I, Fei Xie, hereby submit this original work as part of the requirements for the degree of Master of Design in Design.

It is entitled:
How interaction design for ceramics exhibition will help audiences to have a better experience in museums.

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Committee member: Katie Parker,

Committee member: Renee Seward,
How interaction design for ceramics exhibition will help audiences to have a better experience in museums.

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by

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Abstract

The common ways of offering information and educating visitors in museums are providing audio, interpretive signs and video displays. However, non-interactive ways don’t work well at engaging audiences. Artifacts in most museums are not allowed to be touched by visitors. They are usually put into glass display cabinets for protection. This thesis focuses on identifying issues of user experience design in museums and define interactive product requirements for museum exhibitions as a harmonious whole system in order to provide audiences exciting experiences during visiting.

Among archaeological artifacts, ceramics play an important role in understanding a region’s culture and technology. However, for audiences from a different cultural background, it is hard to understand when there is a lack of contextual information. There are also lots of stories behind ceramics, which are worth detailed explanations. However, only a limited amount of information can be presented to audiences in the museums. For that reason, this thesis uses ceramics as an entry point and discusses how to present knowledge of exhibition subject and artifacts information to audiences by using interaction designs. By applying the Goal-Directed design approach in the process, this thesis is seeking for solutions to provide a better museum experience and creates multiple prototypes of interaction design for ceramic exhibition. The last chapter of the thesis summarizes findings from the process and extends the finding to general design requirements for designing interaction products or system for museum exhibitions.
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Last but not least, thank you to my family, classmates and friends.
Chapter 1. Introduction

1.1 Why interaction design

Interaction design is the practice of designing interactive digital products, environments, systems and services, according to Alan Cooper, the author of About Face. Interaction design for exhibitions ranges from commercial purposes to art exhibitions. In the case of ceramics exhibits in museums, interaction designs' purposes are more about helping visitors to interpret information, encouraging them to discover and get a memorable and delightful experience. Current exhibitions in museums are mostly just art pieces on display. The most common and basic ways of offering information and educating the public in museums are using audio, interpretive signs and video displays. User experience is all the aspects that a product or system brings to its users, including users’ emotional feelings, mental perception and the physical outcome that users received from the experience.

However, non-interactive technologies do not work well for representing ceramics’ nature and engaging visitors during visiting. Sometimes, visitors can only look at the artifacts from a distance through the glass cabinet window, especially for archaeological findings or precious breakable sculptures.

1.2 Why ceramics

The earliest ceramics found date back to 25,000 BC. The earliest pottery found date back to 20,000 years ago in southern China and it was used for cooking. People from a few cultures have started pottery manufacturing during the Paleolithic. From ceramics archeology finds, we can deduce that the earliest pottery in different cultures has almost the same figures and similar
geometric patterns. However, forms of ceramics change a lot during thousands of years of cultural and region specific development. Different cultures have a wide variety of forms and styles of ceramics to date.

Ceramics have changed from being basic storage containers and drinking vessels to art objects, luxury decorations and high performance products for manufacturing. The types of ceramics have also changed due to social factors, the technology of making ceramics, and aesthetic preferences over time. Ceramics play an important role because of the culture and technology behind it. However, only a limited amount of information can be presented to audiences in the museums. Therefore, how to choose the right amount of information and use attractive ways to present it is essential issues that need to be solved.

1.3 Context introduction – Difference of Museums in China and United States

Ceramics, bronze containers, antique jade and antique hardwood furniture are major categories in Chinese historical and archeology museums. For those major categories, there is usually a relatively large exhibition area for each of those themes. They are usually arranged according to a timeline. In addition, in some museums, each category even has its own series of showrooms. Most Chinese museums and American museums share the features mentioned above. However, the great difference is that, in Chinese museums, there are only Chinese antiques, so ceramics are simply arranged by time. There are ceramic artifacts from many countries in most U.S. museums. Therefore, they are also arranged according to the producing time and producing countries. Secondly, in china, the majority of visitors to museums are Chinese audiences. They come from the same culture background with artifacts. Relatively, museums in U.S. usually have artifacts that were imported from other cultures. Therefore,
museums in U.S. are in a greater need of clear tools to assist visitors to understand artifacts that come from exotic cultures.
Chapter 2. Goal-Directed Design Approach

2.1 Goal-directed design approach

Goal-Directed Design approach is “a set of methods to address the needs of this new kind of behavior-oriented design, which addresses the goals (Rudolf, 1998) and motivations of users.” – About Face 3. It’s a core methodology that was developed by Cooper, a leading interaction and service design consultancy.

Goal-directed design explains the relationship between goals and activities. Someone’s goal is driven by his inner motivation while tasks and activities are performed because of the goal. Therefore, what designers should do is to design services or products that help users to accomplish their goals. There are six phases in this process: Research, modeling, requirements definition, framework definition, refinement and support.

![Figure 1. Process of the Goal-Directed design process](image)

2.2 Why use the Goal-Directed design approach

The information shown in the museum should not make the audience feel overwhelmed or disappointed. What is truly important for audiences to know from museum educators’ point of view sometimes may be different with what audiences actually want to know. What do audiences want to learn? How deeply do they want to know about materials and processes? What makes
them come to the museum and want to learn about ceramics? In order to answer those questions, the Goal-Directed design approach will be used in the process. This thesis applies this approach and develops several prototypes of interactive tools for ceramics exhibitions from the research to design phase, and focuses on how to integrate different components and multiple formats of interactive tools.
Chapter 3. Research and Modeling

3.1 Research – understanding context and user

3.1.1 Understanding the context -- Museum

The majority of museums in the US are non-profit or operated by government agencies. There are diverse kinds of museums. Due to their different purposes, subjects in museums, and the group of people they attract, the proper ways of presenting artifacts are different from institution to institution. For example, a private museum’s owner would want to share his collection with others and is concerned mostly about safety and preservation issues, while some non-profit museums think their mission is cultural dissemination and hosting educational activities. Overall, all the museums play the role of artifact conservation and exhibition to the public. What they are concerned about is engaging the public, educating people, sharing meaningful information and making profits as well.

In order to understand the context, user behavior and user goals, the following activities have been conducted:

- User observation and field study
- User interview
- Subject matter expert interview
- Market research - Benchmarking existing product system
- Contextual Inquiry

3.1.2 Current tools used in museums
Current tools that are used in museums could be categorized into four quadrants according to the format and content information of them. Most tools are in the subject related content – static quadrant.

1. Static. This includes printed materials and historical decoration. They help visitors to build a first impression.

2. Interactive but not related to the subject such as comment and suggestion boards and wayfinding signages. They help in engaging visitors, but the actions are meaningless and have nothing to do with the subject.

3. Content information is subject related, but the actions are meaningless and have nothing to do with the subject. This includes audio device, image puzzle and folded interpretive sign.

4. Interactive information such as digital interactive screens, smart phone applications and interactive online maps etc.
Figure 2. Format – content categories of current tools in the museums

Figure 3. Interactive facilities in children’s museum
Children’s museums are doing a better job at engaging children and families by providing interactive facilities and making good use of them. According to the “Experiential Education” theory, people could learn from experience by engaging in the activity directly. A Shortcoming of this form of interaction is that it has to relate to a specific topic and it’s static, it’s hard to change or update over time.

Figure 4. Interactive screens in museums
<http://www.secondstory.com/>

Meanwhile there is another kind of museums, which uses a different approach, digital interaction products. Different interaction products vary in size and form from public interactive touch screens to a more personal approach, which are smart phone applications. This form of tools could be updated or change subjects by provider, and they are interactive. Most digital products require only one finger control, which also means only one finger is engaged in the interaction. However for ceramics artifacts, such a handicraft subject, it’s not appropriate because the behavior itself has little connection to the subject.
In the case of museums showing antique ceramic artifacts, there are museums that focus on the art and craft value of artifacts and the other kind of museums that concentrate on introducing historical tradition of hand making technique. London Victoria and Albert Museum is an example of the first kind. In addition to historical potteries, the museum also uses some simple forms of potteries to demonstrate different methods of pottery shaping. Another great example is Meissen Porcelain Museum in Germany. The museum moves through the history, and also provides videos and "trained artisan workers" along the way that move through each stage of the process.

Figure 5. Ceramic exhibition in London Victoria and Albert Museum

< http://www.vam.ac.uk/>

The Jingdezhen Ceramics Historical Museum is an example of the latter kind. It has a specific theme and takes use of the original historical environment, and tries to simulate the old time in both its decoration and arrangement. It emphasizes the process of how ceramics were shaped in traditional ways.
Identify users – user observation and interview

User observation and field study are conducted in Jingdezhen Historical Ceramic Museum, which is in Jiangxi Province, China, and three local Cincinnati museums including the Cincinnati Art Museum, Cincinnati Children’s Museum and Taft Museum. Cincinnati Children’s Museum has a specific theme and targeted visitor groups – Children and families. Taft museum is a historic house museum. Cincinnati Art Museum is a comprehensive art museum in Cincinnati that attracts visitors all year.

In addition to context observation, the following questions are asked in order to understand users’ expectations and attitudes. Here are some online survey questions about people’s attitude in the museum:

- How often do you go to a museum?
- Why do you go to museums? Or what’s your goal?
- Do you usually search online about ongoing exhibition before you go to a museum?
- What do you want to learn about an exhibition? (Imagine you came to a ceramic exhibition in an art museum, what do you want to learn from the overall exhibition?)

- What aspects do you want to learn about artifacts in the museums? (For example, a ceramic artifact, what do you want to know about it?)

- What kind of take away do you want to get after your visits to museums? (What do you want to gain after your visit to museum?)

- What’s your best and worst museum experience?

Although every audience is different and has individual tastes, most of them share similar reasons and goals when they decide to go museums. The primary user group of museum interaction products includes audiences of all ages. They have an average background knowledge of ceramics. Here are some findings of visitor behavior and activities from the observation. Data is collected by the observation of 12 visitors in Cincinnati Art Museum:

- 12 individuals spent less than 4 seconds on average in front of one glass cabinet if there isn’t anything interesting that attracts their attention (minimal 1 second, maximal 10 seconds).

- Although there are lots of verbal explanations for every artifact, 5 out of 12 individuals read the showroom introduction text. 2 out of 12 read some of the interpretive signs thoroughly.

- 10 out of 12 got museum exhibition introduction flyers and museum map guides and would keep them after the visit. However only one of them said she would read the flyers again someday.

- It’s a one-time browse. Few visitors go back and forth in the museum.
- Not like a cell-phone application that only targets at a specific group of user, interaction design in the museum should be designed to all year groups’ users that would come to the museum.

- Visitors to the museum have the following 4 kinds of attitude.

  1. I want to have fun!
  2. I’m serious about this.
  3. Yes, I want to experience everything.
  4. No, I just want to walk around and see.

Figure 7. Four different kinds of attitude of museum visitors

Touch points in the museum during one’s visit:

Figure 8-1. Touch points in the museum during one’s visit-1
Subject matter expert interviews

Experts on this domain include docents in the museums and pottery artists. Interviewees include docents and ceramics tutors in university and a ceramic studio. Here are some insights after interviews:

- Compared to average visitors, docents spend more time in museums and have a longer experience with artifacts and facilities in the museum.

- In order to become a docent, volunteers or employees must receive pre-training and remember up-to-date exhibition information. So docents are familiar with content and information shown in the museums.

- “The interpretation serves as a reminder to us,” according to a docent.
Ceramics teachers are dedicated to the same tasks as educators in museums. Interviews with a ceramic tutor in Cincinnati local ceramic studio and artists in Jingdezhen were conducted.

### 3.2 Understanding the subject

The major features of a ceramic art piece including color, shape, texture, weight, material, the temperature of making it, where it comes from, and stories about it. Among all this information about a ceramic piece, only some can be known just by looking at it, but for the texture and weight, it can be determined by touching it. There is also information that would only
be interesting to professionals in the field such as the material that was used in the clay and glaze and ways of decoration, etc.

### 3.3 Identify common issues of ceramics exhibition in museums

Considering the essential information about ceramics, the ways that ceramics are presented have three major issues.

First of all, ceramics’ nature is not shown. Making ceramic pieces involves using hands and requires creative work, but they are isolated and not touchable in museums. There are more than 20 steps to make a piece of pottery, but what visitors can see in the museum is only the final stage or finished piece rather than the process.

Secondly, there’s lack of contextual information. Many ceramics in museums come from other cultures. For local visitors, there’s a lack of contextual information to help them understand the function or background of those ceramics in the past. Additionally, when talking about data information such as the producing year, period, or firing temperature, it’s hard for audiences to make connections to real life and make any impression.

Last but not least, there’s a lack of connection between the subject and ways of interacting with tools in museums. None of the behaviors of using one finger to tap on a screen or flip an interpretive sign is going to make audiences have a better understanding or an interesting experience.
Chapter 4. Modeling and Design Requirements

4.1 Personas and Context Scenario

Based on research, interviews and museum observations, 3 personas are developed to represent 3 different goals and behavior patterns of visiting museums.

Three personas were created initially in order to understand visitors’ need in different age groups. They are sub-personas of the primary persona. A primary persona was created afterwards that covers common features of these three sub-personas.

![Three initial personas](image)

**Figure 10. Three initial personas**

**Primary persona and goals – a normal visitor**

Emily is a first year college student. She likes reading and collecting posters from her childhood. She is new to this city. She hears the museum is one of the most famous attractions in
the city, so she plans on going to the museum with a couple of friends on the weekend. She goes to the museum website to check out what’s currently on display before the visit.

Goal:

Explore a new place
Hang out with friends and have fun
Enjoy great art pieces and relax in the artistic environment
Know more about the art in the city

Secondary persona and goals – a knowledgeable ceramic artist

David is a professional pottery artist. He works in a ceramic studio. He’s been working on designing and making a series of pottery since last month. However, he is facing a bottleneck now. After a whole week’s work, David went to a local art museum on Saturday because he heard about a new ongoing exhibition. While he was walking around in the ceramics show district, he could tell how those antique ceramics were shaped and decorated. Unexpectedly, a beautiful antique vase caught David’s attention. When he looked at it closely, he found the surface texture of this vase was made in a unique way. He really wanted to touch and feel it at this second.

Goal:

Relax and enjoy the weekend
See contemporary art trends
Get inspiration from historical great art pieces
Find and learn things he didn’t know before
Successfully deal with the bottleneck on this work
Be able to create more popular art pieces
Become a great ceramic artist

Tertiary persona and goals – a museum docent

Mrs. Green has been a member of the Cincinnati Art Museum for decades, and she’s also a docent now. After Mrs. Green retired, she started to volunteer at Cincinnati Art Museum as a docent because she wanted to engage in some meaningful activities that could combine her interest in art too. She used to spend a lot of time in the museum, just to look at the artifacts, read their names and imagine stories of them. She is very knowledgeable and willing to share her knowledge with others.

Goal:

Enjoy everyday in the museum
Keep points of importance in mind
Effectively introduce all the important and interesting information to audience
Share her favorite artifacts with people of the same taste or hobby
Get positive feedback from audience
Become a expertise in the field eventually

4.2 Requirements phase --- scenarios and design requirements

Scenario is a tool to analyze persona data and functional needs. It is useful to describe a clear picture of the personas’ behavior and attitude in the context, so that a designer could find opportunity gap and define design requirements. Three scenarios are built based on qualitative research findings and personas.
Scenario (Emily)

1. Before going to the museum, Emily visits the museum website to check out ongoing museum exhibitions, open hours and a direction guide.

2. Emily picks her friends up and drives to the museum.

3. Emily and her friends arrive at the museum. After paying for parking, they come to the reception desk in the lobby.

4. Emily gets a museum guide map and some flyers about the museum and current exhibitions.

5. Emily uses the map and wayfinding signage to guide herself.

6. After finishing the exhibitions on the first floor, she walks in front of a big floor plan map. She looks for the name of an exhibition she found previously online and thinks about what's next.

7. She finds the exhibition showroom on the second floor and skims the introduction for the exhibition.

8. She walks in a clockwise direction in the showroom.

9. A piece of pottery attracts Emily’s attention. She reads the interpretive sign of this artifact and wants to find out what it was. She couldn’t find it and there’s no docent as far as she could see. Thus, she moves on to the next artifact.

10. In a “touch and learn” area, she opens the drawer and plays with the image puzzle, and tries to see what she’s going to find after putting the puzzle together.

11. After visiting, she takes exhibition intro flyers back home as a souvenir for one of her art related poster collections.
Design requirements:

- Provide up-to-date exhibition information and recommend exhibition according to audience’s interests.
- Help audience to plan route.
- Be able to guide audience in the museum customizable.
- Use engaging ways to present artifacts.
- Have the ability to explain artifact fast and accurately.
- Categorize key features of artifacts and use accessible and understandable way to interpretive content.
- Allow audiences to save knowledge regarding their experiences or the experience from the visit.
- Have the ability to answer audience’s particular question about the show on time.
- Provide a platform for audiences to comment and enter feedback.
- Allow audiences to have meaningful take-away after their visits.

Scenario (David)

1. After he checks for the opening hours of museum, David drives his family to the museum on Saturday.
2. Because David has been to the museum many times, he doesn’t take a museum guide map, but he reads some new exhibition brochures at the front desk.
3. David guides his wife and children around.
4. When they come to the ceramic artifacts showroom, he is passionate about introducing potteries to his children and encourages them to find their favorites.

5. David is attracted to one piece of work. He stops in front of the glass cabinet and reads the introduction thoroughly.

6. He explains why it is unique to his wife and children. It is because the unique way of surface decoration. He wants to hold it closer to feel it.

**Design requirements:**

Be able to provide in-depth information when audiences want to find out more.

Provide audience the chance to get first hand research news and info.

Provide different levels of information according to audience’s need: for entry level, intermediate level and professional level.

**Scenario (Mrs. Green)**

1. After morning exercise and breakfast, Mrs. Green gets ready for her volunteer work later in the day. She leaves home a half-hour before work starts.

2. When Mrs. Green arrives at her work place, she puts down her personal belongings and goes over introducing materials about current exhibitions.

3. During the introduction of art pieces to audiences, Mrs. Green sometimes glances at labels to remind herself the accurate information such as firing temperature and producing time.
Design requirements:

Be able to provide up-to-date exhibition related information.

Be able to work as a reminder to docents.

Be able to get feedback from audiences and know what are the frequently asked questions.

Points of importance should be highlighted.
Chapter 5. Concept Development and Prototypes

5.1 Functional and data elements

Here’s an example of an antique vase. Key elements of the vase include the following aspects:

As I mentioned in the research phase, there’s a lack of contextual information for audiences to understand. Museum ceramic exhibitions usually assume audiences already have fundamental knowledge of the subject. The chances to learn should be provided for novices. Fundamental knowledge, a measurement of data information and other explanations for complicated subject knowledge should be supplemented at kiosks.
There are more than 20 steps in the **process of making ceramics**. Here are a few important steps in making ceramics. At the beginning, raw material is mined, ground into powder and brought to studio for artists and craftsmen to work with. Next, artists and craftsmen use those materials as ingredients to make the clay body. By doing wedging, they could remove the air bubbles in the clay.

![Figure 12. Process of making ceramics – 1](image)

The next important step is forming the clay body. Although there are many ways of doing it, wheel turning, hand building and mold making is very popular. Then, before the clay body totally dries and becomes a Greenware, it is called Leatherhard, and it’s the perfect time to work on surface carving and decoration.
After hours of bisque firing, the clay body becomes stronger and artists add glaze to it. Last but not least, the clay body is fired in glazing firing and sometimes another glaze firing in order to get a different texture or color effect. Finally, a ceramic art piece is completed. For ceramic potteries in China, they were sold to royal families and stayed there for hundreds of years before they were transferred to museums.
The history of ceramics is another dimension of contextual information. Process of shaping ceramics shows a pottery’s life, while history shows a big picture and changes in trends.

5.2 Framework definition

Framework ranges from definition of overall product function, structure and form to detailed visual interfaces. Broader definition of interaction design includes designing of products and services in an environment as a whole system.
Solutions to solve current issues of interaction design for ceramic exhibition are:

Using an overall system to tell a story of ceramics from the elementary to the profound. In order to present all aspects of ceramics’ features entirely, multiple forms of interaction products and non-digital interactive facilities should be supplementary to each other using a combination of visual, aural, read/write and kinesthetic solutions. Forms of products in this thesis are including:

1. Users could download museum application on their devices such as iPhone or iPad; non-smart phone users could borrow a hand-held device from museum at the entrance.
2. Interactive kiosks are used to provide fun fundamental knowledge.
3. Take use of ceramic pieces. Interactive games of tangible ceramic pieces allow audiences to have tactile feeling.
4. Infographics are used as supplemental material in the experience to provide visualized information.

Self-guide interactive system

The following chart shows key paths of three personas using the self-guide interactive system.
Figure 16. Storyboard of primary persona and secondary persona
Figure 17. Storyboard of tertiary persona
Here are some example pages of the application prototype:

Figure 18. Interface examples of the self-guide system – 1
The earliest pottery was made 18,000 years ago. People started pottery manufacturing during the late Paleolithic. Forms of ceramics change a lot during thousands of years of development. Different cultures have different forms and styles of ceramics now.

Plum Flower Vase
China
19th century

It is traditionally used to display branches of plum blossoms. The meiping was first made of stone-ware during the Tang Dynasty (618-907). It was originally used as a wine vessel, but since the Song Dynasty (960–1279) it became popular as a plum vase and got its name "meiping". It has a narrow base, a wide body, a narrow neck, and a small opening.

Figure 19. Interface examples of the self-guide system – 2
Kiosks

Kiosks are used to present entry-level knowledge and interactive medias. Target group of kiosk is not limited to children. It is designing for beginner’s primary need and secondary need of intermediate, expert users. Here are some solutions for kiosks.

1. Fundamental knowledge of ceramics --- Ceramic Measurement --- to connect ceramic knowledge with daily life
2. Simulate process of making pottery and allow audiences to make their own pottery --- Ceramic Studio
3. Summary of the exhibitions in museum and understanding ceramic in other field --- use ceramics as a material to understand technology revolution from the past to the future.

Solution prototype 1 -- Ceramic Measurement

The ceramic measurement is a way to provide a scale of data information. Here’s an example of visualizing temperature of firing porcelain by comparing to simple little things in daily life that everyone has experienced before. For instance, the temperature of firing porcelain is 2200F while ice cream is -10F, body temperature is 98F, temperature to bake a cupcake is 350F, etc. This prototype is aiming at providing a sense how hot the temperature is to audiences.
Figure 20. Interface examples of the kiosk Ceramic Measurement
Solution prototypes 2 -- Ceramic Studio

The Ceramic Studio is an application that simulates the process of making a pottery. The behavior of shaping the pottery also simulates the wheeling turning experience. After go through the process, users could see how a pottery would look like on screens that are made by their choices of materials. At the end, users will have the choices of saving it to one’s self or sharing with others.

Figure 21. Workflow of the kiosk Ceramic Studio
Solution prototype 3 – Summary of ceramic knowledge, from past to the future

Museum experience sometimes is isolated from the real world. The summary of the exhibition should be provided near the end of an exhibition. For a subject like ceramics, modern applications of ceramic as a kind of material ranges from industrial products such as tableware,
high performance ceramic knives, to bulletproof vests. It is important to make a connection between the inside and outside world of museum exhibition.

Figure 23. An antique vase – Northern Song Dynasty Cizhou Kiln White Glaze Black Color Tang Grass Plum Vase

**Take use of ceramics and visual elements**

Ceramics’ names and interpretive signs usually consist of many professional terms, such as the decoration method and surface patterns. By providing ceramic examples of specialized vocabularies, museums could help audiences to have a connection between the words and ceramic features. Take a look at the pottery above as an example (figure 23): the Chinese name of this artifact is “Northern Song Dynasty Cizhou Kiln White Glaze Black Color Tang Grass Plum Vase”. The name includes all the key features of the artifact. Interpretive sign and ceramic pieces should provide information corresponding to the complex name (features information) of the artifact. After that, if viewers wanted to know more, they could move forward to see ceramic
examples. According to Neil Fleming’s VARK Learning type model, “Knowledge of, and acting on, one's modal preferences is an important condition for improving one's learning” (Fleming and Baume 4). The redesigned interpretive sign takes use of visual element and tries to improve efficiency of conveying information.

Redesign of the interpretive sign:

![Prototype of the redesigned interpretive sign](image)

**Figure 24. Prototype of the redesigned interpretive sign**

Museums should also provide ceramic pieces that allow audiences to touch and feel. For instances, ceramic fragments and secured ceramic installations.
Figure 25. A prototype set up

Figure 26. Prototype – using ceramic pieces as educational material
Figure 27. Prototype – providing ceramic pieces to allow audiences have tactile feeling

Proving ceramic workshops that allows visitors to put their hands on clay and work with it is another way to enhance audiences’ tactile feeling. Study indicates playing with clay could be a great opportunity for children to have a sense of shaping three-dimensional objects.

5.3 Tests and Analysis

The same way of interpreting artifacts is used on both solutions of printed interpretive sign and the self-guide museum application. It is assumed in this thesis that a combination of visual elements and highlighted verbal information would be more effective to convey the information. An experiment is conducted in order to test usability of the redesigned sign.
In order to simulate the scan reading situation in museums, 11 interviewees were asked to read a sign and look at an artifact in 30 seconds. The same sets of questions were asked in the current exhibition environment and to a prototype set up. Standards to measure the solutions’ efficiency are the rate of correct answers. Test result shown in figure 29 indicates that when reading the current sign, there’s a much higher rate to remember information on the left column than the right. When using the redesigned sign, there were 60% more right answers on both left column and top right area.

Usability assessment should be conducted as future work. When it comes to development support phase and how to apply interaction design to a museum, many realistic questions would need to be considered. For instance, considering the cost of handheld device and non-smart phone users, static infographics and printed materials may play a more important role. Another question would be loss and damage problems of ceramic pieces.
Correct Answers

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<tr>
<th>Title</th>
<th>Decorator Type</th>
<th>Original Country</th>
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<th>Donor/Owner</th>
<th>Artifact Code</th>
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Figure 29. Test results and analysis
Chapter. 6 Conclusions

Interaction design prototypes that are proposed in this thesis are specifically designed for ceramic artifacts. When designing for another kind of artifacts or museums, the context and the subject may be quite different. Further research will need to be conducted on that subject in order to define a customized interaction framework for that topic. However, some design requirements can be applied as general requirements when designing for museum exhibition for the public.

Aiming at museum exhibition, here are a few design requirements for overall interaction designs:

1. When designing **form, structure and behavior** of an interactive product, designers should take the subject information into consideration. Interaction design should be able to help user build connections to subject information in both the content and behavior level.

2. The **format of interaction design** should move to the upper right quadrant, which is the quadrant of “subject related content - dynamic interactive format”.

3. **Content information** that is presented in the museum should meet the needs of beginners, intermediates and experts. Audiences come to museums because of different goals and expectations. The information should be able to lead audiences to new knowledge based on their existing knowledge. Exhibition information of the following aspects should be provided:
   a. An overview of the exhibition
   b. Fundamental knowledge of the subject – an explanation of specialized vocabularies
   c. Introduction of its originally contextual environment
4. The **ways of presenting information** should take into account that audiences have different learning types.

5. The **overall solution** should work as a harmonious whole system so that it could help the audience has better communication with other audiences, artifacts, exhibitions and even the knowledge outside the museum.

Figure 30. Communication between different roles in the museum
**Future work**

Design solutions in this thesis are attempting to build connection among the museum, audiences and docents and allow audiences to have interactions with artifacts and the museum. Future work could be conducted to help the audiences communicate with other key partners in the museum, such as other attendees, exhibition coordinators, conservators and visitor service assistants.
Reference


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