Evaluating Visitor Experience in the Citi Money Gallery at the British Museum

An Interactive Qualifying Project Report to the Faculty of the Worcester Polytechnic Institute, in partial fulfillment of the Bachelor of Science degree in cooperation with the Coins and Medals Department at the British Museum

Submitted by:

Alyssa Corini

Zeng Liu

William Moore

Scott Osborn

Project Advisors:

Professor Zhikun Hou

Professor Wesley Mott

Sponsors:

Thomas Hockenhull

Benjamin Alsop

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Abstract

The British Museum's Citi Money Gallery underwent renovations in 2012. Using visitor tracking, questionnaires, and visitor counting, our study evaluates the effect of the changes on the visitor experience. iPads and foreign language questionnaires streamlined our sampling process and increased the size and demographics of the sample population, allowing for a substantially better understanding of visitor experience. Increased visitor engagement and satisfaction indicates that the renovations were effective.

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Authorship

Section	Writer(s)	Editor(s)
Chapter 1: Introduction	Zeng Liu, William Moore	Alyssa Corini, Scott Osborn
Chapter 2: Background	Scott Osborn	William Moore
2.1 The British Museum	Alyssa Corini, William Moore, Scott Osborn	Scott Osborn
2.2 The Department of Coins and Medals and The Citi Money Gallery	Alyssa Corini	Scott Osborn
2.3 Visitor Characteristics	Alyssa Corini	Alyssa Corini, Zeng Liu, Scott Osborn
2.4 Museum Gallery and Display Characteristics	Zeng Liu, William Moore	Alyssa Corini, Zeng Liu, William Moore
2.5 Summary	Zeng Liu, Scott Osborn	Alyssa Corini, Scott Osborn
Chapter 3: Methods	All	All
3.1 Pre-Testing Procedures	Alyssa Corini, Scott Osborn	William Moore, Scott Osborn
3.2 Tracking Visitors	Alyssa Corini, Scott Osborn	All
3.3 Questionnaires	Alyssa Corini, Zeng Liu, William Moore	All
3.4 Visitor Counting	Scott Osborn	Alyssa Corini, William Moore
3.5 Data Analysis and Comparisons	Alyssa Corini	Scott Osborn
Chapter 4: Findings and Analysis	Alyssa Corini	William Moore
4.1 Bias	William Moore	Scott Osborn
4.2 Visitor Counting Analysis	Zeng Liu	Scott Osborn
4.3 Visitor Demographic Analysis	Zeng Liu	Scott Osborn
4.4 Visitor Classification	Alyssa Corini	Scott Osborn
4.5 Tracking Analysis	Scott Osborn	William Moore
4.6 Heat Maps	William Moore	Scott Osborn
4.7 Name Recognition	Alyssa Corini	Scott Osborn
Chapter 5: Conclusion and Recommendations	William Moore	Alyssa Corini, Scott Osborn

Table of Contents

List of Figures

List of Tables

Chapter 1: Introduction

The British Museum, established in 1753 as the first national public museum, is "Britain's most popular attraction," according to the newspaper the *Telegraph* (Kim, 2013). In 2012, the British Museum welcomed 5.8 million visitors from around the world. To ensure that it maintains its position as one of the most visited sites in London, the British Museum strives to improve its overall goal of educating visitors by constantly renovating its exhibits and evaluating the effectiveness of the changes made.

In 2012 the Department of Coins and Medals (DCM) renovated its main gallery to help improve the visitor experience and ease of travel through the space. The DCM houses one of the world's finest numismatic collections, containing almost a million objects. Its collection spans the history of coinage, from the earliest use for trade and exchange to the latest developments in digital technology. Approximately 1,500 coins, medals, banknotes and other objects are displayed in Gallery 68, The Citi Money Gallery.

The most recent renovations to the DCM main gallery took into account results of a 2010 study examining visitor satisfaction and movement through the gallery. With a specific focus on display case 10 (see Appendix A) the study revealed that placing unique and interesting objects in the middle of the gallery helped reduce the number of visitors who walkthroughs the gallery without stopping at any cases. An additional survey on visitor satisfaction was conducted in the summer of 2012, a time when the museum was experiencing low visitation rates because of the Summer Olympics. While the study suggested that the renovations were overall effective in improving the visitor experience, limited data was collected from foreign, non-English speaking visitors. As such, the British Museum wanted to reevaluate the effects of the gallery renovations.

The goal of this project was to assist the DCM in the British Museum to evaluate the effectiveness of the renovations made to the Citi Money Gallery in 2012 to enhance the visitor experience. We employed the same strategies from the 2010 study including visitor tracking and linked questionnaires. Our project provided more analysis on the changes made, while making our target subjects more representative of the British Museum's typical visitor population. This was achieved by translating the questionnaire into several languages and using tablets, such as an Apple iPad, to increase the ease of conducting questionnaires. We provide the department with useful insight on their gallery improvements and the impact of these renovations on creating a better visitor experience.

Chapter 2: Background

The British economy is largely dependent on tourism. According to a report published in *Caterer & Hotelkeeper* (2012), in 2010 alone, nearly 30 million people visited the nation, contributing 115 billion pounds to the British market. The tourism industry accounts for close to 10% of the national economy. Although tourists come from a multitude of countries each year, the majority of travelers are from the United States, France and Germany. As a result, many non-English speakers visit Britain's major attractions. In addition to the steady growth of British tourism over the past decade, many major events such as the Royal Wedding and the Queen's Diamond Jubilee provided an additional boost. These events helped combat the country's economic recession that began in 2008 (Caterer & Hotelkeeper, 2012).

A large part of Britain's tourist appeal comes from its long history and impact as an empire. The most visited attractions include properties own by the British Crown, such as Buckingham Palace, Westminster Abbey, and the British Museum. Today, the British Museum is the United Kingdom's most popular visitor attractions with nearly six million visitors a year (BBC, 2013). As the most visited tourist attraction in all of the United Kingdom (Caterer & Hotelkeeper, 2012), it is vital that the British Museum investigate ways to ensure that it maintains its large number of visitors.

2.1 The British Museum

For the last 260 years, the British Museum has housed important collections of artifacts from around the British Empire and the globe. The British Museum was founded under the principles of making its collections accessible to the public and displaying its collections to the greatest number of people possible (British Museum, 2013). It constantly works to improve its overall goal of providing education both nationally and internationally by renovating its exhibits and surveying the effectiveness of the changes made (British Museum, 2013).

Founded in 1753 via an Act of Parliament, the British Museum was the first national public museum in the world (British Museum, 2013). It was founded by Sir Hans Sloane when he bequeathed his collection of more than 71,000 artifacts to King George II. The collection was first displayed in a 17th-century mansion called the Montagu House. The museum was opened to

the public in 1759 and has been in continuous operation since then, with the exception of both World Wars (British Museum, 2013).

In the nineteenth century, the museum experienced a period of growth, both in the number of exhibits and in the prominence of the artifacts housed. During this time, the British Museum obtained some of its more illustrious pieces including the Rosetta Stone (acquired in 1802) and the Parthenon Sculptures (acquired in 1816). The museum also built additions such as Quadrangle Building in 1852 and the Reading Room in 1857. This period of growth also showcased a large increase in visitor numbers to the museum, with attendance of around 5,000 people per year (2013). In 2012, the British Museum welcomed nearly six million visitors, which shows its continuous impressive growth.

Today, the British Museum is located on Great Russell Street in London. Throughout the 20th century the museum has undergone additional expansions, including the Duveen gallery, which house the Parthenon Sculptures. In addition, existing exhibits and buildings were restored. Some of the more recent developments include the museum's restoration of the King's Library in 2003, and the renovation of Department of Coins and Medals' permanent exhibit in 2012 (British Museum, 2013).

The British Museum comprises ten different divisions: Africa, Oceania, and the Americas; Ancient Egypt and Sudan; Asia; Coins and Medals; Conservation and Scientific Research; Greece and Rome; Middle East; Portable Antiquities and Treasure; Prehistory and Europe; and Prints and Drawings. These divisions are organized by location or subject, allowing visitors to easily follow the chronology of a specific culture. Some departments focus less on a geographic region and more on a common trend throughout history. One such department is Coins and Medals.

2.2 The Department of Coins and Medals and the Citi Money Gallery

The Department of Coins and Medals' mission is to display an array of coins and related materials from over thousands of years and to explain their significance and differences (British Museum, 2013). As one of the largest departments in the British Museum, it houses over one million objects from around the globe. The department developed from a collection of 20,000 coins and medals from Sir Hans Sloane's initial donation. There are a variety of displays, from the world's first coin to forged currency. The department also has about 50,000 specimens of paper money (British Museum, 2013). The Citi Money Gallery is contained within the

Department of Coins and Medals. This gallery is a popular exhibit in the museum, attracting a wide variety of visitors from many different countries.

In 2012, the gallery changed its sponsors, entering into a five-year contract with Citi Bank, resulting in substantial renovation (British Museum, 2013). The museum used existing visitor tracking data to optimize the new layout of the gallery (Eagleton, 2012). Given the location of the main display gallery of the Citi Money Gallery, many visitors traverse the gallery en route to the Greek collection. As a result, many people walkthrough, but not all are necessarily interested in the contents of the room. This problem has added difficulty to the museum's attempts to gauge the effectiveness of the displays. In addition, the content in each display case was updated, taking into account information gathered from visitor questionnaires (Eagleton, 2012). The objective of our project is to conduct similar evaluations on the gallery now that the renovations are complete, which will be described later on. It is important to reassess the gallery using similar methods as before, so that reliable conclusions can be drawn about the effectiveness of the renovations.

2.3 Visitor Characteristics

2.3.1 Visitor Demographics

The British Museum continues to welcome people from around the world. Surveys conducted by Worcester Polytechnic Institute (WPI) students in 2010 revealed that approximately two-thirds of visitors to the Department of Coins and Medals were not from the United Kingdom (Peterson, Lybarger, & Clinckemaillie, 2010). The results also revealed that half of the guests willing to complete the survey did not speak English (Peterson et al., 2010).

Visitors also vary in age, from young school children to adults, and knowledge base. Research conducted by the National Endowment for the Arts indicated that a large portion of museum goers had education beyond secondary school (Coffee, 2007). Finally, recent events, including the Olympics and the Queen's Diamond Jubilee, have drawn a different type of visitor to London as compared to previous years. Since guests have different education levels, speak different languages, and visit the museum for different reasons, museum curators must develop ways to attract and engage with a variety of people. The collection of visitor demographic information is valuable for museums as a way of adjusting their displays to address the interests and learning capacities of their visitors.

2.3.2 Visitor Intentions

Despite the varied backgrounds of museum visitors, there are common reasons for their visits. Coffee states, "school groups come to the museum as part of a structured learning experience" (Coffee, 2007). Non-school groups may visit for a social experience instead, notes Coffee: "Not only do many visitors come to the museum in pairs or as part of a small group, but they also continue their visit as a shared experience with at least some members of their group" (Coffee, 2007). As museum-goers move through the exhibits they offer their own opinions and thoughts to the members of their group. Museums exhibits are meant to spark conversation and ideas between guests thus serving an altered role as an "educator" that is visitor-led rather than museum-led (Chen & Sheng, 2012).

In addition to distinct intentions, museum visitors also differ in their engagement with the museum displays and collections. Morris Hargreaves McIntyre, a British consulting firm specializing in research and evaluations in museums, separates visitors into four different categories based on their engagement in museum collections (Morris, Hargreaves, & McIntyre, 2005). They called this categorization of museum visitors the "Hierarchy of Visitor Engagement" (Morris et al., 2005), which includes the categories of spiritual, emotional, intellectual, and social. Visitors engaging with collections on a spiritual level use displays and exhibits to escape and envelop themselves in something outside their daily activities. Emotional visitors use museums to spark their interests and inspire curiosity. These types of visitors are necessary to the museum because they are the ones who spend hours in just one exhibit and return frequently. Intellectual visitors will go to exhibitions for academic purposes and they intend to expand their personal knowledge. Intellectuals challenge themselves and look to museums for answers to their questions. Social type visitors visit museums to interact with workers, displays and other visitors; they do not necessarily go to a museum for academic purposes, but rather for a shared experience (Morris et al., 2005). These distinct types of museum visitors suggest that museums must accommodate both diverse learners and different types of engagement levels.

Museum visitors have also been classified based on how they travel through an exhibit and their consumption of knowledge, termed as the "Hierarchy of Meaning Making" (Morris et al., 2005). Based on the "Hierarchy of Meaning Making," visitors are categorized as browsers, followers, searchers, and researchers. According to Morris and colleagues (Morris et al., 2005), a

browser is a visitor who goes through a museum selecting the cases and displays that spark their interest. When browsers pick a case that appeals to them personally, they will read the description to fully understand the object on display. Followers usually take a route that has been predetermined for visitors by the museum curators. The searcher visitor will come to a museum to absorb all the knowledge on a specific subject. Researchers having a depth of knowledge already visit museums to acquire additional expert information (Morris et al., 2005). Many museums use "Hierarchy of Visitor Engagement" and "Hierarchy of Meaning Making" to evaluate what types of visitors are touring their museum (Morris et al., 2005). These two different classification systems also allow museums to identify what captures a visitor's eye and attention, and modify their displays accordingly.

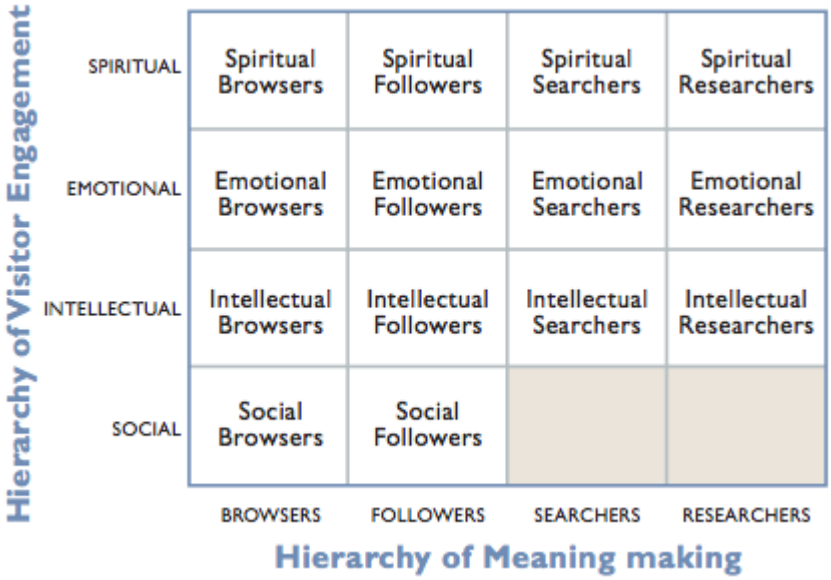

Figure 1: Impact Climbing Frame (Morris et al., 2005)

The "Hierarchy of Meaning Making" and "The Hierarchy of Visitor Engagement" can be combined to manipulate the way a visitor interacts with exhibits in addition to their objectives for visiting the museum. Figure 1 displays the different combinations. Certain combinations are unlikely to appear. For example, the social visitor is only likely to be integrated with the browser and follower, as these visitors probably do not have the educational capacity or intellectual depth to be classified as searchers and researches. Searchers and researchers are types of people who engage with the displays that attract and interest them. By contrast, social visitors feed off other guests' opinions and outlooks on items, looking at a variety of displays rather than any particular

displays. Observations of how a visitor travels through a museum reveal the category of "Meaning Making" and "Engagement" they fit into.

2.4 Museum Gallery and Display Characteristics

In addition to assessing types of visitors, researchers have measured the impact of different types of displays on visitors. Display cases that get in the way or block the flow of traffic are undesirable for museum exhibits (Raloff, 1998). Also, complex instructions or interactive displays that are too complicated to comprehend turn visitors away (Raloff, 1998). Consequently, in evaluating the visitor experience, assessment of physical display layouts, as well as descriptions on items and instructions for how to traverse the collection, are key.

The British Museum worked on improving their exhibition process and exhibition effectiveness of Citi Money Gallery during their recent renovation. They created a path of twelve "key objects" for visitors to follow (Bright, 2011). The idea was that these would serve as an overview of the gallery's major themes. The objects can also showcase some of the quality of the exhibit. These key objects allow a visitor either to follow the objects in chronological order or to skip between them and still leave feeling she has a good idea of the objects in the gallery. In addition, during the renovations, the curators of the gallery set up cases in such a way as to entice the visitors while the text provided information and kept visitors interested in the display. This method takes advantage of iconic or flashy objects to draw in the visitors (Eagleton, 2012). Our evaluation will mainly be directed towards these changes previously mentioned.

Finally, case content must be assessed carefully to ensure that it is both physically appealing and informative to all types of museum visitors. The study conducted by WPI students in 2010 determined that the majority of people tend not to have prior knowledge of the exhibit content of coins and medals. The gallery tends to attract primarily browsers and followers with fewer searchers or researchers (Peterson et al., 2010). This favors an exhibit that, while offering substantial information, appeals to a person who is less knowledgeable of the specific subject area. Our project will determine if the renovations succeed in attracting browser – and follower – type visitors and offer an interesting and engaging experience.

2.5 Summary

To evaluate the success of the renovations in attracting particular types of visitors and providing both an entertaining and educational value, we will examine some of the factors that affect the quality of the visitor experience. These factors will include: visitor experience quality; educational value of exhibit; scope and quality of the collection displayed; quality of the exhibition, which are adapted from *Metrics of Success in Art Museums* (Anderson, 2004). The quality of visitors' experience can be defined as their personal response to the collection and how much information is retained from looking at the exhibit. The museum can be seen as serving its educational mandate by keeping track of the number of schoolchildren visiting, as well as the amount of visitors that can articulate the exhibit's core mission and the quantity of visitors that plan on revisiting. Scope and quality of collections can be calculated by the number of items that were lent to other institutions and the number of items on display. Quality of the exhibition can be measured as the number of overall visitors and the highlight of ten or more artifacts in the permanent collection. The management of priorities, achievements, and the percentage of goals the museum accomplished from the most recent plan in relation to its forecast plan, are also components of measuring the overall quality of the exhibition and will be used to measure effectiveness of the renovation conducted in 2012.

Chapter 3: Methodology

The goal of this project was to assist the Department of Coins and Medals in the British Museum to determine the effectiveness of the renovations made to the Citi Money Gallery to enhance the visitor experience and to estimate the number of visitors that travel through the gallery. We aim to accomplish this by:

- Tracking visitors as they travel through the Citi Money Gallery.
- Identifying visitors' self-reported experiences with the Citi Money Gallery.
- Estimating the number of museum visitors that flow through the Citi Money Gallery.
- Analyzing data collected and drawing correlations between the questionnaires and tracking surveys, in addition to comparing results to previous projects.

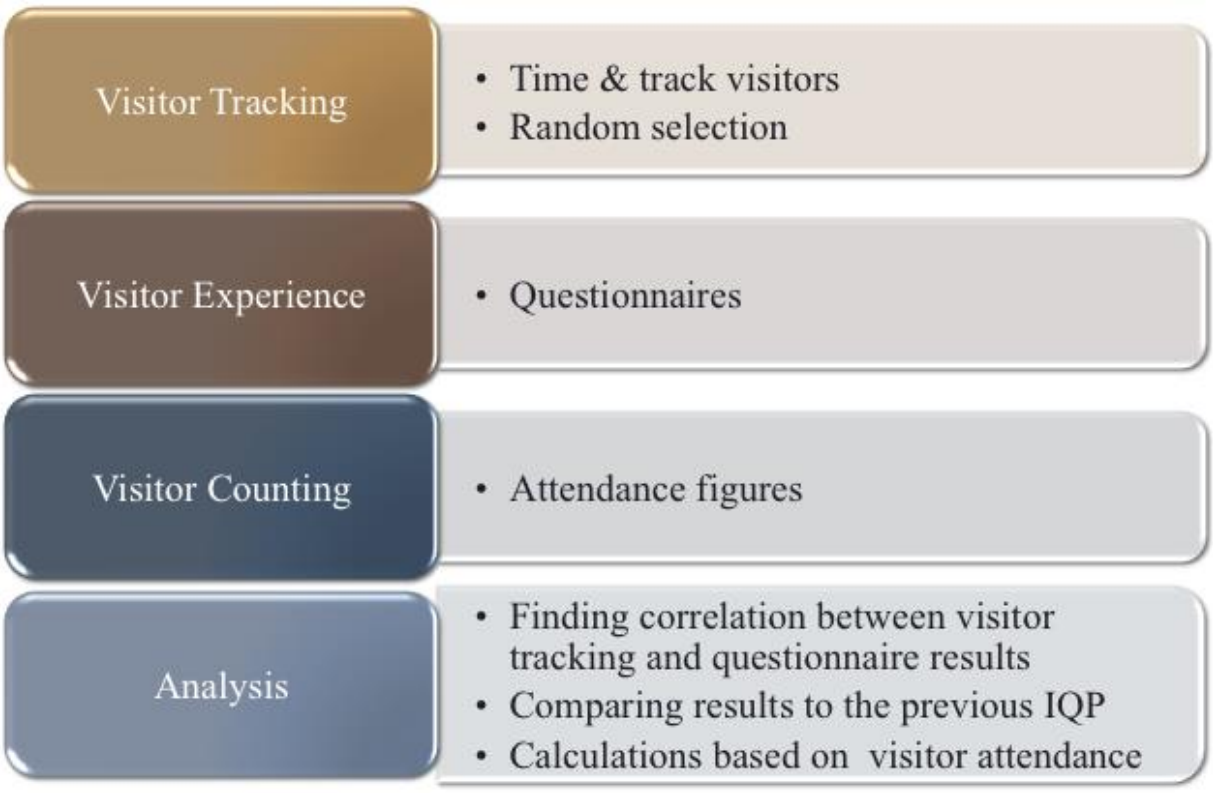

Figure 2: Project objectives with associated methods

In order to evaluate and possibly improve an exhibit, current success must first be assessed. There are used multiple measures used to define success, ranging from easily measurable quantities such as attendance numbers, to more abstract ideas, such as the visitors ability to connect emotionally or spiritually with the exhibits. Some of these measures, such as

are number of artifacts lent to other museums and assessing the visitor's knowledge retention while in the exhibit, were out of the scope of this project. Instead, we focused on assessing attendance, visitor engagement, social interaction, and emotional response to the gallery. Success was measured by the amount of positive feedback about the gallery and its different features, amount of time visitors spend at each case and percentage of people who are engaged in the exhibit. In addition, the success of the renovation is assessed by the increase of these results over the one reported in the 2010 study. Educational value is commonly connected to an exhibit's impact on its audience (Dean, 1996), allowing us to draw broader conclusions about the gallery without having to test every aspect of success.

3.1 Pre-Testing Procedures

In order to ensure that the data collection process ran smoothly, the questionnaires and tracking methodology needed to be tested. This process focused on ensuring that the application running the questionnaire worked correctly every time and on allowing the trackers to practice, helping ensure consistent results. This pre testing also included running mock trackings, not worrying about the randomization of visitors, but selecting visitors that would provide the best practice to track. In addition, questionnaires were not only given to people tracked, but also people who seemed likely to take it as well as those who seemed likely to reject the offer. This gave the people giving questionnaires a chance to practice approaching complete strangers. The final part of testing the methodology involved counting visitors for varying amounts of time. The idea behind this was to see for how long visitors needed to be counted to be able to estimate the number of people who walked through the door in one hour. From all of the pre-testing, the minor flaws in the methodology were fixed and the testing procedure was finalized.

3.2 Tracking Visitors

Using visitor tracking, we were able to assess the paths taken through the gallery and observed the breakdown of time spent observing specific displays in the gallery. Tracking visitors provided quantitative data to help understand visitors' engagement in the exhibit. Many techniques for tracking visitors in the museum were out of the scope of this project. The British Museum did not allow us to use methods such as monitoring visitors' actions on video because of its impact on visitor privacy and the difficulty of obtaining the right to monitor guests. Nor

was software such as Noldus Observer used, because of the high licensing costs. Because of these concerns, using pencil and paper to record trackings sufficed.

To achieve a large enough sample size to compare to the previous project's visitor observations, a sample of three hundred and twenty eight individuals, chosen at random were tracked. The frequency of which visitors were tracked was based on the pretesting data, in which it was determined that every fifth visitor was suitable for our observations. This number was chosen because it allowed enough time for the next tracking sheet to be set up, while not taking so long that there was time wasted waiting for visitors enough visitors to walk through the door. The need for a set number of people to walk through the door prevents the person tracking to purposely biasing whom they choose to track. The next subject was chosen after the previous track and questionnaire had finished. Each visitor took from less than a minute to about a half hour; therefore, tracking was done for a set amount of time each day, instead of trying to obtain a specific number of tracks.

Once a visitor was selected, the tracker would start a stopwatch as the visitor crosses an imaginary line, marking the entrance to the gallery. During pretesting it was determined that the threshold of the door was not a good marking for determining if a visitor had entered the gallery, because a fair number of people would walk through the doorway, decided that the gallery did not interest them than immediately walk out, without ever getting close enough to a case to examine the contents. The stopwatch then would remain running until the visitor exited the gallery. The tracker would mark on the map from which entrance the subject entered and observe their movements, tracing their path on the small map in hand. In addition, each time the subject stopped at a case to observe the contents, one of six symbols would be recorded on the case indicating their time at the display. The six symbols included 'G' for glance; '1' for less than fifteen seconds; '2' for between fifteen and thirty seconds; '3' for between thirty and sixty; '4' indicating between sixty seconds and one hundred and twenty seconds; and '5' for over one hundred and twenty seconds. The time ranges for each symbol were determined during pretesting and observation based on how intently a visitor was looking at the objects in the case and the amount of time they spent at the case. In addition, this scale was adapted from a 2010 study. Other symbols used for subject behavior were a 'D' for discussion between visitors; a 'P' for photograph of the contents of a case; and an 'A' for a visitor who was engaged in a museum-based audio tour. This process continued until the subject left the gallery, at which time the

individual was approached with a questionnaire. The questionnaire contents will be explained in further detail in section 3.3.

For collecting visitor tracking data, a timer was used to keep track of how long the visitor spent at each case as well as the total time in the gallery. In addition, we needed multiple copies of a small gallery map (Appendix A) upon which we traced the path of each visitor. To decrease the likelihood of visitors realizing they were being tracked we used our smart phones as timers.

Many researchers believe that there is an obligation to inform visitors that observations are taking place. Some researchers think that the visitor should be notified before being observed or entering the gallery that observations will be taking place, while others believe a general announcement suffices (Yalowitz & Bronnenkant, 2009). Another way to identify that a study is taking place is by the observer wearing some form of identification, such as a specific shirt or nametag. Yalowitz and Bronnenkant (Yalowitz & Bronnenkant, 2009) suggest that if the tracking studies are to be followed by an interview, visitors should be informed at the end with an information sheet explaining the objective of the study. Given these debates, we decided to notify the visitor by directly displaying a sign at the entrances of the gallery and explaining the purpose of our study to each visitor being observed.

3.3 Questionnaires

While visitor tracking provided a baseline of visitors' behavior, the questionnaire provided insight into what they thought and felt about the exhibit. A comprehensive view of visitor engagement with the exhibit was created through the use of data from both visitor tracking and questionnaires. There were two different methods for obtaining questionnaires depending on the language of the visitor. For the English, or other languages that that could be spoken fluently, a structured interview was conducted, recording the visitor's data into the questionnaire. The non-English questionnaires were self-administered on an iPad. Even though the questionnaires were being administered in two different forms (interviewer-led and self-administered), the access to a previously untapped demographic outweighs the potential inconsistencies in the data collected.

The questionnaire used was a slightly modified version of the British Museum's questionnaire for the Citi Money Gallery (Appendix B). There was no new content added, just clarifications and rewordings to provoke better and more in-depth responses. The changes were

made based on the findings of the pre-testing as well as a few limitations in the iPad application. This questionnaire addressed three types of questions. The first type related to demographics, which provide information on the varied backgrounds of the visitors. The second type of question dealt with the general museum experience. This gives insight into the visitors' intentions and their knowledge prior to their visit. The final type of question provided a more in-depth look at the object that engaged the visitor the most, as seen in questions sixteen through nineteen in Appendix B. The purpose of these questions was to get information about the visitor's takeaway from the gallery and how closely they observed some of the contents of the cases. This provided insight into how the object that attracted their attention related to the Gallery's 12 key objects to understand if the items had more attracting power than the rest the other artifacts.

The questionnaire provided data on what visitors took away from the gallery as well as what features, such as video screens and the hands-on station, that they liked the most. The questionnaire was gear towards looking at changes made during the renovation and assessing how people were receiving them. We used an application available on iPad tablets, called Caretotell, for conducting questionnaires in order to streamline our data collection. This application easily allowed us to implement the questionnaires in several different languages.

Foreign language versions were used to increase the percentage of visitors able or willing to take the questionnaire. This was important given the high percentage of foreign visitors to the museum every year (British Museum, 2012). Past studies have noticed the limited participation of non-English speakers (Peterson et al., 2010). This addition provided information from a broader and more representative sample of the gallery visitors. The questionnaire was translated into French, German, and Chinese.

The sampling of the questionnaires was linked to the visitor tracking component of the project. Once a visitor was tracked, they were asked to complete an exit questionnaire. The previous studies showed that a percentage of the visitors tracked would not be willing to complete the questionnaire; therefore, the total number of completed questionnaires may be fewer than the number of visitors tracked. For ethical considerations, all questionnaires were conducted anonymously and with the consent of the subject. We provided a scripted information sheet was provided to inform the visitor of the project and their role in the research. If the visitor

did not wish to participate, or chose to withdraw their participation the data collected was deleted.

3.4 Visitor Counting

Methodology pertaining to estimating the total number of visitors who travel though the gallery was added at the request of the sponsor. The Department of Coins and Medals wanted to report visitor estimates to Citi Bank, but they had never been able to get a good estimate. Counting every person who walked into the gallery in a given day was not feasible, so the counting was done for 10 minutes at the end of each hour. A team of two people at each entrance into the gallery, counted every person who entered the gallery past the same line used for visitor tracking, see section 3.2. All guests old enough to walk on their own (i.e., not in a stroller) were counted, and employees were not counted. School and large tour groups were recorded in the notes column, as they tended to create large spikes in visitor numbers. These counts were taken on average five times a day to gather data throughout the entire day.

A small one day study was devised after noticing the high number of people walking through the gallery or turning around instead of entering. In this study, for a three-hour span, visitors were counted for ten minutes intervals, with five-minute breaks in between. During each count, the total number of visitors that enter the gallery was recorded, as well as the number of people who turned back after looking in the gallery and the number who just walked through without stopping. The goal of this study was to gather more information on the percentage of walkthrough as well as the percentage of people who do not stay in the gallery.

3.5 Data Analysis and Comparisons

There were two main goals for analyzing our data gathered by visitor tracking and linked exit questionnaires: (1) to obtain a complete picture of the visitor experience by combining observation data with questionnaire data; and (2) to compare collected data to the findings from studies conducted prior to the gallery renovations and during the 2012 London Olympics. These two goals allowed us to understand the intentions of the people who visit the gallery and to make judgments on the success of the renovations to the gallery.

The first part of creating a picture of the visitors was to draw correlations by comparing the visitors' thoughts about the gallery with the path they took and the amount of time they spent at each display case and in the gallery overall. In addition, each visitor was classified on the

"Hierarchy of Meaning Making" (Morris et al., 2005) using the data collected. This entailed looking at both the amount of time the visitor spent in the gallery overall, which display cases they spent the most time at, as well as their thoughts and feelings about the gallery. By making these classifications helped to tell if the gallery is tailored towards one kind of visitor or is enjoyed equally by all types.

The last aspect of comparing the tracking data to the questionnaire responses was assessing the importance of the foreign questionnaire and how those results differed from those of the English speakers. The importance was assessed be seeing how much survey response increased with the foreign additions. The foreign questionnaires were used to see if the gallery is successful for a non-English speaking audience and if non-English speakers' gallery browsing habits differ from those of the English speakers.

For comparing the results of this project to the results of studies conducted during the Olympics and before the renovations were complete, a few questions had to be addressed, such as; Have the kinds of museum visitors had changed significantly? Are their habits in the gallery different? These questions and others were addressed by comparing the assessment of the visitors on the "Hierarchy of Meaning Making" (Morris et al., 2005) to those of the 2010 studies, as well as looking at how the amount of time spent in the galleries and at specific cases changed. The second part of this cross-study comparison was to determine if the visitors' experience had changed since the renovation. The analysis of questionnaire answers and data gathered while tracking determined if the renovations had been successful in creating an engaging visitor experience.

Microsoft Access and Excel were used for data inputting and analysis. Access is widely used by researchers as a database tool; it assists in doing queries on relational data models and facilitating data analysis. Excel was mainly for statistical analysis, and creating graphical representation of the results. Excel was also used to create heat maps. Adobe Photoshop was used to produce graphs depicting visitor movements indicating which routes are being frequently taken and at which cases visitors tend to stop.

Chapter 4: Findings and Analysis

This chapter examines the data that we collected in The Citi Money Gallery. First we discuss some of the biases that we came across while doing our project. After that we talk about our results from counting the number of visitors and their demographic information. Next, the chapter assesses the classification of visitors into categories to describe the type of visitor that the Gallery sees on a daily bases. The next section, tracking analysis, finds trends in the visitors' paths. After that we discuss the attracting and holding power of cases using heat maps. Finally, our last section of findings and analysis reviews three of the questions from our questionnaire and how visitors answered these three specific questions.

4.1 Bias and Limitations

One of the important aspects when looking at data is to realize the various biases created by the methodology. While steps were taken to reduce bias as much as possible, every experiment has some amount of bias. In addition, the project does have various limitations, which can also impact the results. These need to be kept in mind when doing the data analysis. They allow for better interpretation of the results.

The most pressing concerns with the data are the lack of feedback or suggestions when answering the questionnaire. When asked about the gallery visitors were very reluctant to give suggestions or negative feedback. They would usually say the gallery is doing a good job and leave it at that. While we tried to offset this by giving examples of possible negative feedback during prompting, most people tended not to give bad feedback. This was possibly because people did not want to give negative feedback to someone taking information on behalf of the British Museum. It is also possible that people genuinely didn't have any negative feedback, although that wouldn't be a bias.

A different problem that we ran into was in implementing the foreign-language questionnaires. While the survey was available in multiple languages, we did not have any system in place to make that aware to the visitor. We were forced to approach them in English, lacking any knowledge of other languages, causing many visitors to assume that the questionnaire was only in English. This led to many people being unwilling to take the survey, creating a large boost in the number of rejections due to language.

The final bias that gets factored in was intentional. We specifically avoided certain groups, like tour groups, or anyone under the age of 18. The tour groups were avoided as they generally had a predefined path and could not generally be stopped for a questionnaire. The reason kids were avoided, is that to ask them questions generally requires parental consent, among other issues. The final people we intentionally avoided were chaperones for school groups. While the school children were looking at the cases, the chaperones were not; their attention was on the children. This also means that they were not going to be willing to answer a questionnaire, as it would distract them from the ware bouts and actions of the children. While this was an intentional bias added to the data, it still needs to be taken into consideration.

4.2 Visitor Counting Analysis

Visitor counting gives us a rough estimate of the gallery's success and preliminary observations about people's flow through the gallery. The gallery has two entrances, one to the Greek & Roman exhibition and one to the stairs. We split into 2 groups, counting people at each entrance at the same time. The counting was done for 10 minutes at the end of each hour. The figures were recorded from May 10th to May 28th.

Figure 3 shows the average amount of the people visited the gallery during a day. The numbers were calculated by multiplying the original numbers by 6. The gallery received about 300~400 people per hour taking the average from both doors. The first time period got the least counts because it was the time when the museum was just open. People started to flow in during 11:00 – 12:00. We noticed that tourists groups usually come in around 11:00, causing the big increase as shown in the graph. There is a small drop during the 13:00 – 14:00 time period, which is reasonable because it was lunchtime.

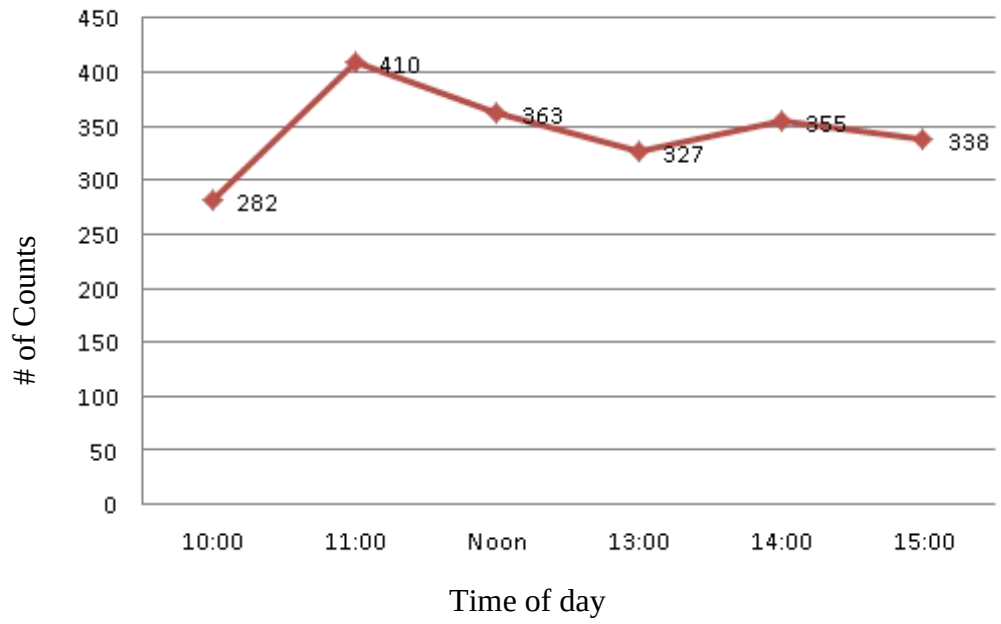

Figure 3: Average counts of visitors during different hours in a day

Figure 4 is a breakdown of Figure 3 from the two entrances of the gallery. The Greek & Roman side got a received more counts than the stairs side, indicating that more people tends to use the gallery as a hallway to get to the stairs and other galleries.

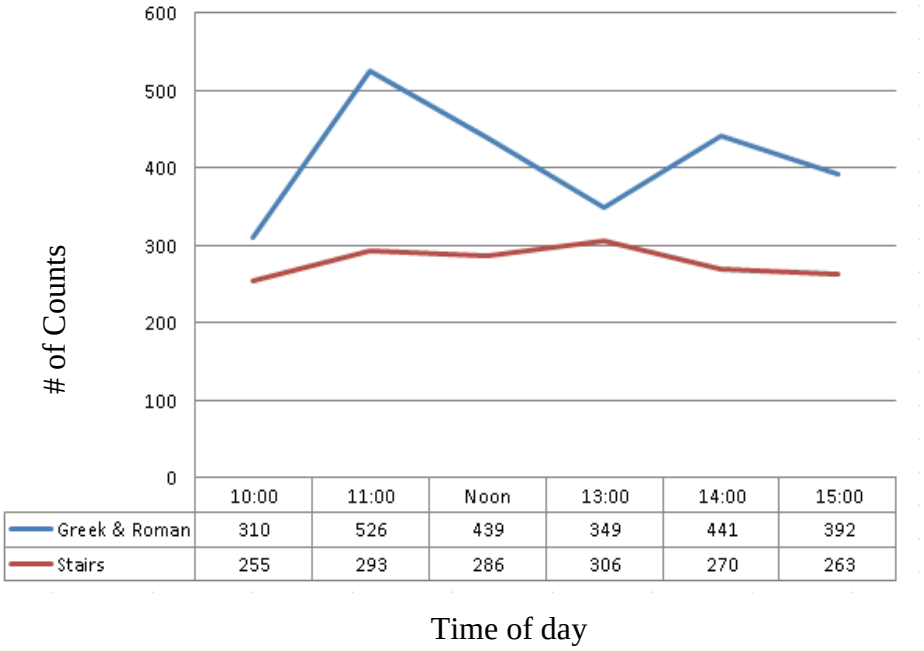

Figure 4: Counts of visitors at each entrance

Below is a graph showing the number of counts we got on each day from 10 am to 4 pm. We tended to get more people when it was rainy. The greatest number of counts took place on May 28th, which was the day after a bank holiday and had heavy rain.

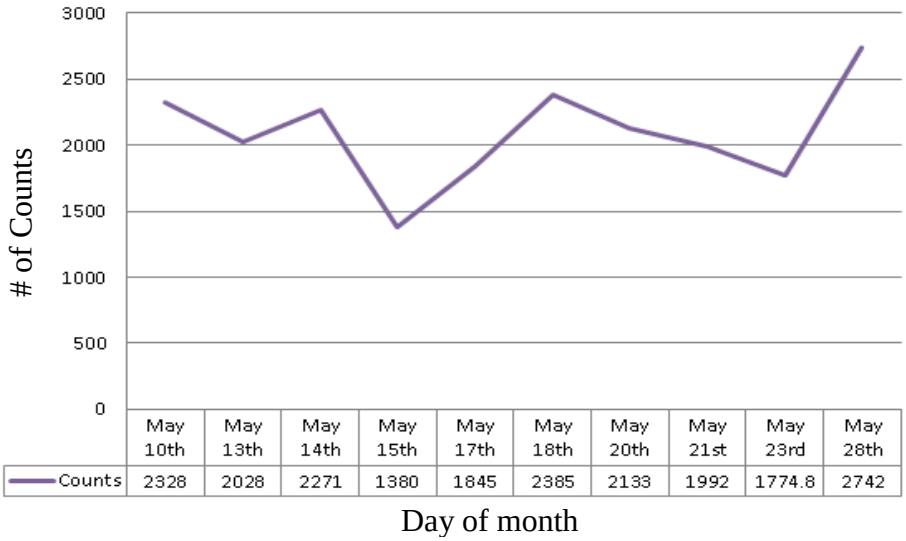

Figure 5: Total counts of visitors by day

4.2.1 One-Day Study

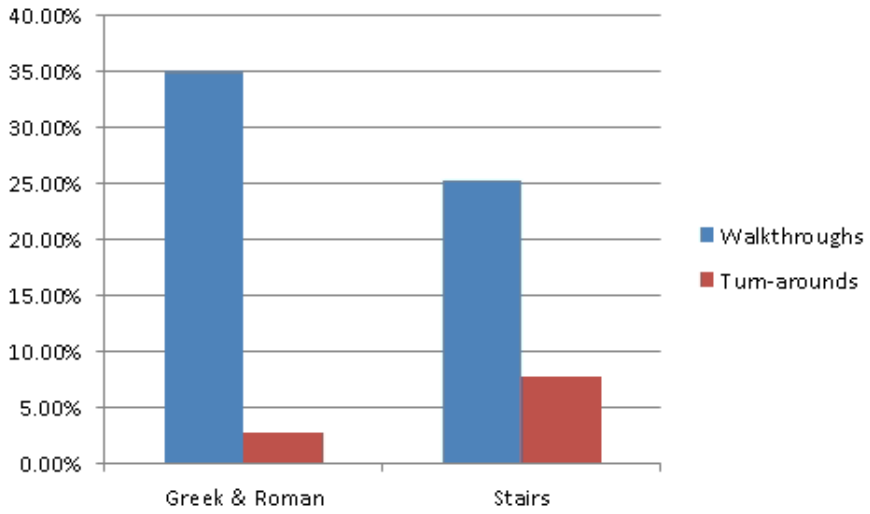

Figure 6: Percentages of walkthroughs and turnarounds from the one-day case study

In order to implement a more exhaustive analysis, we spent May 22nd doing all-day counting instead of doing a ten-minute counting at each hour. We did seven trials in total, each

ran ten-minutes. The percentage of walkthroughs was 30.78%, which was similar to what we got from visitor tracking, 38.23%.

From Figure 6, we can tell that the Greek & Roman side got more walkthroughs while the stairs side got more turnarounds; the Greek & Roman entrance had 10% more walkthroughs, while the stairs entrance had 5% more turnarounds. This once again proved that people tended to go to the stairs side to get to other galleries.

4.3 Visitor Demographic Analysis

We performed 330 trackings and collected 108 questionnaire responses, out of which 105 are matched up with our tracking sheets. We matched them up because the visitors we did questionnaires with are the ones we tracked. The data showed a variety in visitor demographics. Our sample consisted of people from 28 countries speaking 20 different languages. The majority of them were from the UK, representing 24% of the sample population. The US represented 18%, and Italy, France, Germany each at 6%. The 2010 IQP reported that 39% of the visitors in 69a gallery were from the UK (we assume the figure in 68 gallery was similar), and the 2012 project reported that 40% of the visitors in 68 gallery were from UK. As shown below, only 24% of the visitors from our study were from UK. Therefore, there is a huge increase in the percentage of people from outside of the UK, and we conclude that the gallery experienced more international visitation compared to previous years.

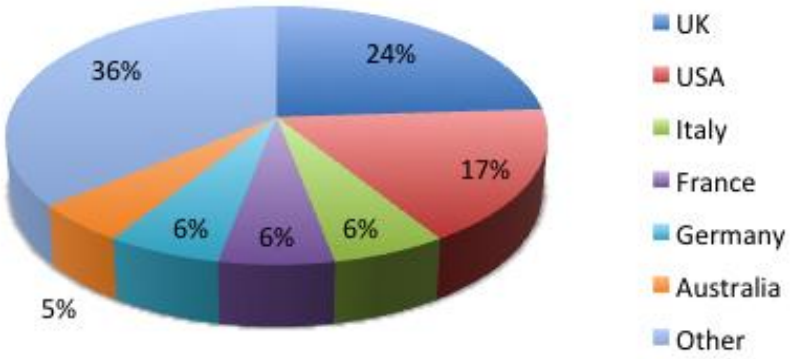

Figure 7: Distribution of visitors' countries of origin

As for visitor language, 48% of them speak English as their first language, followed by Chinese, German, and French each at 6%. Out of those we surveyed 65% are male, not only because more males came into the gallery but also because females had a higher refusal rate. It could be that males were more willing to spend time in the gallery for the purpose of extending knowledge of the subject matter; therefore they were more confident about taking a survey about the gallery.

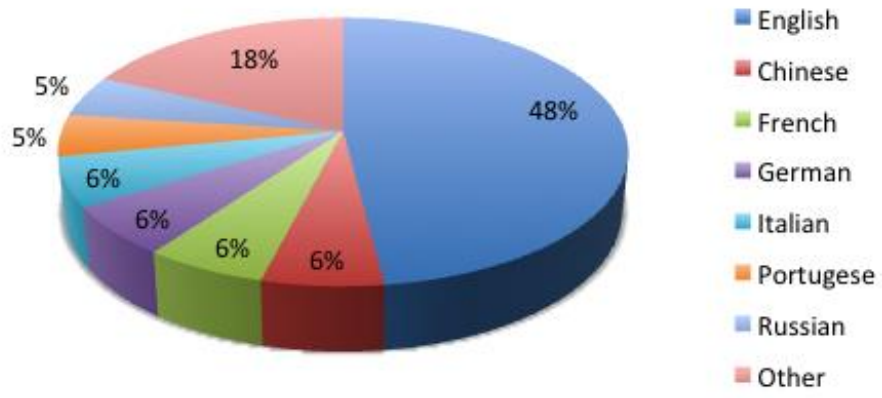

Figure 8: Distribution of visitors' first language

4.4 Visitor Classification

Visitor Meaning Making, as mentioned in chapter 2.3.2, measures how visitors interact with the exhibits on display. Examining the path visitors take in the gallery and how long they spend at cases will show if they are a browser, follower, searcher, or researcher, as defined in chapter 2.3.2.

As Figure 9 shows that about half of the visitors tracked were browsers, which is predictable for a museum. However, the number of browsers was reduced and the other classification percentages increased from the previous study. The numbers displayed that about 68% of visitors were browsers (Clinckemaillie, Lybarger, & Peterson) in 2010 and in our current study only 46% were browsers. Since the percentage of browsers decreased, it can be concluded that there was percentage of higher visitor engagement within the gallery.

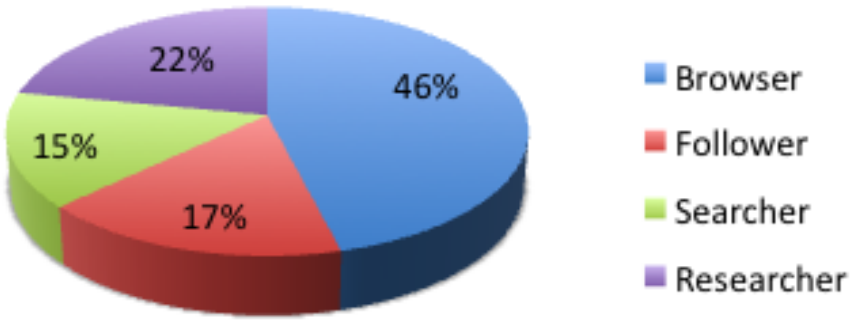

Figure 9: Visitor Meaning Making (n=108)

Figure 9 also shows that a 37% of the visitors tracked were searchers or researchers. The questionnaire showed that about 90% visitors come into the gallery with little or no previous knowledge of the information presented, but are deeply engaged with the material presented. Followers are visitors that tend to taken the path displayed by the museum to understand the full theme of the gallery. Visitors using the museum-provided audio guide are also considered as followers.

There may be some discrepancy in the classification system between our study and the previous one. Since no key was provided from the previous study, the two sets of data can be compared; however, the results may differ slightly. Appendix E shows the rubric that we used to classify visitors into the Visitor Meaning Making and Engagement categories.

Based on visitors' answers to the questionnaire, each visitor was classified into one of four categories on the scale of visitor engagement. Each category: social, intellectual, emotional, and spiritual-conveys how the visitor reacts to the gallery.

The previous studies did not use this breakdown to classify visitors. Therefore, no direct conclusions can be made about the improvement on visitor engagement. However, as Figure 10 shows, about two-thirds of visitors were Intellectual and Emotional. Intellectuals come to museum to learn and improve their knowledge. Emotional visitors connect with a specific object in the gallery and come to the museum to understand other cultures. The last third are Social and Spiritual museum visitors. Social visitors usually come to the museum to pass time. Meanwhile, Spiritual visitors are most likely alone when visiting and come to stimulate their creativity

(Morris et al., 2005). From the breakdown in Figure 10, we can conclude that the majority of visitors attending the Citi Money Gallery are connecting with artifacts and learning while in the Gallery.

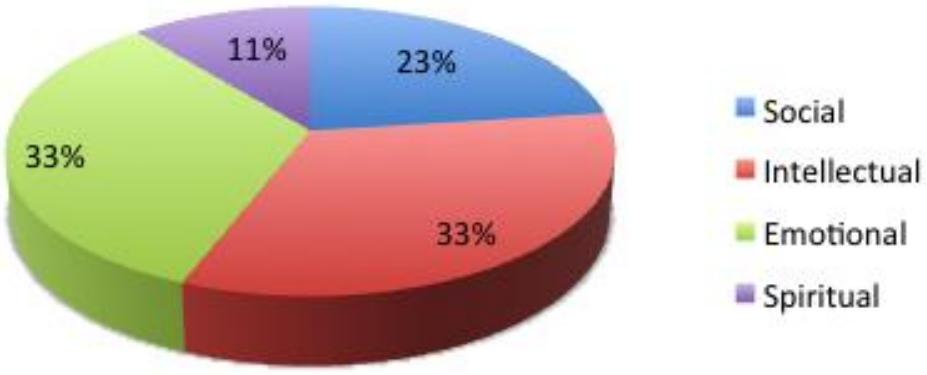

Figure 10: Visitor Engagement (n=108)

In Figure 1, the Impact Climbing Frame connects Visitor Engagement and Visitor Meaning Making. Social visitors cannot be Searchers or Researchers because this type of visitor comes to the museum for entertainment and social interaction (Morris et al., 2005). Comparing Visitor Engagement to Visitor Meaning Making shows that more visitors fall into the inner sections of the Impact Climbing Frame. Therefore, there is higher searcher-researcher to emotional-spiritual visitors, which means more visitors are spending more time engaging with cases and with the gallery in general.

4.5 Tracking Analysis

Visitor tracking provides trends in peoples' visits that are hard to understand from just the amount of time spent at cases. While the numeric data, discussed in section 4.6, provides insight into where people stop the longest, or don't stop at all, the visual tracking data explains how they got there, and what they were exposed to along the way. Originally, our intention was to determine a most common path from each of the doors into the gallery, because of the varying paths visitors take, this was not possible. Instead each door got three main paths, left, right or center. For these paths we did not include any of the walkthroughs. Each path was chosen based on the visitor's first movement in the gallery. Did they walk straight in, did they turn

immediately left, or did they turn immediately right? Each track was placed into one of three categories, ensuring that all tracks were counted exactly once. This created six sets of maps, seen in Figures 11 through 15. There are three maps for each door, a center path, a path favoring the left side of the gallery and a map favoring the right side of the gallery. In addition, two maps were omitted from the analysis section, because they did not show any new trends in the data (see Appendix F).

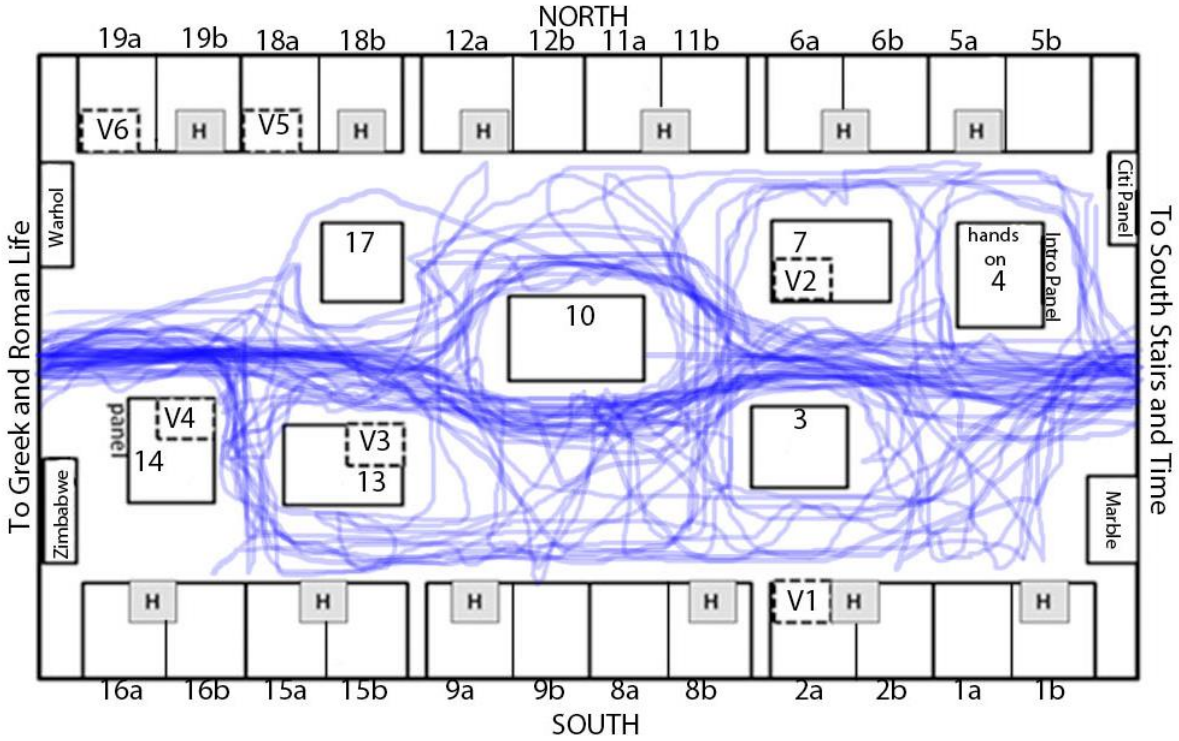

Figure 11: Greek and Roman Life doors straight path

When observing visitors who enter through the west door, coming from the gallery of Greek and Roman Life, we quickly see many trends. First there is very little consistency to where the visitors walk. No matter the direction they walk after entering the gallery, the map has fairly consistent coverage indicating that visitors took many different paths, and as a whole saw all of the cases. The one major exception to this is with the center path. Here, visitors have no tendency to loop back and look at the cases to the immediate left or right of the door; instead they travel farther into the gallery before examining the cases on the gallery walls, as seen in Figure 11. This is very different from the graph of people who turn left or right, as they have a

fairly high tendency to loop around to the other side of the gallery and see the cases on the other side of the door.

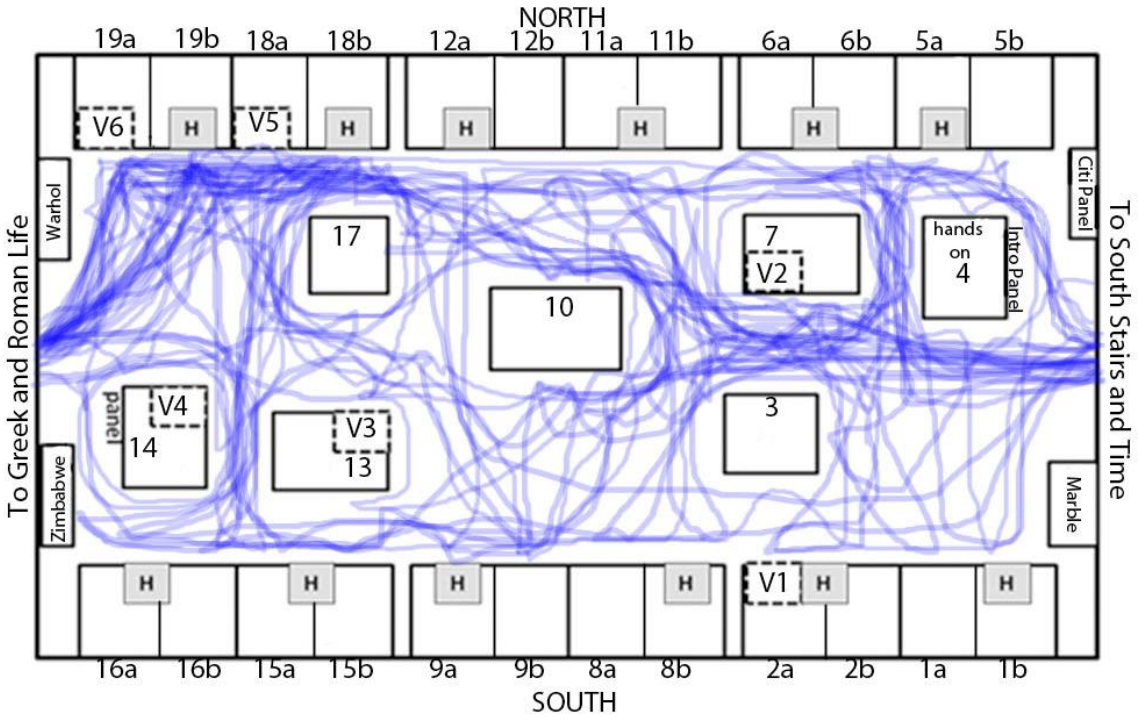

Figure 12: Tracking map of visitors who turned left

The trend of visiting both sides of the gallery is clearly seen in Figure 12 here, despite everyone entering towards case 19, here are still a fair number of visitors who head down to cases 15 and 16 afterwards. On the east side of case 10, the only other major areas of traffic for all three paths are around cases 4 and 7. These two cases have relatively high traffic on all four sides, showing that people also pass near to cases 5 and 6 as well as case 3. The majority of cases on the south wall of the gallery have much less traffic, indicating that fewer visitors are exposed to their contents.

Visitors' trends differ greatly when they enter from the door coming from the south stairs. Some trends are similar, such as high traffic around cases 4, 7, and 10, but how visitors get there and what they do after is quite different for each door. This is seen quite clearly on the map of visitors who turn immediately left after entering.

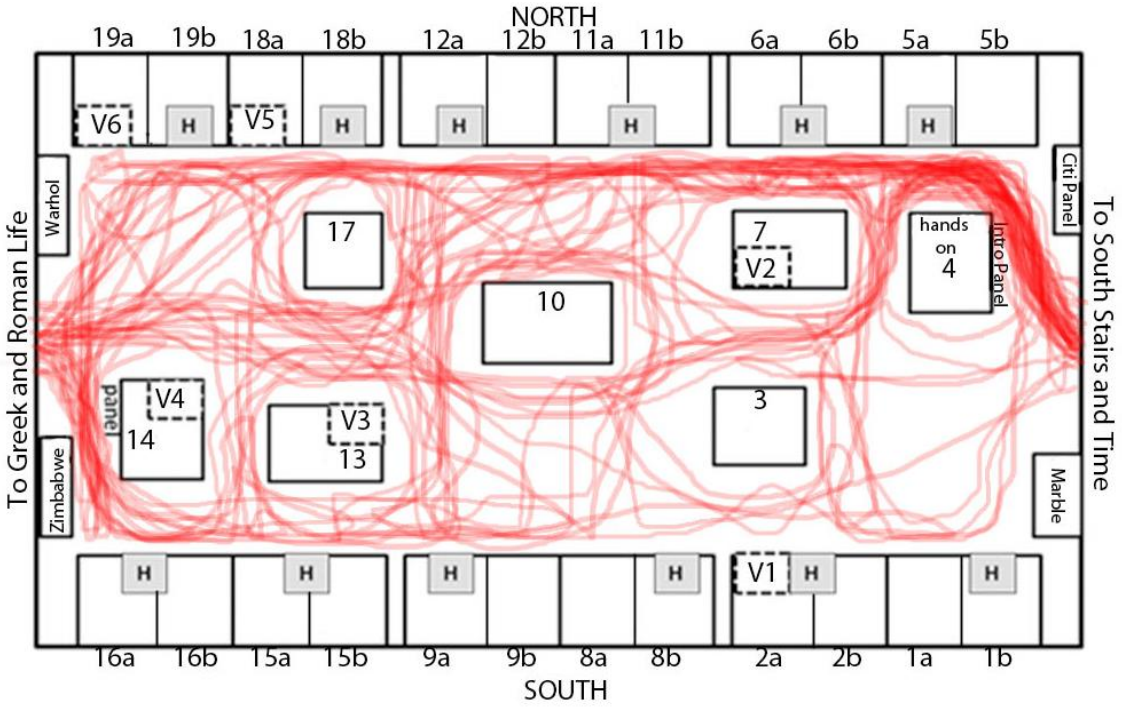

Figure 13: South Stair visitors who turned right

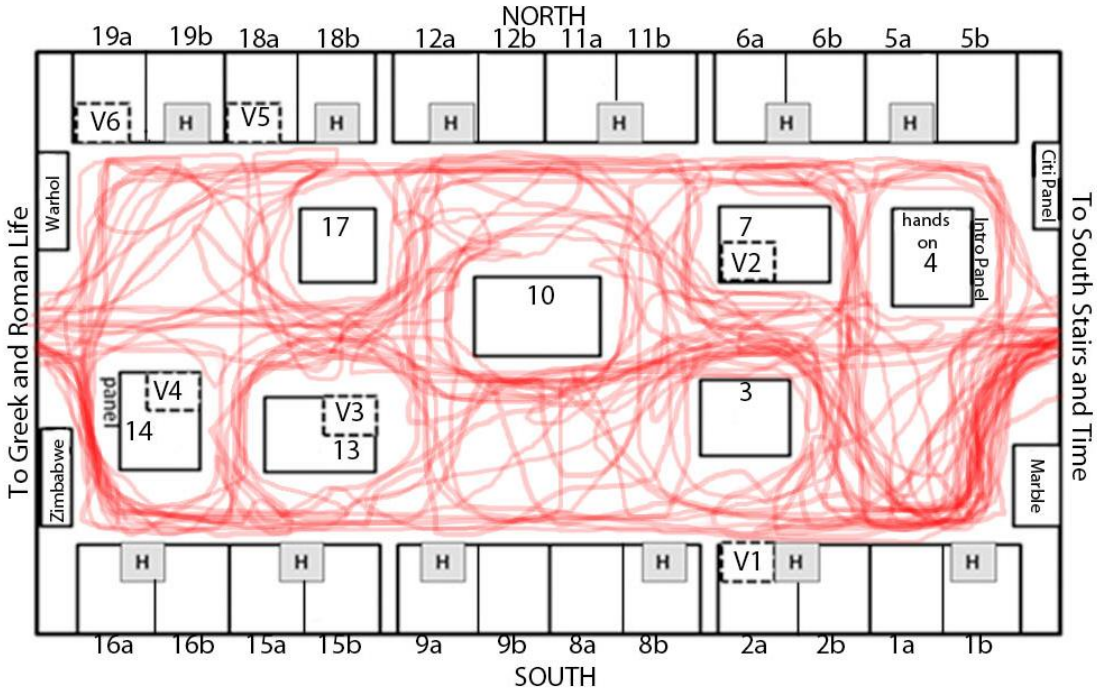

Figure 14: South Stair visitors who turned left

The map in Figure 14 shows that despite every visitor starting their visit to the left, many of them still see cases 4 and 7, and then head north very quickly. This leads to a fairly even spread of visitors across the entire gallery. The only other place where there is a high concentration is near the Zimbabwe piece, just west of case 14. There is a fairly noticeable trend of visitors stopping at that piece right before they exit. This is made noticeable on the map where people turn right upon entering. Here it is clear that despite the seemingly low interest on the cases on the south wall, there is a high concentration of people near Zimbabwe. This map also reflects the noticeable tendency of people spreading out to the west of case 10. Many people visit cases 18 and 19, but they also go to cases 15 and 16.

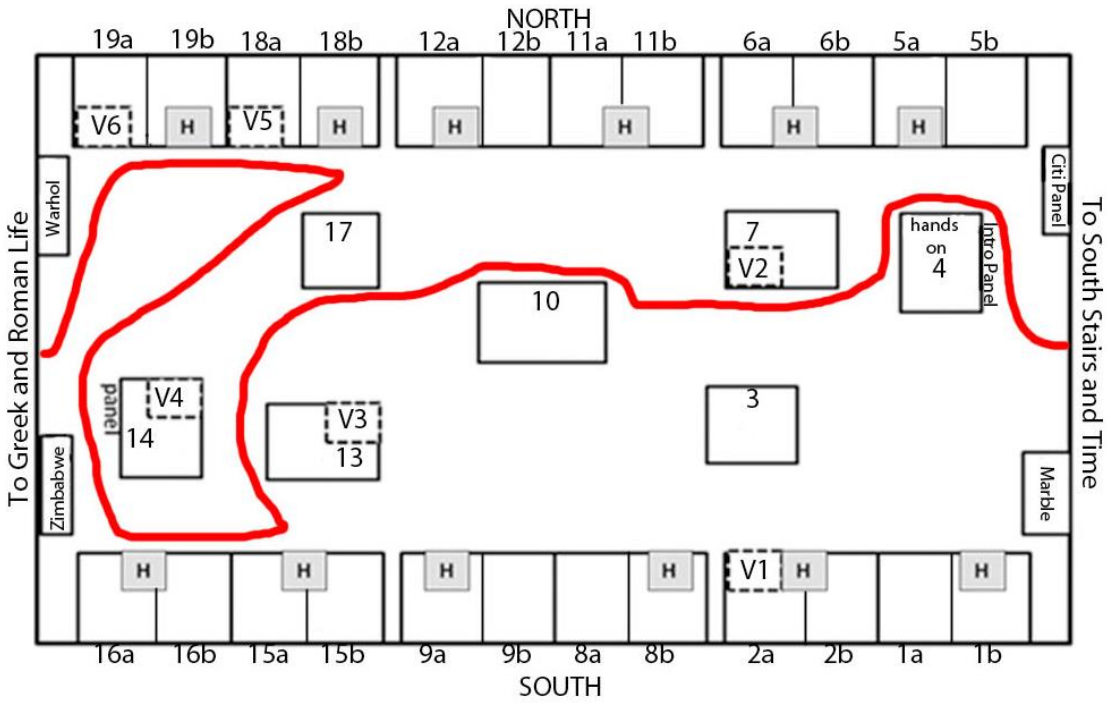

Figure 15: Generalization of most common path

The overall trends for the gallery show that more people walk past the cases in the center of the gallery, as apposed to staying close to the cases on the walls. This trend mirrors the numerical data, seen in Figures 20 and 21, nicely. The center cases have some of the higher total number of stops. In addition, cases 15, 16, 18, and 19 all have relatively high visitation rates. From the combination of the cases that people stop, Figure 20, at and the data from their tracking paths, the most common path visitors take when entering from the south stairs can be

determined. It is one that puts them near cases 4 and 7, then near case 10, maybe stopping near 13 and 17, but spending the rest of their time at cases 18 and 19, 15, and 16 or all four, usually finishing off looking at the Zimbabwe piece. The path when entering from the Greek and Roman Life Gallery is very similar to the path when entering from the south stairs, except in reverse. The only major difference is a stronger tendency for visitors to stick nearer to the center of the gallery, rather than look at cases 15, 16, 18, or 19. Figure 15 shows a representation of this path.

4.6 Heat Maps

One of the methods for evaluating our visitor tracking data is the use of heat maps. Heat maps allow us to visually examine the visitor tracking data to determine the effectiveness and strengths of various exhibition cases in the gallery. They are made by putting the data collected from visitor tracking into a visual format. In addition, since these heat maps were done in a previous evaluation, they allow us to compare data from before the renovations to current data with the renovations. We would anticipate a change in the heat maps due to the renovations. All of the pervious maps are from the 2010 IQP (Clinckemaillie et al., 2010) during their study of the case with the "lamb of god exhibit". The "lamb of god exhibit" was one of the time periods during their study when they changed a specific case. These maps were chosen for consistency. For this 2013 study we looked at three types of heat maps: holding power, attracting power, and first case visited. These heat maps will allow for a graphical representation of the visitor tracking information.

It is important to note when comparing the heat maps that there are some changes to heat map methodology. Scaling needs to be kept in mind as it changes throughout the different heat maps. In addition the 2010 IQP scales do not always completely match up with this project's scale. This is due to the different data ranges of visitor tracking from the two projects. In addition, the 2010 IQP cases have their heat map distribution divided by full cases, while this project divides some of the full cases into two subcases. The 2010 IQP exhibition cases are just listed as numbers like 1, 2 and 3, while this project divides some cases into a subcase and b subcase, like 1a, 2b, and 3. This distinction was done to help further pinpoint exactly where people go in the gallery. This causes the percentages comparison to be slightly off, especially in the case of attracting power. Finally, the 2010 IQP has around half the amount of non-walkthrough visitor tracks this project uses. This also could cause potential discrepancies. These differences need to be taken into consideration when examining the heat maps.

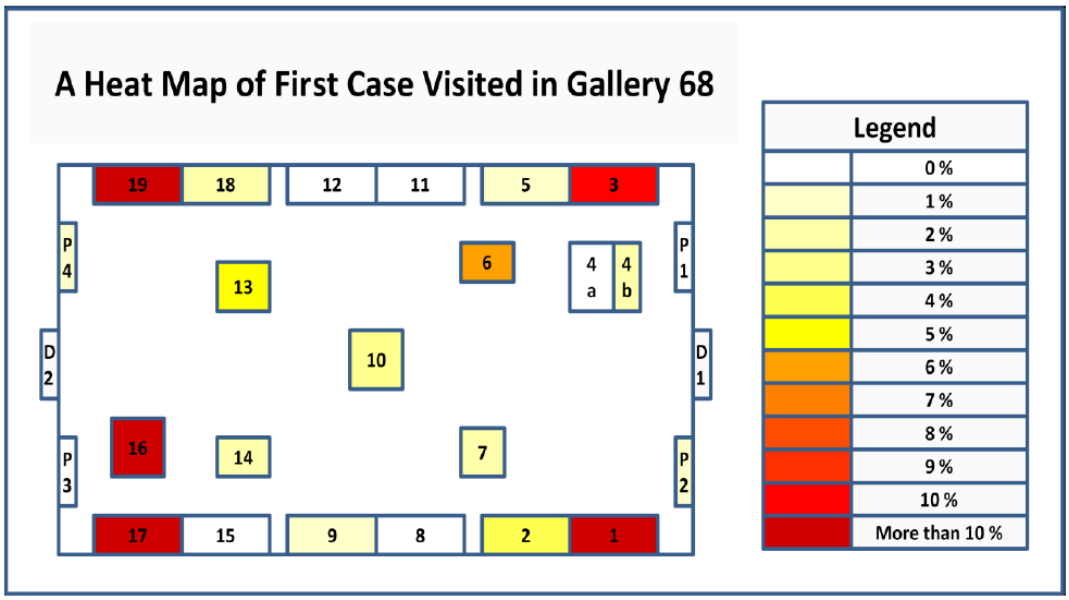

Figure 16: 2010 IQP Heat map for first case visited (n=100) (Clinckemaillie et al., 2010)

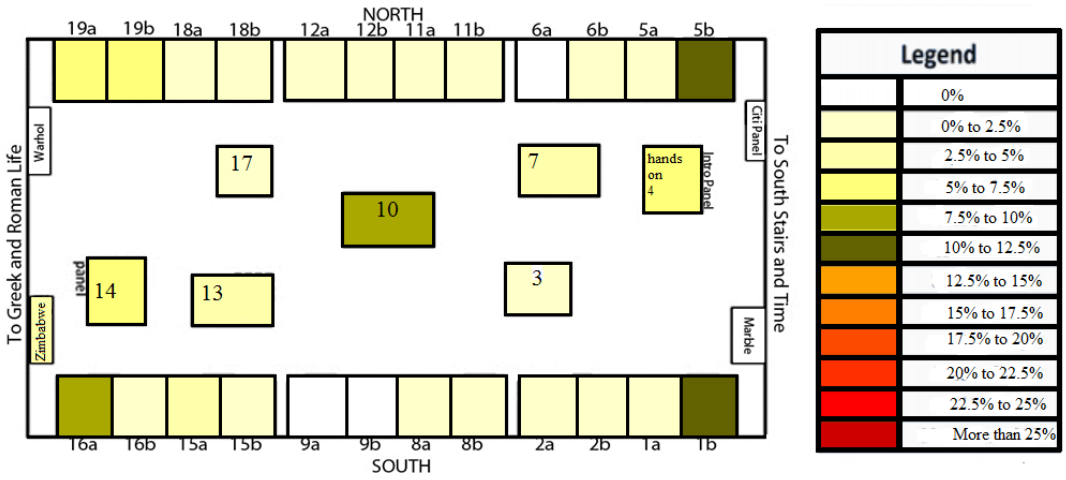

Figure 17: Heat map for first case visited in this study (n=203)

The first heat maps show what percentage of people visited each case as their first case. Apparent in both heat maps the corner cases 19, 17, 3, and 1 in Figure 16 and cases 19a, 16a, 5b, and 1b in Figure 17. All of these cases have at least a 5% first case visited rate. This seems to be a fairly consistent trend. One major difference is that in Figure 17 almost all cases have at least someone start looking at the gallery there. The Figure 16 data shows mostly only the central cases have people start there. This indicates post renovations might have caused a wider variety

of starting locations. It is also possible, that the change in sample sizes could have also caused this. In general these serve as fairly similar patterns.

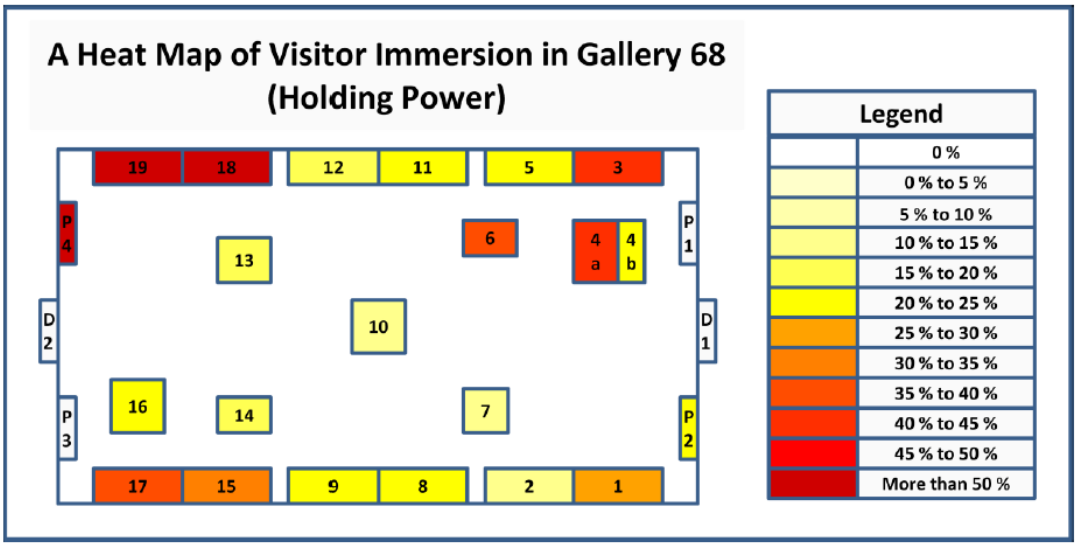

Figure 18: 2010 IQP Heat map for holding power (n=100) (Clinckemaillie et al., 2010)

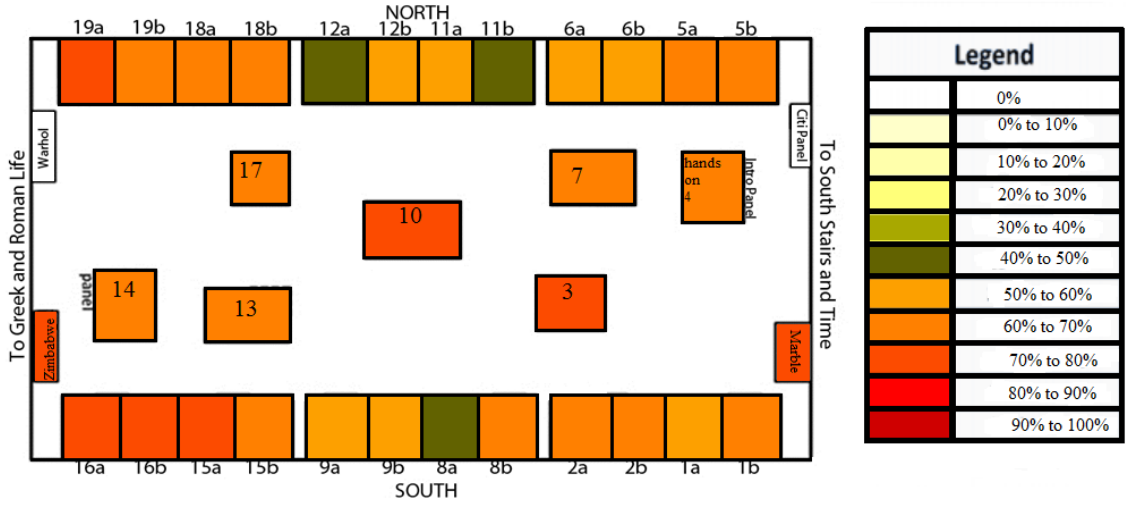

Figure 19: Heat map for holding power in this study (n=203)

This group of heat maps focuses on the holding power of the cases. This was calculated by dividing the number of people who stayed more than a given time by the total number of people who visited the cased. The time is given at ten seconds for Figure 18 and fifteen seconds for Figure 19. Consistent with both cases is that in general the outer cases of the gallery like 16a,

1b, 5b, and 19a in Figure 19 and 1, 3, 17, and 19 in Figure 18 have fairly high holding rates. This contrasts to the lower holding rates in case such as 12a, 11b, and 8a in Figure 19 and 8, 11, and 12 in Figure 18. This helps reinforce the consistent pattern of visitors seeming to prefer the outer areas of the gallery to the inner area.

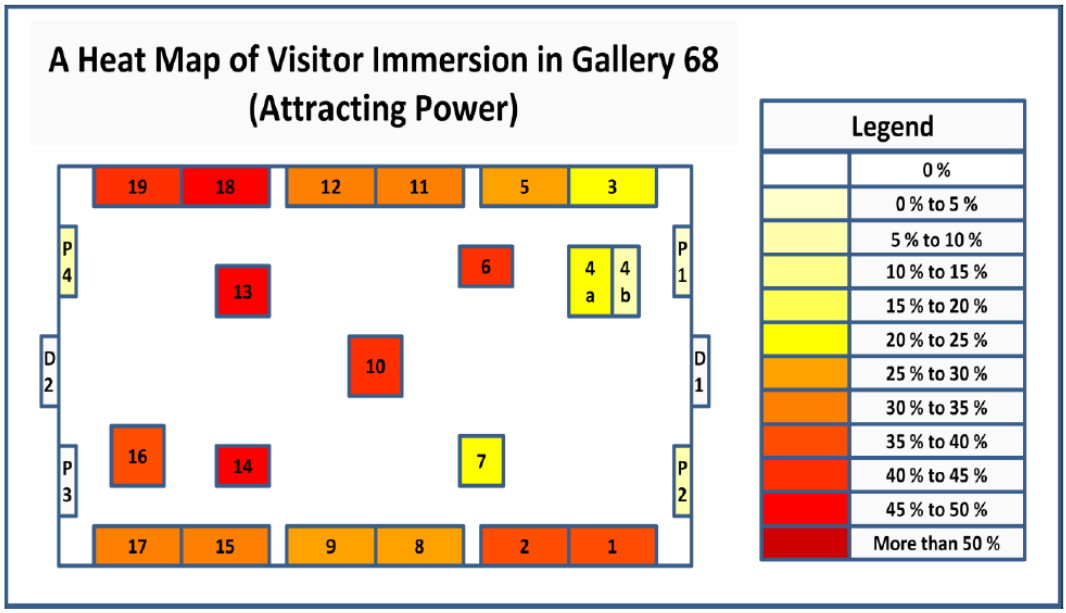

Figure 20: 2010 IQP Heat map for attracting power (n=100) (Clinckemaillie et al., 2010)

One of the major factors with holding power is the scaling. In the previous IQP Figure 18 has only three cases above 50%. However, Figure 19 only has three cases below 50% holding rate. This indicates a much higher overall holding rate for the gallery after the renovations. It seems that in the new gallery, visitors tend to be much more involved in what they are looking at and stay for longer periods of time.

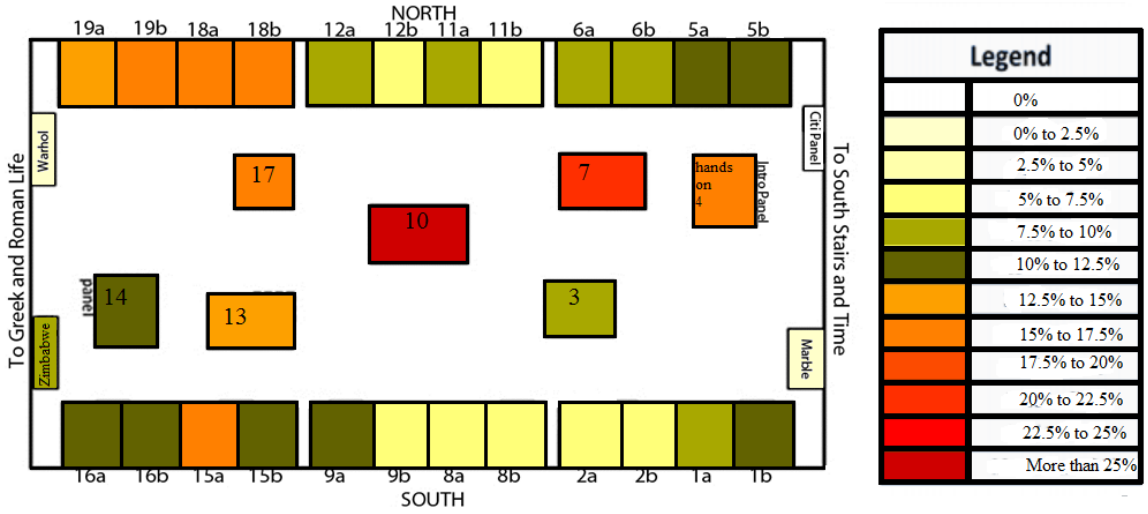

Figure 21: Heat map for attracting power visited without glances in this study (n=203)

The next group of heat maps highlights the attracting power of the cases. Attracting power is the percentage of people who looked at the case, not including walkthroughs. One other thing to note is that while Figures 20 and 22 include people who simply glanced at the case, Figure 21 does not. Consequently while Figure 20 isn't as useful for comparing to the 2010 IQPs, it provides a more accurate look at how many people visited the cases. Also, since Figure 21 and Figure 22 factor the subdivisions in each exhibition case they are by nature going to show a little less attracting power than Figure 20. This is because in Figure 20 if a person visits either half of a case they are considered visiting it, where with Figures 21 and 22 they must hit the specified half to visit that case.

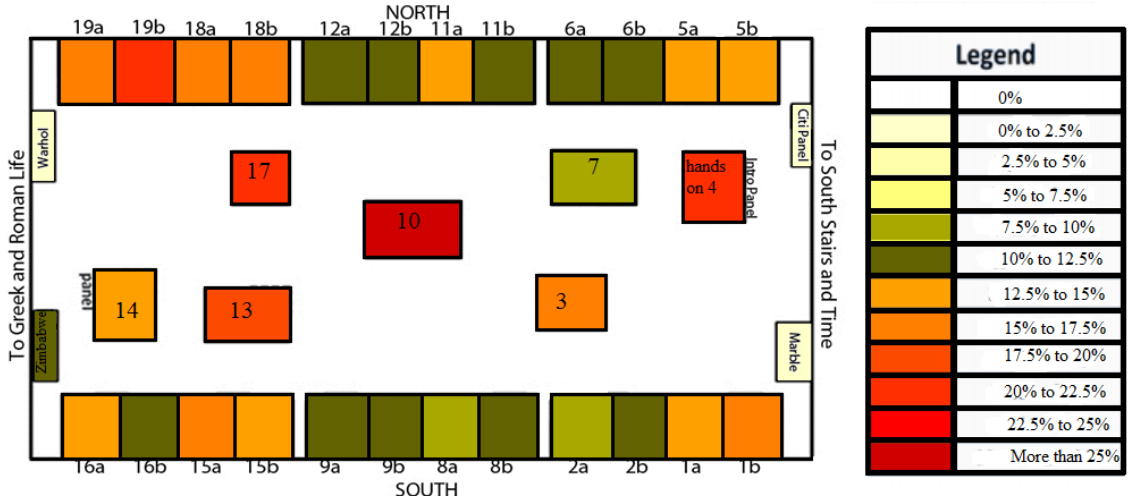

Figure 22: Heat map for attracting power visited with glances in this study (n=203)

One consistency throughout all of the attracting power of cases is that the distribution attracting power is very high in cases 19 and 18. This area is very effective at holding people's attention and some of the modern objects of the gallery. Also, for Figures 21 and 22 the case with the highest attracting power is 10 with over one fourth of visitors looking at it. This seems to indicate people have a tendency to be attracted to the familiar objects when it comes to examining cases. Also Figures 21 and 22 reveal a trend to go to the outer and central cases with attracting power. This is a consistent theme throughout the heat maps.

When one examines Figures 20, even with the discrepancies, it is fairly clear that the older 2010 IQP did tend to find an overall higher attracting power with the cases. This is not surprising, especially considering the vastly increased holding power of the cases in Figure 19. What the data suggests is that the renovations tended to cause people to become more involved in cases they visited versus simply briefly looking at all of the cases in the gallery. This shows an increased effectiveness of individual cases to hold the visitor for the time they do spend in the gallery. This is reinforced by our findings in visitor demographics that there are fewer browsers and followers, but more searchers and researchers. Figures 21 and 22 tend to show increased involvement with the individual cases.

Another aspect of the heat maps in Figures 21 and 22 is that certain cases have what is known as "key objects", which have been previously discussed in the report. They key objects most closely reside in cases 1b, 2b, 5a, 6b, 8b, 9a, 11b, 12a, 15a, 16a, 18b, and 19b with a little discrepancy on exact location between a and b in some cases. These key objects throughout the heat maps tend to be about as frequently visited as the other cases without key objects. The one exception is 15a tends to have an increase in attracting and holding power compared to the surrounding cases. However, in general while these key objects serve as highlights of the gallery, there doesn't seem to be any data specifically suggesting that they are more frequently visited.

When one combines the data from the various heat maps, a complete picture of the case can be seen. While the first case visited tends to show very similar data in both evaluations, comparison of the holding and attracting power leads to interesting results. The overall results indicate that between the 2010 IQP and this evaluation, there is a decrease in attracting power and increase in holding power. This indicates that viewers are more focused and tend to become engaged with the individual cases of the gallery. Visitors seem to have taken to the renovations with greater involvement with the cases.

4.7 Name Recognition

Questionnaire responses revealed that 53% of visitors did not intend to visit The Citi Money Gallery and 48% of visitors anticipated visiting it. Many of the guests who intended to visit found out about the Gallery through the Museum's leaflet. Only 57% of visitors with respect to the total number questioned knew the name of the Gallery, either Money or The Citi Money Gallery. Even though half the visitors knew the name of the Gallery, only about 16% questioned knew that Citi Bank sponsored the Gallery. Also from talking to visitors, we believe that since the name of the Gallery is displayed in gold lettering on the top of the doors, many visitors do not relate the gold word Citi to Citi Bank because there is no logo accompanying it.

Chapter 5: Recommendations and Conclusion

Using the various analysis techniques, we were able to get a valuable grasp of the overall impact of the renovations to the Citi Money Gallery on visitor experience. First and foremost, the renovations were effective and worthwhile. The major trends evident in the heat maps and visitor classification are that, compared with pre-renovation data, visitors are becoming more engaged and absorbed in the cases. The feedback received from the questionnaires were mainly positive, with the majority of visitors reporting that they enjoyed the Gallery and information displayed.

Some other common themes emerged from our findings. For instance, visitors tended to walk through from the Greek and Roman Life door using the Gallery as a hallway, while fewer coming from the South Stairs door did so. Visitors had a tendency, moreover, to favor the outer objects and the immediate center case of the Gallery. The middle area of the Gallery saw less overall attention. Finally, while around half of the visitors knew the new Gallery's name, a low percentage actually knew the Gallery's sponsor, Citi Bank.

Based on our findings, we recommend improvements in two major categories: gallery setup and display; and processes for future evaluations and displays. We understand that not all of these changes likely can be implemented fully, but we still feel that they should be considered when doing future studies.

First, because guests focused heavily on the areas by the doors of the exhibit, as seen in the heat maps, it would be useful to put especially strong and interesting displays by the entrances to help attract people entering and exiting. The effectiveness of such strategy is evident in the increased number of visitors, regardless of the door the entered, who spent more time at the end cases near the Greek and Roman Life door than the number who spent time near the South Stairs door. Related to this, while the introductory panels were useful, they did not "grab" many visitors' attention. The key is to increase the visual appeal of the panels to lure more visitors as they enter the Gallery. The central wall cases also need a few strong items to help attract people into that area as they wander throughout the Gallery. We found in general that guests tended to travel more towards the center of the gallery, near case 10, and the outside edges. Finally, people were very responsive to the hands-on exhibit – *all* gave positive feedback and we recommend its continuation.

Our other recommendations deal with future evaluation procedures. We made two major changes in our evaluation process, which we felt were highly effective for our results. First, using iPads simplified our data collection by exporting all the responses to a single database; moreover, museum visitors are increasingly familiar with such technology, which tends to engage them more readily in the questionnaire process. Second, we recommend the use of foreign-language questionnaires, which increased data for our evaluation and enlarged our sample population.

Even with these suggestions, it appears that the overall results of the gallery were altogether successful. Our sampling of the Museum's visitors gave a well-rounded insight into the visitor experience. The renovations to the Citi Money Gallery clearly have been a success. This project also paves the way for different departments in the Museum to start implementing advancing technology in visitor satisfaction studies. Each innovation in evaluating and improving its galleries helps the British Museum maintain its position as the world's premier museum and London's top tourist attraction.

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Appendix A: Visitor Tracking Sheet

Total Time:	**Subject #:**

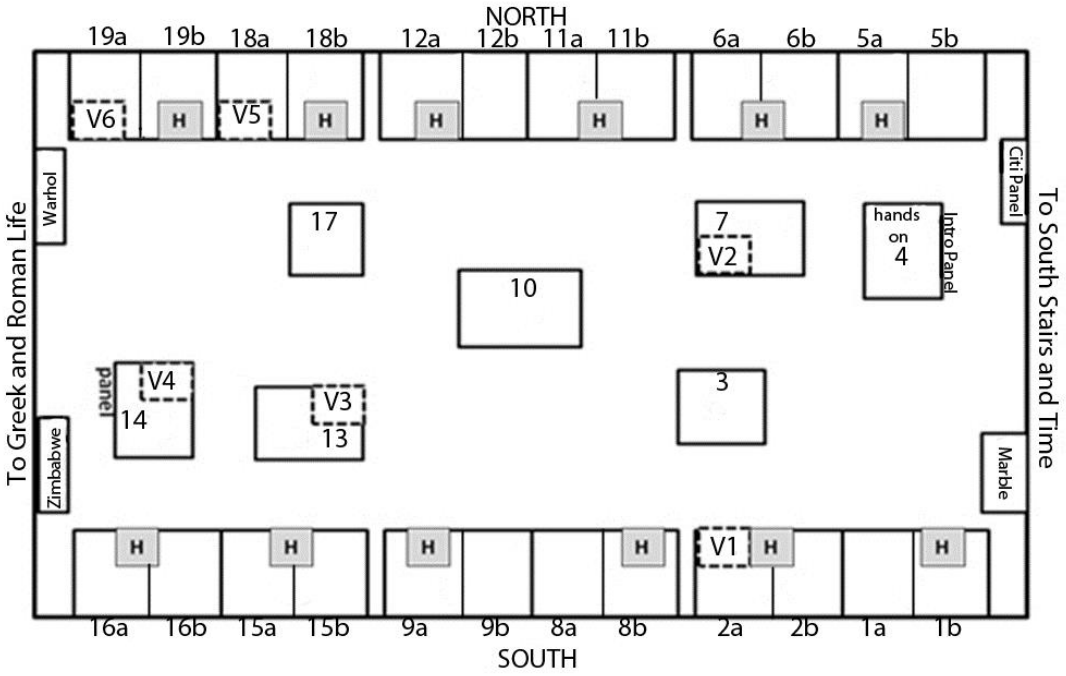

Figure 23: Gallery map used for tracking sheet

☐ Refusal to Answer

Reason:

☐ Lang.

☐ Time

☐ Other: _____

Hands-On:

☐ Open

☐ Closed

Walkthrough?

☐ Yes

☐ No

Age: _____

Gender: M / F

Time spent at case:

G: Glance

1: >15 sec

2: 15-30

3: 30-60

4: 60-120

5: 120+

D – Discussion

P – Photograph

A – Audio Tour Engaged

#	Date	Start Time	# in Group	Total Time

Notes:

Appendix B: Questionnaire

Citi Money Gallery Questionnaire

Gallery 68 **Number:**

Hi, my name is..... I'm a University student working on behalf of the British Museum. We are looking to find out more about our visitors and what you think about the gallery. We would like to ask you a few questions about the gallery you just visited.
Thank you. Please do not feel pressured to answer in any particular way. We will not be offended by any negative responses.
If at any point you would like to retract your answers from our study, you may do so.
I would now like to ask some questions about you. These are strictly for classification purposes and your name will not be recorded.

1. **What is your first language?** ……

2. **In which country do you currently live?** ……

3. **Who are you here with?**
□Alone □Children □Adults □School Party □Organised group □Other

4. **What age group do you fall into?**
□0-7 years □8-11 years □12-14 years □15-16 years □17-19 years □20-24 years
□25-34 years □35-44 years □45-54 years □55-59 years □60-64 years □65+ years
□Prefer not to say

5. **Gender?** □ Male □Female □Prefer not to say

6. **Is this your first visit to The British Museum?** □ Yes □ No

7. **If not your first time: How long ago was your last visit?**
□ 12 months ago or less □ Between one and two years ago
□ Between two and five years ago □ More than five years ago

8. **Including today, how many times have you visited in the past 12 months?**.....

9. **How would you best describe your level of knowledge of the subjects covered in this gallery?**
□ Expert knowledge □ General knowledge □ Little or no knowledge

10. **I'm going to list some reasons for attending The British Museum, have a look down the list below and say which apply to you.** Tick all that apply.
□ It is one of the major attractions in London
□ It is an enjoyable way to pass the time
□ To improve my own knowledge
□ I have a personal interest in the subject
□ I have an academic/professional interest in the subject

□ To get a better understanding of other people/cultures
□ To see fascinating, awe-inspiring things
□ Other, please state……

11. Did you intend to visit this Gallery? □Yes □ No

12. How did you hear about this gallery?
□ The British Museum's official website □ Leaflet □ Banner
□ Advertisement (TV/Radio/Online) □ Poster
□ Other, please state……

13. Do you know what the name of the gallery is? □Yes □ No

14. Do you know who the sponsor is? □Yes □ No

15. How do you know?
…….

16. Was there a particular object in this gallery that attracted your attention?
□Yes, please state what it was……
□ No

17. Do you remember what it was that attracted you to the object in particular?
-Object
□ Object shape □ Object size □ Object name□ Personal experiences related to objects
□ Object colour
-The way it is displayed
□ Background colour □ Space around object □ Object mounted more prominently
□ Large label with image
-Other, please state……

18. Why do you think they are displayed like this?
……

19. How good were these features at explaining what you were looking at? (please tick the number)

	ineffective				effective
Objects	1	2	3	4	5
Introductory Panels	1	2	3	4	5
Labels	1	2	3	4	5
Videos	1	2	3	4	5
Hands on	1	2	3	4	5

(No hands on while visiting □)

20. Is there anything you wanted to know from the display but couldn't find out?

……

21. Is there anything you particularly liked about this gallery?

……

22. Is there anything you particularly disliked about this gallery?

……

23. Do you have any suggestions for this gallery in general?

……

Thank you for your time today. We appreciate your assistance. Have a nice day!

Appendix C: Visitor Counting Sheet

Date:	
Weather:	
Holiday/Events:	
Door:	

Time:	People:	Notes:

Date:	
Weather:	
Holiday/Events:	
Door:	

Time:	People:	Notes:

Appendix D: Visitor Classification Rubric

Visitor Meaning Making Rubric

Browser:

- Own selection of items
- Minimal time in gallery
- Random objects

Follower:

- Museum selection
- Require themes
- Require narrative
- Audio guide

Searcher:

- Have previous knowledge
- Rely on museum to present objects
- Longer time in gallery

Researcher:

- Select own objects
- Focused
- Longer time in gallery

Visitor Engagement Rubric

Social:

- Cannot be searcher or researcher
- At museum to pass time
- Social interaction

Intellectual:

- At museum for professional or academic reasons
- Stimulating children's knowledge
- Hobby
- Self-improvement

Emotional:

- Attraction to a specific object
- Visiting to understand other cultures
- At museum to experience the past

Spiritual:

- Visiting museum alone
- Escapism
- Stimulate creativity

(Morris et al., 2005)

Appendix E: Questionnaire Responses

(Some questions are not shown either because they were deleted/changed, or because of the small number of responses. The results from question 1 & 2 are included in the Data Analysis section.)

3) Who are you here with?

	Alone	Children	Adults	School Party	Organised group	Other	Total
Counts	26	11	67	6	1	4	108
Percentages	24.07%	10.19%	62.04%	5.56%	0.93%	3.70%	100%

Table 1: "Who are you here with?" answers

4) What age group do you fall into?

	12-14 years	15-16 years	17-19 years	20-24 years	25-34 years	35-44 years	45-54 years	55-59 years	60-64 years	65+ years	Total
Counts	1	3	6	23	29	14	15	6	2	8	107
Percentages	0.93%	2.80%	5.61%	21.50%	27.10%	13.08%	14.02%	5.61%	1.87%	7.48%	100.00%

Table 2: "What age group do you fall into?" answers

5) Gender?

	Female	Male	Total
Counts	38	69	107
Percentages	35.51%	64.49%	100.00%

Table 3: "Gender" answers

6) Is this your first visit to The British Museum?

	No	Yes	Total
Counts	35	72	107
Percentages	32.71%	67.29%	100.00%

Table 4: "Is this your first visit to the British Museum?" answers

7) If not your first time: How long ago was your last visit?

	12 months ago or less	Between one and two years ago	Between two and five years ago	More than five years ago	Total
Counts	12	6	8	9	35
Percentages	34.29%	17.14%	22.86%	25.71%	100.00%

Table 5: "How long ago was your last visit?" answers

8) Including today, how many times have you visited in the past 12 months?

	1	2	3	5	Grand Total
Counts	2	7	2	1	12
Percentages	16.67%	58.33%	16.67%	8.33%	100.00%

Table 6: "How many times have you visited in the past 12 months?" answers

9) How would you best describe your level of knowledge of the subjects covered in this gallery?

	Expert knowledge	General knowledge	Little or no knowledge	Grand Total
Counts	10	56	40	106
Percentages	9.43%	52.83%	37.74%	100.00%

Table 7: "Level of knowledge" answers

10) What are your reasons for attending The British Museum? Choose from the list below and say which apply to you.

Reason	Counts	Percentages
It is one of the major attractions in London	60	56.60%
To improve my own knowledge	51	48.11%
To get a better understanding of other people/cultures	45	42.45%
I have a personal interest in the subject	35	33.02%
It is an enjoyable way to pass the time	33	31.13%
To see fascinating, awe-inspiring things	29	27.36%
I have an academic/professional interest in the subject	15	14.15%
Other	2	1.89%

Table 8: "Reasons for attending the British Museum" answers

11) Did you intend to visit this Gallery?

	No	Yes	Total
Counts	55	51	106
Percentages	51.89%	48.11%	100.00%

Table 9: "Did you intend to visit this Gallery?" answers

12) How did you hear about this Gallery?

	Advertisement (TV/Radio/Online)	Banner	Leaflet	Other	Poster	The British Museum's official website
Counts	2	2	11	24	4	10
Percentages	3.92%	3.92%	21.57%	47.06%	7.84%	19.61%

Table 10: "How did you hear about this Gallery?" answers

12.1) Other, please state

Below is a word cloud graph with the answers to this question. The larger the word, the more frequent the word was used...

Figure 24: "How did you hear about this Gallery? - Other" answers

13) Do you know what the name of the Gallery is?

	No	Yes	Total
Counts	46	60	106
Percentages	43.40%	56.60%	100.00%

Table 11: "Do you know what the name of the Gallery is?" answers

14) Do you know who the sponsor is?

	No	Yes	Total
Counts	89	17	106
Percentages	83.96%	16.04%	100.00%

Table 12: "Do you know who the sponsor is?" answers

16) Was there a particular object in this gallery that attracted your attention?

	No	Yes	Total
Counts	36	69	105
Percentages	33.96%	65.09%	100.00%

Table 13: "Object Attraction" answers

17) Do you remember what it was that attracted you to the object in particular?

Object Shape	16	23.88%
Object Size	8	11.94%
Object Name	13	19.40%
Object Colour	13	19.40%
Personal Experiences	14	20.90%
Background Colour	5	7.46%
Spacing around the Object	6	8.96%
Object mounted more Prominently	7	10.45%
Large Label with Image	7	10.45%

Other	17	25.37%

Table 14: "What attracted you to the object?" answers

19.1) How good were the objects at explaining what you were looking at?

	<=25%	<=50%	<=75%	<=100	Total
Counts	6	15	19	67	107
Percentages	5.61%	14.02%	17.76%	62.62%	100.00%

Table 15: "Object explanation" answers

19.2) How good were the Introductory Panels at explaining what you were looking at?

	<=25%	<=50%	<=75%	<=100	Total
Counts	28	22	12	45	107
Percentages	26.17%	20.56%	11.21%	42.06%	100.00%

Table 16: "Introduction panels" answers

19.3) How good were the labels at explaining what you were looking at?

	<=25%	<=50%	<=75%	<=100	Total
Counts	4	15	18	70	107
Percentages	3.74%	14.02%	16.82%	65.42%	100.00%

Table 17: "Label explanation" answers

19.4) How good were the videos at explaining what you were looking at?

	<=25%	<=50%	<=75%	<=100	Total
Counts	69	14	5	19	107
Percentages	64.49%	13.08%	4.67%	17.76%	100.00%

Table 18: "Video explanation" answers

19.5) Did you visit the Hands-on exhibit?

	It was not Open	No	Yes	Total
Counts	43	40	22	105
Percentages	40.95%	38.10%	20.95%	100.00%

Table 19: "Did you visit the Hands-on exhibit" answers

19.5.1) how good were the Hands-On-Exhibit at explaining what you were looking at?

	<=25%	<=50%	<=75%	<=100	Total
Counts	0	1	2	19	22
Percentages	0.00%	4.55%	9.09%	86.36%	100.00%

Table 20: "Hands-on exhibit" answers

21) Is there anything you particularly liked about this gallery?

Below is a word cloud graph with the answers to this question. The larger the word, the more frequently the word was used.

Figure 25: "Anything you particularly liked about the Gallery?" answers

22) Is there anything you particularly disliked about this gallery?
Below is a word cloud graph with the answers to this question. The larger the word, the more frequently the word was used.

Figure 26: "Anything you particularly disliked about the Gallery?" answers

23) Do you have any suggestions for this gallery in general?
Below is a word cloud graph with the answers to this question. The larger the word, the more frequently the word was used.

Figure 27: "Any suggestions for the Gallery?" answers

Appendix F: Visitor Tracking Results

Number of people in the group:

# in Group	Counts	Percentages
1	100	30.58%
2	162	49.54%
3	34	10.40%
4	22	6.73%
5	3	0.92%
6	2	0.61%
7	2	0.61%
8	1	0.31%
10	1	0.31%
Total	327	100.00%

Table 21: Number of people in the group

Total number of walkthroughs:

	Counts	Percentage
Total number of walkthroughs	125	38.23%

Table 22: Total number of walkthroughs

Number of males and females:

	Males	Females	Total
Counts	68	56	125
Percentages	54.40%	44.80%	100.00%

Table 23: Number of males and females

Total number of refusals to answer the questionnaire:

	Counts	Percentage
# of refusals	95	29.05%

Table 24: Total number of refusals

Reason for refusals:

Reason for refusal to answer	Counts	Percentages
Language	38	40.00%
Time	19	20.00%
Other	38	40.00%
Total	95	100.00%

Table 25: Reason for refusal

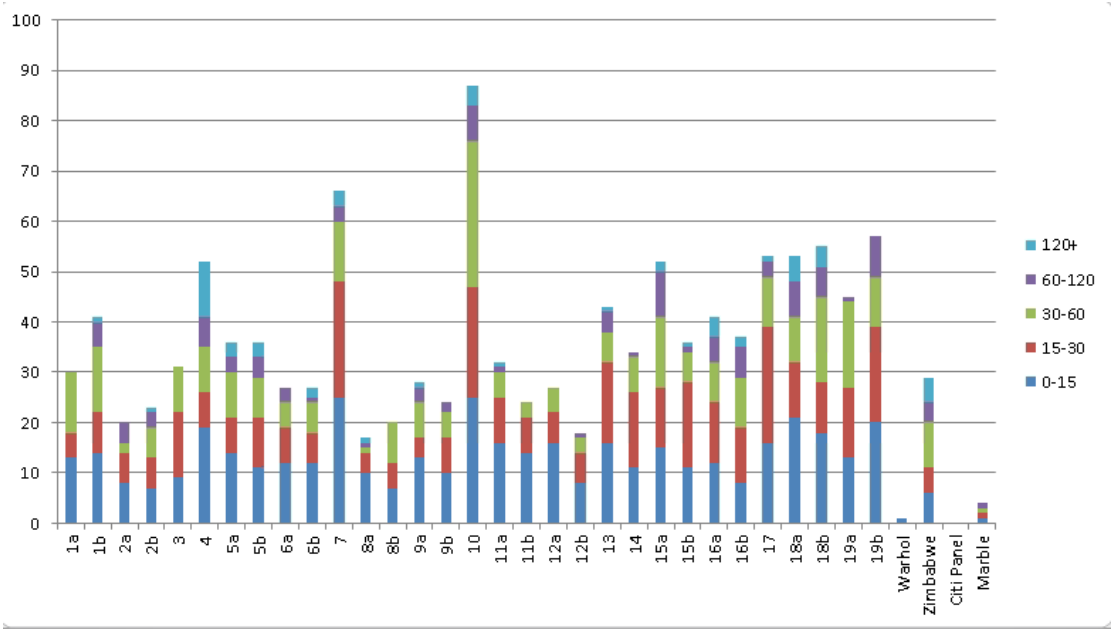

Figure 28: Number of stops at each case (with time range distribution)

Average Time Spent at the Gallery(s): 174.44

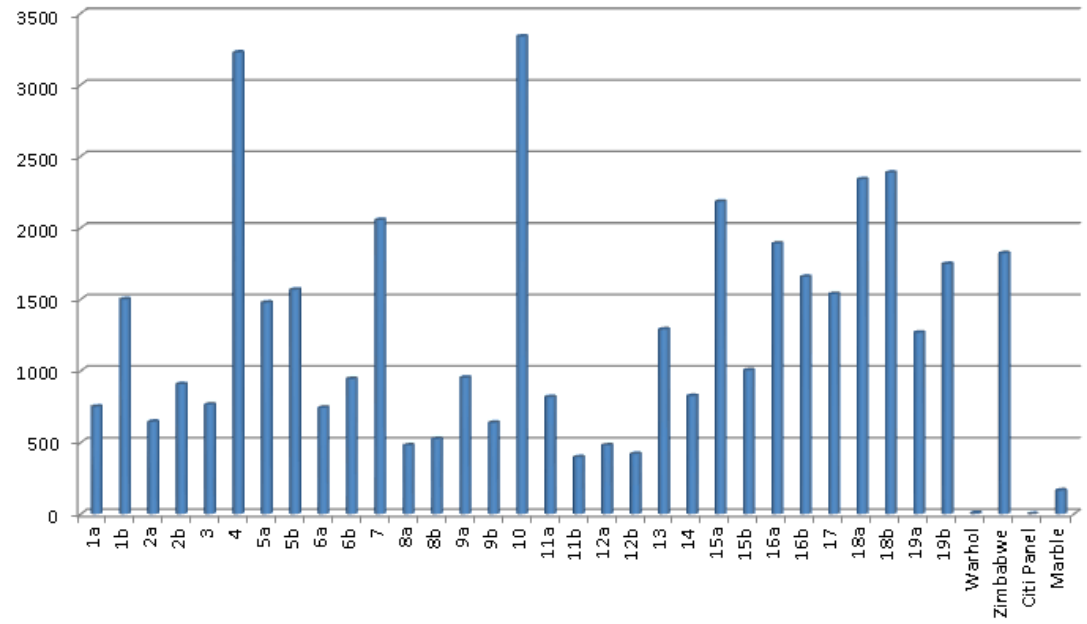

Figure 29: Total time spent at each case

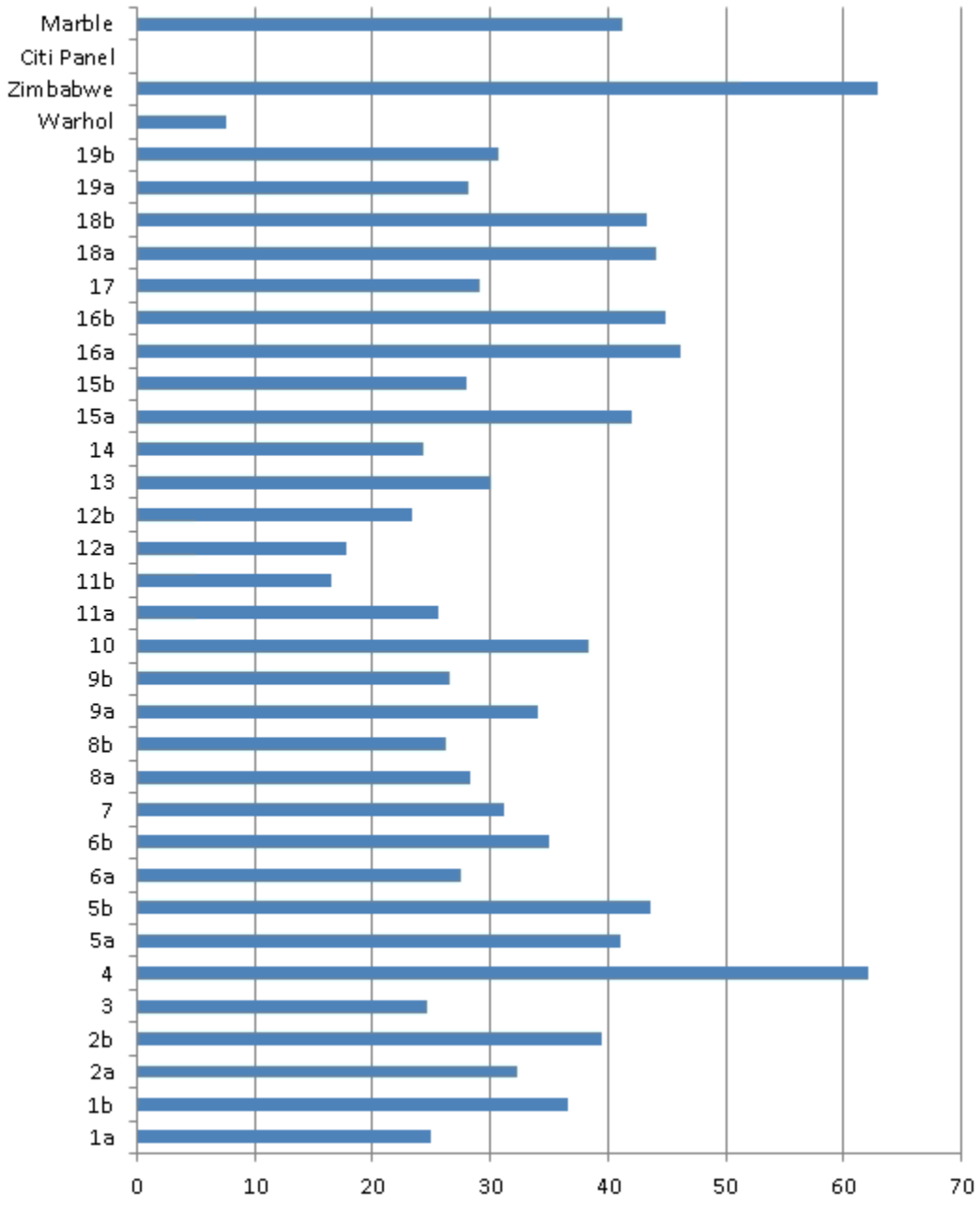

Figure 30: Average time spent at each case

Appendix G: Other Tracking Maps

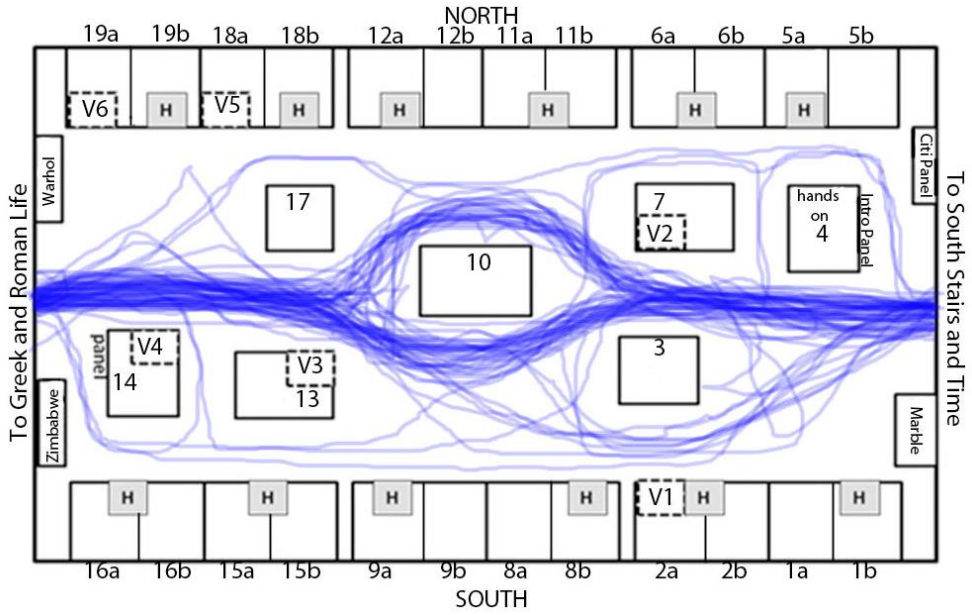

Figure 31: Greek and Roman walkthroughs

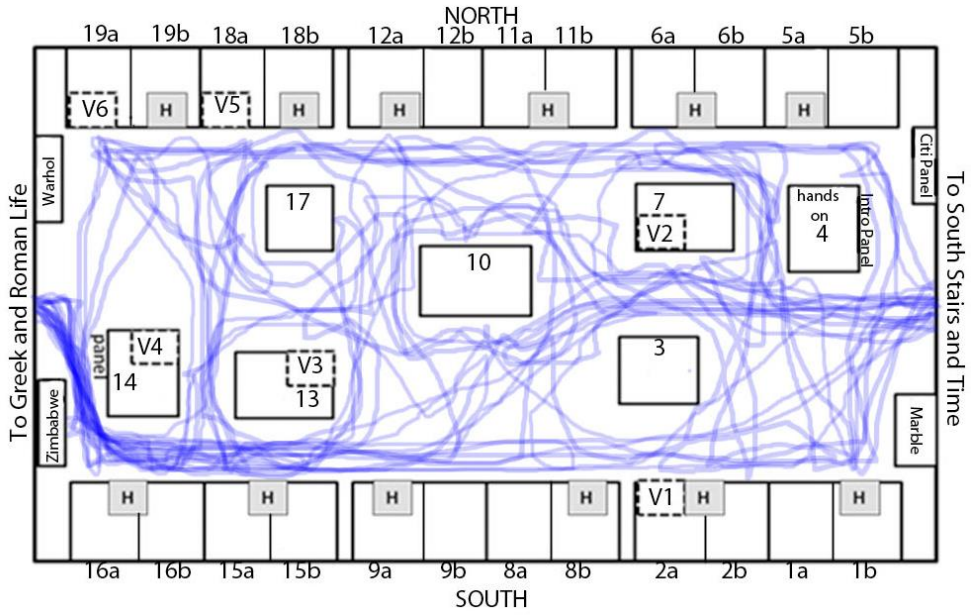

Figure 32: Greek and Roman right path

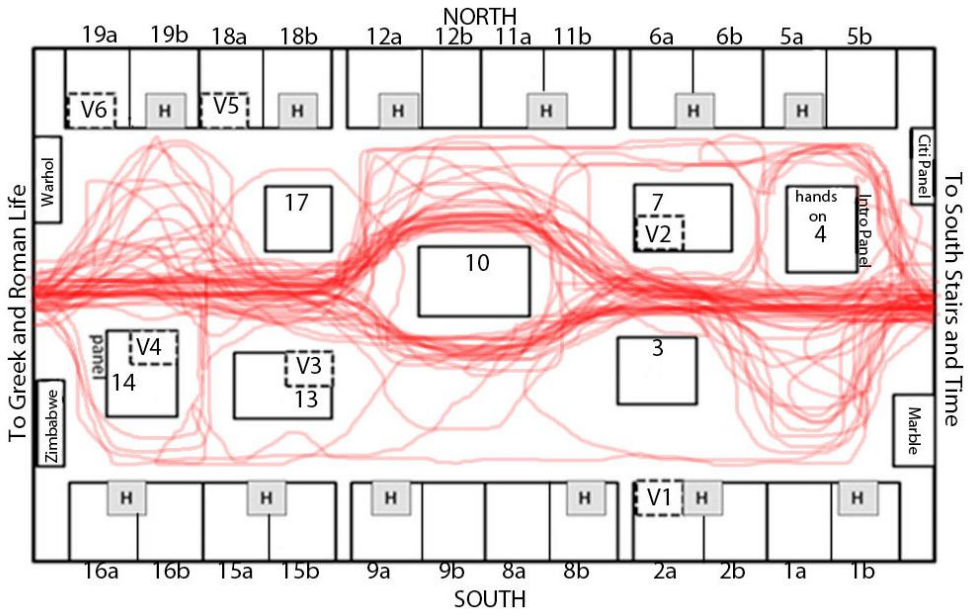

Figure 33: South door walkthroughs

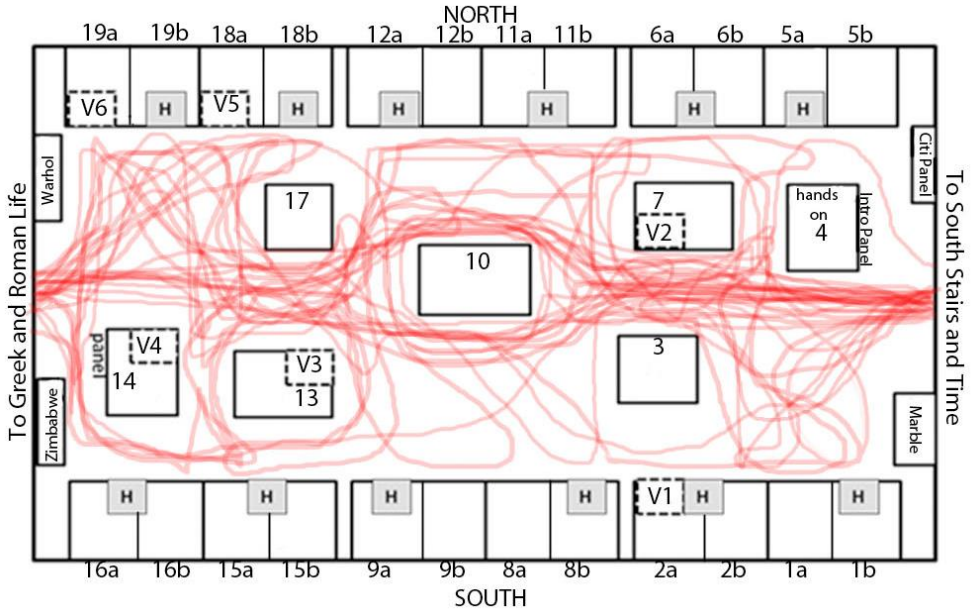

Figure 34: South door center path