



# WPI



## Highlighting Pueblo Architecture through an Interactive, Multimedia Exhibit

An Interactive Qualifying Project Submitted to the Faculty of  
WORCESTER POLYTECHNIC INSTITUTE  
completed at the Santa Fe Project Center  
in partial fulfillment of the requirements for the  
Degree of Bachelor of Science

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**Submitted on:**  
October 11, 2017

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*This report represents the work of four WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its website without editorial or peer review. For more information about the projects program at WPI, please see: <http://www.wpi.edu/Academics/Projects>.*

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## Executive Summary

The distinctive architectural style of the Pueblo people has proven to be one of the world's most persistent architectural traditions. The development of this tradition can be seen throughout the migrations of the Ancestral Pueblo, who moved south, establishing communities that still exist today. Of course, Pueblo architecture, like all aspects of a living culture, evolved over time and was influenced from contact with external forces. The arrival of the Spanish brought new building techniques, including the highly influential introduction of adobe bricks. These bricks, formed from a sun-baked combination of clay-rich mud and straw, would form the basis of Pueblo architecture for centuries to come. Other changes though would prove far more damaging to the culture of the Pueblo. Over the 20th century, federal aid in the form of housing grants would enforce Anglo style architecture on the pueblos, spreading out once tight knit communities over large plots of land, and disrupting traditions related to the use and maintenance of their homes. Fortunately, a new generation of community leaders and architects have begun work restoring the architectural traditions of the Pueblo, both by

revitalizing historic buildings as in Figure 1 and constructing new ones with input and feedback from the communities they serve.

Our sponsor, the University of New Mexico's Indigenous Design and Planning Institute (iD+Pi), is working to educate a new generation of students in addressing the architectural needs of indigenous communities, like the Pueblo. iD+Pi has worked to break the image of indigenous architecture as a purely historic, and want to publicize contemporary efforts in the field of indigenous architecture. iD+Pi started the iArchitecture exhibit initiative to work towards this goal. Our team was

tasked with planning an exhibit highlighting specific examples of contemporary Pueblo architecture.

We started by researching exhibit design with a focus on digital interactives and multimedia, which our sponsor was particularly interested in. Upon arriving in Santa Fe, we began work collecting information on what goes into an effective museum exhibit. We toured a variety of museums throughout New Mexico, collecting information on both digital and analog interactive exhibit displays. We identified common methods of employing both media types to add to an exhibit, as well as common failure



**FIGURE 1:** A TRADITIONAL ADOBE HOME IN DISREPAIR SITS NEXT TO A RECENTLY RENOVATED ADOBE HOME



points. Our team interviewed museum exhibit designers from many of the institutions we visited previously. These interviews exposed significant overlap in the opinions of museum professionals towards digital technology; it can be a powerful tool, but must be implemented effectively, and when it fails it can quickly become a distraction. The general consensus was that digital media was best used in a supporting role within a larger exhibit. It can draw people in and display content that would not be possible with traditional analog techniques.

“It takes a lot of effort to make [digital interactives] work well within an exhibit...”

—Matt Celeskey, *Exhibit Design Supervisor, NMDCA*

Beyond professional opinions, we also wanted to hear from the intended audience of iD+Pi’s exhibit. Our team interviewed visitors at the Albuquerque Museum and the Museum of International Folk Art. From over 100 interviews, we were able to draw some useful conclusions. While a majority of

people preferred analog components to digital, most still believed that digital interactives added value to the exhibit. Additionally, the way this data correlated with age surprised us. Although interest in digital media did decline slightly with older patrons, the effect was less pronounced than anticipated; a majority of patrons over 65 still claiming digital media added to the specific exhibit used.



**FIGURE 2:** ONE OF THE RESTORED HOUSES IN OWE'NEH BUPINGEH PLAZA

Our team obtained list of sites from our sponsor that would be featured in the exhibit. We were tasked with identifying how to present these architectural sites and their stories in a way that helped build the narrative of the importance of contemporary Pueblo architecture. Our team interviewed the points-of-contact from each architectural site as well as visited the

pueblos where the buildings were located. We wanted to know why each building was important to the community it served and how the architecture from each site was informed by their culture. The buildings being documented varied widely, from the Ohkay Owingeh Housing Authority’s restoration of homes on the historic Owe’neh Bupingeh Plaza (Figure 2), to the construction of the Pueblo of Acoma’s advanced Sky City Cultural Center & Haak’u Museum. Additional sites included Old Zuni Mission, Tsigo Bugeh Village, and a personal residence within the Santa Clara Pueblo (Figure 3).



**FIGURE 3:** THE LIVING ROOM OF THE PERSONAL RESIDENCE IN SANTA CLARA PUEBLO

While the history, purpose, and materials of each building varied widely, there were some common themes. Of course, each building’s

exterior featured the traditional earthen appearance typical of southwestern architecture, whether it was achieved by mud plaster at Owe'neh Bupingeh or stucco at the Haak'u Museum. However, we soon discovered that the truly important unifying factor between each of these sites was the process that went into their construction. While aesthetic considerations were certainly present, far more important was the impacts the structures would have on the way people lived their lives. Our team focused on scale massing, the placement of buildings relative to each other. This can be seen in Ohkay Owingeh's Tsigo Bugeh Village (Figure 4); by placing housing units in close proximity, the housing authority hope to restore the communal lifestyle lost to the large spacing common in past public housing programs. Additionally, we identified points in the architecture that helped tell the story of each specific site. Such points of focus included six types of stone at the Sky City Cultural Center & Haak'u Museum, each one representative of a different point along the Acoma peoples' migration and the cracks in walls at Old Zuni Mission, resulting from the application of stucco over an adobe core. This information allowed us to design an exhibit that

would both further develop the audience's understanding of contemporary Pueblo architecture, while also informing them about the specifics of each featured site.



**FIGURE 4:** ONE OF THE HOUSING COMPLEXES OF TSIKO BUGEH VILLAGE

With a firm understanding of both exhibit design and content, our team began developing an exhibit plan for iD+Pi. To do so, we first had to understand of the resources available to us. This began with a tour of the Indian Pueblo Cultural Center (IPCC), the museum hosting the iArchitecture exhibit. We learned IPCC has access to an impressive collection of digital media platforms, all of which they develop content for in-house. One of the digital media platforms the IPCC has available, a touch table they are able to customize in-house, is featured in Figure 5.



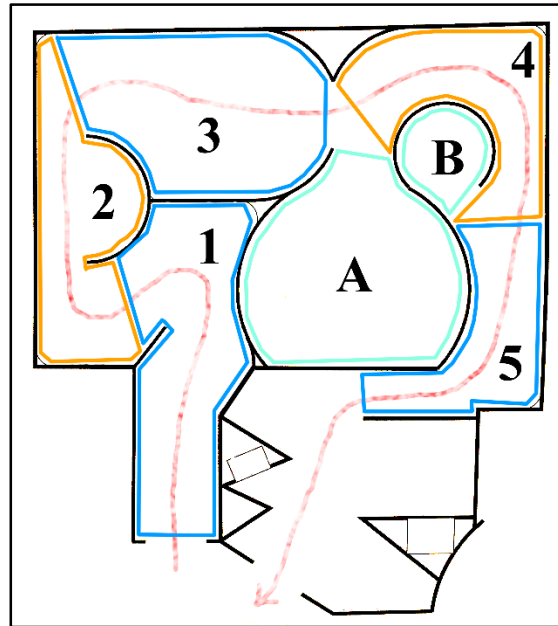
**FIGURE 5:** THE TOUCH TABLE AVAILABLE AT THE IPCC

Additionally, we visited Navajo Technical University to better understand the capabilities of their laser scanners, which would be used to create models of each site being featured in the exhibit. We initially explored a variety of digital platforms recommended by our sponsor, including virtual reality and panoramic theaters but ultimately determined such options would require vast resources to implement without meaningfully adding to the exhibit. We decided to focus our efforts on technology and designs we were confident could be easily implemented by iD+Pi and IPCC.



Our team developed plans for the final exhibit in the form of floorplans and three dimensional (3D) mock-ups from our collected data. Based on our findings throughout our work, our teamed identified content areas that should be central foci of the exhibit. We then developed potential floorplans for turning these themes into a compelling narrative within the exhibit space. Potential content areas included common architectural features, use of space, key cultural considerations, and the work of specific indigenous architects. One such floorplan is featured in Figure 6. For the digital interactive component of the exhibit, we focused on developing a more detailed plan for how the technology would be used. Our first proposal used a combination of 3D printed models and a large touch screen, known as a touch table, would respond when a model of a specific site was placed on it, displaying photos, videos, and other content related to the specific building. Our second potential design combines a traditional theater with full scale models of each site. The visitor would select from a map which site they wanted to learn more about, illuminating its model and triggering a video about the site. Both potential

designs balance analog and digital components and work to support our overall exhibit plan.



**FIGURE 6:** ONE OF THE TWO FINAL EXHIBIT LAYOUTS

At the end of our work, we delivered to iD+Pi our completed floorplans and 3D models of the exhibit space, as well as a complete collection of our interview and survey data. We hope that, with these plans, iD+Pi will be well prepared to work in conjunction with their partners to create a truly compelling exhibit for their audience.

## Abstract

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For generations, indigenous communities' traditions have evolved and it is necessary that the planning process of buildings on indigenous lands reflects them. The following report recommends multimedia exhibit designs for the University of New Mexico's Indigenous Design and Planning Institute which showcase the works of contemporary Pueblo architecture. We gathered information on interactive multimedia technologies available through observational studies and collected data on peoples' preferences of interactives through standardized interviews. To understand exhibit design, we interviewed exhibit designers and visitors. These objectives led to a well-developed plan for an exhibit that will inform the public and future architects on designing contemporary buildings on indigenous lands.

## Acknowledgements

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This research was supported by Worcester Polytechnic Institute and the University of New Mexico's Indigenous Design and Planning Institute. We would like to thank our sponsors, Dr. Theodore Jojola and Ms. Michaela Shirley, from University of New Mexico's Indigenous Design and Planning Institute for their guidance and insight; and Professor Lauren Mathews and Professor Melissa Belz from Worcester Polytechnic Institute for their assistance with the development of our methodology and report.

Thank you to Councilman Arlen Quetawki, Sr. Wayne Lahi, and Tom Kennedy from the Pueblo of Zuni; Brian Vallo from the Pueblo of Acoma; Tomasita Duran from Ohkay Owingeh; and Tessie Naranjo from the Santa Clara Pueblo for welcoming us and sharing their cultures, histories, and architectural practices.

Thank you to Jamie Blosser, Shawn Evans, and Barbara Felix for their insight into contemporary Pueblo architecture and for sharing their experiences with the design and planning process.

Thank you to Melanie LaBorwit at the New Mexico History Museum, Joyce Begay-Foss at the Museum of Indian Arts and Culture, Laura Addison at the Museum of International Folk Art, Drew Tulchin at Meow Wolf, Elizabeth Becker at the Albuquerque Museum, Rachel Veracka at the New Mexico Museum of Natural History and Science, the Bradbury Science Museum, and Shelsea Ochoa at the Denver Museum of Nature and Science for allowing us to conduct research at your institutions.

Additionally, we want to extend a thank you to Caroline Lajoie with the New Mexico History Museum, Matt Celesky with the New Mexico Department of Cultural Affairs Museum Resources Division, Stephen Hutchins with the Albuquerque Museum, and Sarah Rovang with the Taubman College of Architecture and Urban Planning at the University of Michigan for their insight into exhibit design.

Lastly, we would like to say a special thank you to Rachel Moore and Leo Vicenti from the Indian Pueblo Cultural Center for hosting the exhibit and assisting in the exhibition's design planning.

All pictures were taken by the authors unless otherwise noted.

## Chapter 1. Introduction and Background

The Pueblo people of the American Southwest have lived on the same lands for millennia (Zax, 2008). Through centuries of survival on unforgiving arid terrain, they have developed a distinctive architectural style. As a result of their resilience, the Pueblo people have been portrayed as “static, timeless, and unchanging” (James, 1997, p. 430). However, they are very much a dynamic people, who continue to adapt to the ever changing forces of the outside world. As the first people to build permanent homes on the American continent, architecture plays a key role in their histories and cultures. Unfortunately, the changes brought by Western construction methods have disrupted Pueblo architectural traditions, and few architects are prepared to design for unique needs of different indigenous communities. Addressing this problem will require bringing more indigenous students into studying architecture, a field where they are woefully underrepresented (T. Jojola, Personal Communication, April 5, 2017).

Our sponsor, The University of New Mexico’s Indigenous Design and Planning Institute (iD+Pi), recognizes this problem and is piloting projects that aim to encourage a new generation of indigenous architects. Along with academic work, iD+Pi places an emphasis on putting students to work in the field and assists in numerous indigenous land planning and architecture projects. Their efforts are focused on contemporary Pueblo-style architecture, promoting the idea that modern, contemporary buildings should be viewed as a legitimate evolution of a community’s history (Jojola, 1992, p. 78-99). Change is an inherent process in all cultures—including contemporary, thriving indigenous groups—therefore contemporary buildings should be viewed as a legitimate evolution of those communities’ architectural traditions (Asquith & Vellinga, 2004). To keep the Pueblo architecture relevant to those who inhabit it, the architecture must change to reflect a changing society (Heath, 2016).

Currently, indigenous architectural achievements receive minimal attention within the national architectural community (T. Jojola, Personal Communication, April 5, 2017). The goal of our project was to create a plan for an interactive, multimedia exhibit that would encourage awareness of culturally informed architectural practices by showcasing essential examples of contemporary Pueblo architecture. Our goal was tied to iD+Pi’s iArchitecture initiative started in 2013, which aims to increase recognition of indigenous peoples working in the field of architecture, especially those that use their skills to give back to their community. Additionally, the iArchitecture initiative seeks to encourage the pursuit of architecture within indigenous communities. Through a museum exhibit showcasing seven sites, we sought to inspire architects to engage native communities at all stages of the design and planning process. As for the use of interactive multimedia within the exhibit, studies suggest that visitors learn more effectively with some sort of digital interaction compared to exhibits with no digital interactive component (Marstine, 2006).

In 2014, there were 107,000 licensed architects in the United States and nearly 8,000 unlicensed architects entering the field. Of those 8,000 unlicensed architects, only 22 of them were Native American. To put it differently, 0.29% of architects entering the field were Native American, yet they make up 1.69% of the population (Busta, 2016). Indigenous peoples are up to six times less likely to pursue a degree in architecture than members of the general United States population.

This underrepresentation is of particular concern to the Pueblo people because architecture plays a key role in their cultures and lives. This chapter establishes the historic context of why architecture is important to the Pueblo, how Pueblo architecture is being modernized, as well as providing additional understanding of the demands and challenges of creating an effective exhibit that will showcase examples of contemporary Pueblo architecture. Finally, we explore the work done by iD+Pi in this field along with an explanation of why projects such as this are so needed.

## 1.1 Introduction to Pueblo History

The Pueblo peoples of the American Southwest have built and lived on the same land for thousands of years. As one of the earliest peoples to move from a nomadic to an agrarian social structure, architecture is incredibly important in Pueblo history (Muench & Pike, 1986). In Spanish, the term “*pueblo*” originally described a “large nucleated village surrounded by its own fields” (Fletcher, 1984, p. 8). This term came to encompass both the physical settlements and the people within them. To create a clear distinction in use, this paper will generally use “the Pueblo” in reference to the indigenous peoples while “pueblos” refers to the actual settlements and the communities within them.

The contemporary Pueblo are a diverse people comprising numerous tribes speaking multiple languages. Despite their differences, they historically shared a common geography, agrarian lifestyle, and common architectural heritage (Kamp, 1998). These traits are closely intertwined; their distinctive architectural style developed as a result of a transition to farming associated with a cessation of nomadism, and the consequent development of permanent structures. The Ancestral Pueblo were the first to create such buildings within the present-day United States (Romero & Larkin, 1994).

Traditional pueblos of the American Southwest consisted of a central village of interconnected, multi-story dwellings surrounded by farmland. They were built from adobe, which



**FIGURE 7:** THE REMNANTS OF A KIVA AT BANDELIER NATIONAL PARK

consists of sun-dried mud bricks reinforced with straw and waterproofed with additional mud coatings (Romero & Larkin, 1994). Individual families had their own living spaces, but dense living arrangements built a tight knit community. There were many common spaces such as the *kiva* (Figure 7), used for spiritual gatherings and community discussions, that led to members of the Pueblo spending most of their day in close proximity to one another (James, 1997). This interconnectedness

continues to be seen in the culture and traditions of the Pueblo people.

As they grew in numbers during the 14th century, the Ancestral Puebloan people split into different groups and founded new settlements, many of which are still lived in today, such as the pueblos of Zuni, Acoma, Ohkay Owingeh, and Santa Clara. In total, there are 19 Pueblos. The

continuous existence of pueblos is impressive considering the cultural erasure and forced relocations of other indigenous American groups following European contact (Sando, 1992).

The arrival of the Spanish tested Pueblo resilience and many aspects of Spanish culture were imposed on the pueblos, leading to the Pueblo Revolt of 1680. Pueblo resilience continued despite successive claims to their land made by Spain, Mexico, and the United States, but each claim brought cultural change. In the late 19th century, conflicts arose from outside agencies putting demands on native lands, challenging Pueblo building practices. The Department of Housing and Urban Development (HUD) attempted to increase housing availability by imposing Anglo standards of housing within Pueblo communities. Communities were forced to choose between maintaining architectural heritage or receiving HUD's financial support and accepting HUD-style architecture (Malnar & Vodvarka, 2016). For indigenous communities such as the Pueblo, architecture represents culture, history and religion; the HUD-imposed standards clashed with the community-focused cultures of pueblos. Many of the deficits in housing planning have since been identified and sometimes rectified, but their impacts remain visible (Malnar & Vodvarka, 2016). Today, there are instances of Pueblo people living in culturally-relevant architecture. However, there are also cases of historic Pueblo buildings falling into ruin (Malnar & Vodvarka, 2016).

## 1.2 Contemporary Pueblo Architecture

In the past, pressure from the federal government undermined Pueblo people and their unique architecture. Currently, many homes within pueblos are built with the techniques and amenities of their Anglo counterparts, with residents more likely to work outside the pueblo than within it (T. Jojola, Personal Communication, April 5, 2017). Our project with iD+Pi involved the documentation of buildings identified as significant examples of how Pueblo architecture has evolved and advanced with the community while maintaining a connection with their cultural heritage.

The idea of contemporary Pueblo architecture overlaps with the broader concept of vernacular architecture. "Vernacular architecture" refers to architecture that reflects the culture, landscape, environment, history, and traditions of a group of people in a particular region (Belz, 2015). For the purposes of this paper, the phrase refers solely to the Pueblo region and culture. There are some key architectural features seen in countless contemporary building projects on pueblos: earthen materials/earth tones, a relationship to the cardinal directions, and ties to the individual pueblo's culture and traditions.

Architects and planners of vernacular architecture take into consideration the environment, making the buildings appear as though they are built out of the land itself. For example, the Poeh Cultural Center and Museum in the Pueblo of Pojoaque made use of adobe brick, stone, and local wood in its construction, only using materials such as steel and concrete for structural reinforcement where absolutely necessary (Malnar & Vodvarka, 2016). To ensure that the Poeh center was welcomed by the community, it began hosting training programs on traditional construction methods as it was being built. By getting the community involved in the construction of the Poeh center, the building was welcomed into the community because of its reflection of Pojoaque culture, while also playing a hand in the preservation of Pojoaque traditions (Poeh Cultural Center: Facilities, 2017). The Poeh Cultural Center and Museum is an example of how contemporary Pueblo architecture incorporates earthen materials and tones.



Contemporary Pueblo architecture is oriented to the cardinal directions and aligns with the solar and lunar solstices, in the same way that traditional Pueblo structures do. This is one design feature that is evident in many contemporary Pueblo structures, regardless of tribal affiliation (Walker and Venzor, 2011).

During our time with iD+Pi, we studied and documented five of the eight sites being considered for the iArchitecture project: the Old Zuni Mission in the Pueblo of Zuni (Figure 8), the Sky City Cultural Center & Haak'u Museum in the Pueblo of Acoma, Tsigo Bugeh Village in Ohkay Owingeh (Figure 9), the Owe'neh Bupingeh Preservation Project in Ohkay Owingeh, and the Naranjo Home in the Santa Clara Pueblo (Figure 10). We did not study the Headstart in the Pueblo of Isleta or the Poeh Cultural Center in Pojoaque Pueblo, which are the two other sites that will be featured in the exhibit, due to time and permission constraints.



**FIGURE 8:** THE FRONT FAÇADE OF THE OLD ZUNI MISSION



**FIGURE 9:** AN IMAGE SHOWING THE CLOSE PROXIMITY OF RESIDENCES IN TSIKO BUGEH VILLAGE

Tsigo Bugeh Village and the Haak'u Museum were both fully constructed in the early 2000's and address the needs of the community, but their specific function and planning process vary.

### 1.3 Vernacular Architecture and Indigenous Architects

Vernacular architecture addresses community needs while adapting to its populace. Architects and planners must consider the needs of the community such as its people, cultural environment, as well as physical environment (Rashid & Ara, 2015). Architects unfamiliar with the specific architectural traditions of a culture often unintentionally ignore or misrepresent significant characteristics when designing contemporary buildings (Malnar & Vodvarka, 2016). Non-indigenous architects and planners can find it challenging to design and build architecture that is culturally-appropriate for indigenous communities. Failures to do so can include failing to provide sufficient public space for cultural activities, placing buildings too far apart, and disrupting a once strong sense of community, or using building materials that will prove difficult to maintain beyond their initial construction.

The focus on cultural relevance should not be taken to mean that architectural styles must remain static or only drawing on historical styles. Traditions are fluid; to only design buildings



**FIGURE 10:** THE NARANJO HOME, AS VIEWED FROM THE DRIVEWAY

that fit past needs fails to support new needs and evolving practices (Asquith and Vellinga, 2004). Vernacular architecture evolves with traditions by letting people take advantage of modern developments without sacrificing the characteristics of culturally-relevant architecture (Jackson, 1995). The use of Anglo-style construction techniques within the pueblos have proven disruptive to both the architectural and cultural traditions of these communities (T. Jojola, Personal Communication, April 5, 2017). To integrate Pueblo culture and architecture, architects and planners must understand both Pueblo history and modern Pueblo communities to assess future needs. However, iD+Pi must reach an audience greater than just those directly targeted by its mission statement in order to foster increased integration of modern architectural practices with Pueblo culture and traditions. One way for iD+Pi to have a greater impact is through a museum exhibit; museums provide the opportunity to reach and engage a wide audience.

#### 1.4 Interactive, Multimedia Exhibit Design

Indigenous populations, and ethnic minorities as a whole, historically have had a troubled relationship with the museum community (Kalsås, 2015). Until the 1990s, many museums catered to culturally-dominant sections of society (Ames, 1986). It was only in the 1990s that a variety of initiatives in the United States sought to diversify the content of museums with dedicated contributions from minority groups, such as the American Alliance of Museums' *Excellence and Equity* (Pitman & Hirzy, 1992) and the Smithsonian Institution's *Increasing Museum Visitation by Under Represented Audiences: An Exploratory Study of Art Museum Practices* (2001). Today, exhibits dedicated to the struggles and contributions of minority groups are growing in popularity: according to data collected by *The Art Newspaper* in 2015, thirteen of the twenty-five most visited exhibits in the United States focused on the theme of cultural identity or featured works predominantly produced by minority artists (*The Art Newspaper, 2015*).



Museum curators and exhibit designers must find ways of incorporating the most up-to-date exhibit design techniques with cultural narrative in order to attract visitors. As museums sought to diversify their content, they studied how to enhance visitor learning experience, and enjoyment through engagement (Sandell, 1998). Engagement entails occupying the attention of visitors. By designing an exhibit that keeps a visitor captivated through interactions, the exhibit heightens the visitor's learning potential through increased interest and engagement; this is called "active learning" (Bergeron & Tuttle, 2013). Active learning is important in museums because it allows for faster recall of exhibit information, as well as a deeper understanding of exhibit subject material. Modern exhibit design is partially based on the idea that everyone has a different learning style, or a different approach to or way of learning. A related concept is that of multiple intelligences, whereby "learners are grouped into broad categories based on how they learn best" (McAdoo, 2012, p. 18-19). Stemming from these concepts is the Visual, Auditory, Kinesthetic (VAK) Learning Styles Model, whereby every person best learns when information is processed through some combination of seeing, hearing, doing (Farwell, 2003).



In the past, museums often portrayed information exclusively visually on a large scale, a practice typified by art museums with a placard next to a painting with information on the artist. There may have been some hands-on activities specifically for children or audio recordings for the visually impaired, but few exhibits combined the modes of hearing, seeing, and interacting (Morris, 2016). Interactive, multimedia exhibits convey information through multiple methods,

thus appealing to all learning styles. This approach also supports the basic human inclination toward curiosity - arousing interest and motivating people to learn (Black, 2005).

Multimedia, when used to refer to art or education system, is taken to mean “using more than one medium of expression or communication”, while interactive multimedia “supports expression or communication through multiple media with the ability to influence and alter their content and context”. For a more in-depth definition and examples of key museum terminology, refer to Table 1. Dr. Ioannis Deliyannis, a professor in the field of Interactive Multimedia and Digital Technology, described the benefits of interactive multimedia as being able to provide “sense-enhancing technologies in a non-conventional manner” (Deliyannis, 2012).

**TABLE 1: DEFINITIONS AND EXAMPLES OF COMMONLY USED MUSEUM EXHIBIT TERMINOLOGY**

Term	Definition	Examples
medium	A means of communicating about the exhibit subject matter	The material or way something is presented. For example, the medium of a painting could be oil paint on canvas.
single medium, static	Using only one means of communicating about the exhibit subject matter, and not involving feedback or response from observer	 <p>Paintings on display at the Albuquerque Museum A painting communicates the subject matter such that the viewer cannot interact with it.</p>
single medium, interactive	Using only one means of communicating about the exhibit subject matter, involving feedback or response from observer	 <p>Touchscreen on display at the Albuquerque Museum This touchscreen device presents its information only through a screen and needs user interaction (touch) to operate.</p>

<p>multimedia, static</p>	<p>Using more than one means of communicating about the exhibit subject matter, and not involving feedback or response from observer</p>	 <p>Audiophone on display at the New Mexico History Museum</p> <p>An audio device emits sound along with text for the user to look at, but the user cannot otherwise interact.</p>
<p>multimedia, interactive</p>	<p>Using more than one means of communicating about the exhibit subject matter, involving feedback or response from observer</p>	 <p>Touchscreen on display at the Albuquerque Museum</p> <p>A touchscreen that prompts the user to interact by presenting multiple questions. After selecting a question, the user is encouraged to record a video of their answer to the question and that video is added to the exhibit.</p>

Interactive, multimedia exhibits are trendy yet effective, and this is reflected in museums everywhere. Feedback from museum visitors largely guides the development and success of these features (*The Art Newspaper, 2015*). Commonly, museums use visitor surveys for feedback on exhibits. The feedback gathered by museums and outside organizations alike all point to the ability of interactive, multimedia exhibits to engage audiences in effective manners.

### 1.5 iD+Pi and Partners

The unique ability of interactive, multimedia exhibits to both draw in an audience and truly immerse viewers in a topic is of particular importance to the exhibit that we developed for this project. As part of the iArchitecture initiative, this exhibit needs to support iD+Pi's goal of both growing the field and spreading awareness of indigenous architecture. Along with iD+Pi, we partnered with the Indian Pueblo Cultural Center (IPCC) and Navajo Technical University (NTU). The goal of our project was to create a plan for an interactive, multimedia exhibit to encourage awareness of culturally informed architectural practices by showcasing essential examples of contemporary Pueblo architecture. We set out to develop an exhibit containing interactive

multimedia components that would invite the audience to engage with the content at a deeper level. We specifically focused on pueblo architecture.

## Chapter 2. Methodology

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The goal of our project was to create a plan for an interactive, multimedia exhibit that would encourage awareness of culturally-informed architectural practices by showcasing essential examples of contemporary Pueblo architecture.

**Objective 1:** Determined how to best combine different types of content into a compelling exhibit.

**Objective 2:** Identified the background, cultural context, and importance of five architectural sites participating in the exhibit.

**Objective 3:** Provided iD+Pi with a framework for moving the exhibit into its next stage.

The completion of these three objectives allowed iD+Pi and IPCC to work together to prepare the exhibit for its projected opening in 2020.

### 2.1 Objective 1: Determined how to best combine different types of content into a compelling exhibit.

In this objective we contacted various museums about conducting exhibit observations to determine effective combinations of content and medium. For information on the design process and interactive, multimedia exhibits, we conducted interviews with museum exhibit designers. Then we created standardized interview questions for museum visitors and contacted other students for feedback. Finally, we conducted the standardized visitor interviews.

#### **2.1.1 Assessed museum exhibits with similar presentation methods to determine effective combinations of content and medium.**

Our team contacted Melanie LaBorwit at the New Mexico History Museum, Joyce Begay-Foss at the Museum of Indian Arts and Culture, Laura Addison at the Museum of International Folk Art, and Drew Tulchin at Meow Wolf in Santa Fe; Elizabeth Becker at the Albuquerque Museum, Rachel Veracka at the New Mexico Museum of Natural History and Science, and Rachel Moore at the Indian Pueblo Cultural Center in Albuquerque; the Bradbury Science Museum in Los Alamos; and Shelsea Ochoa at the Denver Museum of Nature and Science about conducting exhibit observations in their institutions. We explained that we were students working with the University of New Mexico's School of Architecture and Planning and were visiting museums to gain a better understanding of exhibit planning and design practices, interactive multimedia use, and visitor's experience with interactive multimedia. With their permission, we scheduled a time in the museum's off-peak hours to do an initial walk-through of the exhibit then conduct our observations using the exhibit observation inventory featured in Appendix A. All of the museums we contacted about conducting observations ultimately gave us permission to visit their institution.

iD+Pi wants their exhibit to utilize interactive multimedia and traditional display methods, so we focused on exhibits with more than just static features on display. Our goal was to gather basic information on interactive multimedia use as a starting point for deeper inquiry. To accomplish this goal, we observed the structure and function of the exhibits themselves and made



observations about visitor behavior. In a spreadsheet, a sample of which is available in Appendix B, we categorized features of completed inventories based on media type, whether it was analog or digital, and whether it was static or interactive; one feature could fit more than one category. Additionally, we categorized the features based on the type of information being presented. This step provided a basic understanding of potential abilities of interactive, multimedia features for use in iD+Pi's future exhibit.

If our point-of-contact in that institution was available, we met them briefly and asked about where the museum uses interactive, multimedia features. With this feedback our team moved efficiently through the museum and recorded data on the key features mentioned. The team did a quick walk-through of the museum and took note of any additional interactive, multimedia features. After the walk-through we split up to complete observational exhibit inventories, featured in Appendix A. At the conclusion of the observations, our team asked for the contact information of that museum's exhibit designer for the next method.

### **2.1.2 Interviewed museum exhibit designers for additional information on the exhibit design process and interactive, multimedia exhibits.**

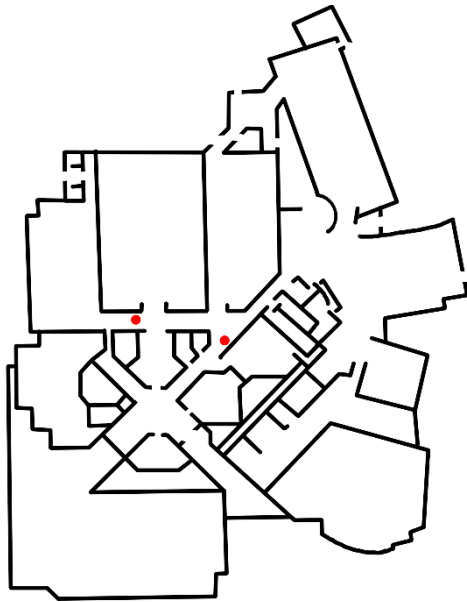
Using the contact information from the previous method, we contacted Caroline Lajoie with the New Mexico History Museum, Matt Celesky with the New Mexico Department of Cultural Affairs Museum Resources Division, Stephen Hutchins with the Albuquerque Museum, and Sarah Rovang with the Taubman College of Architecture and Urban Planning at the University of Michigan about participating in a brief interview. These interviews provided information about the exhibit design process and interactive multimedia use in museums, aiding in the eventual development of iD+Pi's interactive, multimedia exhibit. Depending on availability and our ability to travel, we scheduled a phone or in-person interview. If granted permission, we recorded the interview. For a complete list of exhibit designer interview questions, refer to Appendix C. Upon completion of the interview we shared our contact information for follow-up and saved the audio recording and notes from the interview.

Interviews were sorted into different categories: the primary exhibit-type the interviewee had experience designing (art, science, or history; narrative or non-narrative; interactive or noninteractive); whether they had a positive or negative opinion on interactive multimedia; the greatest challenge in exhibit design. We placed an emphasis on exhibit designers who had experience with history, narrative, and/or interactive exhibits over those with no experience in those areas because iD+Pi's future exhibit will be history-focused, presented as a narrative, and interactive. The interviewees' positive or negative opinions on the use of interactive multimedia in exhibits provided insight into the pros and cons of interactive multimedia use. The greatest challenge in exhibit design provided insight into where iD+Pi can expect to face challenges. Finally, by categorizing interviews based on insight into certain questions, we used the most insightful responses to get a deeper understanding of the topic.

### **2.1.3 Conducted standardized interviews with museum visitors on their experience with select interactive, multimedia exhibits.**

To ensure that the standardized interviews would make sense to a museum visitor, we contacted other students for feedback. We sent the students a copy of the standardized interview

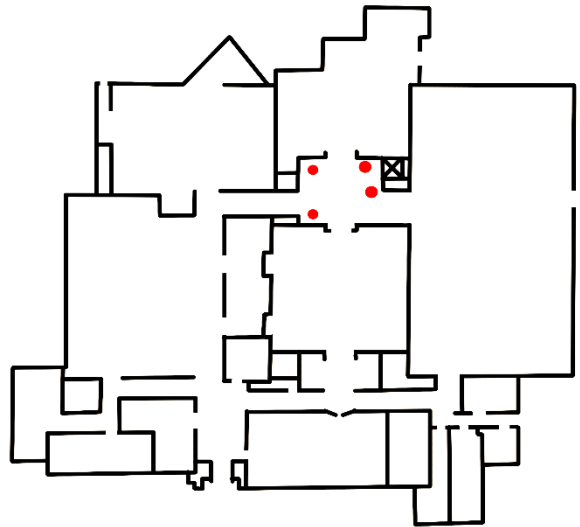
questions and asked if the questions were phrased such that they made sense. We took all feedback into consideration before integration.



**FIGURE 11:** GALLERY LAYOUT AT THE ALBUQUERQUE MUSEUM

With permission granted, two to four members of our team visited the museums to conduct standardized interviews with museum visitors. These interviews contained the same set of questions and a script for the interviewee to follow. We chose positions within the museum to interview visitors within a set of constraints given to us by each museum, waited for visitors to leave the exhibit hall and approached them. All interviewees under the age of 18 were interviewed alongside a guardian who gave verbal consent on their behalf. No interviewee names were taken. When asking visitors' preference on digital or analog interactives, we would follow-up with, "digital interactives are like computer-based systems which respond to the user's actions such as an iPad", and, "analog interactives prompt viewers to physically interact, such as text on a wall prompting you to build with blocks". We provided this explanation of what each type of interactive was to ensure that the visitor understood the difference between the two types of interactives when answering the question. To reference our standardized interview, refer to Appendix E. We stopped surveying visitors after we completed a total of 50 surveys. Responses from the surveys were recorded in an excel sheet, a sample of which is available in Appendix F.

We contacted Laura Addison at the Museum of International Folk Art and Elizabeth Becker at the Albuquerque Museum about conducting visitor surveys based on our assessments from Section 2.1.1. Before giving permission to conduct the standardized interviews, our point-of-contact asked how long we would be at the museum and how many people would be conducting the surveys. Both museums requested a copy of our survey questions before granting permission and a copy of the results of the visitor surveys. To view the standardized interview questions, refer to Appendix D. The standardized interviews included questions about age and gender that were answered based on interviewer observation. We planned the visitor interviews for when the museum experience high visitor traffic; typically, mid-day on weekends or during special events. To see our positions in each museum, reference Figure 11 and Figure 12.



**FIGURE 12:** GALLERY LAYOUT AT THE MUSEUM OF INTERNATIONAL FOLK ART

## 2.2 Objective 2: Identified the background, cultural context, and importance of five architectural sites participating in the exhibit.

Understanding the components, settings, and use of each building to identify what made them culturally-appropriate contemporary Pueblo architecture informed our exhibit content choice. In this context, what makes these examples of contemporary Pueblo architecture successful is that they are buildings that fulfill modern-day construction standards and amenities that use traditions in their design to fit the aesthetic of its location. We had to identify and understand the similarities among them.

### **2.2.1 Interviewed points-of-contact from each architectural site on information important to include in the exhibit.**

We obtained iD+Pi a list of contact information from each of the architectural sites that would be documented in the exhibit and contacted points-of-contact to request an interview about the site. Each pueblo has its own government system, so the point-of-contact needed approval from their tribal government to engage in an interview with us, for us to visit the site, and for us to take photographs.

Once they obtained permission, we scheduled interviews to learn how the building design reflects the specific pueblo. Refer to Appendix E for interview questions we asked each site's point-of-contact. Answers to these questions helped guide content for the exhibit. We also specifically asked each point-of-contact what information the pueblo would prefer was left out of the exhibit. This will ensure proper representation of the architecture, culture, and Pueblo. We categorized the answers of these interviews into themes based on our research focus questions: how the building reflects tradition, what the contemporary aspects of the building are, the involvement of community in the planning process, and the building's importance to the community.

We compared the responses from each point-of-contact on an excel sheet, comparing processes of building construction, levels of community engagement and involvement in the building design, shared problems among the sites, as well as outcomes of the architectural projects. To help with exhibit design, we identified information that was critical to understanding the cultural context beyond the physical architecture. Certain information stood out as being particularly important if it referred to the unique culture, beliefs, and lifestyle of the community and how it relates to the planning and construction of the building.

### **2.2.2 Documented unique architectural components.**

In this method the team assessed the buildings' architecture by visiting them and interviewing points-of-contact. Our team conducted research at the Santa Fe Public Library and the Georgia O'Keeffe Research Library and learned about the buildings' histories and architecture. We looked for and asked about architectural elements and materials unique to the sites' cultures. From our notes and photographs on the architecture we compared similarities in the architectural components and the culture surrounding the buildings. We also asked questions to determine how the points-of-contact want each site to be represented in the exhibit. At each site we looked for architectural elements that were unique to the respective Pueblo and its culture. We also looked for and asked points-of-contact about features that are common in most structures on indigenous

lands in the Southwest. Dates of the interviews for each point-of-contact can be found in Section 3.2.1.

For the site of the Old Zuni Mission, we interviewed Councilman Quetawki Sr. by phone. When visiting the Pueblo of Zuni our team and sponsors at UNM met with the Mr. Arlen Quetawki, Councilman of the Pueblo of Zuni's Tribal Council, Wayne Lahi, Executive Officer of the Pueblo of Zuni's Tribal Council, Mr. Tom Kennedy, Director of Tourism at the Pueblo of Zuni and our contact at Navajo Technical University Ms. Elisha Wortham, Lecturer of Building Information Modeling. At this meeting we asked Mr. Kennedy about historical details, the construction and reconstructions, and information on the murals. We asked about how the architecture of the building is influenced by the Franciscans and the Zuni (known as the Halona at the time of the building's construction). We studied the building to see how the 1960's reconstruction resulted in the building being in poor condition today. We looked for architectural elements that could be found in other Pueblo buildings, and elements that made the mission unique to the Pueblo of Zuni.

Our team met with and interviewed Mr. Brian Vallo, Director at the Indian Arts Research Center and member of Acoma tribe, in Santa Fe at the Indian Arts Research Center to gather information on the Haak'u Museum and hear his perspective on the architecture of the building. As a founding director of the museum and an Acoma member, he gave us insight on the building's identity and history. Our team asked him how the building is influenced by Acoma culture, including what material it is made up of and the significance of the site's location. We compared these details with those of the other sites to find trends, and features unique to Acoma.

We visited Tessie Naranjo at her home to see the site and ask her about the building. We inquired into how the building's current state is influenced by the Naranjo family's history. Discussion about Dr. Rina Swentzell's redesign of the home revealed how certain aspects were updated to be more modern and convenient. We compared these modern elements to contemporary changes at the other sites. We also learned that new elements were incorporated that kept in line with tradition and the family's history.

At Tsigo Bugeh Village, we met with Mrs. Tomasita Duran, Executive Director of Ohkay Owingeh's Housing Authority. At the site we studied how the buildings and plaza relate to the culture of the Ohkay Owingeh Pueblo. We gathered information on the blend of traditional and modern architectural styles in the village, and looked for similarities and differences of these styles with those at other sites. We also met with Ms. Jamie Blosser, Executive Director at the Santa Fe Art Institute and licensed architect, and Mr. Shawn Evans, Principal Architect at Atkin Olshin Schade Architects, to learn more about the Tsigo Bugeh Village and the Owe'neh Bupingeh Restoration Plaza.

### 2.3 Objective 3: Provided iD+Pi with a framework for organizing and presenting content

Our third objective aimed to provide iD+Pi with multiple layouts of the exhibit space and thorough descriptions of organization without suggesting specific content. We investigated methods of presenting 3D models of the sites into the exhibit, and identified opportunities for combining traditional exhibit design with new media. The bulk of our work consisted of contacting

hardware and software companies and planning the layout of the exhibit space, which required knowledge from previous objectives.

### **2.3.1 Identified Platforms for Presenting Content.**

Our team traveled to the Indian Pueblo Cultural Center (IPCC) to better understand the technology already available. While at the museum, we conducted an in-person interview with Rachel Moore and Leo Vicenti, IPCC's museum curator and exhibit designer. To see the interview questions, refer to Appendix G. By interviewing them, our team received a list of companies IPCC worked with to incorporate digital interactives in the museum. Because IPCC did not have any measurements of the exhibit space, our team measured the gallery of the future exhibit space for dimensions to later incorporate into exhibit design drafts.

One of iD+Pi's initial stated goal was for us to provide them with a better understanding of the types of interactive, multimedia displays that could be incorporated into the iArchitecture exhibit. Initially, a wide range of possibilities were presented by our sponsor, including touch displays, augmented and virtual reality, immersive theater experiences, and more traditional interactive and multimedia components. These aspect of the exhibit will incorporate the LIDAR scans completed by Navajo Technical University, however the details of such implementation were left for our team to explore.

We began this process with our visit to NTU to meet with Ms. Elisha Wortham, Head of the Building Information Modeling program, to receive an introduction to her students and their work. Following their presentation, we inquired about the software packages used by her team, as well as potential implementations of the point cloud data they collected. Based on recommendations gained during our exhibit designer interviews, we contacted local companies and organizations with experience in creating the sort of exhibit we aimed to achieve. We contacted Ideum, a company repeatedly recommended by exhibit designers specializing in large touch screens. We asked questions relating to pricing, available software, and past uses of their technology for similar projects.

iD+Pi is still working to secure additional funding for the completion of the exhibit, and as such we wanted to identify multiple possibilities to provide them with multiple potential designs to ensure that one would match their eventual budget. Drawing on our site visits and time speaking with points-of-contacts from the architectural sites, we focused on identifying platforms that would allow us to most effectively convey the key architectural aspects of each of these sites, while also conveying the information in a way that was respectful to the wishes of the communities as identified during our site tours and interviews. Achieving this aim required identifying platforms that would not only convey the raw architectural information, but also the cultural context of the buildings, as developed through our work on our previous objective. To do so, the final exhibit had to present information on cultural traditions, lifestyles, and beliefs that influenced the architecture. This requirement was a constant consideration throughout the design process.

### **2.3.2 Created three potential narratives for the exhibit space.**

Over the course of our project, we aimed to refine iD+Pi's vision of the exhibit by creating guidelines for the organization of the exhibit space. These guidelines covered themes in the architectural sites identified in Section 2.2.1 and Section 2.2.2. At the time of our project, iD+Pi

was just beginning to collect content for the exhibit, forcing us to focus on broad concepts in the exhibit design. To start, we sought to identify what ideas were fundamental to understanding and appreciating the exhibit material. These ideas provided additional themes to the ones identified in the previous sections. Next, we grouped different ideas together in such a way that the ordering and flow of the themes made sense. We contacted Rachel Moore and Leo Vicenti at the Indian Pueblo Cultural Center for feedback on our preliminary organization efforts and incorporated their input. Using a floor plan of the future exhibit space, and the measurements our team collected from surveying the gallery, we marked off areas of the exhibit space for content related to certain themes. Additionally, we marked the general areas where interactive features could be integrated. The organization of the exhibit space incorporated feedback from our interviews with exhibit designers about the structure of narrative exhibits. We came up with multiple exhibit layout suggestions with different configurations of themes and interactives to provide iD+Pi with a range of options so content could easily be added as more content is collected.

### **2.3.3 Selected exhibit components and identified partners for digital implementation.**

In addition to the exhibit layout described in the previous method, we aimed to create a model of the exhibit space that iD+Pi can use to attract donors and explain the project to future partners. Combining our comparisons of media platforms with our exhibit designer interview, and standardized interviews, we developed multiple exhibit concepts consisting of a model with descriptions of technology used, how it conveys content, and required resources. We focused our efforts on the interactive installation due to the lack of content mentioned in the previous method. Each design blends digital interactive and analog components to create an engaging, accessible, and educational experience. We reviewed data from standardized visitor interviews and exhibit designer interviews to determine that the exhibit should incorporate analog and digital content. We also identified combinations of analog and digital technologies. Finally, based on cost and resources available, we modeled two partial exhibit designs that can be scaled as new sponsors and resources are brought into the project.

To prepare for the implementation of our recommendations, we selected several possible partners with experience in interactive, multimedia development related to our exhibit designs. We focused on organizations that can assist in developing more complex digital interactive components since IPCC is able to create simple digital interactive in-house. We considered contacts from our exploration of digital platforms and sought student teams with interest and skill in the fields of computer science, app development, and game design. Three possibilities were ultimately considered: the use of student teams, professional development, and a completely in-house exhibit using IPCC's existing resources. The results of this objective are featured in Section 3.3 and in Chapter 4, Exhibit Design Drafts.



## Chapter 3. Results and Analysis

The following chapter outlines the results from our three objectives that contributed to the creation of our deliverables to iD+Pi.

### 3.1 Objective 1: Determined how to best combine different types of content into a compelling exhibit.

We analyzed exhibit observation data collected from five museums featuring interactive multimedia content and observed trends in media and content use. From our exhibit designer interview with Caroline LaJoie of the New Mexico History Museum, we learned her process begins with curated content and introduces interactive components last. From our standardized interviews with museum visitors we decided that iD+Pi’s exhibit should balance analog and digital features, and focus on attracting visitors from the Albuquerque area.

#### 3.1.1 Analysis of exhibit content and medium.

We received permission from five museums to conduct observations and made formal observations of twelve different exhibits (Table 2).

**TABLE 2:** OUR TEAM OBSERVED THE FOLLOWING MUSEUMS AND EXHIBITS

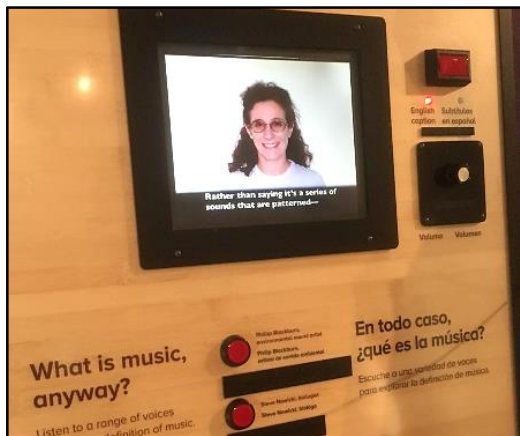
<b>Museum</b>	<b>Exhibit</b>	<b>Observation Date</b>
New Mexico History Museum	Voices of Counter-Culture	29 August 2017
New Mexico History Museum	The Northern Frontier	29 August 2017
New Mexico History Museum	Share Your Story	29 August 2017
New Mexico History Museum	Tell Us Your Story	29 August 2017
New Mexico History Museum	Telling New Mexico	29 August 2017
Museum of Indian Arts and Culture	Here, Now, and Always	29 August 2017
The Albuquerque Museum	Art Quilt	30 August 2017
The Albuquerque Museum	Only in Albuquerque	30 August 2017
New Mexico Museum of Natural History and Science	Time Tracks	30 August 2017
New Mexico Museum of Natural History and Science	Wild Music	30 August 2017
Indian Pueblo Cultural Center	Long Ago	5 September 2017
Indian Pueblo Cultural Center	Permanent Exhibit	5 September 2017

Certain content and information is frequently presented with a certain medium. We found that most audio—such as music or interviews—played on handheld listening devices (Figure 13). There was usually one listening device in the area, limiting interaction to one user at a time. Videos—such as interviews or historic footage—played on a screen with a speaker, allowing multiple visitors to listen at once (Figure 14). If the video’s audio included spoken word, subtitles appeared on the screen. Two museums had a Spanish audio option, but three museums offered Spanish subtitles over English audio.



**FIGURE 13:** PHOTOGRAPH OF AUDIO LISTENING DEVICE AT THE NEW MEXICO HISTORY MUSEUM

Touch screens prompted users to complete a task or offered more information on exhibit content. Some tasks include making a “quilt” out of images by tapping photos and dragging them into a template (Figure 15), tapping a point on a map to play audio from that area, and tapping an image for an in-depth look at the object’s history. The seven touch screens observed could handle only one user at a time. Unfortunately, we did not encounter any augmented reality or virtual reality exhibits.



**FIGURE 15:** VIDEO PLAYBACK DEVICE AT THE NEW MEXICO MUSEUM OF NATURAL HISTORY AND SCIENCE



**FIGURE 14:** PHOTOGRAPH OF A TOUCHSCREEN DISPLAY AT THE ALBUQUERQUE MUSEUM

Information was presented in several different ways. We grouped our observations together based on the type of information being presented by that feature—exclusively audio, exclusively video, combined audio and video—and, for exhibits using video, whether or not a touchscreen was used. In total, we observed 12 exhibits and 18 features. 12 of the 18 features used digital methods of interaction. For an in-depth breakdown of those 12 digital features, refer to table 3, and for additional information from our observational inventories, refer to Appendix B.

**TABLE 3: A BREAKDOWN OF INFORMATION DISPLAYED ON INTERACTIVE FEATURES FROM INVENTORIES**

Total interactive features observed	18
Total digital interactive features observed	12
Number of touchscreens observed	7
Number of exclusively audio interactives	6
Number of interactives with images	4
Number of audio and video interactives	2

### **3.1.2 Exhibit design and interactive, multimedia exhibits**

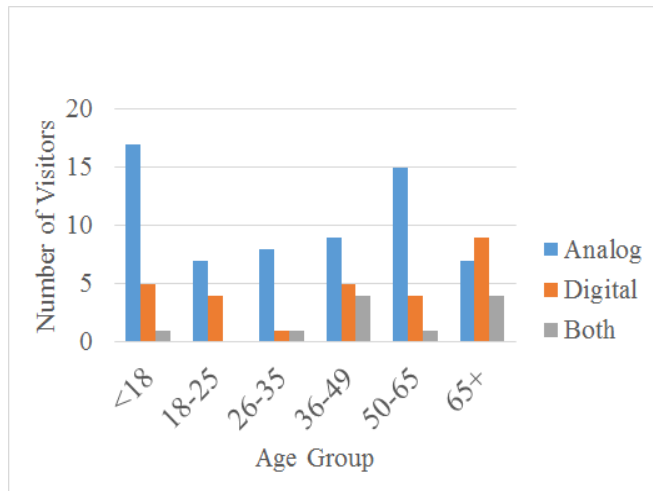
Museum employee interviewees specializing in history exhibits had experience with narrative content, and the designer specializing in science exhibits had experience with digital interactives. The most relevant answers came from the architecture and history exhibit designers since iD+Pi’s exhibit focuses on how architecture reflects the history and traditions of a culture. All of the interviewees explicitly advised that content be curated first, and interactive multimedia be developed last. This agrees with the fact that three of the four designers said that understanding exhibit content is one of the greatest challenges in exhibit design, along with budget restraints. For that reason, we focused on cost and understanding content at every step of the process.

Whether an exhibit designer’s opinion on digital-based interactive multimedia was positive or negative had no correlation to the type of exhibit they had experience designing; interviewees in the same field or with the same experience had opposite answers. Thus, we relied on our standardized visitor interviews for a decisive stance on digital-based interactive media.

### **3.1.3 Visitors and interactive, multimedia exhibits**

We contacted eight other WPI students for feedback on our standardized interview questions. The students gave positive feedback with the exception of the last question, which felt out of place, “Have you been to the Indian Pueblo Cultural Center?”. All eight students found it odd to ask that question in a non-IPCC museum. Our team decided that this question was still worth asking in the interest of our sponsor and adjusted the interview by explaining that the last questions were related to our project.

We conducted 50 standardized interviews at the Albuquerque Museum in Albuquerque and 52 interviews at the Museum of International Folk Art in Santa Fe. Of the 102 visitors interviewed, 59% of visitors preferred analog interactives, 23% preferred digital interactives, and 19% did not prefer one over another. Of the 60 visitors surveyed who preferred analog interactives to digital, 33 visitors said digital interactives still added to the exhibit. When asked to elaborate on their answers, 16% of visitors said that the digital interactive gave additional information or clarity on the subject matter, and an additional 7% said it made them feel more connected to the subject matter.



**FIGURE 16:** A GRAPH OF VISITOR’S PREFERENCE FOR ANALOG OR DIGITAL INTERACTIVES BASED ON AGE

The IPCC is trying to attract younger audiences to their museum without isolating their usual older audiences (Rachel Moore, Personal Communication, September 5, 2017), so our team recorded approximate age information and paid particular attention to those answers. In our analysis, 74% of interviewees younger than 18 and 55% of the interviewees over the age of 50 preferred analog interactives to digital. A more complete breakdown of analog versus digital interactives preference by age group is displayed in Figure 16.

**Discussion: How can we design our exhibit to appeal to target age groups?**

Data from exhibit designer and museum visitor interviews both supported the idea that the most popular and engaging exhibits are predominantly analog with digital interactives tastefully incorporated. In terms of attracting visitors, 83 of the 102 visitors voiced interest in an exhibit on contemporary Pueblo architecture, interestingly 44% of visitors from the Albuquerque Museum and 27% of visitors from the Museum of International Folk Art had been to the IPCC before. The large difference in response is likely due to location of the museums; for example, the IPCC and the Albuquerque Museum are in Albuquerque, whereas the Museum of International Folk Art is in Santa Fe. Patrons of the Albuquerque Museum may be more likely to visit the IPCC than visitors of the Museum of International Folk Art. By catering to a younger and more local audience, hopefully more visitors, especially of a younger generation, would be more likely to visit the IPCC and see the exhibit.

**3.2 Objective 2: Identified the background, cultural context, and importance of three architectural sites participating in the exhibit.**

The results of this objective discuss the outcome of the interviews and site visits. Our results draw upon the architectural processes adopted, to various degrees, among pueblos to ensure their cultural preservation through construction and renovation projects.

**3.2.1 Important site information**

After analyzing the interview responses from the points-of-contact from each architectural site, four common themes emerged: the purpose of the building, the level of community involvement in the design and planning process of the building, who the partners were in bringing the building to fruition, and challenges in the design and planning process. In this context, what makes these examples of contemporary Pueblo architecture successful is that they are buildings that fulfill modern-day construction standards and amenities that use traditions in their design to fit the aesthetic of its location. Refer to Table 4 and Table 5 for important summary information of the architectural sites. For a comprehensive list of points-of-contact from each site as well as the date they were interviewed by our team, refer to Table 6.

**TABLE 4: TABLE OF SUMMARY INFORMATION FOR THE RENOVATED HISTORICAL ARCHITECTURAL SITES**

<b>Restored Historic Buildings</b>	<b>Information Summary</b>	<b>Construction</b>
The Naranjo Home	<ul style="list-style-type: none"> <li>• A personal home passed down the matriarchy with the intention of providing a place of nourishment for all</li> <li>• The home is actively lived in, comfortable, and the design fits traditions of the area</li> <li>• There was no community involvement in the renovation of the home</li> </ul>	Constructed around late 18th century and renovated in 2004
Old Zuni Mission	<ul style="list-style-type: none"> <li>• Was a religious center, then tourist site, and is now figuring out its future purpose</li> <li>• Learning from the mistake of renovating the building without a process in the 1960s and now starting a detailed process for renovation</li> <li>• Considering community involvement in the current design and planning process renovation process</li> <li>• Is working with historic preservation partners</li> </ul>	Constructed in 1629 and renovated in 1969; currently under renovation again
Owe'neh Bupingeh	<ul style="list-style-type: none"> <li>• A plaza filled with personal homes that is also utilized as a community space during holidays</li> <li>• Only open to residents of Ohkay Owingeh</li> <li>• Learned from the mistake of stuccoing the plaza in the 1960s and is now executing a detailed process for renovation</li> <li>• There was a fairly heavy level of community involvement in the design and planning process</li> </ul>	Constructed in early 16th century and renovated in 2010

**TABLE 5: TABLE OF SUMMARY INFORMATION FOR THE NEWLY CONSTRUCTED ARCHITECTURAL SITES**

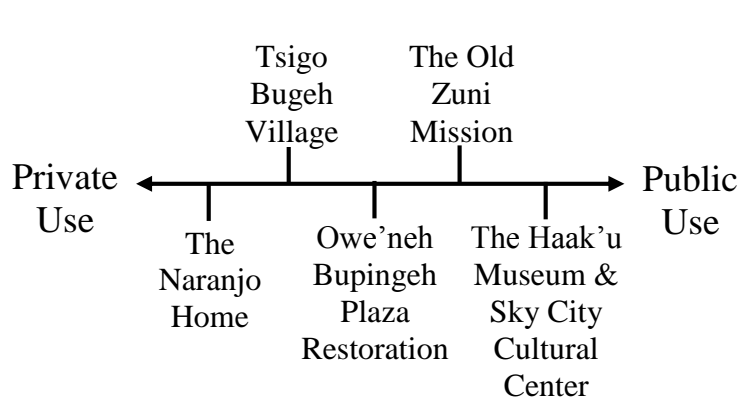
<b>Newly Constructed Buildings</b>	<b>Information Summary</b>	<b>Construction</b>
Tsigo Bugeh Village	<ul style="list-style-type: none"> <li>• A townhouse complex resembling the orientation of the central plaza in Ohkay Owingeh</li> <li>• A secondary location for celebrations</li> <li>• Only open to the families currently living in the homes</li> <li>• There was a fair amount of community involvement in the design and planning process</li> </ul>	Constructed in 2002
Sky City Cultural Center & Haak'u Museum	<ul style="list-style-type: none"> <li>• A museum open to the entire public and cultural center open to only members of the Pueblo of Acoma</li> <li>• There was a very heavy level of community involvement in the design and planning process</li> </ul>	Constructed in 2007

**TABLE 6: TABLE OF SITES FEATURED IN EXHIBIT**

Interview Date	Point-of-Contact	Pueblo	Building
15 Sept 2017	<ul style="list-style-type: none"> <li>• Councilman Arlen Quetawki Sr.</li> <li>• Wayne Lahi</li> <li>• Tom Kennedy</li> </ul>	Zuni	Zuni Mission of Our Lady of Guadalupe, (Old Zuni Mission)
21 Sept 2017	<ul style="list-style-type: none"> <li>• Brian Vallo</li> </ul>	Acoma	Sky City Cultural Center & Haak’u Museum
21 Sept 2017	<ul style="list-style-type: none"> <li>• Tomasita Duran</li> </ul>	Ohkay Owingeh	Tsigo Bugeh Village
			Owe’neh Bupingeh
26 Sept 2017	<ul style="list-style-type: none"> <li>• Tessie Naranjo</li> </ul>	Santa Clara	Personal Home

**Building Purpose**

Each of the architectural sites analyzed was planned, designed, and built to fulfill a specific purpose. For each of the buildings, “success” was partially determined by how well the building served the purpose it was intended for. Collectively, the five architectural sites were designed and built to serve wide range of functions ranging from personal use, such as a small family home to public use, such as a museum. We, the team, organized the buildings on a spectrum classifying each building’s purpose, in terms of its position on a scale between the two extreme points of solely private use and solely public use. The building’s purpose is treated as a continuous trait as opposed to a distinctive trait because we felt that some of the five buildings had intermediate levels of access by members of the community. For example, the Sky City Cultural Center & Haak’u Museum is more public than the Old Zuni Mission because the Sky City Cultural Center & Haak’u Museum is open to any person, regardless of living on the reservation. The Old Zuni Mission was once exclusively open to members of the Pueblo solely for religious activities and then slowly became partially open to tourists. Unfortunately, the mission is now closed to all. A spectrum linking the different buildings together under the building’s purpose can be seen in Figure 17. On this scale, buildings are classified as being made for private use, semi-public use, and public use.



Tessie Naranjo's home in the Santa Clara Pueblo was designed and constructed solely for personal use in the late 18th century, and it has remained a home for the family since. Tessie Naranjo’s great-great-grandmother constructed the house from adobe with the intent that the house would be a “place of nourishment for all,” it’s been cared for and passed down through the Naranjo matriarchy.

**FIGURE 17: SPECTRUM CLASSIFYING EACH BUILDING’S PURPOSE**

An architectural site analyzed that was designed for mostly personal use is the Tsigo Bugeh Village. The Tsigo Bugeh Village is a townhouse complex in the Pueblo of Ohkay Owingeh. Mrs.



Tomasita Duran, Executive Director of Ohkay Owingeh’s Housing Authority, shared that the townhouse complex was designed to address a housing deficit. Tsigo Bugeh Village serves as a contemporary family living accommodation complex with a “plaza-esque feel”; the townhouse complex houses multiple families similar to the central plaza, Owe’neh Bupingeh. The orientation of the townhouses mimics that of the central plaza, featuring a central open area for people to gather as a secondary location to Owe’neh Bupingeh during festivals. Tsigo Bugeh Village serves both personal needs and public needs, providing contemporary living accommodations while also acting as a secondary location for celebrations

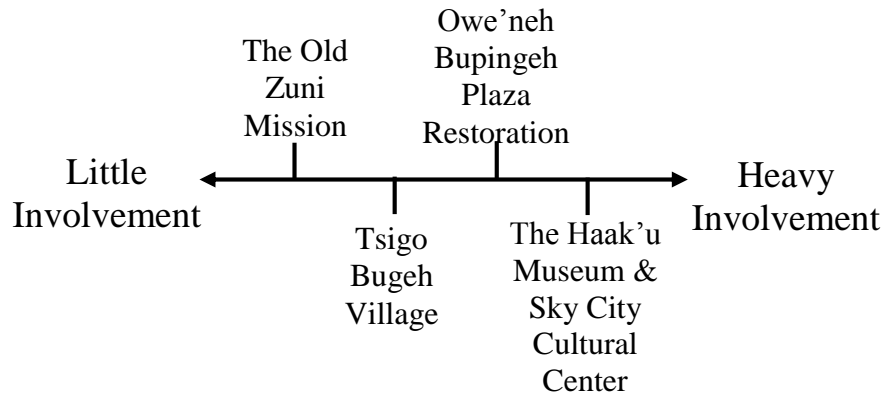
Still within Ohkay Owingeh, not too far from Tsigo Bugeh Village is Owe’neh Bupingeh, the pueblo’s central plaza. According to Mrs. Duran the plaza was originally designed in the early 1500s as living accommodations and to serve as the main site of all celebrations and cultural dances. Years of neglect starting in the mid-1970s left the plaza buildings in decaying state, so families moved away from the central plaza, resulting in a lack of use and compounding the issue. The Owe’neh Bupingeh Restoration Project was started in 2010 to encourage families who left the reservation to move back into the plaza.

We, the team, analyzed other pueblo buildings that were designed to serve more public purposes. Mr. Arlen Quetawki, Councilman of the Pueblo of Zuni’s Tribal Council, and Mr. Tom Kennedy, Director of Tourism at the Pueblo of Zuni elaborated that the Old Zuni Mission was originally built in 1629 as a mission for the reservation and much later on became a tourist destination, the mission always served the public more than it served an individual. Significant structural damage resulted from the original adobe building being stucco’ed over in 1969. Currently, the Zuni Mission is structurally unsafe for entry and closed to the public and members of the pueblo. The Zuni Tribal Council, religious leaders, and Tourism Department must determine what the Mission’s purpose will be once renovated.

Of the buildings our team analyzed, the Sky City Cultural Center & Haak’u Museum from the Pueblo of Acoma tribe falls on the far right of the spectrum covering building’s purpose, as the building is a public space. Brian Vallo, Director at the Indian Arts Research Center and member of Acoma tribe, and Barbara Felix, founder of Barbara Felix Architecture + Design (BFA+D), described the history of the Sky City Cultural Center & Haak’u Museum. The planning process started in June of 2000 with the intention of designing a building to replace the tourism center that burnt down a month prior. After trying to incorporate the tribe’s feedback on the new building, the design team realized they were actually designing a cultural center instead of a tourism center. The Sky City Cultural Center & Haak’u Museum now serves as a cultural center for Acoma residents and a museum for the general public.

### **Community Involvement**

We found that each of the architectural site were planned, designed, and built with varying levels of community involvement. For each of the buildings, success was partially determined by how well the building was accepted and integrated into the community. The five sites were designed and built with varying levels of community involvement ranging from no community involvement to heavy community involvement, where the community played a key role in decision-making. A spectrum linking the different buildings together under community involvement, can be seen in Figure 18. On this scale, each building is positioned between the two extreme points of no involvement and heavy involvement relative to the other buildings.



**FIGURE 18:** SPECTRUM CLASSIFYING EACH COMMUNITY’S INVOLVEMENT IN PLANNING

**The Naranjo Home** underwent renovations in 2004 to contemporize the 300-year-old space. Some of the renovations include replacing the dirt floor with tile, adding an in-house pantry, and replacing the earthen ceiling insulation with modern insulants. The renovations were executed by an outside contractor selected by Ms. Naranjo and her late sister, Rina. All renovation decisions were made without input from Santa Clara’s Tribal Council or residents, because by Tessie Naranjo and Rina Swentzell knew they did not need this.

**Old Zuni Mission’s** last restorative effort took place in 1969. During that renovation, the Zuni Tribal Council did not establish a process of how the Mission should be renovated. The Governor at the time was collaborating with The Catholic Diocese of Gallup and Bureau of Indian Affairs to start construction and chose to use stucco as the building material with the thought that the building would no longer need to be plastered annually. At the time, people did not know that traps moisture within the adobe walls. As a result, over time the adobe returns to dirt and only a stucco cast remains. Recently, The Zuni Tribal Council, and Tourism Department started planning how to renovate the deteriorating Mission. The planning process is in its beginning stages so the Tribal Council is still determining the restoration process moving forward.

The Pueblo of Ohkay Owingeh had some community involvement in the creation of **Tsigo Bugeh Village**. After speaking with Mrs. Duran, and Ms. Jamie Blosser, Executive Director at the Santa Fe Art Institute, we learned that there were several meetings orchestrated by Ohkay Owingeh community members, the Housing Authority, and architectural partners in the planning process. This enabled the architects to learn about the community’s “family life, their social values, and what they’d like to see in material”. Jamie Blosser explained that, the complex was designed in a townhouse style with an open floor plan to accommodate the tradition of large gatherings on feast days.

Both Mrs. Duran and Ms. Blosser also worked on Ohkay Owingeh’s **Owe’neh Bupingeh Plaza Restoration** along with Mr. Shawn Evans, Principal Architect at Atkin Olshin Schade Architects. The benefits of the community’s involvement at Tsigo Bugeh Village inspired the Housing Authority, Tribal Council, and AOS Architects to employ even greater community involvement in the Owe’neh Bupingeh Plaza Restoration. Together, all groups completed a point-of-contact advisory process, holding monthly and annual meetings with the community about the potential restorative efforts. The comprehensive process involved having community elders teach AOS Architects about the pueblo’s history and cultural beliefs. Elders of the community were

asked to share oral histories. An advisory committee identified the priorities of local families still living in the plaza.

Of the buildings analyzed, the Pueblo of Acoma's **Sky City Cultural Center & Haak'u Museum** had the most community involvement. Mr. Vallo explained that the Acoma Tribal Council and advisory board developed a comprehensive process for community engagement, to collect input on what the facility should contain and how it should serve the community. Through this process, the board arrived at the conclusion that they were not rebuilding a tourism center, but a community center; something the pueblo needed, as well as the opinions of the community had alluded to. The community center acts as a common space for community members to gather for social or recreational activities. The fundamental difference between a tourism center and community center is that the tourism center would moreso serve the public, whereas the cultural center moreso serves residents of the pueblo but also provides for the public.

### **Historic Preservation Partners**

Most of the architectural sites involved partnerships between the respective Pueblos and historic preservation partners throughout the duration of the architectural projects. In the case of renovated historical buildings, the historic preservation partner's role was to ensure the conservation of the architecture's historical significance in the community. For the newly constructed buildings, the historic preservation partners ensured the conservation of the landscape.

The **Owe'neh Bupingeh Plaza Restoration**, **Old Zuni Mission**, and **The Naranjo Home** are historic buildings built before the 19th century. Because of the building's historic significance, two of the three historic buildings worked with historic preservation partners throughout the renovation planning process.

In an interview, Tomasita Duran shared that Ohkay Owingeh worked with the New Mexico State Historic Preservation Office throughout the Owe'neh Bupingeh Plaza Restoration to ensure that the historical integrity of the plaza was not lost during renovation and contemporization.

According to Tom Kennedy, The Zuni Tribal Council, religious leaders, and Tourism Department are beginning discussions with the University of New Mexico's School of Architecture and Planning's Historic Preservation & Regionalism program, as well as iD+Pi, with representatives at the National Parks Service at El Morro who have a "historic preservation" team that is largely comprised of Zunis - to ensure that traditional elements of the Mission are not destroyed or lost throughout the renovation process, but incorporated in the new design.

The Naranjo Home was built and renovated using a private contractor. Tessie Naranjo did not share the name of the contractor with our team because she could not remember, but did share that there were no other parties involved in her home renovations. This is the only architectural structure of the five that did not utilize historic preservation services.

The Tsigo Bugeh Village and the Sky City Cultural Center & Haak'u Museum are each newly constructed contemporary Pueblo buildings that were built within the last 17 years. Because these buildings were built on reservations containing other buildings over 500 years old, both of the architects of these buildings worked with historic preservation partners throughout the planning process to conserve the surrounding historic landscape.

The Pueblo of Ohkay Owingeh work with the New Mexico State Historic Preservation Office during the design and planning process of the Tsigo Bugeh Village. By doing so they were able to preserve the natural landscape of the pueblo as well as incorporate traditional aspects of the pueblo's original homes into this townhouse complex.

Similarly, the Pueblo of Acoma worked with the National Trust for Historic Preservation when designing the Sky City Cultural Center & Haak'u Museum to ensure that the natural landscape of the pueblo was conserved.

### **Unique Challenges**

While there are always some challenges associated with architectural planning, there were several unique challenges two of the five architectural sites studied had to overcome. An architectural site was identified as having a "unique challenge" if there were cultural challenges impeding the complete success of a project. The main challenges analyzed were of a financial, social, and religious nature.

Both Owe'neh Bupingeh and Old Zuni Mission were stucco'ed over in the 1960s and face financial challenges in the projects' completion as a result of deteriorating structures. Part of the Owe'neh Bupingeh plaza is still deteriorating and Ohkay Owingeh needs 12 million dollars to finish the restoration. Decaying homes within close proximity of the newly renovated homes are hazardous due to debris and slow progress on the renovation. Similarly, the Zuni Tribe continues to struggle with funding to renovate the Old Zuni Mission.

Old Zuni Mission faces social and religious challenges on top of its financial ones. The Old Zuni Mission has a long standing history and many Pueblo of Zuni members feel conflicted about its role in the pueblo. Community members question whether the Old Zuni Mission represents the Zuni religion or if it represents the forced observance of Roman Catholicism traditions. Another source of contention is over the history represented by the Mission. . There is a controversy that the Pueblo prefers to keep private, and therefore our team can't describe the specifics.

### **Discussion: What Made All Five Buildings "Successful"**

The Naranjo Home, Old Zuni Mission, Tsigo Bugeh Village, Owe'neh Bupingeh Plaza Restoration, and Sky City Cultural Center & Haak'u Museum are all examples of contemporary indigenous architecture built for different purposes and serving different communities. The Old Zuni Mission is considered contemporary because its last renovation happened in 1969. These buildings are featured in the exhibit because they exemplify contemporary Pueblo architecture that successfully addressed the needs of the individual or the specific community. Each building showcases the traditions and practices of its respective pueblo through modernized architecture. From the interviews with our points-of-contact, we inferred that in order for a restored building to be successful, it is important that indigenous groups first establish a detailed restoration or renovation process that fits within the specific pueblo's needs. Additionally, to ensure that the building still fits within the landscape of the area as well as is accepted by the community, a preservation team should be involved in the design and planning process. By doing so, the cultural landscape of the area can be preserved, and significant historic architectural features and artifacts are more likely to be maintained throughout the renovations. Though Old Zuni Mission and Owe'neh Bupingeh's historical restoration projects are not yet complete, both are considered

successful examples of Pueblo architecture because the pueblos that house these buildings are making efforts to rectify the architectural mistakes made in the 1960s regarding material choice. As mentioned earlier, Ohkay Owingeh is employing a process to ensure successful completion and the Pueblo of Zuni is beginning the critical process necessary to lend it a success.

### 3.2.2 Important Architectural Components

The five sites to be included in the Indian Pueblo Cultural Center Exhibit have multiple architectural themes and elements. We compared and contrasted these to highlight what ties the sites together and what makes each unique. Building elements such as adobe bricks and *vigas* are heavily implemented in several of the sites. These commonalities link the sites; however, the individual sites also have features unique to them. The buildings' colors, style influence, and architectural elements are essential to the sites' histories and cultures.

#### Adobe

All five sites have exterior walls constructed of adobe bricks or were built to resemble the adobe style. In a few cases, stucco was used as an outer coating, which resulted in deterioration. Today the Old Zuni Mission is in disrepair from the 1960s reconstruction. A stucco coating on the walls traps moisture in the adobe, ruining the integrity of the adobe bricks. The walls suffer structural damage, referred to as “elephant footing”, that can be seen in Figure 19. Due to the weakened adobe, the walls cave inwards from the weight. Cracks like the one in Figure 20 appear throughout the walls, even going through the murals. As the Zuni Tribal Council assesses damage and considers the future of the structure, they have the opportunity to prevent current problems from occurring again with greater community involvement in the planning and building process.



**FIGURE 19:** PHOTOGRAPH OF DAMAGE ON THE EXTERIOR OF OLD ZUNI MISSION



**FIGURE 20:** PHOTOGRAPH OF CRACK ON THE EXTERIOR OF OLD ZUNI MISSION

Today, the walls of the plaza are built from adobe bricks and require annual re-plastering, an effort that brings the community together.

During the planning process of the Owe'neh Bupingeh Restoration Project, community members were shown older pictures of the plaza and noticed that hand marks were visible from the re-mudding process when plaster was reapplied. Shawn Evans and the team working on the restoration at the time listened to community feedback and eventually decided that the walls should be built using traditional methods to maintain this connection to the pueblo's history. Today, the walls of the plaza are built from adobe bricks and require annual re-plastering, an effort that brings the community together.

same maintenance as adobe and plaster walls when done correctly. Old Zuni Mission provides an example of how the improper use of stucco results in more work than a yearly plastering.

Adobe is essential to Pueblo architectural history. Today communities are choosing whether to build in the tradition manner and continue annual mud plastering or to simply represent the adobe style with a stucco exterior. This decision is based on both community choice and convenience: it is easier to re-plaster a residential community such as the Owe'neh Bupingeh Restoration Plaza, whereas a building serving members outside of a pueblo such as the Sky City Cultural Center & Haak'u Museum requires a building with less upkeep.

### Vigas

*Vigas* are wooden beams, that lay across the ceiling and are a common architectural element in the adobe-based buildings. They are featured in many contemporary buildings especially in the Southwest, but do not provide any architectural support. In many structures, *vigas* extend out of the side walls and are visible from the outside of the building.

The Old Zuni Mission features ceiling *vigas* that can be seen below in Figure 15. They are made of timber taken from around the Pueblo of Zuni from before the original construction of the Old Zuni Mission. Tom Kennedy conducted tours of the Old Zuni Mission for years and explained that most of the original *vigas* suffered extensive damage and rotted prior to the Mission's 1960s rebuilding. The damaged *vigas* have since been replaced.



FIGURE 21: THE CEILING OF OLD ZUNI MISSION



FIGURE 22: A VIEW OF THE DINING AREA AND KITCHEN IN THE NARANJO HOME

and history of each pueblo influenced the implementation of the *vigas*.

Sky City Cultural Center & Haak'u Museum features interior *vigas* that overhang, exposed as portals. The Naranjo home combines tradition with modern conveniences by using the building's original *vigas* but using wood panels to form the interior ceiling instead of traditional *latillas*. *Latillas* are branches or small strips of wood typically laid across *vigas*, as seen in Figure 22. *Vigas* in Owe'neh Bupingeh are unusually long; the wooden beams extend out of the exteriors of the walls more than *vigas* at other pueblos. These four sites share this common building element, however the cultural influence

### Site Orientation

Many of the sites have unique orientations or positions on their Pueblos' lands. The solstices and equinoxes are essential to Pueblo calendars; coinciding with these are harvests and holidays. Many buildings and community areas are orientated to and the sun's position on these



days, and some sites are aligned with important natural and heritage places. The location of the sites is unique to each pueblo. They are similar in that the orientations and positions are reflections of traditional building sites, and they maintain tradition.

The Sky City Cultural Center & Haak’u Museum sits upon a mesa, but it was necessary to excavate in order to construct lower levels and some natural rock had to be destroyed. After many tribal meetings the community decided that the site could be built on. The new building honors the original site as it represents the Pueblo of Acoma migration story, architectural history, and resources of the Acoma Valley. The two-story buildings of Tsigo Bugeh Village surround a plaza that is positioned on the solstice and equinox axes. This presents the plaza as a community center in Ohkay Owingeh. The Old Zuni Mission is an important cultural location, not only because of its religious affiliations notable community members are buried in the cemetery in front of the building, with men buried on the left and women on the right.

### Unique Architectural Features

The five architectural sites all have distinguishing features that set them apart from one another. Similar features and influences can be seen in many southwestern buildings, however their applications and interpretations uniquely express the sites. These features are contemporary and traditional, and establish the sites as unique buildings.

### Ramadas

*Ramadas* are traditional overhangs that provide shade from sun. Traditionally in pueblos, *ramadas* had frames made of wood and branches or crops were laid over the top to dry and provide shade. When designing Tsigo Bugeh Village, architects and planners agreed that it was important to include *ramadas* in the design to maintain a connection to tradition and provide their original purpose of shading. In Tsigo Bugeh Village, *ramadas* are made of metal instead of wood (Figure 23). Metal *ramadas* still provide shade as wooden ones do, however metal ones are able to cool more efficiently and are more durable.



FIGURE 23: THE BACK OF A HOUSING COMPLEX IN TSIKO BUGEH

### Color

The Sky City Cultural Center & Haak’u Museum is unique in that it is painted in a variety of colors. The stucco coating on the walls is mostly earth tones, but also includes shades of purple. These colors are based on soil colors from different areas around the Acoma Valley with the intention of making the building representative of the Acoma region as a whole, instead of just one area. The site’s wide variety of color sets it apart from the others.



## Spanish Influence

The Old Zuni Mission was originally constructed by the Pueblo of Zuni and the Franciscan Catholic Spanish. The building was originally used for religious service and features many elements with religious influence, such as the double doors, church bell, and the altar. After support for the mission from the Franciscans ended in 1822, the building took on different traits influenced by Zuni culture in absence of Spanish influence. The Old Zuni Mission is a unique blend of cultures, balancing two influences of style. An element that solely expresses Zuni culture is the murals.

An *horno* (outdoor bread oven) at the Naranjo Home accentuates the Santa Clara Pueblo culture the house is a part of and Spanish influence, as seen in Figure 24. The Spanish introduced this cooking technology to the indigenous people when they settled the area. Today the *horno* has been built at the home as a reminder of these influences and as a useful cooking tool.



**FIGURE 24:** A TRADITIONAL *HORNO* IN THE YARD OF THE NARANJO HOME

## Materials

The architecture of the Sky City Cultural Center & Haak'u Museum is constructed of materials from Acoma history. When the Pueblo of Acoma was selecting an architecture firm for the project, one of six firms interviewed presented a hand-crafted steel box containing materials important to Acoma history and culture. This included Pottery, Wood, Mica, Adobe, Stone, and Corn. Various neighboring communities also contributed materials and design ideas to make the building representative of all of Acoma history. Throughout the building there is stacked stone, comprised of six different types. These stones were taken from various locations that play an important role in Acoma history. The use of these materials ties the building to the land. Mica has been applied to the glazing on the windows. A traditional Acoma design is visible in the placement of the stones along the parapets. Flashing (thin metal applied to weatherproof elements) and contemporary roofing materials are exposed intentionally as a representation of modern architecture. These elements are historic and traditional to the Acoma. These materials are what separate the Sky City Cultural Center & Haak'u Museum architecturally from the other sites.

## Influences of a Private Residence

Dr. Rina Swentzell designed the renovation of the Naranjo Home to have both more traditional elements and modern conveniences. New tiling was added to the floor. Additionally, there is pottery around the house made by the Naranjo family. The pottery sets the home apart from the other sites because it is solely of the Naranjo family. It was always in Tessie Naranjo's childhood and past and it part of the pueblo's culture. Some additions, such as the insulation is modern amenity that makes living more comfortable and convenient.

The five sites express their history and culture through similar themes and architecture, while maintaining unique identities with other features and influences. In designing and planning contemporary architecture, these sites show how essential these themes are to building on indigenous lands in the area. Incorporating aspects of adobe and vigas is proven to be possible and

successful. Adding features unique to a culture makes a building more expressive and true to the indigenous land it is located on.

### 3.3 Objective 3: Provided iD+Pi with a framework for organizing and presenting content.

In objective three, we identified technology and resources available for the project, and identified ways to implement them into a cohesive exhibit. This culminated in the creation of multiple digital 3D models each one with information on how to go about implementing it into an exhibit, and each one based on findings from our research in the prior two sections.

#### 3.3.1 Methods of Presenting Content

As our team worked towards developing a plan for integrating digital media or interactive multimedia into the exhibit, we considered the feasibility and the practicality of our potential exhibit designs. This required considering costs and the abilities of iD+Pi, IPCC, and their partners to implement our recommendations, making opportunities already available particularly important. During our September 6th visit to IPCC, we were impressed how they were already implementing digital interactives in their exhibits. The museum owns an older generation Ideum touch table used in rotating exhibits. Its programming is typically done in-house by IPCC staff. In terms of the physical space, we realized that IPCC's exhibit team was capable of constructing complex features, such as a life-sized replica of an adobe structure constructed in-house.

From this visit to the IPCC, we reached a series of conclusions. Since the Ideum touch table would be available for iArchitecture's opening, it presented an opportunity for incorporating a digital interactive component without significant expenditure on new technology or programming. The maintenance team's construction abilities allow for the use of larger-scale features, such as life-size partial replicas of buildings or models of architectural features. Our interviews with exhibit designers and museum visitors both suggested that there should be a balance between digital and analog elements in an exhibit.

Following our visit to the IPCC, our team went to Navajo Technical University and learned about their role in the project from Elisha Wortham, director of the building information modeling program. Elisha explained that they are able to take high resolution photographs and record the 3D structure of buildings using point cloud data. In this situation, point cloud is a data set of location coordinates collected by a specialized scanner that can then be used to make 3D models (Cieþka, 2016). Overlaying the photographs with the point cloud data results in a photorealistic digital model of the space. Ms. Wortham's students presented potential applications for this data: one student converted their point cloud data from a project at Chaco Canyon into a polygon-based model and turned that model into a navigable space in the Unreal game engine. Using the same point cloud data, a different student 3D printed a model of the site. This model consisted of multiple sections that could be easily removed, revealing the site's internal structure.

While the navigable videogame-like model is impressive, it took one student nearly three months to complete the project. Using similar technology for the exhibit would likely be costly and take considerable time to develop. It may take less time if assisted by a group with programming and game development experience, but development would still be costly. Additionally, our team's analysis of the standardized visitor interviews and observational

inventories shows that the most popular use of digital interactives was in displaying photos, followed by playing video with audio. We did not observe and visitors did not mention any use of platforms for video game-like interactives. This is likely because cost to develop the program and purchase hardware to run the program is too high for most institutions.

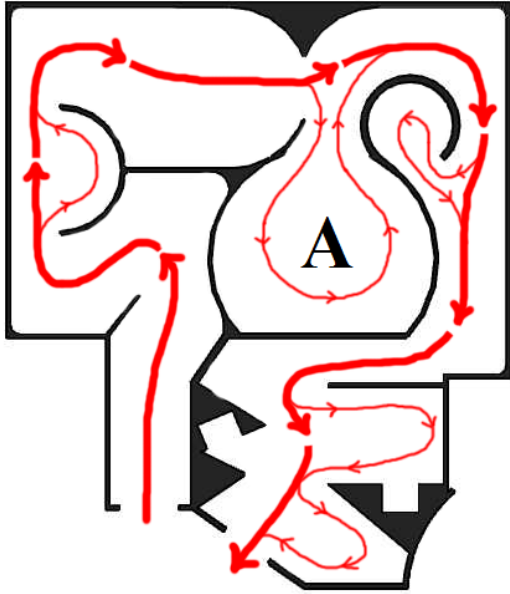
The 3D printed scale model provided an opportunity to use an analog interactive in the exhibit. This technology could create physical models of the building that can be disassembled, revealing internal features. Four of the six analog features we observed included a model that users were able to interact with, and two of those four models could be disassembled and reassembled. 3D printed models also offer the opportunity to replicate unique architectural components within the context of the building; doing so provides the visitor with a better understanding of the way that architectural component fits into a space and the function it serves.

Several exhibit designers recommended contacting Ideum about their touch tables and tangible engine, a software package that allows physical objects to activate different responses by placing them on the touch table. The combination of digital interactives with physical features addresses the need to combine analog and digital components. Additionally, it would appeal to visitors who prefer hands-on activities and those who prefer digital features. Unfortunately, IPCC's current touch table does not support this application and the cost to upgrade to a table capable of running the tangible engine and the cost of software required would require significant investment.

In addition to these areas of focus, we explored other platforms. Our initial experiences with virtual reality proved unimpressive; the technology was interesting at first but lacked depth in content and was often clumsy. Additionally, we observed no use of virtual reality in our museum visits. As such, we chose focus our efforts elsewhere. We are confident that these technologies will allow us to plan an exhibit with an appropriate and effective blend of digital and analog components. An in depth review of our findings can be found in our recommendations.

### **3.3.2 Exhibit Layout Options**

Using the themes identified in 3.2.1 and 3.2.2 of building purpose, community involvement, and important architectural features as a starting point, our team identified three additional ideas fundamental to understanding the exhibit material: what is contemporary pueblo architecture, what makes these buildings contemporary, and what is the history of the building. The last three themes were included to fill in gaps that the other three themes left unaddressed. We grouped the six themes in five different orders based on if one theme provided context for another, the relationship between different themes, and how smooth transitions would be from one theme to another.

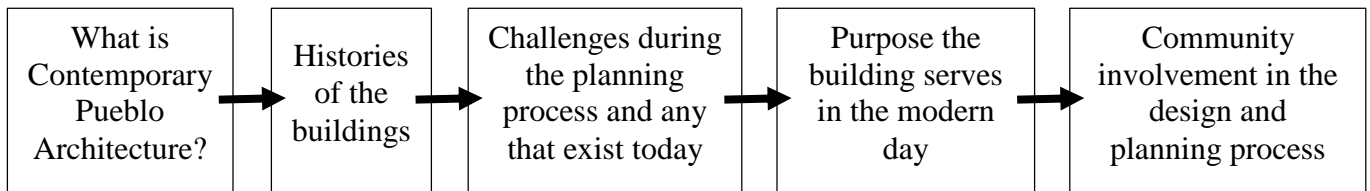


**FIGURE 26:** FLOOR PLANS OF THE FUTURE IARCHITECTURE EXHIBIT SPACE. DIRECTION IS MARKED WITH RED

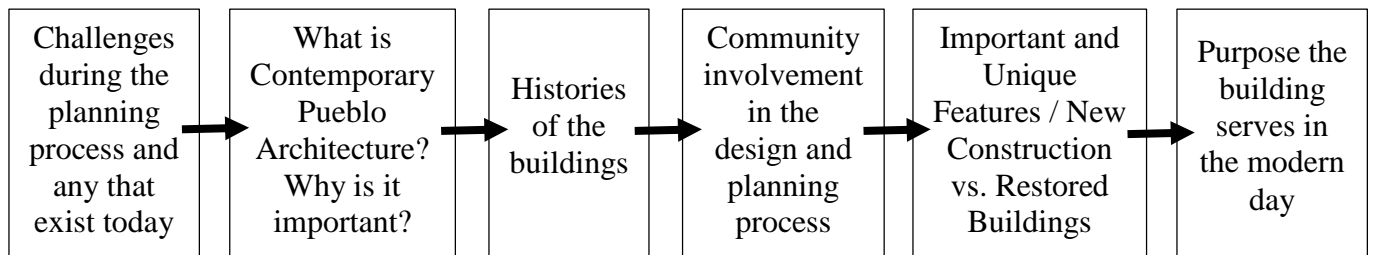
One challenge we needed to work around in our exhibit layout and design is that the floor plan the layout suggestions are based off of is not to scale and the IPCC does not have information about the approximate square footage. Additionally, the curved walls and triangle-like features in black in Figure 25 are permanent and will not be remodeled for iD+Pi's exhibit. Thus, in some ways the exhibit space layout determined the grouping of our themes.

Rachel Moore, curator of the IPCC, provided insightful advice on content curation, stating that content should be in narrative form. A narrative form is written account of connected events or subject matter. Additionally, they explained good narratives are rooted in the power of emotions, even as exhibits. With this advice we reviewed our original groupings and reorganized as necessary, resulting in three potential narratives. Using feedback from our interviews with narrative exhibit designers and

feedback from Leo Vicenti, exhibit designer of the IPCC, we broke up the exhibit space based on content themes, considering how much space each theme might need in the exhibit and marked the central area designated for the large digital interactive feature. Written versions of the final thematic grouping can be seen in Figure 26 and Figure 27, while drawings of the exhibit space with marked areas assigned certain themes and other information are included in Chapter 4.



**FIGURE 25:** THE MAJOR THEMES OF THE FIRST EXHIBIT LAYOUT SUGGESTION



**FIGURE 27:** THE MAJOR THEMES OF THE SECOND EXHIBIT LAYOUT SUGGESTION.

### 3.3.3 Exhibit Models and Digital Interactive Partners

Following our visit to IPCC and discussions with Ms. Wortham, we identified the ideal location for a digital interactive; an oval-shaped alcove midway into the exhibit marked with the

letter “A” in Figure 25. Later, we returned to IPCC to take measurements of the exhibit space to ensure that our digital models accurately reflected the space. Using a floor plan Leo Vicenti shared with us, we identified potential locations for digital content. From this floor plan, our team used SketchUp to create 3D models of the gallery that were used to create the exhibit design drafts in Chapter 4 and the 3D models we presented to iD+Pi upon completion of our project.

After understanding the exhibit space, our team focused on the digital aspect of the exhibit and quickly learned that digital exhibit design requires substantial financial commitment. Many of the new technologies we initially considered were costly enough when implemented well that we were concerned the budget for the exhibit would not allow for their inclusion. Stephen Hutchins, exhibit designer for the Albuquerque Museum, cautioned against poorly implemented digital interactives, warning that they do more harm than good if not integrated into the exhibit thoughtfully. With this in mind, we focused on ways to implement digital media while utilizing resources already available, such as the Ideum touch table at the IPCC; in terms of ease of implementation, this touch table is the best choice since the museum already has experience working with its software. Incorporating digital 3D models into the exhibit presents a challenge to IPCC’s exhibit team due to the specialized knowledge required to create software able to process this data. To address this concern we encourage NTU and IPCC work together by having students convert the point cloud data into content needed for the exhibit. A different option is to work with UNM students with experience in the field. While convenient and less expensive, students are unable to produce the same quality and variety of work as a professional firm. Ideum has experience with digital interactive design; they created an ambitious display for the Smithsonian’s National Museum of the American Indian that allowed users to navigate a 3D model of the Inca capital of Cusco. A similar free-roam experience can be created from point cloud data gathered by NTU, but at great cost; Software development services from Ideum begin at \$50,000 (Murray, personal communication, 09/20/17). We do not feel that such expenses are necessary given the resources currently available to iD+Pi through both Navajo Technical University and the Indian Pueblo Cultural Center, which are capable of creating a compelling exhibit with digital interactives.

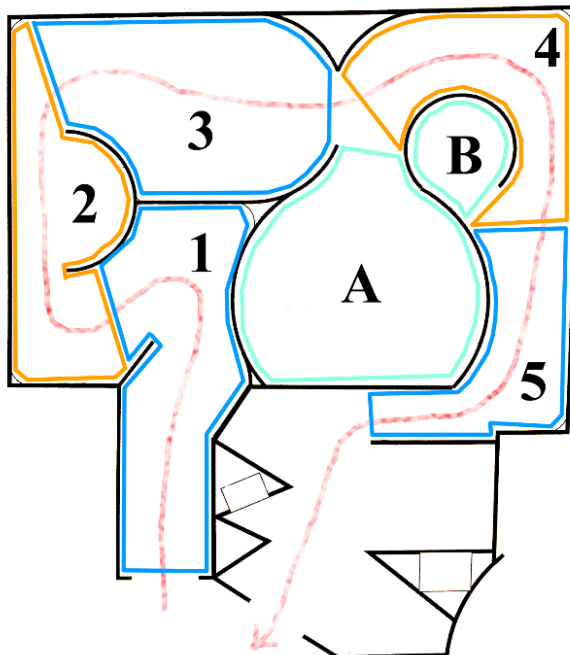
## Chapter 4: Exhibit Design Drafts

The following chapter outlines our team’s exhibit designs for iD+Pi to use in the Indian Pueblo Cultural Center exhibit space. We have two alternate plans involving interactives and three dimensional models. They both address and incorporate what we have discovered in our results. We have two alternative designs for our sponsor to have more flexibility with cost or amount of digital interactives involved in the exhibit. We also address considerations for each design, acknowledging limitations and possible solutions.

### 4.1 Exhibit Layout Designs

The following section contains more detailed versions of the two exhibit layout designs our team created in Section 3.3.2, listed here as Figure 28 and Figure 29. In each figure, the recommended direction and potential flow of traffic through the exhibit is marked with a red path. The area designated for interactive multimedia feature installation is marked with the letter “A”. Another area, marked with the letter “B”, is designated for a hands-on activity. For both layouts, area “B” can present visitors with a question that they are able to respond to using supplies that are provided. These questions should be related to the topic of contemporary Pueblo architecture and able to be answered by visitors of all ages - thus they should be big-picture or ask about broad concepts and opinions, or experiences. Due to the disjointed nature of this space, it is not a good idea to put content in this area that is critical to the narrative of the exhibit. The floor plan of the exhibit space is not to scale.

#### Layout 1



#### Content Themes:

1. What is Contemporary Pueblo Architecture?
2. Histories of the Buildings
3. Challenges During Planning
4. Modern Day Purpose
5. Community Involvement

#### Other Areas:

- A. Interactive Multimedia Area
- B. Hands-On Interactive Area

**FIGURE 28:** THE FIRST EXHIBIT LAYOUT DESIGN

The first layout of the exhibit introduces the topic by answering the question “what is contemporary pueblo architecture?” By starting with this question, visitors are introduced to the topic regardless of knowledge on the subject and eased into the exhibit. It provides some of the background information necessary in order to understand later parts of the exhibit. The end of this section introduces the buildings included in the exhibit and contains a description of why they are considered contemporary. The next theme is the individual histories of the buildings. This provides deeper context especially for the sites that are restoration projects and not newly constructed. In this section, iD+Pi and the IPCC are able to easily integrate artifacts and other traditional content into the exhibit since the theme is commonly seen in museums. The rounded alcove can be used to provide supplemental information or a more in-depth look at the material.

Moving along the red line, the next theme is challenges faced during the planning and design process, as well as any challenges that exist today. Some information in this theme may be dependent on knowledge of the history or context of the building, which is why it follows the History portion. At the same time, some challenges may be closely tied to the building’s history such that it is difficult to separate the two. The challenges that were faced during the design and planning process, along with any challenges that are faced today, lead into the modern day purpose of each building. The building may have served a different purpose in the past (history) or the architects originally intended for it to serve a different purpose during the planning process (challenge), but how the building serves the community in the modern age is part of what makes it contemporary, and what changes were made to the original structure in order to do so. Finally, the exhibit closes on the topic of community involvement. This was one of the major themes identified in our research and is what ties all of the sites together. As mentioned before, the success of buildings is based upon how well a community receives it and its ability to honor the Pueblo’s culture and traditions. In this topic it can start with an individual examination of each building but shift to a much bigger picture point of view to deliver the take-away that the easiest way to ensure a building’s success is by engaging the community throughout the design and planning process. Each building serves as an example of ways that community engagement in a thoughtful and culture-specific manner led to the construction of a successful building.

## Layout 2

### Content Themes

1. Challenges During Planning
2. What is Contemporary Pueblo Architecture?
3. Histories of the Buildings
4. Community Involvement
5. New vs. Restored Buildings / Architectural Features
6. Modern Day Purpose

### Other Areas

- A. Interactive Multimedia Area
- B. Hands-On Interactive Area

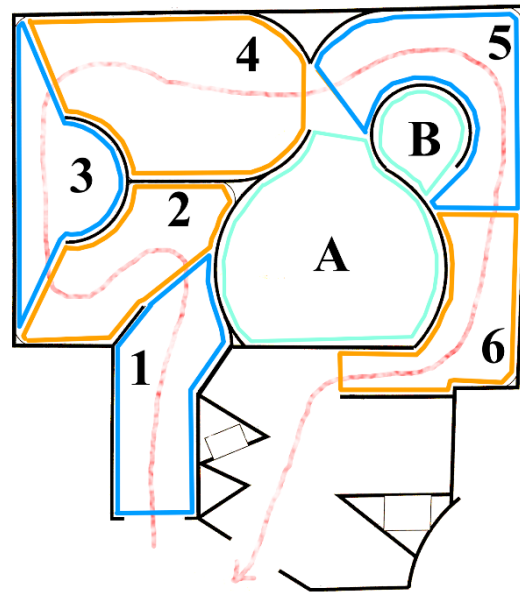


FIGURE 29: THE SECOND EXHIBIT LAYOUT DESIGN

The second layout of this exhibit starts with challenges during the planning process and any that exist today. These outward influences are used to help set the stage by identifying what the communities were up against to start with and, in some cases, what they are still up against. The next area of the exhibit again answers the question “what is contemporary pueblo architecture?” to help dive into the main topic of the exhibit more, serving essentially the same purpose as stated in Layout 1. Area 3 of the exhibit space provides broad historical background on all of the sites featured in the exhibit, with no focus in particular on any single aspect of the building’s architecture. This area will transition into the topic of community involvement in the design and planning process, elaborating more about the specifics of each Pueblo. This topic will feature information our group learned through our site visits and interviews with site liaisons about the unique planning process. This section will emphasize the unique nature of each Pueblo and that community engagement from site to site entailed different things.

The next theme of the exhibit space is important and unique features as well as new construction vs. restored buildings. Since our proposals for the interactive multimedia space marked by the letter “A” focus heavily on the common and unique architectural features, the inclusion in the exhibit space here will be brief. This section is meant moreso to give the visitor an idea of what to look for in architecture to identify it as contemporary pueblo architecture. By mentioning the two groups of new buildings versus restored buildings, we ensure that visitors are aware that there is more to contemporary Pueblo architecture than can sometimes meet the eye, as in the Naranjo home or in Owe’neh Bupingeh Plaza. The last section of the exhibit discusses the purpose that the building serves in the modern day. This section ties the whole exhibit together by describing the meaning behind the design of the site and the influence on the choices made by the community.

There are countless other potential layouts and ways of grouping the iArchitecture exhibit buildings together. The two layouts described in this section are broad recommendations based on



our objectives, understanding of the material so far, and knowledge gained from our previous objectives. Their purpose is to guide the future development of the iArchitecture exhibit and serve as a starting point for further content collection and discussion on the themes of contemporary Pueblo architecture.

## 4.2 Design 1: Analog Interactive 3D Models

Our first exhibit design implements analog three dimensional (3D) models to represent the architectural sites. The primary feature of the exhibit will be 3D printed models made of plastic. The buildings' most important elements will be removable; able to be deconstructed by the visitor. Visitors can access media and information about the sites and their architectural elements by placing the removable elements on a touch table with a tangible engine installed.

Each model representing a site will sit upon a pedestal evenly spaced around the room. A representation of the exhibit design can be seen below in Figure 30. This design will incorporate Ideum's touch table technology. At the center of the room, the touch table will operate with the tangible engine software installed. Running a high resolution software, the table will be prompted to display relevant information and media once an element is placed on it. Video clips, interviews, images, and informational text will be provided for each element placed on the table. These will be developed in the content curation process. A view of the entire exhibit design can be seen in Figure 31.



**FIGURE 30:** A SKETCHUP MODEL OF EXHIBIT DESIGN 1

Based on what we learned from studying existing museum exhibits, and interviewing exhibit designers and visitors, we decided to feature constructible 3D models in this design. Our museum observations included two exhibits with analog interactive components that allowed for the construction or deconstruction of 3D shapes to make a model. From our standardized interviews, we discovered that many museum visitors preferred analog interactives to digital

interactives. Outside of our formatted questions, some visitors explicitly expressed interest in seeing 3D models of the architecture. Our results from point-of-contact interviews at various architectural sites allowed for direct comparisons of shared architectural details among the different pueblos, as well as comparison of the processes that led to the successful constructions or renovation of the buildings. The significant elements shared among the different pueblos, or those that are unique to each pueblo, can be removed from the model by a visitor and then placed on the touch table. For example, the model of the Old Zuni Mission might have a removable *viga*. This piece could then be placed on the touch table. The visitor would be provided information the age and histories of the Mission's *vigas*. They could learn about the original roof *vigas* rotting and the replacement *vigas*. This design features architectural elements as they highlight similarities and differences of the sites. Most Pueblo buildings contain elements such as *vigas*, and adobe influenced walls. However, elements such as the *hornos*, coloring, and materials set the sites apart, bringing out the uniqueness of the buildings and their Pueblo's cultures. The histories of these elements contain stories pertaining to the sites and the Pueblos.



**FIGURE 31:** AN OVERHEAD VIEW OF DESIGN 1

Therefore, we recommend a constructible interactive model for each of the architectural sites. A possible limitation to this design is that the owner of the featured building or tribal council of the pueblo where the architectural site is located may not wish for all of the building's aspects to be accessed by the public through a museum exhibit. They may want to keep some of their building's documentation exclusive to their pueblo. An alternative to having a complete 3D model, or not having the model featured in the exhibit at all, is that certain architectural elements such as the murals could be colorless and texture-less, hiding details.

Other limitations involving digital interactives are usually related to power and software not being up to date. In case the touch table becomes inoperable due to these issues, a solution would be to include additional physical information. We suggest that the exhibit include

correlating background information and stories about the sites and the architectural elements that can be on the wall behind the models.

### 4.3 Design 2: Interactive Theater with Full Size Models



**FIGURE 32: MODEL OF DESIGN 2, USING A THEATER AND FULL SCALE MODELS**

Our second potential digital interactive exhibit design, seen in Figure 32 and Figure 33, is meant to immerse the visitor in the architecture, combining full size models with a more traditional museum theater experience. The layout from Design 1 would be maintained, however 6 full scale models featuring an important architectural element from each site would form a circle around the central seating. In front of each model, a smaller 3D model of the entire site would give visitors a context about the display they are looking at. Guests would enter the theater space and be met with a small, tablet-sized touch screen showing a map of the region with the locations of the architectural sites highlighted. The visitor would select a site, activating a light that would illuminate the display corresponding to their selected site and causing a video containing more information about the site to play. This design allows the guest freedom to choose which site they want to inquire about, while also giving the curatorial team the ability to craft a narrative for the videos to display. IPCC has used interactive theater displays in the past, and their maintenance team is skilled in multiple construction techniques, including adobe. As such we believe its implementation would be very feasible once materials were secured.





**FIGURE 33: AN OVERHEAD VIEW OF DESIGN 2**

The design of this display was closely informed by our research. When asked what they would like to see in an exhibit on contemporary Pueblo architecture, 20% of museum guests specified an interest in either life size models or physical displays of the building materials used, constructed from real materials. This design addresses both requests while also incorporating a full model of each site which was also frequently requested. Of course, contemporary Pueblo architecture is far more than a collection of materials. It is also necessary for people to understand the cultures, beliefs, and lifestyles the drove the design decisions they are observing in the models. The film would elaborate on the architectural elements, including how they were built, why they were included, and what they are for. This can provide a more complete understanding of each site than either technique could alone. Additionally, this exhibit design is highly approachable for all audiences. After the initial interaction, it becomes a passive experience. If properly implemented, this design may significantly increase viewer retention time. If a visitor enjoyed the presentation on the first site, they are likely to go on to learn about more buildings. We are confident that this design would prove to be a major attraction for IPCC.

IPCC curator Rachel Moore and exhibit designer Leo Vicenti brought up a consideration regarding visitor flow when we discussed our designs. With only one large screen presenting media, only one site can be featured at a time. Our solution is to break the exhibit up into separate modules, each consisting of a wall element, smaller model, and an iPad. Each module will have information on one site. With this set up, a visitor can interact with a module and access information without waiting on other visitors. The iPads will display all information the larger screen would have, but at a smaller scale. Three modules for three sites can be see below in Figure 34.



**FIGURE 34:** MODEL OF DESIGN 2 CONSIDERATION

## Chapter 5: Conclusions

We suggested two exhibit designs for Dr. Jojola and the iArchitecture team for use in their exhibit on contemporary indigenous architecture. Our first recommendation is to develop an exhibit based around 3D printed models of the architectural sites. This interactive exhibit plan features physical 3D models associated with information and stories presented through a touch table and as physical text and images. Another recommendation is a plan for the exhibit that features an interactive theater experience with life sized models of unique elements from the sites.

While working towards making exhibit design drafts our team gathered important information in the fields of exhibit design, contemporary indigenous architecture, and interactive multimedia. Through our exhibit designer interviews, we learned the timeline and process of exhibit design, as well as what elements work and what do not, in an interactive, multimedia exhibit. In our site visits and interviews with points-of-contact at the sites, the most important take away was that community involvement in design and planning on indigenous lands results in architecture that reflects the community and its priorities. Finally, we identified the most relevant and applicable interactive media platforms

The purpose of this project was to provide the iArchitecture team from the University of New Mexico's Indigenous Design + Planning Institute with valuable information to contribute to the 2020 exhibit. We hope our recommendations and data collection will be used to influence the final designs of the exhibit. We also completed the project with the intention that our work will contribute to informing architects building on indigenous lands. We hope that iD+Pi will reference the information we gathered as a reference in later classes or projects. This includes our many interviews, standardized interviews, research, and photo documentation. Our research into exhibit design may be useful in work on museum exhibits on indigenous architecture beyond the iArchitecture exhibit.

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# Appendix A: Exhibit Observation Inventory

Name of Observer:

Date of Visit:

Name of Museum:

Name/Theme of Exhibit:

1. Installation context (what is it that ties this certain group of material together):

*If permission is granted by the museum, take a picture of the exhibit and installation.*

2. Observer description of installation (independent of visitors):
3. Number of users in each age category in a 15-minute observation period:

Children (<18)	Adults (18+)

4. Briefly describe how users are able to interact:
5. Observe 5-7 users and record the amount of time (min.) each user spends interacting with the feature. Include your opinion on the user's expression/demeanor after interaction.

	User 1	User 2	User 3	User 4	User 5	User 6	User 7
Time							
Demeanor							

6. Is the interactive element digital? Y / N
7. If the element is digital, does it...
  - a. Make noise/play sounds? Y / N
  - b. Use a projector? Y / N
    - i. If yes, please state what it is projecting onto:
  - c. Use an LED (or similar) screen? Y / N
  - d. Feature languages other than English? Y / N
    - i. If yes, please list them here:
  - e. Feature a timeline? Y / N
  - f. Invite visitors to use mobile devices? Y / N

*If permission is granted by museum, take a picture of the digital element*

8. Draw and label a layout of the exhibit plan. If possible, depict the flow of visitors through the exhibit using arrows.
9. Do a drawing of the interactive feature, include dimensions (to nearest 1/2 foot).
10. Other Important Information (information about system from museum employee, if anything is broken/non-functioning, etc.):

## Appendix B: Observational Survey Analysis Spreadsheet

Museum	Exhibit/Feature	Digital?	Interactive	Multiple Users	How is it interactive?	Content Type
AM	Only in Albuquerque	Analog	Interactive	Technically	Building blocks	N/A
AM	Only in Albuquerque	Digital	Interactive	Yes	Using touchscreen, answer survey	survey data, text
IPCC	Long Ago	Digital	Interactive	Yes	Touchscreen table	Photos, text
IPCC	Permanent Exhibit	Digital	Interactive	No	Select Pueblo on touchscreen, audio plays	Audio, Map of Area, text
IPCC	Permanent Exhibit	Analog	Interactive	Technically	Building blocks	N/A
IPCC	Permanent Exhibit	Analog	Interactive	Technically	To-scale model, can touch, printed info to read	N/A
NMHM	Tell Us Your Story	Digital	Interactive	Technically	Using touchscreen, record video answer to prompt	Video recording
NMHM	The Northern Fronteir	Analog	Interactive	Yes	Touch fur	N/A
NMHM	Telling New Mexico: Stories from Then and Now	Analog	Interactive	No	Handheld phone, dial for audio recording	Audio
NMHM	Telling New Mexico: Stories from Then and Now	Analog	Interactive	No	Handheld phone, press button on table for audio recording	Audio
NMMNHS	Timetracks	Analog	Interactive	Yes	To-scale model, can touch, printed info to read	N/A
NMMNHS	Wild Music	Digital	Interactive	No	Individual listening device	Audio
AM	Art Quilt	Digital	Interactive	No	Using touchscreen, make "quilt"	Paintings
MIAC	Here, Now, and Always	Analog	Interactive	Yes - 2	Individual listening device	Audio
NMHM	Share Your Story	Digital	Interactive	No	Using iPad, record your story	Audio
NMHM	The Northern Frontier	Digital	Interactive	No	Touchscreen, learn more about select photos	Photos, text
NMHM	The Northern Frontier	Analog	Interactive	Technically	"Button" on wall you press	Audio
NMHM	Voices of Counter-Culture	Analog	Interactive	Technically	Book visitors flip thru	Historic Photos

## Appendix C: One-on-one Exhibit Designer Interview

We are a team of students from Worcester Polytechnic Institute in Massachusetts. We are conducting interviews with various exhibit designers to learn more about their experiences designing exhibits. This is a collaborative project with the University of New Mexico's Indigenous Design and Planning Institute. Our goal is to gather a better understanding of what goes into the planning of an exhibit and your insights will be extremely useful. Your participation in this interview is voluntary and you may opt out at any time. If you would like, we would be happy to include your comments as anonymous. If interested, a copy of our results can be provided at the conclusion of the study.

*\*In the event that the interview is running over an hour, only ask questions that have an asterisk.*

Name of Interviewer:

Date and Type of Interview:

Name of Museum:

Name of Interviewee:

1. \*Do you decide content or layout first? Where in the design process do you work in interactive elements?
2. How do you balance designing for different audiences?
3. When designing, what are some of the greatest constraints/challenges to overcome (budget, space, other)?
4. Do you have much experience with designing narrative exhibits? If yes, when you're trying to design a narrative exhibit, how do you balance guiding the visitor through the exhibit while letting them have their own experience?
5. \*How do you decide what components of an exhibit should be emphasized? How do you emphasize those components?
6. \*What is your opinion on digital interactives in an exhibit?
7. In your experience, what exhibit components are typically most durable? Interactive or not, digital or analog - any components that are least likely to malfunction or need extensive maintenance.
8. \*What types of interactives typically work well together in an exhibit? Which don't?
9. Do you have any suggestions for additional resources that we could reference or refer to?

## Appendix D: Standardized Interviews with Museum Visitors

Hi, I'm \_\_\_\_\_ and we're students conducting some short visitor surveys for a project with UNM. As such, this survey is being conducted independently of (Museum Name) but with their approval. Could you spare 2-3 minutes to answer some questions related to your experience at this museum and our project? (pause for response) Thank you very much for your participation.

Museum:

Interviewer:

*Visitor information based on survey conductor's observations - do not ask the visitor these questions.*

How old does this person appear?

>18	18-25	26-35	36-49	50-65	65+
-----	-------	-------	-------	-------	-----

What does their gender appear to be?

Female	Male	Other
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*Standardized interview with museum visitors - ask the visitor these questions*

1. Did you use any of the technology or hands-on activities in the gallery? **Y / N**
2. Did you prefer the digital interactives or the analog/non-digital interactives? **Digital/Analog**
3. Did the interactive aspects of the exhibition enhance or take away from your experience?  
How so?
4. What digital or interactive features in the exhibit did you find the most engaging?
5. Was there anything in the exhibit that you found frustrating, unclear, or otherwise disliked?

These final three questions relate to our project and the exhibit that we are working on independent of this museum.

6. Would you be interested in an exhibit on Pueblo Architecture? **Y / N**
7. What would you be interested in seeing included in an exhibit on Pueblo Architecture?
8. Have you ever been to the Indian Pueblo Cultural Center? **Y / N**

## Appendix E: One-On-One Interview with Liaisons from Key Pueblos

Good \_\_\_\_\_, we are students from Massachusetts working with Ted Jojola and Michaela Shirley on the iArchitecture exhibit. Right now, we are helping gather information about the buildings that will be featured in iD+Pi's contemporary Pueblo architecture exhibit. After talking with Ted and Michaela, we decided it would be best to set up this interview so that we can make sure that the wishes and boundaries of \_\_\_\_\_ Pueblo are met and respected through the execution of this exhibit. We are grateful for your participation in this interview, but it is completely voluntary so you are welcome to opt out at any time. With your permission, we would like to record this interview for transcription purposes. If you have any questions or concerns after this interview, feel free to reach out to us.

Interviewer and Scribe:

Interviewee:

Date of Interview:

Pueblo/Site Represented:

1. Can you tell us a little bit about the building? When it was built, what it was built for, etc.
2. *(If not satisfied with the answer to 1, then ask this question)* Does the community have any stories pertaining to the building?
3. How is this building significant to \_\_\_\_\_ Pueblo?
4. What do you want people to know about this building?
5. *(If 3 has no mention of cultural importance, then ask this question)* Is there anything people need to understand about the building culturally?
6. In your opinion, what is the most important element or feature of the building's architecture?
7. How do you see this building tying different generations of your community together?
8. How do you think \_\_\_\_\_ Pueblo will benefit by having this building documented?
9. *(If 8 has no mention of how their culture can benefit, then ask this question)* How do you think \_\_\_\_\_ Pueblo's culture will benefit from having this building documented?
10. What impact do you want this building to have by being included in the exhibit?
11. Do you have any concerns about the exhibit?

## Appendix F: Standardized Visitor Survey Analysis Spreadsheet

POOLED													
Age	Male	Female	Other	Interactives __ to the exhibit			Interactive Preference			Exhibit on Pueblo Arch		Been to IPCC	
				Added to	Took Away	Other/NR	Analog	Digital	Both	Interested	Not Interested	Yes	No
<18	13	10	0	22	0	1	17	5	1	19	4	6	17
18-25	3	7	1	4	0	7	7	4	0	11	0	2	9
26-35	5	5	0	5	0	3	8	1	1	7	3	2	8
36-49	6	5	0	10	1	7	9	5	4	17	1	11	7
50-65	8	12	0	2	0	18	15	4	1	15	5	5	15
65+	7	13	0	8	1	11	7	9	4	15	5	10	10
MUSEUM OF INTERNATIONAL FOLK ART													
Age	Male	Female	Other	Interactives __ to the exhibit			Interactive Preference			Exhibit on Pueblo Arch		Been to IPCC	
				Added to	Took Away	Other/NR	Analog	Digital	Both	Interested	Not Interested	Yes	No
<18	5	5	0	10	0	0	10	0	0	9	1	1	9
18-25	0	1	1	0	0	2	2	0	0	2	0	0	2
26-35	3	4	0	5	0	2	6	1	0	4	3	2	5
36-49	3	5	0	3	0	5	4	3	1	7	1	4	4
50-65	7	9	0	1	0	15	12	3	1	11	5	4	12
65+	5	4	0	3	0	6	5	2	2	6	3	3	6
ALBUQUERQUE MUSEUM													
Age	Male	Female	Other	Interactives __ to the exhibit			Interactive Preference			Exhibit on Pueblo Arch		Been to IPCC	
				Added to	Took Away	Other/NR	Analog	Digital	Both	Interested	Not Interested	Yes	No
<18	8	5	0	12	0	1	7	5	1	10	3	5	8
18-25	3	6	0	4	0	5	5	4	0	9	0	2	7
26-35	2	1	0	2	0	1	2	0	1	3	0	0	3
36-49	3	7	0	7	1	2	5	2	3	10	0	7	3
50-65	1	3	0	1	0	3	3	1	0	4	0	1	3
65+	2	9	0	5	1	5	2	7	2	9	2	7	4



## Appendix G: One-On-One Interview with Rachel Moore

1. What role will your design team be playing in the process?
2. What design decisions should be made by ID+PI? What design decisions will be made yourself? *We are trying to get an understanding of our role in the project and what work we can accomplish without stepping on your toes.*
3. Ask for dimensions of the space that the exhibit will be in.
4. What experience do you have working with digital or digitally interactive exhibits in the past?
5. Are you currently doing any work regarding this exhibit? If so, can you briefly explain what you've accomplished?
6. Given that the exhibit is slated for 2020, what milestones do you expect to hit/complete when? Let's assume this is in the ideal scenario.

## Appendix H: One-On-One Interview with Jamie Blosser

1. Were you involved on the Tsigo Bugeh Village project?
2. What steps were taken to make it representative of Ohkay Owingeh's unique culture while incorporating contemporary building practices?
3. What kinds of traditional practices were taken into account during its creation?
4. What was the community's involvement in the process?