The museum is a cultural place for people to broaden their horizons and it is also an essential environment for informal learning. However, due to our fast-paced lifestyle and diverse forms of entertainment, needs are increasingly varied, and museums face many challenges. Many people, especially young people like Generation Z (a group of people who were born between the mid-1990s to the mid-2000s), are not interested in static exhibitions with tedious and wordy interpretations. Therefore, building the connection between Generation Z and making history museums more engaging is crucial. The goal of my project is to identify the engaging elements for Generation Z and apply them to a design intervention for building connections between Generation Z and history museums. According to my literature review, online survey, and a walking interview, there are three key findings which can drive my design intervention: (1) Gen Z thinks that use of heavy text and lack of interaction are disengagement elements. They believe that creating memories related to history can help them to generate empathy and increase their interest in history. (2) Gen Z is active on social media platforms such as Snapchat, Instagram and they enjoy watching “stories,” which is a visual scrapbook of videos and photos that disappear after 24 hours. (3) Gamification (a method to incorporate the elements of a game into a non-gaming environment) can help individuals to learn and absorb knowledge. Rewards, self-expression, altruism, storytelling and visual communication are crucial gamification elements which can make individuals feel more engaged in the learning environment. I developed three generation prototypes and had participants interact with them to gain feedback from my target group. Finally, the overall design outcome is a location-based mobile application called MUZE which can collect historical stories in daily life. The app has three features: the ability to collect historical stories, the ability to share feelings and thoughts about the history in the form of a short video, and the ability to redeem virtual or physical rewards related to the history museums.

Keywords: Generation Z, history museums, engaging, mobile application, gamification
HOW CAN THE HISTORY MUSEUMS BE ENGAGING FOR GENERATION Z?
-A MOBILE APP WHICH CAN COLLECT HISTORICAL STORIES FROM HISTORY MUSEUMS

by

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B.E., China University of Mining and Technology, 2017

Thesis
Submitted in partial fulfillment of the requirements for the degree of Master of Fine Arts in Design.

Syracuse University
June 2019
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Background

A museum is a place for collecting and displaying objects. It is a public place with aesthetic functions, cultural functions, scientific functions and so on. According to the International Council of Museums (2007), the definition of museum is “a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment” (“Museum Definition”, para.2). However, this understanding of museum is outdated. With the development of society and the advancement of science and technology, museums are constantly being redefined. The museum is not only an institution that collects, protects, studies, and displays cultural heritage, but also becomes a full-service and future-oriented cultural service and educational institution.

However, due to the fast-paced lifestyle and diversified forms of entertainment, people’s cultural needs are increasingly diversified, and museums currently face many challenges. Many people, especially Generation Z, are not interested in unchangeable exhibitions with tedious and wordy interpretations. During my exploration of this topic, I found that the history museum is less engaging for Generation Z.

Generation Z is the cohort after the Millennials. Although the definition of the date and age varies, Generation Z is a group of people born from the mid-1990s to the mid-2000s. According to Fuze (2016), Generation Z is the second largest segment of the United States’ population. Moreover, this generation is expected to take up 29% of the American population in 2025, which is a large and significant proportion.

My goal is to find out the engaging elements for Generation Z and apply them to a design intervention for building connections with history museums. I hope the design outcome can help Generation Z learn more about history, helping them to become more informed. Also, the museum can benefit from the connection which would, in turn, make the museum become more popular and hopefully solicit more visitors.
Literature Review

Because my goal is to explore how museums can be engaging for Generation Z, my literature review mainly focused on four parts: Museum Engagement, the characteristics of Generation Z, How Generation Z learns, and Gamification.

1. Museum Engagement

Tizbaz (2013) indicated that there is a gap between young people and museums since museum’s curatorial strategies no longer meet the specific needs and interests of this age group. Cesário, Matos, Radeta, and Nisi (2017) emphasized the importance that the younger generation attaches to interactive technologies when visiting museums. Moreover, the four design categories summarized in their articles can be used as a guide for my research and design. They are interaction, gaming, localization, social media. I can also refer to these four categories in my survey and interview and get a more specific and useful description which can drive my design from the answer of the participants.

2. The Characteristics of Generation Z

According to Fromm and Read (2018), they conducted a study about Generation Z. They concluded some characteristics of Generation Z including their habits of using mobile devices, education, entertainment, social media expectations. Their report also mentioned that the mobile-only, visual stimuli, small screen, video, brand personality are part of the new communication rules which are acceptable to Generation Z.

Turner (2015) explored how technology affects Generation Z. First, he presented some of the features of Generation Z, such as their dependence on mobile phones, the popularity of social media among them, and so on. Moreover, this article also explained some of the thinking and communication methods of Generation Z. They spend less time thinking independently, and they rely on search engines. Also, a new mode of thinking which is faster and disjointed has gradually replacing linear thinking.

Other scholars also mentioned the vital role of the mobile phone in Generation Z’s daily life. Fromm and Read (2018) conducted a quantitative and nationally representative study in September 2016 in the United States. In their book, they claimed that Generation Z is mobile-only instead of mobile-first. The smartphone is the portal between their offline and online world. According to the 2018 State of Generation Z study conducted by the Center for Generational Kinetics (Watson, 2018), 55% of Generation Z spends five hours or more a day on their mobile phone.

As digital natives, Generation Z is used to gaining and publishing information on smartphones to communicate with the outside world. As for the way of receiving information, Fromm and Read (2018) found that Generation Z enjoys short and punchy text, as well as compelling videos. They also prefer customized messages.

Generation Z is active on the social media and they prefer the form of short video for receiving information. According to Pew Research Center in 2018, the Top 3 most frequently used social media platform among Generation Z are YouTube (85%), Instagram (72%) and Snapchat (69%). Besides, “Stories”, which is a visual scrapbook of videos and photos that disappear after 24 hours — are becoming popular among Generation Z on social media platforms. Surveyed 1,000 people aged from 16-24 in the U.S in 2018 about their media consumption and digital advertising preference, VidMob (2018) found that 72% of Generation Z watch stories on Snapchat, and 70% Generation Z consume Instagram Stories. Vlog is the most popular type of video, which draws 42% Generation Z.

3. How Generation Z learns

Seemiller and Grace (2018) mentioned the characteristics of Generation Z concerning learning preference, community engagement, career aspiration in their articles. By conducting a study of more than 750 Generation Z students, Seemiller and Grace (2018) found that in terms of learning preference, Generation Z tends to learn as the observer. This generation also values the efficiency of self-learning. As for community engagement, Generation Z is more willing to solve practical problems rather than just volunteering. Regarding career aspirations, they are eager to have more internship opportunities and hope to achieve self-exploration and self-satisfaction in their work.

Cronk (2018) analyzed the motivators that influence how Generation Z learns and the relevance of these factors to the concept of gamification. The author collects qualitative data through literature review and interviews. The conclusion is that rewards, self-expression, altruism, storytelling, and visual communication are crucial elements that can make Generation Z feel more engaging in the learning environment.

According to the research conducted by Ding, Guan & Yu in 2017, game-based learning is an effective end engaging method for Generation Z to absorb knowledge. They conducted a semi-structured survey of students using online stock trading simulation game. In the end, they confirmed the two hypotheses in the article: game-based learning is more effective than traditional learning methods; students prefer game-based learning.
4. Gamification

The definition of gamification is to incorporate the elements of the game into a non-gaming environment. The significance of gamification is to make participants more engaging and more motivated to participate, cooperate, share and interact (Bunchball, 2018). The term “gamification” first appeared in a blog post by Brett Terill in 2008 and it became widely used in 2010.

Werbach & Hunter (2012) introduced a book which provides a systematic theoretical knowledge about gamification. This book has six chapters. According to the logical sequence of a game, they talk from “the introduction to gamification” to “how to avoid epic fails.” The authors not only analyze the intrinsic motivation and extrinsic motivation of gamification from the perspective of psychology but also innovatively propose six steps to construct a gamification system. Additionally, the gamification toolkit introduced by the authors includes the PBL Triad (points, badges, leaderboards), game elements (dynamics, mechanics, components). “Game mechanic” refers to rules and rewards which can attract users and make the activity more intriguing, such as points, levels. “Game dynamics” refers to the users’ desires and motivations, such as rewards, self-expression.

Skinner, Sarpong & White (2018) mainly introduce the concept of the existing gamified location-based practice of geocaching. This concept is an information and communication technology which can make the tourism experience more engaging, especially with Internet-based technologies. The authors propose an ICT-based conceptual framework for “The Practice of geocaching.” Moreover, the article also analyzed the case of Pokémon Go, which is considered a hi-tech version of geocaching. They also talked about the gamification element that Generation Z feels engaging. For example, Generation Z seeks richer digital and gamified contact experiences. Also, Generation Z enjoys participatory social activities, as well as reward standards of achievement.

5. Conclusion

According to my literature review, I found that although some studies indicate that there is a gap between teenagers and the museum, there are few studies related to Generation Z, this particular group, and their perspectives of the museum. Other than that, I found out that there is limited research which talks about building the connection between Generation Z and history museums by applying the engaging elements for Generation Z to the design of the history museum. I hope that by understanding what factors influence Generation Z to engage with museums, I can develop a design intervention to fill the gap between Generation Z and the history museum.

According to the close relationship between Generation Z and mobile phone, I think the mobile application is an excellent design entry point. First, the mobile phone is the most commonly used and familiar device for Generation Z. Generation Z likes to browse fragmented information on their mobile phone in their daily lives. This phenomenon is related to the nonlinear thinking mode of Generation Z, and also correspond to my design concept (to let Generation Z have interaction with the history museum in daily life). Second, most Generation Z can skillfully use applications. Using the mobile app as a carrier of design concept facilitates Generation Z to accept and get used to, reducing learning costs. Also, mobile applications can be closely linked to the social media platforms that Generation Z is passionate about, increasing the impact in this age group.
Methodology

1. Online Survey

In order to know the experiences and perceptions of the museum of Generation Z, I use the methodology of the survey. I had an IRB approved study to support my approach (see Appendix A). Participants of this study are a convenience sample set of people who are classified as Generation Z who are over 18 years of age in the United States. The participants are personally known by the primary investigator who has pre-existing knowledge of participant email addresses. Participants are recruited from a convenience sample. The sample is expected to chain-refer some Generation Z who are willing to participate in the survey. Interested participants are emailed a link to an online form preceded by a consent form (see Appendix B for consent form) that explains the interest and scope of the study, risks, procedures for involvement and confidentiality, and researcher contact information. Upon agreeing, the participants are routed to a 10-minute anonymous online questionnaire that asks questions about their experiences and perceptions of museum design (see Appendix C for survey questions). The questions include some basic questions about their visiting, their museum experience, and their opinions about the museum in the digital age.

2. On-site Walking Interview

Based on the feedback from a mid-term report and discussions with my outside committee professor Meriel Stokoe, I narrowed down my research scope to the history museum which is less engaging for Generation Z. In order to know the experiences and perceptions of history museums according to Generation Z, my professor Dr. Jody Nyboer introduced a creative methodology to me which is the on-site walking interview. While the participant is experiencing the museum, I can ask his or her some questions about his or her feelings and thoughts. I chose the Erie Canal Museum, which is a local history museum as my sample site. They had a permanent exhibition called “The Erie Canal Made New York.” Here is the floor plan of the exhibition which can help me make efficient field notes during the walking interview. Before the participants go through the whole process, they need to sign the consent form (see Appendix D for consent form). The participants need to wear the GoPro on their head to record where they are looking. Also, the GoPro can record the participant’s direct quotes. While the participants are experiencing the museum, I can ask a series of questions about their feelings and thoughts. Through the experience, I will ask them to express their feelings and thoughts aloud. Also, I posed follow-up questions after the experience, like “What parts did you find to be least engaging?” “What design elements would you add to make the museum more engaging for your generation?” (see Appendix E for interview questions).

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(Figure 2 IRB Approval Letter)
(Figure 3 The Floor Plan of the Exhibition "The Erie Canal Made New York" in the Erie Canal Museum)

(Figure 4 The Erie Canal Museum)

(Figure 5 The Erie Canal Museum)
Findings

1. Online Survey

I received nine responses. The survey revealed that as for the display format, Generation Z has interest in various high-tech means to display content such as virtual reality, augmented reality, 4D technology. In addition, they expressed that too much text and lack of “navigation prompts” are disengaging elements when they visit a museum.

Here is the complete result of their answers.
2. On-site Walking Interview

One participant went through the on-site walking interview. I transcribed her quotes and categorized them into three parts (see Figure 10): engagement, disengagement, improvement. I found that some physical or digital models which can interact with are more attractive to her. She considered that the heart texts and lack of navigation were disengaging when she went through the whole process. She also provided her thoughts about how to redesign the museum for her generation. Besides more organized interpretation and visual guideline, she thought that creating memory between the museum and Generation Z is a great way to build the connection between the museum and Generation Z. For example, the idea of storytelling can help them establish relationships with historical events and historical figures, generating empathy.

(Figure 9 The Screenshot of the video from the GoPro)

3. Conclusions

According to my literature review, online survey and the walking interview, I found the following key takeaways which can guide my design intervention.

(1) Generation Z thinks that heavy text and lack of interaction are disengagement elements. They believe that creating memories related to history can help them generate empathy and increase their interest in history.

(2) Generation Z is active on social media such as Snapchat and Instagram, and they enjoy watching “stories,” which is a visual scrapbook of videos and photos that disappear after 24 hours.

(3) Gamification, which is a method to incorporate the elements of the game into a non-gaming environment, can motivate Generation Z to learn and absorb knowledge. Rewards, self-expression, altruism, storytelling and visual communication are crucial gamification elements that can make Generation Z feel more engaged in the learning environment.

(Figure 10 The Key Points from Participant’s Direct Quotes)
1. First-generation Prototypes

Based on the findings from desk research, online survey and the walking interview, I came up with two prototypes.

The first prototype is based on my pop-up exhibition idea from last semester. I turned it into a complete and more detailed plan. This exhibition combines physical and digital elements. People will see a historical scene offline, and then use their phone to scan the QR code on the wall to get a character card. By looking for an item corresponding to the character within the scene, one can browse the story between the character and the thing on their mobile phone. After collecting all the items, a report will be automatically generated to help people review the life of the character and deepen their understanding of the character and historical events. However, after discussions with Professor Carr, we thought that this idea lacks certain feasibility. At the same time, this idea is not easy for me to quickly collect feedback and perform iterations. So, I turned this exhibition into an online exploration. This little game can be accessed via a link on social media such as Facebook and Twitter. People can know some interesting facts about the lives of numerous characters by searching for the item corresponding to the characters in the pictures.

The second prototype is a game on the mobile phone which can collect historical events. Since 85% of Generation Z selected mobile phone as their most frequently used device, a mobile application can be a good solution for the history museums to build the connection with this specific age group. Posters can be everywhere in people’s daily lives. These posters may be in the original location of the historical event, or a crowded place such as a mall, or a museum. People can learn about historical events by scanning the poster and listening to historical stories. After scanning the posters, a character will appear and talk about a section of his or her stories. At the same time, other historical stories in this area can be collected according to the guidelines.

(Figure 11 The UI Design of the First Prototype)

(Figure 12 The UI Design of the Second Prototype)
2. Feedback from Experts

By comparing the advantages and disadvantages of two prototypes, finally, I chose the second one to develop. I made a simple clickable prototype which showed the primary functions of my design idea. The URL is https://pro.modao.cc/app/ShEZ37wTZZ0umDKFeoDbCwGkhIM8A4h.

I showed my idea and prototype to three experts, and I gained lots of great feedback.

One expert resource was my outside committee member, Professor Meriel Stokoe. She is an expert in the field of Museum Studies. I asked her some questions based on the following topics: (1) Do you think the target group (Generation Z) will like it? (2) How can this application help the museum? (3) Do you know any other examples of using technology which makes the museum more attractive (inside or outside the museum)? (4) How to tell the stories in the history museum to Generation Z? Professor Stokoe gave me much useful advice. First, she believed that in order to attract Generation Z, it is necessary to establish a connection between the target group and history. For example, she mentioned that Generation Z is more concerned with self-expression, so building their own personalized roles may make them more engaged. This feedback is consistent with the conclusion of the walking interview in my previous pilot exploration. At the same time, she mentioned that some members of Generation Z would also like to collect things, so I need to add a pointing mechanism and an achievement system. When users collect a certain number of stories, they will gain some feedback. Also, she believed that even in the digital age, physical objects still play an irreplaceable role in the study of historical museums and historical knowledge. She mentioned an article called “Do History Museums Still Need Objects?” The author concludes that the digital age has brought opportunities for physical museums. The visit to the e-Museum has increased the interest of the audience to a certain extent and promoted the audience to enter the real museum and explore the exhibits in more depth.

Another professor is Rebecca Xu from Computer Art. She is an expert in interactive technologies and game design. First, she thought that it is essential to figure out what object the users are scanning. Is the application still using posters or just stickers? Compared to stickers, posters can provide more information, which makes it easier for people to understand some historical knowledge. Then she mentioned that I should fully consider the interactive ways of presenting information. What kind of information will appear when people use a mobile phone to scan posters? Animation, video, detailed interpretation, website are all forms of display that can be used. However, she asked me to consider ways that are easy for my target group to accept and let them feel engaging. Moreover, Professor Xu suggested that I find more information about gamification which can provide theoretical support for my design intervention.

The third experts I talked to is Dr. Zina Alaswad who is the candidate of EDI faculty. She is an expert in the field of gamification and has done extensive research in the area of applying gamification into the learning environment. I showed her my existing user interface design and talked about some of my design ideas. She gave me a lot of advice. The first is to use the PBL system reasonably, such as avoiding excessive exposure of personal information in the leaderboard. In terms of the badges, she suggested that users can share the obtained badges on social media such as Facebook and Instagram to form competition with friends and also stimulate Generation Z to use the app since they are active on the social media. She also mentioned an aspect that I did not think of before: that is, users can get bonus points if they can create content based on the historical stories. This approach helps users thoroughly learn and understand historical knowledge.

3. Feedback from Users

In order to gain feedback from my target group, I made a feedback book, which is a pdf document (see Figure 13) where participants can type in their thoughts. The material included four parts: (1) Problem Statement: he subject of my research, why this topic is crucial (2) Research: A summary of my previous pilot exploration (3) Design Process: An introduction to how I design the application. After researching museum engagement and Generation Z, generating ideas, and creating the prototypes, the circulation between getting feedback from users and revising the design based on the feedbacks help me iterate and polish my design. (4) Prototype: In this section, each page I placed one page of my user interface and put some descriptions next to it. On the right side of the page is the location where the participants can write their feedback. I have provided some perspectives for thinking for them. These aspects include -What do you think about the design? -Do you think it is easy to understand how to use this app? What about the interface? -Do you feel that this app can provide an engaging history museum-based experience? -Are there any aspects of the design that make you feel confused? Uncomfortable? -What would you change about the design, and why?
I sent out the document to three participants who were from Generation Z. I collected their feedback and divided them into the following parts:

<table>
<thead>
<tr>
<th>Functions</th>
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<tbody>
<tr>
<td>• Share with friends</td>
</tr>
<tr>
<td>• Compete with friends</td>
</tr>
<tr>
<td>• Achievement System</td>
</tr>
<tr>
<td>• Digital Rewards: points which can be used to unlocked stories</td>
</tr>
<tr>
<td>• Physical Rewards: museum ticket or souvenirs</td>
</tr>
<tr>
<td>• Scan the objects</td>
</tr>
<tr>
<td>• Short video interpretations</td>
</tr>
<tr>
<td>• Celebrities dub the video or play as an actor or actress</td>
</tr>
<tr>
<td>• Leaderboards and badges may increase the users’ enthusiasm</td>
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<table>
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<tr>
<th>Interface</th>
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<tr>
<td>• Confused about the words “Scan” and “Discover”</td>
</tr>
<tr>
<td>• “Save” and “back” buttons are a little confusing</td>
</tr>
<tr>
<td>• Add some more curious incentives to the poster to encourage passers-by who don’t know the app to scan the poster and download it</td>
</tr>
<tr>
<td>• Add a section called “In which museum can I find this character?”</td>
</tr>
<tr>
<td>• Add “sign in” or “log in” buttons</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Other thoughts</th>
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<tr>
<td>• Posters can be placed in the history museum, campus, bus station, and different crowded locations</td>
</tr>
<tr>
<td>• This app can increase people’s awareness of the history museums</td>
</tr>
<tr>
<td>• It attracts people who love learning history and can also develop more potential users</td>
</tr>
<tr>
<td>• Activities: competition about finding posters in a specific area</td>
</tr>
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<table>
<thead>
<tr>
<th>Questions</th>
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<tbody>
<tr>
<td>• How to let Generation Z play the game?</td>
</tr>
<tr>
<td>• How to build the connection between playing the game and visiting the museum?</td>
</tr>
<tr>
<td>• How to prevent people from using photos from the internet?</td>
</tr>
<tr>
<td>• How can museum benefit from this design?</td>
</tr>
</tbody>
</table>

The primary function of this app is to collect historical stories in everyday life. Users can open app and scan posters to collect historical stories in their daily lives. Users can also view nearby historical stories on the map and tag them.

4. Second-generation Prototype

According to the feedback from experts and users, I used the software called sketch to make the user interface design of the second-generation prototype. Next, I made the interactive function of the application by using a prototype software called MockingBot. The second-generation prototype can be viewed at the following URL: https://mockingbot.com/app/f628ac19d93983fc390e71e1e81d13ac33db9f0bf

The name of this mobile app is “MUZE”. The design of the logo was inspired by the problem that the app hopes to solve: building the connection between Generation Z and history museums. The “M” in “MUZE” stands for history museums, and the “Z” stands for “Generation Z.” The mobile phone icon in the middle of the two letters indicates that the mobile app can connect Generation Z and history museums.

(Figure 14 Feedbacks from Participants)

I think this feedback can be treated as descriptive data for me to design the next iteration. Besides, some of the feedback provide a different perspective on my thesis topic. For example, how to establish a connection between people using the application and people visiting the museums? How can the museum benefit from the design? I have always been in the perspective of Generation Z, thinking about how to make this application more engaging. However, how to form a sustainable business model and benefit the museum is also an important issue that I need to consider and study.

(Figure 15 The Landing Page)

(Figure 16 Collect Historical Stories)

(Figure 17 View Nearby Historical Stories)
Feedback from Thesis Committee Members

On April 1st, I showed my thesis’s progress and my second-generation prototype to my thesis committee members. I received a lot of useful feedback. Feedback mainly contains the content of research, the features of the app, and how to present my design.

As for the features of the app, thesis committee members mentioned that I need to consider that is there a better form of discovering stories rather than scanning the posters? Can users get a notification when they are close to the geographic location of a historical story? At the same time, my app should include the culture and elements that are popular in Generation Z, such as “stories” on social media, which is a visual scrapbook of videos and photos that disappear after 24 hours. Also, Generation Z may feel more engaging if they can become the content provider themselves, creating a short video like vlog in the app.

According to the Cambridge Dictionary, vlog means video blog, which is a record of someone’s thoughts, experience, and opinions in the form of video and is published on the internet.

At the same time, in the form of presentation and exhibition, I also received a lot of feedback. I should come up with a short statement to explain what my app does at the beginning of my presentation. This need requires me to summarize the main features of the app in a concise language. Then I need to identify the target group and create using scenarios to help audiences better understand the whole process by using the method of storytelling. At the same time, I should reorganize the research I have conducted and explain it in a more logical order. For example, I researched the characteristics of Generation Z and their popular culture and then extracted the factors that make Generation Z feel engaged. Then I need to explain how I apply these key factors to my design.

I also applied the gamification theory to my design and built a complete gamification environment. Users can get points when they are collecting historical stories. They also get extra points if they share historical stories on social media platforms. I also added an achievement system to my app. By completing the tasks specified in the achievement system, such as collecting a certain number of historical stories and contributing a certain amount of comments, users can obtain badges and additional points. Users can also view the leaderboards to see their rankings among all users and as well as their friends. Moreover, users can use the points to redeem virtual or realistic museum-related rewards, such as free tickets to museums, coupons for museum gift shops.
Based on the feedback I received, I completed my third-generation prototype based on the second-generation prototype. The third-generation prototype can be viewed at the following URL: https://mockingbot.com/app/d06d247d96c0501b65d7babc0e68c2b86c40300

First, I changed the way of collecting historical stories from scanning the posters in daily life to automatically receiving them according to the guidelines of the map. When the users approach the geographic location of a historical story in everyday life, the system will automatically pop up a notification “Historical story about the Erie Canal near you, do you want to explore and collect?” Users can also open the map directly in the app, following the guidelines to get close to the historical story and collect. This way avoids the posting problem of the poster in the city and also simplifies the process of scanning the posters to complete collecting when the users walk on the street.

Secondly, I added the “stories” feature to the app as one of the means to attract Generation Z. I turned the comment function in the previous second-generation prototype to creating “user stories” related to the historical story. After collecting a historical story, users can share their feelings and thoughts in the form of short videos. According to the Generation Z study conducted by Maru/VCR&C in 2016, Generation Z is very concerned about privacy on the Internet. They don’t want some of their personal feelings and photos to exist permanently on social media. At the same time, Generation Z prefers video messages to text. This phenomenon shows the reason why “stories,” which is a form of short video that only exists for 24 hours, are welcomed by Generation Z on social media platforms. Therefore, “user stories” about historical stories in the “MUZE” app are impermanent and only exist for 24 hours.
7. Feedback from an Expert

In order to gain feedback from the museum’s perspective, I contacted Ashley Maready who is the curator of Collections and Exhibitions at the Erie Canal Museum. She manages the collection of over 60,000 artifacts (objects, photographs, books, archival materials) held by the Erie Canal Museum and is in charge of conducting historical research and writing.

I explained my design idea to her and showed her my third-generation prototype. She thought my design was great. She mentioned that Generation Z is indeed one of the groups in which museums lack of connections. Take the Erie Canal Museum as an example. The demographics of most visitors are baby boomers. As a museum’s staff member, Ashley is actively exploring ways to improve the Generation Z’s experience in the museum. Furthermore, she believes that through the mobile app and gamification, Generation Z can understand historical stories in daily life, which helps them to be aware of the surrounding history museum and generate interest in visiting the museum for more details.

Also, as the museum’s curator, Ashley also made some suggestions for my app. The first is the interface of the museum page. She suggested that I can add information including opening hours, website, social media accounts. At the same time, I also need to indicate that the Erie Canal Museum is a free museum. In terms of rewards, she mentioned that in addition to free ticket, gift shop coupon, users can also gain a free ticket to the museum’s special events.

(Figure 25 The “Museum” Page)

(Figure 26 The “Rewards” Page)
8. User-testing

In order to test the usability of the app and gather information from my target group, I conducted a user-testing. Participants can have access to the third-generation prototype which they can interact with by clicking the following URL: https://mockingbot.com/app/d06d247df6c6015b65479abcec6e8c5f6c4030D

The entire user-testing process consists of three parts. The first part is a brief introduction to the design concept and the main features of the app. In the second part, I had assigned three tasks corresponding to the key features to the participant when they were interacting with the third-generation prototype. The three tasks are (1) Task One: Open the map and collect one historical story. (2) Task Two: Check the story “Building the Canal,” view “User stories,” and create one “User Stories.” (3) Task Three: View “Rewards” and Redeem a free ticket to The Erie Canal Museum’s special event. The third part is to let participants have an open exploration of the interface and answer the following questions: Do you think it is easy to understand how to use this app? Do you feel that this app can provide engaging history museum-based experience for your generation? Do you think by using this app you can learn more about the history and increase your interest in history museums? Are there any aspects of the design that make you feel confused? Uncomfortable? What would you change about the design, and why?

I recruited 11 participants who are in the age range of Generation Z. When they were completing three tasks and freely exploring the features of the app, I asked them to say aloud their thoughts, feelings, and confusion so that I could record some critical information. At the same time, I also observed the operation of their mouse through the camera including where they paused or hovered-over content as well as noting various wrong clicks. These non-verbal messages are indirect and essential feedback from the participants.

All participants have completed task one, and task two, while three participants have not completed task three. Most of the feedback I received is about small adjustments. For example, adjust the color of the “Rewards” button and add a description to the badges in “My Page.”
9. Final Prototype

In the process of designing the second-generation prototype and third-generation prototype, I found some drawbacks of the prototype software I used which was called MockingBot. First of all, the animation function in MockingBot is limited. It only can accomplish the basic jump between pages and the transition animation cannot be automatically generated. For example, when simulating user getting close to the geographic location of a historical story, MockingBot cannot make the animation of the user’s avatar move on the map. Additionally, MockingBot cannot horizontally display prototypes on the iPad. This limitation is a problem for me to show my digital interface with the iPad at the thesis show.

Therefore, after searching and comparing different software for prototyping, I finally chose to make the interaction and animation for each page by using the software called Adobe XD. The final version of the prototype can be viewed at the following URL: https://xd.adobe.com/view/8ec5d5cd-5725-4066-7492-4946768306ba-f8f4/

I also modified some of the details based on the received feedback to make the user flow more smoothly. First, based on the feedback from users, I turned the “Rewards” button to red to make it more prominent on the page. Moreover, I have added some animations to make the jump between pages more natural, giving users the feeling of using a real app.

Finally, the app has three features. The first one is collecting historical stories in daily life. This App is location-based. Users can open the map in the app and view nearby historical stories. Then they can go to a geographic location and collect them. The historical stories come from history museums and can be anywhere in people’s daily lives. The second is that the user can express their feelings about the historical story. They can become the content provider and share their thoughts on historical stories with other people in the form of a short video. Users can also view and share other people’s stories. These stories are time-limited and only exist for 24 hours. The third is to redeem rewards related to the museum. I applied the theory of gamification into the app. The gamification system includes points, badges, leaderboards, and achievement systems. Points and badges can be obtained by completing different tasks such as collecting a certain number of historical stories and creating user stories. Users can also view the total leaderboard and friends’ leaderboards. Then users can use these points to redeem virtual or physical rewards related to the history museum. Rewards include museum tickets, gift shop coupons.
10. Thesis Show

Because my design outcome is a mobile app, how best to clearly show my design concept and the flow of use has become a crucial issue in my thesis exhibition. I divided my poster into three parts. The first part is the problem statement, why it is important, key takeaways from my research. This part mainly introduces the background and research of my thesis project. The second part is a storyboard to show how this application works. I showed the user’s usage scenarios by visual elements and storytelling. The third part is to display the app’s four critical features on a map so that the visitors can clearly understand the role of the app in the community. In addition to the poster, I placed an iPad on the table to let the user interact with the prototype. I also made some historical stories in the app into cards and put them on the table for visitors to view and take-away.

Discussion

I think the "MUZE" app can build the connection between Generation Z and history museums to a certain extent. First, Generation Z was born with technology, and the mobile phone is their most commonly used device. The design concept of this app is to bring the museum to the daily life of Generation Z, let them be aware of the surrounding history museums and historical knowledge. Secondly, I have incorporated a lot of elements in the app that Generation Z feels engaging. For example, "user stories," Generation Z likes to be the content provider in the form of a short video, and share these stories on social media, which is also a spontaneous promotion of the historical stories as well as the app itself. Also, the app’s gamification system is not only an engaging element that attracts Generation Z, helping them absorb historical knowledge, but also an essential tool for completing the conversion from using the app to visiting real museums. Users can complete tasks and earn points that can be used to redeem museum-related rewards, such as free ticket, gift shop coupon. Although we live in the digital age, historical museums and objects still play an irreplaceable role, both culturally and educationally.

This app not only allows Generation Z to access historical stories and history museums in daily life but also allows the museum to gain more Generation Z visitors. At the same time, this app can also play an essential role in the community, bringing new opportunities to the tourism industry. When users travel to a new city, they can explore the city and learn about the history of the city through this app.
Although I have proved that the "MUZE" app is a powerful tool for building Generation Z and history museums through continuous iterating and gaining feedback from users and experts, my project still has some limitations, and some parts need to be improved.

The first is that the app needs to build a complete database of historical stories. Currently, the app only shows some historical stories from the Erie Canal Museum. If the app can collect more historical stories from the history Museums and form a database, the richness of the content will increase.

The second is the implementation of the functions in the app. Currently, my project is to simulate the user’s use process through the prototype software. For example, if the user moves to the geographic location where the historical story is located under the guidance of the map, the system will automatically collect the story. The current prototype is a process of simulating movement through animation production and does not implement the full functionality through programming and location-based technology.

The third is that I need to improve the methodology of the user-testing. My user-testing is online. Participants used their computer to complete the user test by clicking on a URL and jumping to the prototype interface. Although I can hear the voice of the participants and see the movement of their mouse, the camera couldn’t capture their expressions and micro-actions. This flaw may cause me to miss some critical feedback, such as the expressions when they see a confusing page or description.

The fourth is that I need to recruit more participants and collect more feedback. Although I have designed three generations of prototypes and received feedback from Generation Z, museum curator, museum professionals, experts in the field of gamification, I still need larger sample size to test my prototype to ensure the usability of the app. Also, the number of participants in the online survey and walking interview is limited. I may gain more valuable opinions if I could recruit more participants.

The fifth is about the exploration of the app’s own functions. The source of historical stories in the app is mainly from local history museums. However, historical stories can also be about the history of the city. According to the map of the app, users explore the city and come to the place where the historical event has occurred and collect the historical story. In this case, the city and its relationship to the museum became a gamified experience.

Finally, I also need to think about the business model of the app. In order to ensure the authority of historical stories, the app needs to work with historical museums and historical associations to obtain authoritative academic materials. I need to consider what the sustainable business model is for the app. Moreover, this app can collaborate with schools, becoming an engaging gamified experience in the student’s field trip.

Conclusions

Through the exploration of my thesis project, I have the following conclusions:

1. It is practical to use a mobile application to enhance various forms of interaction between Generation Z and a History Museum. By making use of such tools, Generation Z can learn about historical stories and the surrounding area through fragmented information in daily life.

2. Incorporating the elements of Generation Z that feel engaging such as stories, videos, and gamification into the design of the app can improve Generation Z’s interest in the app and help to increase user viscosity. For example, sharing the feeling and thoughts about the historical stories through the form of a short video helps Generation Z to understand historical knowledge and generate memories related to the historical story, strengthening the connection between Generation Z and history museums.

3. From the museum’s perspective, this app will not stop Generation Z from being addicted to the digital world. Instead, it enables Generation Z to use the app to visit the museum. Rewards in the app give users more opportunities to get in touch with the History Museum.
Appendices

Appendix A: IRB Application

SYRACUSE UNIVERSITY Institutional Review Board

APPLICATION FOR EXEMPTION OF HUMAN SUBJECT REVIEW

Initials of proposing investigator: [Signature]

Date: [Date]

Principal investigator: [Signature]

Institutional Review Board (IRB):

Title of study: [Title]

Statement of applicability: [Applicability]

Affiliated department: [Department]

Institutional review board (IRB) number: [IRB number]

Institutional review board (IRB) address: [IRB address]

Institutional review board (IRB) contact person: [Contact person]

Institutional review board (IRB) telephone number: [Telephone number]

Institutional review board (IRB) fax number: [Fax number]

Institutional review board (IRB) email address: [Email address]

Institutional review board (IRB) website: [Website]

Institutional review board (IRB) statement of responsibility: [Responsibility]

STATEMENT OF RESEARCH

1. PROTOCOL DESCRIPTION

The protocol must be conducted pursuant to applicable federal statutes, regulations, and guidelines. It must be designed to ensure the safety, privacy, and dignity of the participants. It must be designed to protect the rights and welfare of the participants. It must be designed to protect the confidentiality of the data. It must be designed to protect the confidentiality of the research materials. It must be designed to protect the confidentiality of the research results. It must be designed to protect the confidentiality of the research participants. It must be designed to protect the confidentiality of the research procedures. It must be designed to protect the confidentiality of the research facilities. It must be designed to protect the confidentiality of the research equipment. It must be designed to protect the confidentiality of the research personnel. It must be designed to protect the confidentiality of the research institutions. It must be designed to protect the confidentiality of the research sponsors. It must be designed to protect the confidentiality of the research funders. It must be designed to protect the confidentiality of the research boards. It must be designed to protect the confidentiality of the research committees. It must be designed to protect the confidentiality of the research reviewers. It must be designed to protect the confidentiality of the research editors. It must be designed to protect the confidentiality of the research publishers. It must be designed to protect the confidentiality of the research authors. It must be designed to protect the confidentiality of the research contributors. It must be designed to protect the confidentiality of the research participants. It must be designed to protect the confidentiality of the research teams. It must be designed to protect the confidentiality of the research networks. It must be designed to protect the confidentiality of the research organizations. It must be designed to protect the confidentiality of the research communities. It must be designed to protect the confidentiality of the research societies. It must be designed to protect the confidentiality of the research disciplines. It must be designed to protect the confidentiality of the research fields. It must be designed to protect the confidentiality of the research specialties. It must be designed to protect the confidentiality of the research categories. It must be designed to protect the confidentiality of the research topics. It must be designed to protect the confidentiality of the research subjects. It must be designed to protect the confidentiality of the research methodologies. It must be designed to protect the confidentiality of the research techniques. It must be designed to protect the confidentiality of the research tools. It must be designed to protect the confidentiality of the research instruments. It must be designed to protect the confidentiality of the research data. It must be designed to protect the confidentiality of the research results. It must be designed to protect the confidentiality of the research conclusions. It must be designed to protect the confidentiality of the research findings. It must be designed to protect the confidentiality of the research implications. It must be designed to protect the confidentiality of the research applications. It must be designed to protect the confidentiality of the research contributions. It must be designed to protect the confidentiality of the research impacts.
Appendix B: Consent Form for Online Survey

Consent Form

Thank you for your interest in participating in my thesis research about Generation Z and museum design! You were chosen as a participant because you are Generation Z, are 18 years or older, and I believe you have some fabulous insights on this topic.

Please read this consent form carefully. If you agree to participate, a 10-minute anonymous questionnaire will be launched in your browser. Some questions will ask you to provide short answers. Others might ask you to select a response or provide a rating. All questions are designed to gather information about your individual perceptions and experiences related to museum design.

At the end of the survey, you’ll be asked whether you have interested in participating in a 60-minute, in-person interview. If interested, please access the link at the end of the survey; a separate form will launch, and you can fill out your contact information. This procedure is to preserve the anonymity of responses in the questionnaire.

Risks and Benefits of Participating in the Study

The study poses minimal risks. The questionnaire and direct interviews ask you to share your experiences, ideas, and perceptions. However, you may refuse to answer questions that make you feel uncomfortable. Also, whenever one works with e-mail or the internet there is always the risk of compromising privacy, confidentiality and/or anonymity. Your confidentiality will be maintained to the degree permitted by the technology being used. It is important for you to understand that no guarantees can be made regarding the interception of data sent via the internet by third parties.

Confidentiality

The data, observations, notes, and documents related to this study will be kept confidential and will be securely stored in a locked room at Syracuse University or password protected on a computer. All data, reports and presentations that emerge will be scrubbed to remove individual identities.

Voluntary Nature of the Study

Participation in this study is voluntary. The decision of whether or not to participate will not affect your relationship with Syracuse University. If you decide to participate, you are welcome to refuse any answer or withdraw your participation at any time without affecting the aforementioned relationship.

Contacts and Questions

All questions or concerns regarding this study should be directed to me at yyang135@syr.edu. Should you have questions for the supervising professor of this study, please contact Dr. Jody Nyboer at jnyboer@syr.edu. We welcome any questions you may have now or later. If you have any questions or concerns of the study that you would like to discuss with someone other than myself or Dr. Nyboer, you are encouraged to contact. However, questions and concerns can also be addressed to the Office of Research Integrity and Protections at 214 Lyman Hall, Syracuse, NY 13244, or (315) 443.3013.

Consent to Participate

To consent to the procedures of this study please click “agree to participate” below and your browser will be directed to the online questionnaire.

Thank you!
Appendix C: Online Survey Questions

Survey Questions

1. Do you agree to participate in this research study?
   Yes
   No

2. What is your age?

3. How often do you visit museums? (Multiple Choice)
   More than once a week
   Once a week
   Once a month
   Four times a year
   Once a year
   Less than once a year
   Other

4. How much time do you usually spend when you visit a museum? (Multiple Choice)
   Less than half an hour
   Half an hour
   One hour
   Three hours
   More than three hours
   Other

5. Which types of museums do you visit? (Checkboxes)
   History Museums
   Natural History and Natural Science Museums
   Science and Technology Museums
   Art Museums
   General Museums
   Specialized Museums

Open-air Museums
Select all

6. Why do you usually visit museums? (Checkboxes)
   Expanding horizons
   Learning knowledge
   Professional interests
   Tourism
   Accompanying others
   Fun factors
   Relaxation
   Killing time
   Others

7. How engaged are you with the following museum design elements?
   Participatory Activities
   Social media
   Multi-media information (e.g. 4D technology)
   Mobile technology (e.g. Augmented Reality, Image Recognition)
   Wearable technology (e.g. Virtual Reality)
   Local-based technologies (e.g. iBeacons)

8. Describe what aspects of museums are difficult to engage your interest.

9. Have you ever visited an “online” museum? If so, which one?

10. What do you think about the museums in this digital age?

11. What are your thoughts about the pop-up museum? For instance, like a small mobile temporary museum?

12. Is there anything else you’d like to share that you believe relates to design and museum?
Appendix D: Consent Form for Walking Interview

CONSENT FORM TO PARTICIPATE IN STUDY
Yunmeng Yang, Graduate Student      Dr. Jody Nyboer, Principal Investigator
Syracuse University

You are invited to participate in a field-exercise that is intended to learn about about museum
design. Your perspectives are valuable to understanding how to improve museum experiences
and engagement for your generation. Your participation will result in data that will support and
guide my MFA Thesis work, and will be used to develop a design intervention that is unique to
your generation: Gun Z.

Procedures

If you agree to participate in this study, you will be asked to wear a digital video recorder while
touring a particular exhibit in Eric Canal Museum in Syracuse, New York. Before the tour you
will be provided with information about the exhibit of interested and fashioned with the digital
recorder. During your tour, you’ll be asked to share your ideas and opinions about what you see.
Your responses will be collected through the video recorder, by researcher field notes and
observations, and with a backup digital recording.

Risks and Benefits

The study poses minimal risks. During the tour you’ll be asked about your opinions and ideas
about what you see in relation to engagement and the exhibit design. The information you
provide will have zero impact on your relationship with Syracuse University. A high degree of
anonymity will be exercised in the collection of data to emphasize and support this. That said,
you may refuse to answer any questions during the tour that may make you feel uncomfortable.

Confidentiality

The data, observations, notes, and imagery collected during your participation with this project
will be kept confidential and will be securely stored in a locked office at Syracuse University or
password protected on a computer. All data, reports and presentations that emerge will be
scrubbed to remove individual names. Please note that whenever one works with e-mail or the
internet there is always the risk of compromising privacy, confidentiality and/or anonymity.
Your confidentiality will be maintained to the degree permitted by the technology being used. It
is important for you to understand that no guarantees can be made regarding the interception of
data sent via the internet by third parties.

Compensation

Participants of this study do not receive any monetary compensation.

Voluntary Nature of the Study

Participation in this study is voluntary. The decision of whether or not to participate will not
affect your relationship with Syracuse University. If you decide to participate, you are welcome
to refuse any answer or withdraw your participation at any time without affecting the
aforementioned relationship.

Contacts and Questions

All questions or concerns regarding this study should be directed to Yunmeng Yang at
yyang135@syr.edu. Should you have questions for the supervising professor and primary
researcher of this study, please contact Dr. Jody Nyboer at jnyboer@syr.edu. We welcome any
questions you may have now or later. If you have any questions or concerns of the study that you
would like to discuss with someone other than myself or Dr. Nyboer, you are encouraged to
contact however, questions and concerns can also be addressed to the Office of Research
Integrity and Protections at 214 Lyman Hall, Syracuse, NY 13244, or (315) 443.3013.

Please indicate your consent to the following by initialing your choice.

____ I consent to participating in this study, allowing the research team authorship to use the
information collected to support the intent of this study.

____ I consent to the research team collecting image, audio, and video documentation of me and my
responses during the tour of the museum.

Participant Info

Year Born      Gender      Country of Citizenship      Language

E-mail

Printed Name

Signature

First

Last

Date
Appendix E: Walking Interview Questions

1. What parts you find is least engaging?
2. Which age group do you think is this museum design for?
3. What design elements will you add to make the museum more engaging for your generation?
4. After the experience today, if you are going to tell your friends who are at your age about one thing you saw here which is really cool, which one will you choose?
Vita

Yumeng Yang was born and raised in Beijing, China. Before attending Syracuse University, she attended China University of Mining and Technology, where she earned a Bachelor of Engineer in Industry Design in 2017. She also attended the Summer School at Columbia University in 2016, taking courses in Architecture and East Asian Culture.