		Facilitating co-creation workshops with librarians and young designers.	
Society Layer			Hosting exhibitions and prototype the selected design solutions.

3.2 Humanity-centered Design Process

In the study, the project team applied humanity-centered design process by adding three extra engaging layers, which was a design experiment. The design process focused on three overlapped sections as shown in Table 3.

Individual Layer – Inspiration Phase

In the individual layer during the inspiration phase, the team conducted eight librarian interviews to understand the internal challenges, culture of the organization (Figure 6) and six user interviews to identify their pain points and needs (Figure 4, Figure 5). The intention was to listen to the users from different angles, which assisted the team to translate the interview result and observation into two comprehensive ideal user journeys from the perspective of librarians and users (Figure 7). In the individual layer, the project was inspired by the people the team had interviewed with, the place the team had visited, and the experience the team had gained.



[Figure 4] User Interview Process Photos



Xu Zhenzhen

Working for a British company, responsible for financial affairs. She brings her daughter Shasha to attend the events held at the Innovation Space of the Shanghai Library every one or two weeks.

1. Current situation and pain points of the library

- The reasons for visiting the Innovation Space: novel, useful for children, interesting, and events designed to popularize science
- The topics of the events attended include science popularization and use of database.
- As readers can only use the functions related to books, they cannot enjoy all the benefits of the database.
- The interaction between events and attendees currently is inadequate and needs to be enhanced.
- The online registration system offers poor user experience. Though the system will provide extra seats in case that the quota for attendees (usually around 30) has been reached, experience for readers is still full of uncertainty.
- The positioning of a library should be offering scientific and interesting events. It is best for a library to integrate science and technology into daily life.

2. Favorable conditions will promote innovative thinking

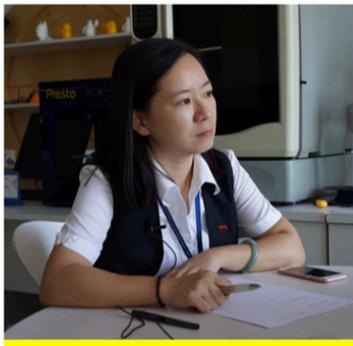
- The scenario for activating minds should also be a place where children can make physical movements safely and freely.
- A place where people can talk to the inner world and deliberate with a clear mind.
- People can be creative especially after some particular activities such as jogging and dancing.
- A quiet environment where people will not get disturbed
- A feeling of thorough understanding can be produced when people are doing brain storming or inspired by others' opinions.

3. Design of the Innovation Space

- Create a “blank” space for readers to answer the question in their minds
- The Innovation Space should make children feel safe, meaning to provide an environment where children can close their eyes, rest for a while and concentrate on a specific topic.
- Movable and interesting equipment can help create a more flexible Innovation Space. The most basic measure is to install wheels on furniture.
- The works of readers can be part of the decoration at the Innovation Space, enabling greater participation of readers.
- Currently there are many co-creation spaces in the market. The Innovation Space can leverage the “Chinese elements” from the space layout and the works of readers to make a profound cultural atmosphere.
- The Innovation Space can be connected to the outdoor environment. An example is the Australian Garden.

“
The Innovation Space should be a place where people can free and activate their minds.”

[Figure 5] User Interview Document



Lin Lin

Deputy Director of the Reader Service Center, with a legal background and 15 years of work experience. All the positions at the center are filled by experienced staff.

1. Positioning of Innovation Space

- The Innovation Space should embody unique features of the library.
- Reflecting on what the core competitiveness of the Innovation Space is
- The Innovation Space is initially designed to give ordinary citizens access to cutting-edge technologies for free, e.g. Google Glass and 3D printing.
- Innovation is not the equivalent of makers.

2. Build a platform where librarians can deliver value

- The duties of librarians at the Innovation Space should not be limited to manual labor.
- Librarians should not be treated as guards of the Innovation Space.
- The team is the most valuable asset.

3. Define the requirements for on-site events

- Learning about why businesses choose to hold events at the Innovation Space
- The Innovation Space can offer more than simply a space for rent.
- Whether librarians can learn and improve themselves by attending these events
- Whether there are suggestions from such businesses about book and software purchasing at the Innovation Space

3. Define the requirements for on-site events

- How businesses enhance their permanent interactive relations with the Innovation Space
- The Innovation Space should not only purchase technological equipment, but focus more on promoting related services through the equipment. An equipment rental mode will be adopted in the future.

4. Exemplary on-site events

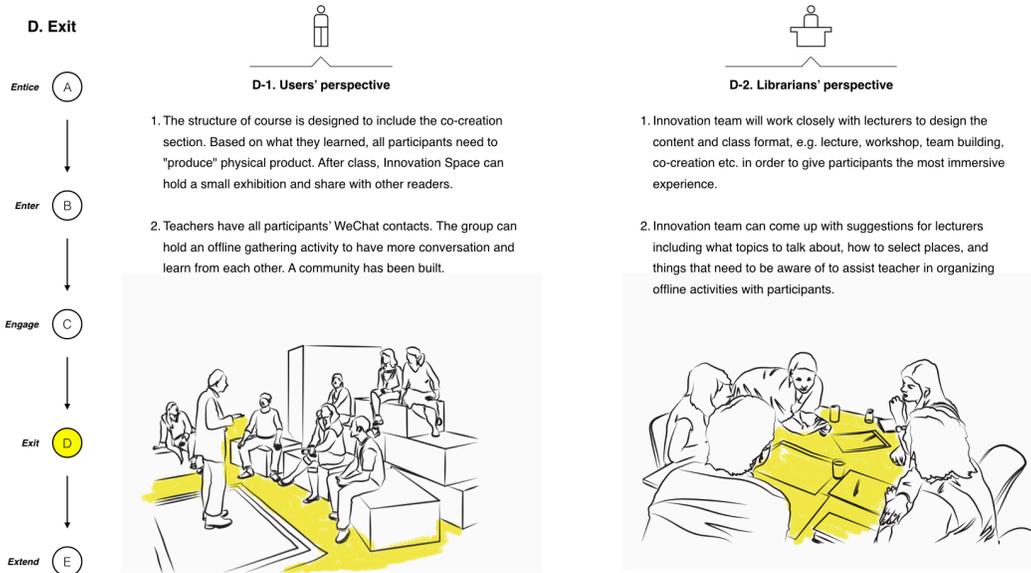
- After creating works at the Innovation Space using on-site documents, Ma Jing held a reader sharing session on typographic design.

5. Next steps for Innovation Space

- Identifying current readers' needs
- Identifying potential market needs

“
We should reflect on what the core competitiveness of the Innovation Space at the Shanghai Library is.”

[Figure 6] Librarian Interview Document



[Figure 7] Two Types of User Journeys from the Perspectives of Librarians and Users

Community Layer – Ideation Phase

In the community layer during the ideation phase, the team conducted one co-creation workshop with twenty librarians, who were responsible for various departments: Innovation Space Team, Digital Production, Digital Marketing, Research Team, Convention and Exhibition Services (Figure 8). The team also co-worked with twenty-seven university students majoring in industrial design from Fudan University Shanghai Institute of Visual Arts to envision the future of the Shanghai Library Innovation Space (Figure 9). The intention was to invite the users including librarians and colleague students to tell their stories and show their needs and expectations through the team's guidance by building and participating in the co-creation workshop. In the community layer, the team viewed design as an engaging tool to facilitate the conversation with the users and to take action accordingly. It also helped the team broaden ways to receive information and user needs from the community and also validate the learnings from the previous individual layer during the inspiration phase. In the ideation phase, it reflected the user's pain points and desire collectively in the community layer in order to come up with inclusive solutions together.



[Figure 8] Hosting the Co-creating Workshop with Shanghai Library Librarians



[Figure 9] Facilitating the Co-creating Workshop with Students of Industrial Design Department from Fudan University Shanghai Institute of Visual Arts

Society Layer – Implementation Phase

In the society layer during the implementation phase, the team co-hosted a two-week exhibition with Shanghai Library Innovation Space team to share not only the ideas, but also the whole design process with the public to gather suggestions on design concepts (Figure 10). The exhibition was opened to the public for free. By the end of the exhibition, the design resonated with the people and our team received a great amount of feedback from the Shanghai Library, parents, young couples, high school and college students, retired citizens and visitors.



[Figure 10] Hosting a Two-week Exhibition at Shanghai Library Innovation Space

After the exhibition, the team made a second-round concept refinement with Shanghai Library Innovation team by adding the feedback received from the public. The intention was to cover most user needs from the library and users in the context of a broader society, before the project went into the production and implementation phase. In the society layer, what the team wanted was not to implement the design result, but instead to make an invaluable social impact through the right implementation.



[Figure 11] Part of the Implementation Outcome at Shanghai Library Innovation Space

3.3 Design Highlight and Result

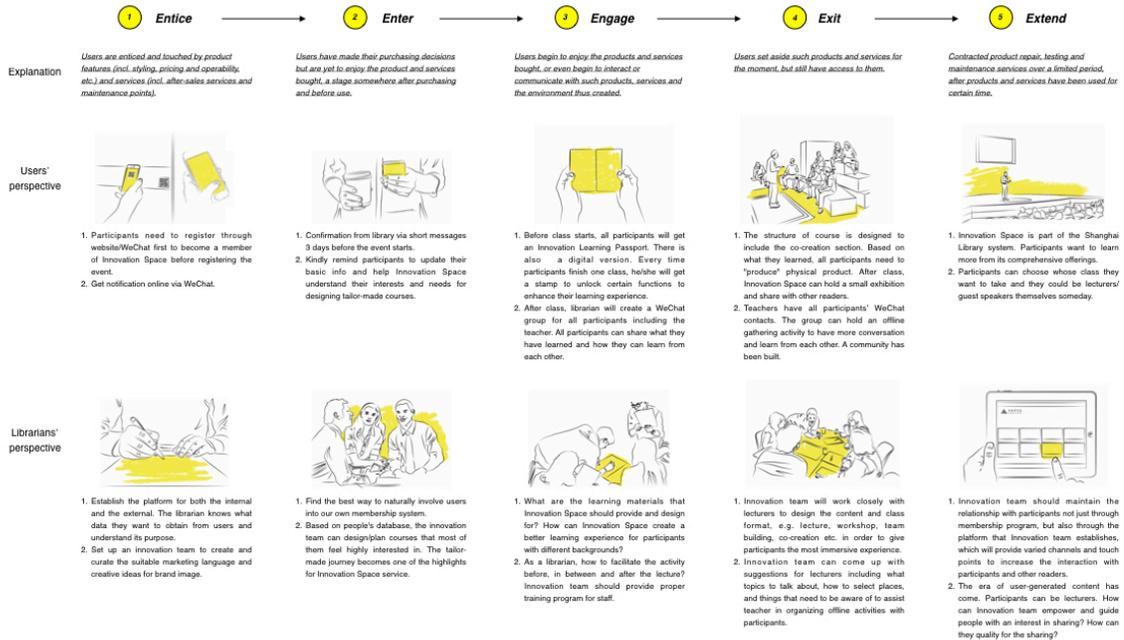
Following the Shanghai Library's mission of "providing excellent knowledge services", the user experience design covers every aspect of the Shanghai Library Innovation Space, from the individual, product, organization, and space, to the service and experience it offers. In making knowledge come alive and flow freely, the design enabled users to learn and experience in the Shanghai Library Innovation Space what extended beyond the walls of the library and provided a more enriching learning experience for readers. The following five learning points were the design highlight and result of the project reflecting the value of humanity-centered design.

Map Out the Journey of Users and Librarians

Humanity-centered design was applied in reconsidering the Shanghai Library Innovation Space's market positioning, organizational structure, user experience, and space planning, which took innovation in all aspects to a new layer by not only satisfying users' needs but also enhancing library staffs' value in transformative development. One possibility was presented in Figure 12 providing the ideal user journey from the angle of librarians and users.

User Journey Summary

Visualize and contextualize key touch points in the scenarios to help us think through the whole journey that participants have taken. The structure includes Touch points, Scenarios, Analogous examples and Ideas.



[Figure 12] Journey Map of Users and Librarians

Establishment of A Customized Platform and Courses

A Shanghai Library Innovation Space learning platform was established for both librarians and users/readers. Based on people's databases, the team designed the courses that most of them felt strongly interested in. In order to find the best way to naturally involve users in our own membership system, the team designed learning materials, facilitated activities before, in between and after the lecture and provided a proper training program for staff. The team needed to work closely with lecturers to design the content and class format, such as lecture, workshop, team building and co-creation to give participants the most immersive experience in order to better connect with them. It maintained relationships with the participants through the membership program and the platform it established, which provided varied channels and touchpoints to increase their interaction. The era of user-generated content has come. The team also designed three learning tools to support the customized learning platform and its courses (Figure 13, Figure 15).

Create New Roles for Librarians to Empower Users

Designing libraries—repositories of the best of human knowledge—is no small feat, since it signifies a greater social responsibility for advancing human civilization and culture, as in the case of the Shanghai Library Innovation Space where knowledge, education, and innovation intersect. A humanity-centered design has enhanced design elements in space so much so that knowledge, education and innovation opportunities can be found everywhere and come in the context of dialogues rather than just existing in the physical environment. One key element to nurture an innovation-oriented culture and knowledge-based community with a more positive influence on society lies in reframing the roles and responsibilities of the librarians. (Figure 13, Figure 14)

Design for Tools Summary

At Shanghai Library Innovation Space, both digital tools and physical devices are to assist each touch point or different scenarios in making sure that the whole journey will always be user friendly, consistent and joyful. The intimacy level of the tools ranges from private, semi-private to public. However, the core value and purpose of the tools is all about enhancing the user learning experience.



A. Learning Secretary

The app, Learning Secretary is designed to embed most of online services into WeChat platform to help librarians provide better service to users/readers. Users/readers can see Learning Secretary as a personal assistant while for librarians it can be regarded as the quickest and most direct window to communicate and interact with participants.



B. Learning Passport

Learning Passport creates a brand new digital identity for Innovation Space and cultivates creative community. The tailor-made system is based on users/readers' learning condition to change the suitable content and challenge for learners. Learning Passport is embedded into the existing Shanghai Library website system. The format could be designed as either digital or physical version.



C. Learning Helper

Learning Helper is a learning-aid tool to improve user experience at Innovation Space. It is connected with other digital tools to be integrated into the personal learning data library. Learning Helper also bridges the relationship between Innovation Space staff and users/readers.

Design for Future Role Summary

People, whether librarians or users/readers, are the most important and valuable assets for Shanghai Library. They often have to play different roles and sometimes play multiple roles at a time to deal with challenges or difficulties. The future role of Shanghai Library Innovation Space is integrating the roles they've already been playing. In order to deliver better user experience, help librarian realize their self-fulfillment and achieve the purpose of Innovation Space, three key roles of *Envisioner*, *Expert* and *Enabler* need to work collaboratively and seamlessly as this is critical to bring the overall service design to life and to realize the value of Shanghai Library Innovation Space.



A. Envisioner



B. Expert



C. Enabler

Why Purpose of role

- An inspirational leader with great vision.
- Encourage people and have the willingness to offer professional help.
- Bring inspiration, the latest information and knowledge to Innovation Space.
- Bridge the gap between things outside and inside the library.
- Unlock users/readers' potential and creativity.
- Guide rather than just give people what they want.

Who Requirement of role

- With great vision and can deal with systematic challenges.
- Empathic with users/readers and do understand people's needs.
- Highly motivated in, responsive to and responsible for any situation.
- With social influence and can guide others.
- With strong point of view and have passion in what they do.
- With rich and profound knowledge on certain area/industry.
- Co-create content with Innovation Space.
- With an open mind and have the willingness to share knowledge, stories and experience with users/readers.
- A people person with great communication skill.
- With strong motivation to guild and mentor others.

What Service offering

- Empower people and create the proper environment to let people grow.
- Transform people's achievement into their own fulfillment.
- Serve the purpose of Innovation Space to map out the comprehensive user's/reader's journey.
- Cultivate culture and attract communities for Innovation Space.
- Give specific topic of speech.
- Deliver interesting, inspiring and immersive experience to others via speech, workshop or other format.
- Assist users/readers in achieving his/her goal.
- Facilitate workshops, activities, conferences or other events at Innovation Space.
- Guide users/readers to help them know how to enjoy Innovation Space.
- Solve users/readers' questions and concerns.
- Create and maintain an outstanding and immersive user experience at Innovation Space.

[Figure 13] New Roles and Supporting Tools for Librarians

Enabler

1. Why – Purpose of role

- Unlock users/readers' potential and creativity.
- Guide rather than just give people what they want.

2. Who – Requirement of role

- With an open mind and have the willingness to share knowledge, stories and experience with users/readers.
- A people person with great communication skill.
- With strong motivation to guild and mentor others.

3. What – Service offering

- Assist users/readers in achieving his/her goal.
- Facilitate workshops, activities, conferences or other events at Innovation Space.
- Guide users/readers to help them know how to enjoy Innovation Space.
- Solve users/readers' questions and concerns.
- Create and maintain an outstanding and immersive user experience at Innovation Space.

4. Analogous Example

- Starbuck coffee master service



[Figure 14] New Roles for Librarians—Enabler

Learning Helper

1. Design Intent

- Learning Helper is a learning-aid tool to improve user experience at Innovation Space. It is connected with other digital tools to be integrated into the personal learning data library. Learning Helper also bridges the relationship between Innovation Space staff and users/readers.

2. Delivery Format

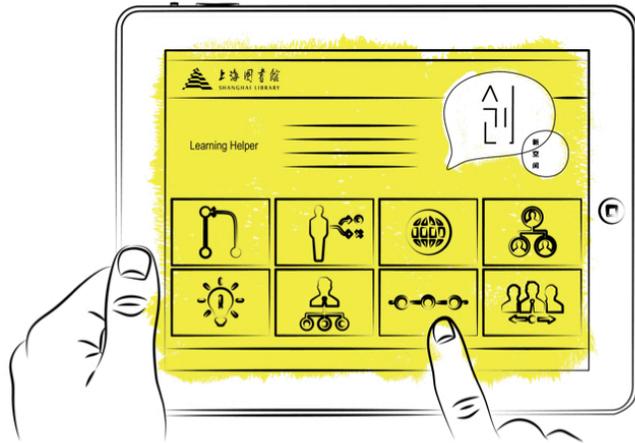
- Touch screen
- Tablet

3. Intimacy Level

- Public

4. Key Features

- Users/readers can seamlessly access any learning-related info at Innovation Space with Learning Helper.
- Every zone has at least one Learning Helper as learning-aid tool.
- Learning Helper will enhance users'/readers' overall indoor learning experience.
- Self-navigation program designs a mechanism to guide and solve most frequently asked questions from users/readers.
- Learning Helper can link to users'/readers' Learning Passport or Learning Secretary.



[Figure 15] New Supporting Tools for Librarians–Learning Helper

Set up Environment Design Principles and Design

The environment is a macro perspective of design in space, which unlike space design, consists of tangible products and tools and intangible experience and organization. To create humanity-centered experience is to contrive a better, interactive and dynamic space, in combination with the current Shanghai Library Innovation Space. The appropriate contextual design will produce more meaningful conversations and wonderful experience in space, empowering people to do the right thing in the right context. Principles for the design of the environment in the Shanghai Library Innovation Space project are comprised of:

1. Apply the humanity-centered design approach.
2. Space can create a flowing and open atmosphere.
3. Space can truly deliver tailor-made and targeted service experience.
4. Space can satisfy needs of both librarians and users/readers.
5. Space is designed for the purpose of complementing rather than combining functions of different zones.

In applying the above principles, the design highlights (Figure 16, Figure 18) consist of:

- **Social Zone:** Creating a sharable atmosphere to empower users that are willing to share and listen. The storytelling corner is one of the furniture designs in the zone (Figure 17).
- **Personal Zone:** Encouraging users to design experience for their own needs to cultivate a sense of belonging.
- **Exploration Zone:** Building a zone with innovative voice of tone to unlock users' creative potential and nurture the culture of making and creating.
- **Learning Zone:** Designing the most direct way of learning experience and creating a proper place for formal events.
- **Exhibition Zone:** Creating a space that will make users feel relaxed, refreshing and recreational for socializing and learning.

A. Welcome Zone

Users should develop a sense of what Innovation Space has to offer, understand whom they can speak with, what types of resources they can use, learn more about Shanghai Library and see what's happening at the Innovation Space today.

Users/readers should experience

- Welcome Zone is in the center of the Innovation Space. Therefore staff responsible for this zone can notice anything that's going on in every corner of the space and direct anyone that needs help or support to the right person or area.
- A friendly and human-centred environment. The cylinder-shaped front desk can adjust its height according to need of the users (adults and kids).

B. Learning Zone

The Learning Zone is designed for a more formal/traditional way of learning. Innovation Space will invite external speakers, professors or internal staff to share their knowledge with users/readers. The team also designs a series of flexible furniture such as triangle tables and round stools to adapt to requirements of the space/speakers.

Users/readers should experience

- An area that speaker can give speech and share story.
- Librarians will organize events, lectures and even workshops, in addition to answering questions.
- Create an encouraging, inspiring, positive, and orderly atmosphere.

C. Social Zone

The Social Zone is the most playful zone in the Innovation Space where users/readers can hang out together, listen to others' stories, make friends or just chat with each other. This zone has very iconic interactive stools that allow users/readers to enjoy the environment naturally.

Users/readers should experience

- An area to "play" with furniture and listen to people's story.
- Cultivate a social, comfortable and easy-going atmosphere.
- Attract active, engaged and fun community.

D. Exploration Zone

The Exploration Zone is all about creating and making. Bring tangibility during the creativity journey is critical for people and it's a constructive way to inspire more conversation and ideas. It is the physical embodiment of the Innovation Space community and represents creative culture.

Users/readers should experience

- Innovation Space hosts regular courses related to design, making and science for cultivating innovative culture.
- An area designed to let people enjoy the making process, and make mistakes as well as to encourage people to learn lessons and improve themselves.

E. Personal Zone

The Personal Zone is designed for users/readers to conduct one-on-one or one-to-many conversations. People can decorate, design their own "bubbles" via module box system and stretch their body freely and enjoy their own space. All people need is their imagination.

Users/readers should experience

- An area to leave your track and decorate your own personal space based on your needs, interest, hobbies and etc.
- Helpful and dedicated librarians to answer people's questions.
- Semi-private areas for personal time or for conversation with friends, staff or colleagues.

F. Exhibition Zone

The Exhibition Zone is not just to display the latest exhibition info, speaker schedule, posters, but also people's creation and artworks. It also serves as the transition area to connect other zones seamlessly.

Users/readers should experience

- An area to display the latest knowledge, exhibition information and even participants' works.
- It shifts from a place for purely information display to art exhibition.
- A transition area to other zones.

Design for Zones

The concept of zone design is planned more through people's emotional needs than the space functions. It enhances the compatibility and interaction between different zones, creates new interactive forms for each zone and improves the service experience for the librarians at Shanghai Library Innovation Space.



Floor Plan Mapping

Based on the 5 design solutions, including: Storytelling Corner, Transformer Box, Walking Asset, Tangram Furniture and Tumbler, how might we integrate them with the existing site, Shanghai Library Innovation Space, to fully realize the values and spirit of human-centered approach and mindset?

A
Design for Workshop Area
Walking Asset

B
Design for Playgrounds
Tumbler

C
Design for Lecture Area
Tangram Furniture

D
Create Your Own Space
Transformer Box

E
Design for Sharing
Storytelling Corner

[Figure 16] Environment Design Highlight – Zone and Furniture

1. Key Words

- Sharable, Cozy.

2. Purpose of Zone:

- Create a sharable atmosphere to empower users that are willing to share.
- Build a sense of belonging for users.
- Learn how to act as a good listener.

3. Analogues Examples

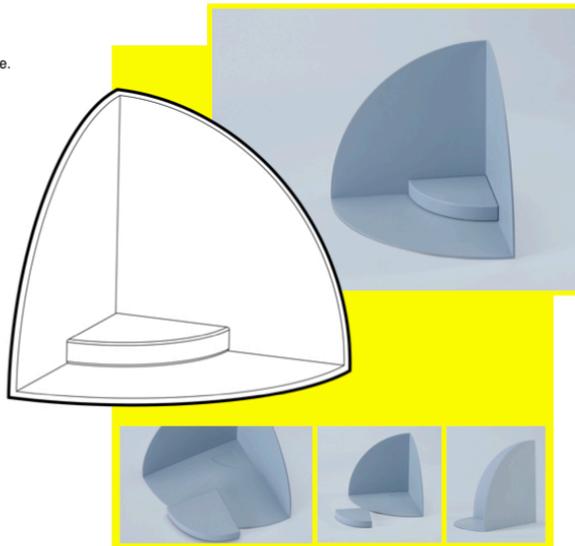
- Long table setting at restaurant is designed for socializing, sharing and storytelling.



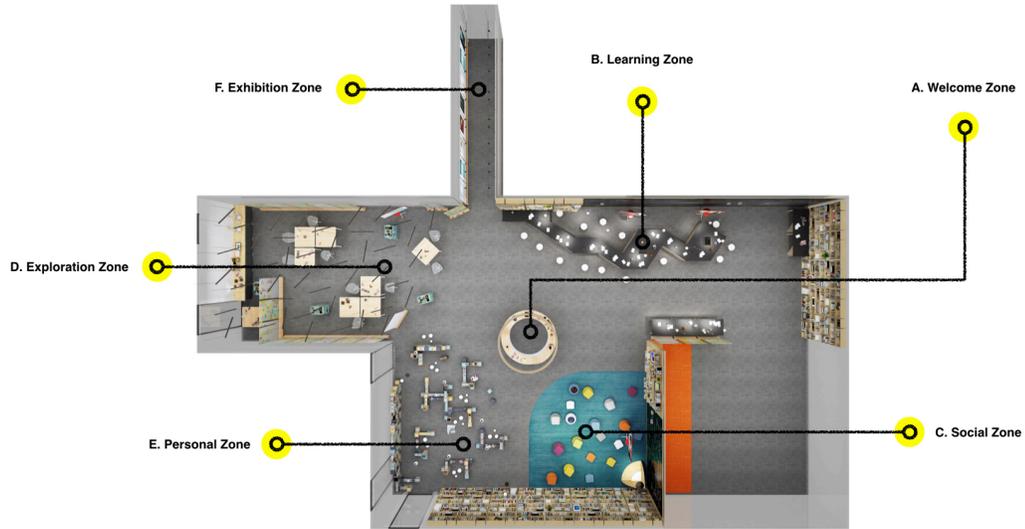
Photo resource: <http://www.arenacalgary.com/Sponsored-A-Champagne-Taste-of-the-Good-Life/>



Storytelling Corner



[Figure 17] Furniture Design Highlight – Storytelling Corner



[Figure 18] Floor Plan and Zone

Next Step for the Project

The Shanghai Library Innovation Space project took around thirteen months to complete, from the research, design to prototype for phase one in 2017 by applying the humanity-centered design. In the spring of 2019, the Shanghai Library put part of design into production and finished one of the concepts, Social Zone—Storytelling Corner and opened it to the public in March 2019 (Figure 11, Figure 19).

During the entire design process, the team worked closely with librarians and users on project design from user surveys, strategies development, brainstorming, to modeling and testing. When the project was completed, the team had learned to put people first and leverage the humanity-centered design to maximize the value of the design process, which allowed them to make further changes to the design in the future. Regarding the next step for the project, the rest of the design concepts in the space need to be realized to curate the desirable user experience for readers and librarians and to meet three engaging layers from the individual layer, community layer to society layer.



[Figure 19] Environment Design Highlight – Social Zone

4. Summary and Suggestions

4.1 Key Learning of Humanity-centered Design

The following three takeaways summarized the learning and reflections of the Shanghai Library Innovation Space project by applying humanity-centered design. The brief comparison of human-centered design and humanity-centered design was documented in Table 4.

Humanity-centered Design is an Awareness and Action

According to the previous methodology research, the human-centered design is an overlap between mindset shift and design thinking process (IDEO, 2018). In the study, the humanity-centered design is defined as a practical and creative act and process to transform the social challenges into invaluable positive impact. It is also an awareness to remind the design team, clients and users to value everyone's opinion and to take care and respect the voice of minority groups. It echoes the idea of inclusive design. Instead of viewing some people outside of the range of 'normal', considering those as a mismatched interaction (Holmes & Maeda, 2018). In short, the humanity-centered design is an awareness and action with evolving purpose in the context of treating the target user group from the individual layer, community layer to society layer.

Humanity-centered Design is a Participatory Design Process

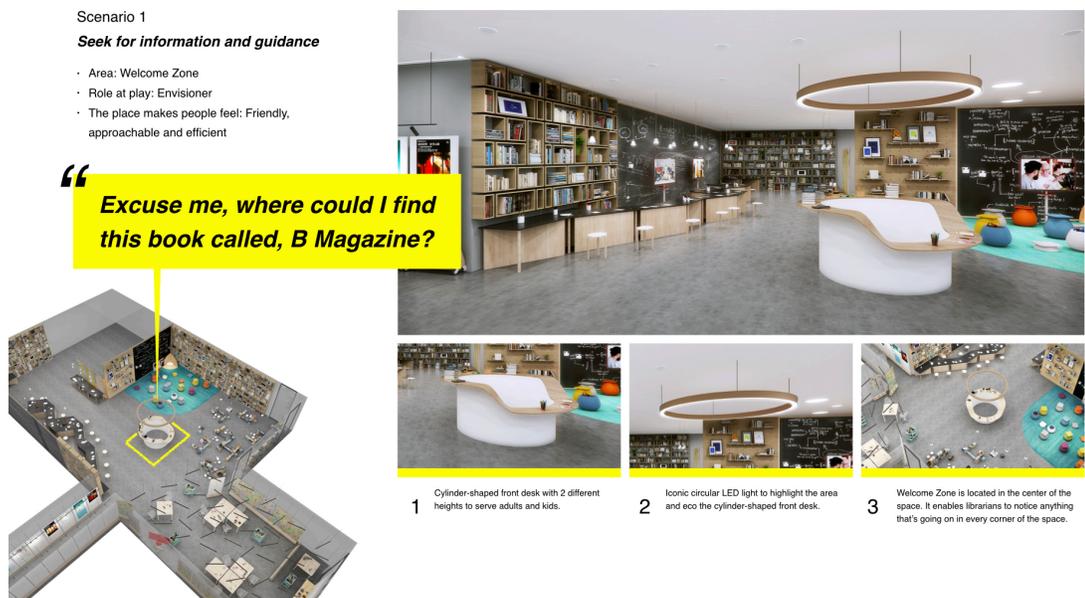
In the case study, the project team played the role of a creative enabler. The project team applied humanity-centered design to create suitable conditions that allowed the participants to be immersive into the design challenge we were going to tackle with and vice versa to make the team empathic with users' needs and pain points. There were many activities that required participants and communities to engage during the design process, such as conducting co-creation workshops with librarians and facilitating the design class with the college students to co-work on the challenges. The idea of its participatory nature lies in the inclusiveness of design, one of the characteristics of the humanity-centered design. The team has learned a lot of invisible and nonverbal behaviors from the users through participatory activities.



[Figure 20] Participatory Design Process Photos

Humanity-centered Design is to Create with Care

One of the core values of the humanity-centered design is to create with care. To be more specific, the care represents empathy with action that is inclusive. The team not only considered the majority of library users, but also put themselves in the shoes of the minority groups including the elderly, the children and the handicapped by conducting user interview and immersive observation. Therefore, the humanity-centered design consisted of three layers: individual layer, community layer, and society layer, intended to incorporate as many voices of the users as possible during the design process from inspiration phase, ideation phase and implementation phase, and ultimately to scale the social impact beyond the project outcome. One of the examples from the Shanghai Library Innovation Space project was to redesign the front desk. Usually, people viewed the front desk purely as a furniture of an object. In the study, the team viewed it as a human touchpoint to connect with the readers, users, and librarians (Figure 21). Since the new front desk design took the children and people sitting on wheelchairs into consideration, the lower curve design of the furniture was to create a humane space for the people to have eye-contact with the librarians when they returned or borrowed the books out of respect. The details were shown about how the team created a humanity-centered experience with great care (Figure 22).



[Figure 21] Environment Design Highlight – Welcome Zone



[Figure 22] User Experience at Front Desk by Applying Humanity-centered Design

[Table 4] The Comparison of Human-centered Design and Humanity-centered Design

Methodology	Human-centered Design	Humanity-centered Design
A Brief Description	Human-centered design is a process that overlaps with mindset and design thinking.	Humanity-centered design is a status that overlaps with awareness and action.
Elements in Framework	<ul style="list-style-type: none"> • Journey (Time) • Number of Ideas (Diagram area) • Process Phase 	<ul style="list-style-type: none"> • Journey (Time) • Number of Ideas (Diagram area) • Engaging Layer
Key Stages	<ul style="list-style-type: none"> • Inspiration Phase • Ideation Phase • Implementation Phase 	<ul style="list-style-type: none"> • Individual Layer • Community Layer • Society Layer

4.2 Next Step for the Humanity-centered Design

The study is a preliminary discussion between the human-centered design and humanity-centered design in the principle level by presenting one case study related to public learning space experience design. Further research can refine the process of humanity-centered design as well as provide more detailed instruction on how to apply humanity-centered design to different types of projects such as product innovation, service, experience, and organization design in order to refine and to validate the definition of the three engaging layers to ‘gettingtoscale’ (IDEO & Bill & Melinda Gates Foundation, 2015) the impact of the modified methodology and the outcome. The reason lies in that the scope and type of project will influence the person who is going to participate in the project in terms of the project team and target users, the selection and the involvement of key stakeholders, the business model, the budget, the social impact and its relevant recourse.

Acknowledgements: *The DMI conference paper and the Shanghai Library Innovation Space project can’t be finished successfully without the great help and warm support from many people, friends, faculties and family. Especially thanks go to Shanghai Library Innovation Space Team: Chu Hao, Zhou Yin, Xiong Dingyue, Le Yiting, Yao Xin; Fudan University Shanghai Institute of Visual Art ; IDEO: Elyssa He, Nelson Schöller, Jasper Yang; Shanghai Skyin Visual Arts Co. Ltd.: Fan Wong, Dylan Wang; Frame By Frame Productions: Pak Fung Wong, Chin-Chiang Ko; Boio: Terrence Zhang, Vicki Sun; Shanghai Hanzhen Interior Design Company: Louis Shao, Ernest Yu; Puten Model Company: Shu-Yan Wang, Lin Shun Kuang, Yu Fong Jhen; Zhou Xuan, a professional English translator; King Kong, Roy · Original photographer; Dennis Wang, Yimishiji communication designer; Jerry Wong, Matthus Printing Co., Ltd founder; Chan Wai Yeh, lecturer of Engineering and Information Technology at Southern University College, Malaysia; MIT Integrated Design & Management (IDM), and MIT AgeLab.*

References

Belliveau, P., Griffin, A., Somermeyer, S., & Product Development & Management Association (Eds.). (2002). The PDMA toolbook for new product development. John Wiley & Sons, Inc.

Chou, C.-J., & Conley, C. (2011). Investigating Users’ Interaction with Physical Products Applying Qualitative and Quantitative Methods. In M. Kurosu (Ed.), Human Centered Design (Vol. 6776, pp. 3–12). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-21753-1_1

Cooper, R. G. (1999). The Invisible Success Factors in Product Innovation. *Journal of Product Innovation Management*, 16(2), 115–133. <https://doi.org/10.1111/1540-5885.1620115>

Donelli, F. (2017, October 24). It’s time for a Humanity-Centered Design. Medium. <https://medium.com/@fdonelli/its-time-for-a-humanity-centered-design-59f9fa551d8e>

Goltsman, S. (2011). OUTDOOR PLAY SETTINGS: AN INCLUSIVE APPROACH. In *Universal Design Handbook* (pp. 226–235). McGraw-Hill.

Holmes, K., & Maeda, J. (2018). *Mismatch: How inclusion shapes design*. The MIT Press.

IDEO (Ed.). (2015). *The field guide to human-centered design: Design kit* (1st. ed). IDEO.

- IDEO. (2018). What’s the difference between human-centered design and design thinking? IDEO | Design Thinking. <https://designthinking.ideo.com/faq/whats-the-difference-between-human-centered-design-and-design-thinking>
- IDEO, & Bill & Melinda Gates Foundation. (2015). Design Thinking for Libraries—A Toolkit for Patron-centered Design.
- Kazmierczak, E. T. (2003). Design as Meaning Making: From Making Things to the Design of Thinking. *Design Issues*, 19(2), 45–59. <https://doi.org/10.1162/074793603765201406>
- Liem, A., & Sanders, E. B.-N. (2011). The Impact of Human-Centred Design Workshops in Strategic Design Projects. In M. Kurosu (Ed.), *Human Centered Design* (Vol. 6776, pp. 110–119). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-21753-1_13
- Millman, D. (2011). *Brand thinking and other noble pursuits*. Allworth Press.
- Sklar, A., & Madsen, S. (2010). Global Ergonomics: Design for Social Impact. *Ergonomics in Design: The Quarterly of Human Factors Applications*, 18(2), 4–31. <https://doi.org/10.1518/106480410X12737888532921>