

June 2016

# IWM Digital Resource for Volunteers

Andrew Gregory  
*Worcester Polytechnic Institute*

Linda Sara Baker  
*Worcester Polytechnic Institute*

Rachel Louise Plante  
*Worcester Polytechnic Institute*

Shintaro Norman Clanton  
*Worcester Polytechnic Institute*

Follow this and additional works at: <https://digitalcommons.wpi.edu/iqp-all>

---

## Repository Citation

Gregory, A., Baker, L. S., Plante, R. L., & Clanton, S. N. (2016). *IWM Digital Resource for Volunteers*. Retrieved from <https://digitalcommons.wpi.edu/iqp-all/1634>

This Unrestricted is brought to you for free and open access by the Interactive Qualifying Projects at Digital WPI. It has been accepted for inclusion in Interactive Qualifying Projects (All Years) by an authorized administrator of Digital WPI. For more information, please contact [digitalwpi@wpi.edu](mailto:digitalwpi@wpi.edu).



# WPI

## IWM Digital Resource for Volunteers

---

An Interactive Qualifying Project Submitted to the Faculty of the

WORCESTER POLYTECHNIC INSTITUTE

In partial fulfillment of the requirements for the Degree of Bachelor of Science by:

Linda Baker

Shintaro Clanton

Andrew Gregory

Rachel Plante

Project advisors:

VJ Manzo

Jianyu Liang

June 23, 2016

This report represents the work of one or more WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review.

# **ABSTRACT**

The Interaction Volunteers at Imperial War Museums London engage with visitors in the exhibits and discuss about certain artifacts. The communication of information among the Interaction Volunteer team, however, has been inefficient as the system relied on paper resources. Our IQP team surveyed volunteers and conducted a focus group to gather input about layout and features for a potential digital resource which the Interaction Volunteers could use in management of artifactual content and digital forms. This information was then used to design a website utilizing a content management system in order to make the communication of information more simple and efficient for the Interaction Volunteer team.

# ACKNOWLEDGEMENTS

Our team would like to thank our advisors, Professors V.J. Manzo and Jianyu Liang, for their continued support and guidance in completing this project. We would especially like to thank Mr. Grant Rogers, Informal Learning and Engagement Manager at Imperial War Museums London, for sponsoring and providing insight for our project and for sharing his enthusiasm for the museum.

In addition, we would like to extend our gratitude to the Learning and Engagement Department and Digital Design Department at Imperial War Museums London, for providing us the resources we needed to complete our project, and to the Volunteer Program at Imperial War Museums London for their advice and participation in our project.

Finally, we would like to thank Paige Neumann, Research and Instruction Librarian at WPI Gordon Library, for providing assistance in our project research.

---

Linda Baker

---

Shintaro Clanton

---

Andrew Gregory

---

Rachel Plante

# **EXECUTIVE SUMMARY**

## **Introduction**

Imperial War Museums, or IWM, is a museum organization that highlights the stories and experiences of civilians and soldiers during wartime. At IWM London, interaction volunteers walk around the galleries and present artifacts to visitors. Previously, information on the artifacts and various forms were all kept on paper. This led to disorganization of information which negatively affected the Volunteer Program's efficiency. Our team set out to develop a digital resource that contained the information and the forms for the interaction volunteers.

## **Methodology**

Our methodological approach had three key phases, which involved gathering data, creating a preliminary design, and finalizing our prototype. The data gathering process included a condensed volunteer training program that each of our team members completed, a survey of the general volunteer body, and a focus group interview to see what was required in the digital resource. Our preliminary design was built in PowerPoint and concentrated on the layout. Once the preliminary design was finalized, it was constructed in WordPress with added functionality.

## **Results**

The results of our General Volunteer Survey indicated that the volunteers wanted a resource that would be highly accessible and easy to use. The focus group interview yielded similar responses as well as ideas for additional features and considerations.

Using WordPress, we were able to construct a digital resource that is easy to edit and has a wide variety of functions. WordPress has a user friendly interface, and individuals with minimal background in web design and programming can easily make changes. Additionally, a "How To" guide was developed that demonstrates how to make changes on the digital resource in detail.

## **Recommendations**

We have three recommendations for IWM regarding the digital resource. Our first recommendation is to move the website to a local server rather than a third party hosting service. Our second recommendation is to use this digital resource across other volunteer groups at IWM London as well as other IWM branches. Finally, we recommend IWM to hire a professional designer to improve the design of the digital resource.

## Authorship

Chapter and Section Number	Primary Author(s)	Primary Editor(s)
<a href="#">Abstract</a>	Andrew Gregory	Shintaro Clanton
<a href="#">Executive Summary</a>	Shintaro Clanton	Rachel Plante
<a href="#">Introduction</a>	Linda Baker	Rachel Plante
<a href="#">Lit. Review: Introduction</a>	Linda Baker	Rachel Plante
<a href="#">Lit. Review: Common Museum App Features</a>	Andrew Gregory	Shintaro Clanton + Linda Baker
<a href="#">Lit Review: Intro to CMS</a>	Linda Baker	Rachel Plante
<a href="#">Lit Review: Necessary Programs</a>	Rachel Plante	Andrew Gregory
<a href="#">Lit Review: Volunteer Program</a>	Rachel Plante	Linda Baker + Andrew Gregory
<a href="#">Lit Review: Imperial War Museums</a>	Shintaro Clanton	Linda Baker
<a href="#">Methods: Introduction</a>	Linda Baker	Shintaro Clanton
<a href="#">Methods: Phase 1</a>	Andrew Gregory + Rachel Plante	Shintaro Clanton + Linda Baker
<a href="#">Methods: Phase 2</a>	Rachel Plante	Linda Baker
<a href="#">Methods: Phase 3</a>	Rachel Plante	Andrew Gregory + Linda Baker
<a href="#">Results and Analysis: Volunteer Survey</a>	Rachel Plante + Linda Baker	Shintaro Clanton
<a href="#">Results and Analysis: Focus Group</a>	Linda Baker + Andrew Gregory + Rachel Plante	Shintaro Clanton
<a href="#">Conclusions and Recommendations: Intro</a>	Shintaro Clanton	Andrew Gregory
<a href="#">Conclusions and Recommendations: Recommendations</a>	Shintaro Clanton	Andrew Gregory
<a href="#">Conclusions and Recommendations: Conclusions</a>	Shintaro Clanton	Andrew Gregory

# TABLE OF CONTENTS

ABSTRACT	.....	ii
ACKNOWLEDGEMENTS	.....	iii
EXECUTIVE SUMMARY	.....	iv
AUTHORSHIP	.....	v
TABLE OF CONTENTS	.....	vi
LIST OF FIGURES	.....	viii
LIST OF TABLES	.....	ix
CHAPTER 1: Introduction	.....	1
CHAPTER 2: Background	.....	3
2.1 Common Museum App Features	.....	3
2.2 Introduction to Content Management Systems	.....	8
2.3 Necessary Programs	.....	8
2.3.1 Integrated Development Environments	.....	9
2.3.2 Web Content Management Systems	.....	9
2.4 Volunteer Programs	.....	10
2.5 Imperial War Museums	.....	11
2.5.1 Imperial War Museums Core Values	.....	11
2.5.2 Imperial War Museums Corporate Plan	.....	12
CHAPTER 3: Methodology	.....	14
3.1 Phase 1: Data Gathering	.....	16
3.2 Phase 2: Preliminary Design	.....	18
3.2.1 Information Collection	.....	19
3.2.2 Prototype Design	.....	20
3.2.3 Testing	.....	21
3.2.4 Data Evaluation	.....	22
3.3 Phase 3: Final Prototype	.....	22
CHAPTER 4: Results and Analysis	.....	23
4.1 General Volunteer Survey	.....	23
4.1.1 Volunteer Demographics	.....	24
4.1.2 Quantitative Data Analysis	.....	25
4.2 Focus Group Discussion	.....	28
4.2.1 Volunteer Paperwork	.....	29
4.2.2 Initial Prototyping	.....	29
4.2.3 Digital Prototyping	.....	30
4.3 Final Product: Website	.....	30
CHAPTER 5: Conclusions	.....	31
5.1 Conclusions	.....	31
5.2 Recommendations	.....	32

BIBLIOGRAPHY .....	33
APPENDIX A: Website Screenshots .....	35
APPENDIX B: Website Tutorials .....	39
APPENDIX C: Volunteer Focus Group Questions .....	52
APPENDIX D: General Volunteer Survey Questions .....	53
APPENDIX E: Glossary .....	56



# LIST OF FIGURES

Figure 1: Scope and Relevance of Our Project .....	2
Figure 2: British Museum App. <i>Vusiem Ltd. 2016.</i> .....	3
Figure 3: Exploratorium App. <i>Exploratorium. 2016.</i> .....	4
Figure 4: Smithsonian App. <i>Marques, The Smithsonian Museum of Natural History. 2015.</i> .....	5
Figure 5: Canadian War Museum App. <i>Tristan Interactive. 2012.</i> .....	5
Figure 6: Global Mobile Data Usage. <i>Acquired from Cisco Systems</i> .....	11
Figure 7: IWM Annual Report – Visitation Numbers .....	12
Figure 8: Project Timeline .....	14
Figure 9: Iterative Design Process .....	17
Figure 10a: Paper Prototype page showing Blue Trolley Artifacts .....	18
Figure 10b: Page showing specific artifact .....	18
Figure 11a: Blue Trolley page in WordPress site before CSS .....	21
Figure 11b: Blue Trolley page in WordPress site after CSS .....	21
Figure 12: Column chart representing time spent by volunteers completing paper forms .....	25

# LIST OF TABLES

Table 1: Cross Tabulation Data of Length of Time at IWM London vs. Level of Comfort Using Mobile Devices .....	23
Table 2: Cross Tabulation Data of Length of Time at IWM London vs. Amount of Time Spent Filling Out Paperwork.....	24
Table 3: Cross Tabulation Data of Length of Time at IWM London vs. Frequency of Referencing Binder.....	26

# CHAPTER 1: Introduction

Education is one of the defining features of the human race. While every other member of the animal kingdom uses instinct to retain ancestral information, humans have progressed and learned over time. Each generation teaches the next generation, and through scientific development, our culture improves the collective knowledge through a recursion of learning. Throughout history, humans have developed new methods of improving technology that in turn improves teaching methods. Among our species' oldest teaching methods lies the museum, which may have first been created circa 530 BCE (Lewis, 2011). While languages and stories change and adapt over time, primary sources and artifacts found in museums may have been kept in the same shape throughout history. This preservation allows visitors to get a vivid, educational experience that they might not be able to get with a textbook. Since people first started keeping records and artifacts in buildings, museums have been closely integrated into our culture. Many museums today assist with this educational experience by having staff members interact with the public; these staff members and volunteers speak with museum visitors about exhibits, offering further historical or scientific perspectives that visitors might not have learned on their own. These volunteers make museum experiences more interactive: as they engage visitors person-to-person, their conversation is naturally tailored to match their audience.

Despite the benefits of this personal learning experience, person-to-person interaction between volunteers and visitors has its own limitations. Unlike a computer, a volunteer inherently has a limited knowledge of the subject matter, in contrast to the encyclopedic information that can be accessed with the internet. With the rise in popularity of smartphones in the past decade, and the widespread development of third-party applications, or “apps”, a new form of museum supplemental learning has emerged. Museums have released mobile apps, which offer more information about their collections, on popular mobile app markets. Although these apps have the potential to contain a lot of relevant subject matter, accessibility is often an issue. It is difficult for an app to be as engaging as it is informative to visitors. Language, age, disability, and financial barriers, among others, make universal accessibility difficult. One can easily conclude that neither a human interactor nor mobile app can provide a perfect learning experience with visitors, as both have their strengths and weaknesses.

An ideal situation may be reached with the union of human interactors and digital learning methods. If a museum volunteer were to interact with the public while keeping a specialized mobile app close-by for reference, a synthesized relationship may develop, as the volunteer continues to use their own strengths in leading accessible and tailored conversations with the public. All of their sources are just a few taps away on their mobile app, allowing them access to a library of useful information to share with museum visitors.

A synthesized volunteer mobile resource like the one described above may be among the first of its kind. Several loosely similar examples can be found in the mobile apps provided by other museums such as the neighboring British Museum. However, none of these apps appear to be tailored specifically to provide supplemental materials for museum volunteers. As shown in Figure 1, several different scopes of relevant real-life examples visibly overlap with the scope of our project. There are mobile apps designed for volunteers in general, such as VolunteerMatch and Catalista (“Apps for Volunteering”, n.d.). However, these apps are not attached to specific affiliations; rather, these apps are designed to help increase volunteering worldwide by matching prospective volunteers with needed roles. In another scope, many museums create mobile apps that offer visitors additional information about exhibits and sometimes additional features such as recommended paths and games. To provide another frame of reference for this project, numerous organizations and companies use semi-private websites to host volunteer or employee resources, such as sign-in/out forms, surveys, and informational documents. While each of these modules have tie-ins with the proposed museum resource for volunteers, there is currently a void in this field for a product that contains all of the elements in one application.

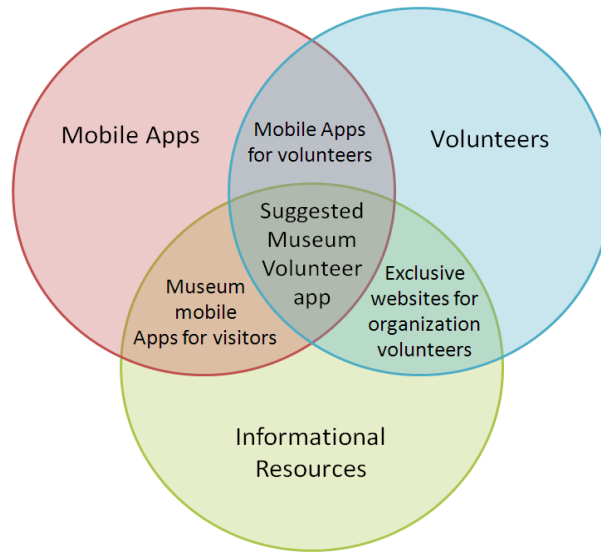


Figure 1: Scope and Relevance of our Project

In this project, we will develop a digital system for Imperial War Museums that can be used to synthesize the gap between human interaction and mobile app learning in museums. We have divided our project into three phases, which involve gathering data, developing the digital system, and finalizing the prototype. These phases will be detailed later in the methods section.

## CHAPTER 2: Background

In this chapter, we provide an overview of the usage of mobile apps within museums to convey information about artifacts to museum visitors. It then goes into further detail of the definition of a Content Management System, and why it will likely be a critical factor in our project's success in terms of bringing information to the volunteers and allowing them to engage visitors. This chapter concludes with an introduction to IWM and their CP14, and how their Volunteer Program functions.

### 2.1 Common Museum App Features

Typically, a mobile app designed for a museum has the goal of providing the user with information using more effective and accessible methods. This is possible due to the capabilities of a mobile app. An app is capable of storing large amounts of information and media and

displaying it in interactive ways. Digital learning is a new, rapidly expanding field in which many different industries and departments are exploring. The usage of apps in museums is continuing to grow as more people adopt smart devices (Tsai & Sung, 2012). Digital learning can be defined as facilitated learning through the use of technology, and as such, museum mobile apps generally fall into this category. Digital apps are used most commonly in museums to provide additional information and provide interactivity to the museum's exhibits. The British Museum App provides a perfect example of this functional design. This app provides an in-depth look at key artifacts along with images, maps, and events (Vusiem, 2016). The simplicity of this design shows how information can be provided to visitors in a simple way without losing any beneficiality. Many other museums elaborate upon this simplistic idea and develop additional features that improve upon this design with alternative methods for information dispersion. Features such as self-guided tours allow patrons to make their way around a museum viewing exhibits which appeal to their interests. Wayfinding is a feature which points out different exhibits as people pass through different rooms. Bookmarking within a web browser, along with social media connections, allows people to save and share what they find in order to do more in-depth research later or spread what they have learned to their peers (Economou & Meintani, 2011).



Figure 3: British Museum App.  
Vusiem Ltd. 2016.

The Exploratorium Science Museum in San Francisco released a pocket travel guide, which expands upon the initial idea of simply putting the information in front of the visitor. These apps use a combination of articles, videos, and interactive elements to engage the user in ways a wall-plaque or block of text cannot (Economou & Meintani, 2011). Combining physical and digital information helps in gaining this different insight.



Figure 2: Exploratorium App.  
Exploratorium. 2016.

The US Holocaust Museum takes a more personal approach to engage the visitor in the museum's exhibits. Visitors can read stories of individuals as well as see artifacts associated with these stories. These stories include photos and videos and allow users to send these sources to their personal email if they are interested in learning more after they leave the museum (Lamb, 2015). If a museum is able to provide visitors with a memorable experience, visitors are more likely to leave with a better understanding of the content than if they had read displays on their own (Economou & Meintani, 2011).

Many other museums use interactive media to improve their visitors' experience, enjoyment, and retention. Some museums provide enhanced tools, such as using augmented reality within an app. One example is the Smithsonian app, which uses GPS to show which exhibits are nearby and may be of interest to the user. Interactive overlays work in conjunction with the physical exhibits to provide yet another way of presenting information (Lamb, 2015). This dynamic system promotes different exhibits throughout the museum and helps facilitate a more fulfilling experience. The Cleveland Museum of Art allows users to set a pathway through the museum, hearing more about the exhibits they see along the way (Lamb, 2015). Users can also use the camera on their device to scan the artwork and gain more information. Several other museums have taken this route and have added features that allow museum visitors to add their own pictures to the app's database and to share these pictures on social media (Economou & Meintani, 2011). Augmented reality shows how it's possible to add information about exhibits in different, nontraditional ways which are often more effective and allow patrons to get more from the experience (Wood, 2014).



Figure 4: Smithsonian App. Marques, *The Smithsonian Museum of Natural History*. 2015.



Finally, an app can use interactivity, such as games, to promote information, learning, and retention. Usage of recently learned information helps to solidify the concepts in one's memory (Heick, 2014). Trivia games are quite good at this, as they help to resurface information which a user may have read or heard previously. They can also promote the further interest in a topic (Røtne & Kaptelinin, 2015). Another example is a museum scavenger hunt; these scavenger hunts typically involve moving through a museum and finding different artifacts or exhibits, which motivates people to explore the museum further than they may have without this game. This helps museum patrons see all that the museum has to offer. However, these interactive games often can lead visitors to rush through the museum's exhibits, and visitors may retain significantly less information if it is not pertinent to the game (Tsai & Sung, 2012). Each app affects the user's experience differently depending on the content it provides and how they use it. One unifying factor in each of these apps is that they implement a system for managing their respective content.



Figure 5: Canadian War Museum App. *Tristan Interactive. 2012.*

## **2.2 Introduction to Content Management Systems**

A Content Management System, or CMS, is defined by Yan Han as “a software system that provides preservation, organization and dissemination services for digital collections” (Han, 2004). A CMS is an application that uses an accessible user interface to support the distribution and modification of digital content (Raghavan & Ravikumar, n.d.). In short, a CMS offers developers the ability to easily update information visible to users. A CMS is often a staple of modern mobile apps. There are several types of CMSs, based on the application and intended usage of the CMS. For instance, a Mobile Content Management System (MCM) is a CMS specially designed to be used in conjunction with mobile devices.

A Web Content Management System (WCM) is a CMS specially designed to be used on a website on the internet. WCMs are widely used by corporations and organizations to manage content in an automated and elegant way, saving time that web developers would otherwise spend manually programming each change in, while also keeping a professional and programmed uniformity to the site’s layout. This automation also makes it easier for non-developers to add their own content to the website, significantly improving the accessibility of web design to clients. In most cases, a WCM offers a simpler user interface for a non-technical user, such as a volunteer in a museum, to easily add new information, therefore cutting out the need for constant technical support for the website. There are many WCMs available on the internet; one of the most well-known WCMs is Drupal. Another popular WCM is Wordpress, commonly used to create blogs on the internet.

## **2.3 Necessary Programs**

The history of the internet as we know it today began in the early 1990s with the invention of the first web browser by Tim Berners-Lee (Berners-Lee, n.d.). Berners-Lee created the markup language for constructing web pages, known as HyperText Markup Language (HTML), and the machine instructions for how to transfer them between computers, known as HyperText Transfer Protocol (HTTP), in addition to this web browser (Berners-Lee, 1991). Together, the web browser, HTML, and HTTP are the basic foundations on which all web pages are built and accessed. In order to build a website or any other kind of program, it is necessary to have the proper tools and development environment.

### **2.3.1 Integrated Development Environments**

The basic tools required for building a website include a text editor and a web browser. While a simple layout for any website can be made with these tools, often more sophisticated tools are required to create professional-looking and highly functional websites. One such more advanced tool is an Integrated Development Environment (IDE). An IDE is a versatile application that allows developers to create and edit code for their particular program, app, or website ((Rouse, 2016). IDEs typically include debugging tools, a compiler for a particular programming language, a runtime environment for program testing, syntax checking, and project directory organization tools. These tools allow developers to write and test their programs efficiently. Directory organization tools help the developer keep track of and organize project files, which is particularly useful for projects containing hundreds of files. Syntax coloration and checking act like a spell checker for a word processor. They make sure any programming errors are noticeable among all other program text so the developer may fix them before testing the program. If errors beyond typing mistakes exist, the debugging tool is useful for finding where the program starts behaving incorrectly while running. Lastly, because IDEs include support for compilers and provide a runtime environment, the developer does not have to open a separate application to test their program -- a web developer would not have to open their web pages in a separate browser, for instance. In particular, one useful IDE for web development is Eclipse PHP. This IDE contains the tools and language support for building websites that might utilize scripts for interactive and secure web pages.

### **2.3.2 Web Content Management Systems**

While the process of building a web page may be simple in most cases, designing a website to look aesthetically pleasing and to be functional is no easy task. One tool that aids in web development is a Web Content Management System (WCM). WCMs are a specialized type of CMS that allows developers to create and organize media for use in their websites. Web developers often use WCMs to build the structure and layout of web pages and to incorporate any scripts, tools, or security features they built in another IDE. Like IDEs, there are many WCMs in existence that are used for different kinds of websites. Drupal is a familiar WCM that is used for general website building and is not tailored to any specific website type in particular. It requires little-to-moderate knowledge of HTML and other web-programming languages.

Wordpress is a “blogging” WCM. It is often used to create blog posts and online personal journals and is tailored so that someone of any technical background could build a website. Though IDEs and WCMs are not the only two tools used for building websites, these resources can be used to create professional and elegant websites.

## **2.4 Volunteer Programs**

Many volunteer programs aim to enhance the user experience and foster an interest in the material. The National Museum Volunteers in Thailand begins with an intense training program led by the more experienced guides (Stamer, Lerdall, & Guo, 2008). The training helps to cover all material the volunteers could come in contact with and helps them to develop a deeper understanding of the subject as a whole. Since the process is led by the more experienced volunteers, these programs become self-managed and serve to benefit the museum while allowing the volunteers to have a sense of ownership of the success. This system is also implemented at IWM: volunteers watch each other present material and learn how to present on new artifacts.

Another related museum with an extensive volunteer program is the British Museum. The museum selects its volunteers from those who are enthusiastic and engaging toward the visitors (“Volunteer Opportunities”, 2016). Their roles include engaging with the public about different objects and exhibits along with answering an array of questions from the public. These aspects are also shared with the Imperial War Museum’s Volunteer Program.

The Imperial War Museums span five locations in the greater England Area; three museums known as IWM London, HMS Belfast, and Churchill War Rooms are all located in London, while two locations known as IWM Duxford and IWM North are located outside of London. IWM relies on the service of volunteers at each of their five locations. The Volunteer Program is open to anyone 18 years of age or older, and offers positions in a number of different jobs for various timeframes throughout the year. Short-term positions are available mainly for college-age students and volunteers who are looking for a smaller role in the museum. Long-term positions are available for volunteers who are looking for a greater involvement in the museum; all types of roles in the Volunteer Program are open to long-term volunteers. Overall, the purpose of the Volunteer Program is to assist the museum in all aspects of operation so that

visitors may have enjoyable visits and that the museum may continue to effectively serve the public in its education and tourism roles.

IWM divides their Volunteer Program into two main volunteer teams. The first team includes each of the London locations, while the second team is comprised of IWM North and IWM Duxford. Volunteer roles vary at each location, but include collections support, membership ambassadors, learning support, operations support, and warship conservation (“Volunteering with IWM London”, 2016). Specifically at IWM London, the Volunteer Program includes positions for Interaction Volunteers and IWM Membership Ambassadors teams. The duties of a Membership Ambassador Volunteer are to help increase visitor enrollment in the Membership Program, and to help current museum members explore the benefits of their membership and renew their existing memberships when they near expiration (“Volunteering with IWM London”, 2016). The duties of an Interaction Volunteer are to answer questions that visitors may have about the museum and its exhibits, and to lead object handling demonstrations. The object interaction portion of the program involve engaging with the public and is assisted by the use of a collection of helmets and headgear. One of the goals of the program is to show the public a different way of thinking about the exhibits and to promote connections to different objects and events. The current organization structure for these volunteers consists of a binder to store information and paperwork to keep track of their interactions (Rogers, 2016).

## **2.5 Imperial War Museums**

### **2.5.1 Imperial War Museums Core Values**

IWM’s primary goal is to provide an opportunity for visitors to study and understand the history of modern conflict (“IWM Corporate Plan”, n.d.). IWM retains records that explore the lives of those affected by conflict in order to convey to museum visitors the impact that war has on everyday life. IWM offers visitors these narratives in vivid detail, engaging guests in powerful experiences with hopes to communicate the causes and effects of conflict in the modern era.

IWM holds four core values in high regard. These values are courage, authority, relevance, and empathy, which affect their mission, collections, and visitors (“IWM Corporate Plan”, n.d.). Volunteers and employees strive to be courageous, confidently challenging the

established wisdom; authoritative, setting a standard of excellence while offering the general public their deep and dynamic knowledge and collections; relevant, keeping an impartial voice that's relevant to modern society; and empathetic, respecting that visitors come from a wide variety of backgrounds sharing many points of view.

IWM was founded during March of 1917 during World War I and, approved by the British War Cabinet so that they could record the events taking place during the war (“History of IWM”, n.d.). When the Second World War broke out, a decision was made that the museum would continue to collect artifacts and information from both World War I and World War II (“History of IWM”, n.d.). Similarly, at the beginning of the Korean War, the IWM redefined the museum's terms to their modern definition of preserving records of every conflict that either the British or Commonwealth were involved in after 1914.

## **2.5.2 Imperial War Museums Corporate Plan**

In the IWM Corporate Plan of 2014-17 CP14, a long term plan was published in which several major strategic changes to the museums are described and planned to occur between 2014 and 2017, with potential risks documented (“IWM Corporate Plan”, n.d.). One critical goal listed in the Corporate Plan is to increase IWM's relevance to various audiences by the means of adding more digital supplemental materials (“IWM Corporate Plan”, n.d.). With the digital expansion, IWM will be capable of reaching out far beyond the physical boundaries of the museum and will allow them to increase the size of their audience.

Modern audiences visiting IWM have continuously rising expectations for the digital delivery of materials. Mobile use has increased rapidly over the last decade, and will increase exponentially over the next few years (Cisco Systems, n.d.). As seen in Figure 6, in 2015, the worldwide mobile traffic was an average of 3.7 exabytes per month. In 2016, the projected mobile traffic will be approximately 6.2 exabytes per month. By 2020, the mobile traffic is projected to be more than 30 exabytes per month. As these numbers increase, people will be more accustomed to using and seeing mobile technology in regular activities. This may lead to expectations for implementation of technology in their surroundings, such as in a museum. IWM is trying to improve the integration of mobile technology in their exhibits, in order to increase the accessibility of their information to visitors. The “Digital Transformation Strategy” is set to focus on IWM becoming ‘mobile first’ in terms of digital content (“IWM Corporate Plan”, n.d.).

IWM will continue to extend their presence in the digital world and work to be as accessible as possible.

As shown in Figure 7, the number of visitors to IWM locations has shown significant increase since 2013. In 2014 the number of visitors increased by more than 50% compared to the visitation numbers in 2013. Additionally, the amount of people that have visited IWM’s website increased by 32% in 2014.

Performance indicator ('000s)	2014–15	2013–14	% change
<b>Access</b>			
Number of visits to IWM (excluding corporate hospitality guests and virtual visitors)*	2,814	1,876	50%
Number of unique website visits	5,517	4,167	32%
<b>Audience profile</b>			
Number of visits by children under 16 visiting IWM	617	513	20%
Number of overseas visitors	957	691	38%
<b>Learning and outreach</b>			
Number of facilitated and self-directed visits to IWM by children under 18 in formal education	177	152	16%
Number of instances of children under 18 in on-site organised activities	162	128	27%
<b>Visitor satisfaction</b>			
Percentage of visitors who would recommend a visit	96%	98%	-
<b>Income generation</b>			
Admissions income (gross)	£8,837	£8,011	10%
Trading net profit	£5,720	£2,824	103%
Fundraising income**	£18,950	£20,102	-6%
<b>Regional engagement</b>			
Number of UK loan venues ( <i>exact number reported</i> )	183	119	54%

Figure 7: IWM Annual Report - Visitation Numbers

## CHAPTER 3: Methodology

As we prepared to work in conjunction with the Imperial War Museums (IWM) in London, we formulated our overall goals and objectives for the project and outlined the intermediate steps that had to be completed in order to achieve our goals. Our project aimed to fulfill two goals: to design and implement a system to optimize the accessibility of IWM London’s clerical and artefactual records; and to increase productivity, efficiency, and quality of the Volunteer Program’s operations with our system. Our first objective was to assess the state of IWM London’s Volunteer Program and their previously implemented system of record-keeping

by administering surveys and interviews to the volunteer staff. These tasks helped us confirm whether an app or another digital resource would provide any improvements on the previous system of record-keeping. Additionally, information gathered through these tasks helped us understand IWM's Volunteer Program in general and gave us a better idea of what features should be included in our design. Our second objective was to create a visual layout of our design, present it to a focus group, and collect feedback in order to refine our design plans. Our final objective was to create a functional design of our product and collect feedback in order to identify future approaches to consider.

To achieve our goals and objectives, we have divided our project into three distinct phases, which directly coincide with our three objectives. Our first phase involved data gathering and collection. We surveyed and interviewed groups of volunteers to collect information on the volunteer program and to get a better idea of how we should design our product. Our second phase involved examining the data we collected in Phase 1 and using it to create a visual layout of the design. This design was then presented to a focus group of volunteers to collect their feedback. Our final phase involved examining the data we collected in Phase 2 and using it to create a functional prototype of the design. Once again, we presented this prototype to a focus group of volunteers for testing and collected their feedback. This feedback was then compiled to identify potential future changes IWM may wish to make on the prototype.

Figure 8 shows the timeline for our project. In Week 1, we completed a condensed version of the volunteer training each new volunteer completes. Weeks 2 and 3 we collected information from the volunteer body and the focus group so that we could begin designing our prototypes. These activities correspond with the first phase of our methodology. Beginning in Week 2 and ending in Week 5, we began working on Phase 2 of our methodology, which involved initial prototype design, focus group testing, and making revisions on the prototype. We began the last phase of our methodology in Week 4, in which we created the final version of our prototype and collected feedback from our focus group. During the last two weeks of our project, we analyzed the results we obtained from completing our methodology and prepared these results for our final presentation.



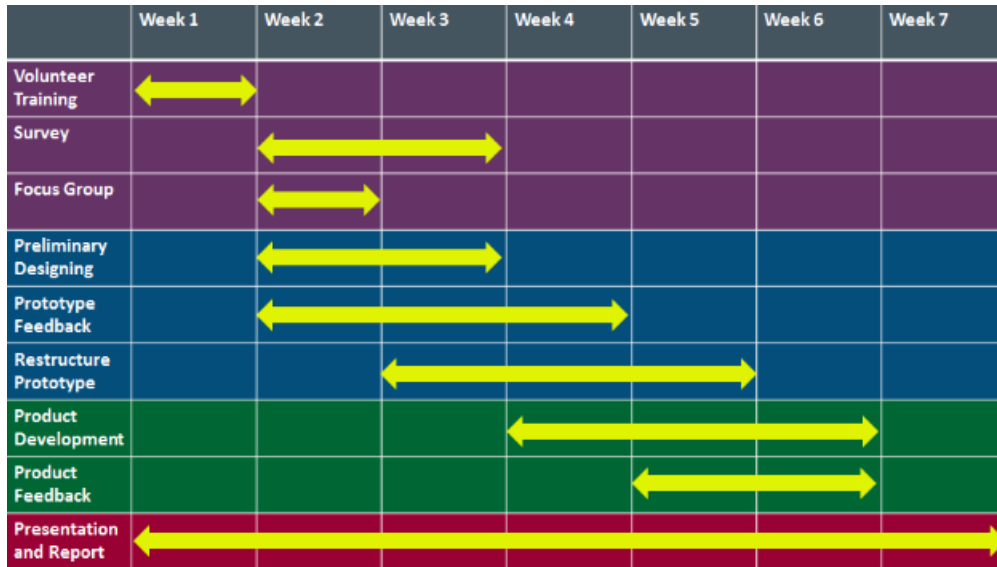


Figure 8: Project Timeline

### 3.1 Phase 1: Data Gathering

The Volunteer Program at the Imperial War Museums London branch is comprised of Interaction Volunteers, Operations Volunteers, Collections Volunteers, and Membership Ambassador Volunteers. Throughout the IQP process we primarily focused on the subsection of Interaction Volunteers. Prior to our project, the interaction volunteers at IWM London completed tasks such as logging hours and recording interactions with visitors, all on paper. The paper system was ineffective in facilitating immediate communication between volunteers and supervisors, which may have caused higher rates of miscommunication. Relevant information recorded on paper documents would only be available to those volunteers and supervisors who had a physical copy, and these documents could not be viewed on-demand at any time. Paper forms also lead to incorrectly recorded information when the forms were not filled out as soon as information became available. For example, volunteers filling out an interaction report at the end of their shifts would likely to forget details of their interactions earlier on in their shift, as these details were not recorded immediately. Although the paper-based system in place at IWM London could have continued to function, the limitations it has in terms of information collection and dispersion demonstrated the necessity of a new system. As the Interaction Volunteer system operated prior to our project, each new volunteer started by specializing in one artifact, which

they would present to visitors. Volunteers learned about other objects by listening to their colleagues communicate with visitors and through conversations with each other. This system often made it challenging for Interaction Volunteers to internalize all information about every artifact.

In order to identify the needs of the Volunteer Program at IWM, we found it necessary to communicate with the volunteers to gather their input about the state of their previous paper-based system and what features they would like to see in a digital-based system. We conducted a survey with the general volunteer body and a focus group with key volunteers to obtain this information. With the implementation of a digital resource, this system could be more efficient. In order to identify our approach, we gathered data and information in three stages.

The first step to remedying the issues of efficiency and record-keeping in the IWM London Volunteer Program was to communicate with our sponsor, Grant Rogers, in order to gain a perspective on the Volunteer Program in relation to these issues. We completed the Volunteer Training Program, which allowed us to gather information about interaction volunteering from a first-hand perspective. This perspective allowed us to see how the program functioned, and how a new digital system would benefit the program. Additionally, we discussed several topics with Rogers, including the logistics of the program, its shortcomings, and any areas in which it could be improved. This step helped us conceive additional questions to ask a focus group of volunteers.

The second step was to communicate with four experienced volunteers as a focus group to discuss the state of the volunteer program. We learned about the volunteers' day-to-day experiences with the program and what improvements they would like to see. The topic then shifted to the inconveniences the volunteers experience with the system and some potential solutions the focus group envisioned. Finally, we discussed the features, aesthetics, and overall functionality that the volunteers wanted and needed in a digital system. The questions we asked the focus group can be found in Appendix B.

The final step of our preliminary data collection was to survey the Volunteer Program through an online survey using Qualtrics. Volunteers were asked about how they currently complete necessary paperwork for their positions, how long it usually takes to complete this paperwork, and any difficulties or annoyances they have encountered with this paper-based system. Additionally, volunteers were asked about their experiences using mobile technology to

gauge how comfortable they would be with a new mobile, digital-based system. The benefit of surveying volunteers outside our focus group was that we gathered information from a broader spectrum of volunteers, including those who are less experienced and may have trouble with a new system. This data was used to design our resource to aid as many volunteers as possible. The survey questions can be found in Appendix C.

### **3.2 Phase 2: Preliminary Design**

IWM London was looking for a digital resource that expanded upon the original system to help the Volunteer Program be more efficient and improve communication. Originally, IWM London proposed an iPad app, however our team assessed alternative options for a digital system and decided that a website would be the best option for the Volunteer Program's needs. A website is platform independent, meaning that it can be accessed through any device with an internet connection. This means that the website can be accessed by volunteers despite their location. However, accessibility encompasses more than just how easily one can reach the website. Our website must be designed so that it is easy to use. Interfaces that have a steep learning curve or do not lead the user to its proper function from its design often cause user frustration, user dissatisfaction, and incorrect results (Brown, 2009). In order to prevent these inconveniences, our interface design followed careful guidelines as we considered the varying capabilities of our user group.

Our design process consisted of four distinct steps. The four steps are information collection, prototype design, testing, and data evaluation. Part of the information collection step was completed in Phase 1: Data Gathering, and our first step of this phase relies on Phase 1. The second step, prototype design, involved creating a small, low-fidelity (*see Appendix E for Glossary*) layout of a potential design. Following prototype design, the third step of Phase 2 is testing, in which the focus group was presented with the prototype design. The final step of Phase 2 involved collecting focus group feedback on the preliminary design and examining this data in order to form our next prototype. Figure 9 visually outlines our preliminary design process. The design process begins with information collection and then moves to prototype design, testing, and data evaluation. Should the preliminary design process need to be repeated, it may start over at information collection or skip to prototype design. The design process would begin again at information collection if the next prototype needed drastic changes to fit the

user's' expectations. If drastic changes to design concepts were not necessary, the design process would begin at prototype design since no new information is needed to continue prototype development.

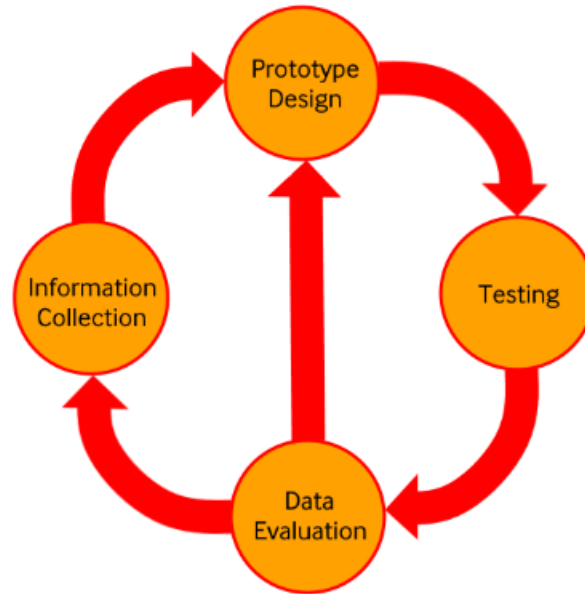


Figure 9: Iterative Design Process

### 3.2.1 Information Collection

Interface designers must complete several iterations of investigation, design, and evaluation in order to build well-designed interfaces. The investigation phase of interface development acts as a reference to the design and evaluation phases. Designers must first investigate the necessities of an interface before beginning the design process. Common assessments include, but are not limited to: *Who is the interface for? What task or problem is the interface intended to solve? What are the requirements for the interface to fulfill its purpose?*

The most common form of investigation used by professionals is interviewing the target audience (Walker, Takayama, & Landay, 2002). Our team met with the focus group in order to gather additional information that helped us determine our approach to designing the interface. In a full-group discussion, our team asked this focus group questions regarding how they would envision a digital resource for the Volunteer Program. Additionally, we asked them about any

ideas and features they would like to see implemented. The feedback we received was used to guide our design process.

### **3.2.2 Prototype Design**

For our first prototype, our goal was to create a basic design that encompassed a defined layout rather than create a functionally-complete prototype. Based on the time to develop a prototype, resources available to us, and information we collected in the first step of our preliminary design phase, we created what is known as a “paper prototype,” or a low-fidelity (*see Appendix E for Glossary*) layout of the potential design. “Paper prototypes” consist of storyboard-like drawings of each screen of the interface design layout. Buttons and other interactive widgets on the screen are labeled with their function and where they lead to, if applicable (“Prototyping”, n.d.). Our “paper prototype” was created using Google Slides, a presentation tool. This prototype took the paper-based reference binder and represented it in a digital form by containing slides for all artifacts present in the Volunteer Reference Binder. The reference binder contains all paper-based resources that volunteers may refer to during their shifts, including artifact information pages and daily paperwork forms such as tally sheets. An example of two slides from the “paper prototype” are shown in Figures 10a and 10b. The prototype had little functionality and was limited only to navigating between the home page and artifact pages, but it served as an effective representation of our preliminary design and provided our focus group a baseline for offering feedback.



Figures 10a & 10b: (a) Paper Prototype page showing Blue Trolley Artifacts; (b) Page showing specific artifact

### 3.2.3 Testing

There are several different ways to test a prototype design, but the most practical and time-conscious way was to perform a prototype demonstration with our focus group. Usually, prototypes are tested by presenting the focus group or user population with the prototype and asking them to complete a series of tasks. Testing facilitators take on an observation role and record the test users’ responses and reactions, and help to answer questions the users may have without directly telling the users how to complete a task. By having the facilitator take on a passive, observation role, the facilitators can record an accurate representation of how a user would truly use the interface.

Due to time constraints, we chose to do a prototype demonstration. We presented the “paper prototype” to our focus group by showing and explaining the step-by-step process of how a volunteer might navigate through the prototype to access information or to fill out the tally sheet at the end of their shift. The purpose of our prototype design phase was to use this “paper prototype” to explore a broad solution for the interface in order to identify more specific paths the design will follow. While two of our team members presented the prototype to the focus group, the remaining team members recorded the focus group’s initial reactions and responses to the design. Following testing, we asked our focus group about the features they liked or did not like and asked for any suggestions or requirements they had for our next prototype.

### **3.2.4 Data Evaluation**

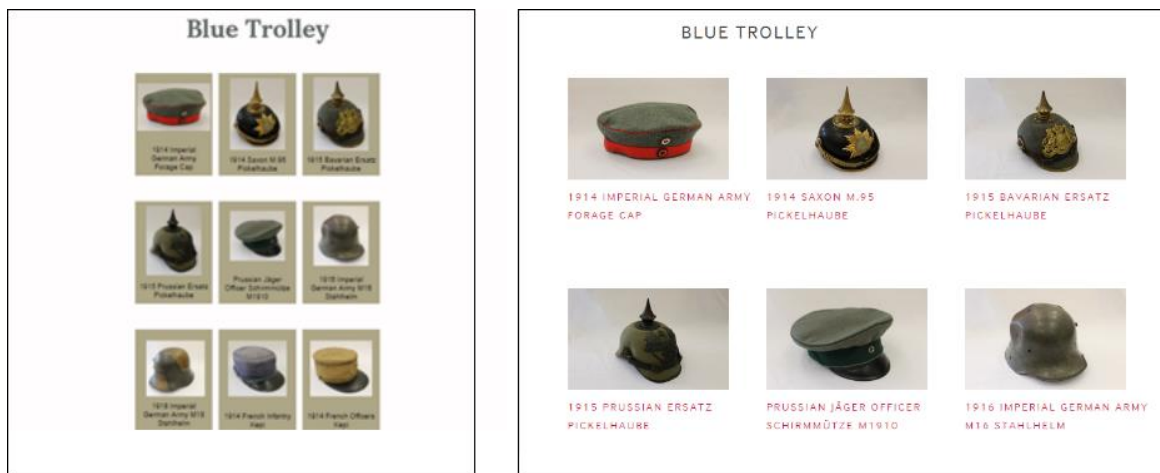
After our prototype testing stage was completed, we collected and examined all the data from the prototype demonstration, as well as data from the General Volunteer Survey and our focus group interview. This stage was important to the preliminary design process, as well as the overall design process, because it identified the ways in which our “paper prototype” was successful in meeting the goals and objectives for our project and the areas in which our “paper prototype” needed to improve. The data we received was intended to guide us on developing a second version of our prototype that fulfills more of the needs and desires of the Volunteer Program and has more functionality than the “paper prototype.” The volunteer demographics data, specifically about each volunteer’s level of experience, was cross-tabulated with responses to other questions to look for trends. Suggestions made by both the focus group and general volunteer body were examined to find common needs or desires that were shared by most volunteers. Using the data we collected and analyzed, we began development of our final prototype.

### **3.3 Phase 3: Final Prototype**

After presenting the paper prototype with the focus group, we began to create a final website prototype. While its predecessor’s purpose was primarily centered around design, the final prototype was focused on adding functionality based on the design of the paper prototype. While the paper prototype offered a cost-effective and time-conscious approach to developing an interface, the presentation only allowed the focus group to observe the prototype but not test it. As a result, it was difficult to get an accurate representation of how effective and user-friendly the interface was. The final prototype was built upon this design and took into account what improvements were necessary to create a “successful” digital system.

Phase 3 transitioned to a finalized design using the data collected from presenting the paper prototype. The key difference between Phase 2 and Phase 3 is the platform on which the prototype is developed. This prototype was designed in WordPress and was hosted by Zyma, a hosting service that allowed us to provide computing power and storage so the website can be accessed through the internet. From there, a domain name was assigned for the host, allowing users to access the site. With a host established, the WordPress software was installed on the

server, allowing us to begin building the site. To begin, the design that was previously established was transferred into the WordPress site. Figures 11a and 11b show an example page from the final prototype. Figure 11a shows the “Blue Trolley” page from when the design was first transferred into WordPress, and Figure 11b shows the design of this same page after custom CSS (see Appendix E for Glossary) was applied to match the style guides set forth by IWM’s branding team. After installing the site's framework, our focus shifted to implementing suggestions that we received from the focus group. These suggestions included features such as a search function and forums. The result was a polished site which contained the functionality and features asked for by both Grant Rogers and the focus group.



(a)

(b)

Figures 11a & 11b: Blue Trolley page in WordPress site; (a) before CSS; (b) after CSS

## CHAPTER 4: Results and Analysis

### 4.1 General Volunteer Survey

During Phase 1 of our methodology, our team released a survey to the general body of volunteers at the Imperial War Museums London branch. This survey asked questions which were intended to identify the basic demographics of the volunteer body, their volunteering experience at IWM London, and their level of comfort using mobile devices. This survey was also intended to gather suggestions volunteers had for a digital format. The survey was sent to



approximately 30 volunteers, and 14 responses were received. However, the sample size we have was too small for a fully accurate representation of the data we hoped to obtain from the general volunteer body. The data we gathered from this survey was intended to inform us on which types of volunteers, based on length of volunteering at IWM London, might use certain features more often than other features in our website. One key question on the survey asks about features the volunteers would like to see in the website. Ever since the project's initial proposal over a year ago, word has spread through the organization about the project to all of the volunteers. Their responses did not consist of many additional ideas, which shows that the volunteers are content with the concept that was discussed prior to the survey.

#### **4.1.1 Volunteer Demographics**

Through our General Volunteer Survey, basic demographics were collected on the volunteers' backgrounds. Half of our respondents have been volunteering at IWM London for fewer than 2 years, while the other half have been volunteering at IWM London for at least 3 years. None of the survey respondents indicated that they have been volunteering for more than 5 years. This statistic shows that the volunteers have varying degrees of familiarity with the program and how it operates.

In addition to our question about time spent at IWM London, we asked our survey recipients their motivations for joining the Volunteer Program. This question was intended to gather qualitative data about our volunteer population. From the responses we received, we determined that people join the volunteer program for several common reasons. Most respondents indicated that they wanted to meet new people through volunteering and to share their love of history with the public. Several respondents also indicated that volunteering provided them an opportunity to gain work experience for other jobs. Some respondents indicated that they were recently retired and wanted to give back to their community by volunteering, and a few respondents reported that they were so impressed by the museum and the Volunteer Program that they themselves wanted to be involved. This variety of responses shows that the Volunteer Program is comprised of volunteers from different educational and vocational backgrounds. Since the volunteers come from different backgrounds, they all have varying experiences and ideas with how information should be presented and formatted. This information

is important to our project, as it was used to guide our design process to improve accessibility for every volunteer.

### 4.1.2 Quantitative Data Analysis

The first trend we observed was length of time at IWM London and level of comfort using mobile devices. As shown in Table 1, seven of our respondents indicated that they were extremely comfortable using mobile devices, and these responses appear uniform across length of time volunteering at IWM London. We can attribute this to the fact that people are generally comfortable with mobile devices no matter how long they have been volunteers. With this data, we can establish that the volunteers are generally familiar with mobile devices and that they will not have issues using our design due to the device on which it is presented.

		How long have you been volunteering at IWM London?							Total
		Less than 6 months	6 - 12 months	1 - 2 years	3 - 5 years	6 - 10 years	Over 10 years	I prefer not to respond	
How comfortable are you with using mobile devices (ie., tablet, mobile phone, PDA) to look up information?	Extremely Comfortable	2	1	1	3	0	0	0	7
	Somewhat Comfortable	1	0	0	3	0	0	0	4
	Neither comfortable nor uncomfortable	0	1	1	1	0	0	0	3
	Somewhat Uncomfortable	0	0	0	0	0	0	0	0
	Extremely Uncomfortable	0	0	0	0	0	0	0	0
	Total	3	2	2	7	0	0	0	14

Table 1: Cross Tabulation Data of Length of Time at IWM London vs. Level of Comfort Using Mobile Devices

Similarly, respondents who indicated that they were neither comfortable nor uncomfortable with mobile devices were also evenly distributed based on their length of time volunteering at IWM London. The unpredictability of this data helps to prove that volunteers cannot be expected to have prior experience in working with mobile devices. This data was important in guiding our design process; we had to take into account our users' levels of comfort using mobile devices so that we could design an interface that is easy to navigate for every user.

Subsequently, we analyzed the correlation between volunteer experience and length of time required to complete paperwork. We hypothesized that with repetition, volunteers would have a better understanding of the questions they would have to answer, reducing the necessary time to complete forms. We found instead, that there seems to be little correlation between a volunteer’s amount of experience and their time spent completing forms, as shown in Table 2.

		How long have you been volunteering at IWM London?							Total
		Less than 6 months	6 - 12 months	1 - 2 years	3 - 5 years	6 - 10 years	Over 10 years	I prefer not to respond	
On average, approximately how much time do you spend filling out paperwork for IWM London each day you volunteer?	I do not fill out paperwork each day I volunteer	0	0	0	0	0	0	0	0
	Under 1 minute	0	0	0	1	0	0	0	1
	1 - 5 minutes	3	0	2	2	0	0	0	7
	6 - 15 minutes	0	2	0	3	0	0	0	5
	16 - 30 minutes	0	0	0	1	0	0	0	1
	31 - 60 minutes	0	0	0	0	0	0	0	0
	More than 1 hour	0	0	0	0	0	0	0	0
	Not Sure	0	0	0	0	0	0	0	0
	I prefer not to respond	0	0	0	0	0	0	0	0
	Total	3	2	2	7	0	0	0	14

Table 2: Cross Tabulation Data of Length of Time at IWM London vs. Amount of Time Spent Filling Out Paperwork

Looking at the volunteers with a broader lens, however, we found that the volunteers, on average, tend to spend about the same amount of time on paperwork. This is fortunate; we do not want the paperwork process to take a significant amount of time out of a volunteer’s day, but on the other end of the spectrum we do not want a volunteer to breeze through the forms so quickly that they do not offer appropriate and thought-out responses. Based on the data shown in Figure 12, we calculated that the average volunteer completes paperwork in approximately 4-8 minutes using the paper forms, and we hoped that the implementation of digital forms might be able to lower that value for all volunteers.

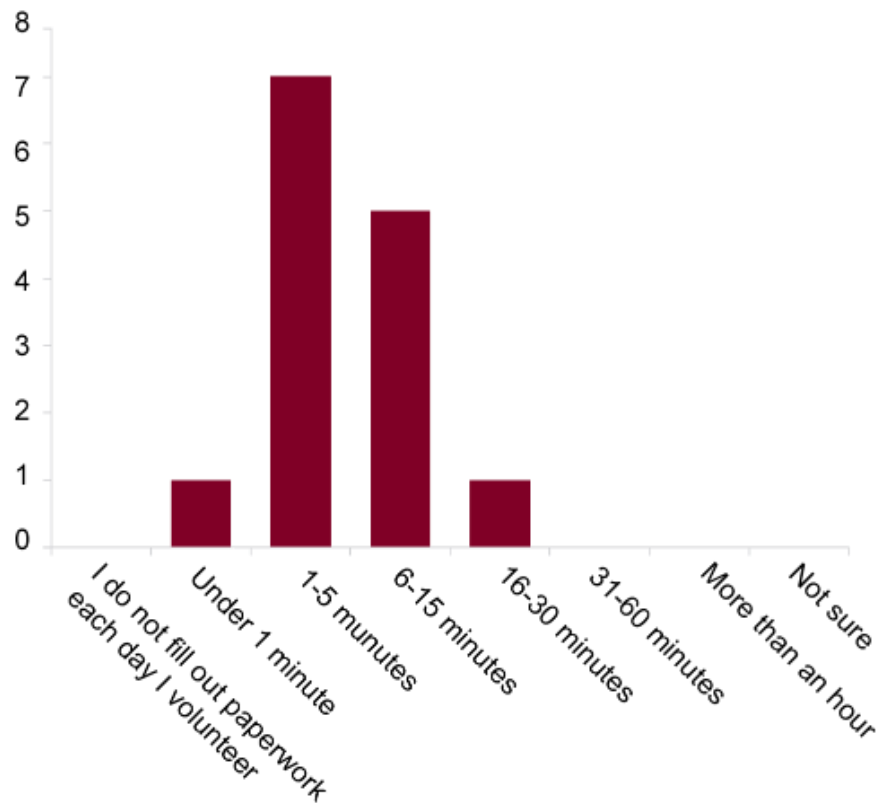


Figure 12: Column chart representing time spent by volunteers completing paper forms

The last piece of data we examined was the impact of length of time volunteering at IWM London in relation to a volunteer’s need to reference the binder of support materials. We hypothesized that volunteers who have been at IWM London for longer periods of time would need to reference the binder less often, as they may have already learned a great deal of information from their experience in the role. Conversely, we theorized that volunteers who have been at IWM London for only a short time would need to reference the binder more often, as they would not be able to draw on extensive personal experience as a volunteer. We examined this data because it would help us identify how volunteers of varying levels of experience would use the website. This data would be useful to determine if, for example, newer volunteers visited certain pages of the site more frequently than others, such as the support materials pages.

However, our findings showed that there was no correlation between length of time volunteering at IWM London and how often volunteers needed to reference the binder. As shown in Table 3, experienced volunteers referenced the binder with the same frequency as less

experienced volunteers, independent upon the level of frequency. In this context, we define experienced volunteers as those individuals who have been at the museum for 3 to 5 years, and less experienced volunteers as those individuals who have been at the museum for fewer than 2 years. Experienced volunteers referenced the binder “Often” and “Every time” as frequently as less experienced volunteers. Similarly, less experienced volunteers referenced the binder “Sometimes,” “Occasionally,” and “Rarely” as frequently as experienced volunteers did. These results show that the frequency with which volunteers reference the binder of support materials is a matter of personal preference and knowledge. From this conclusion, we posit that the support materials pages will be used by all volunteers in equal frequency, regardless of their experience volunteering at IWM London.

		How long have you been volunteering at IWM London?							Total
		Less than 6 months	6 - 12 months	1 - 2 years	3 - 5 years	6 - 10 years	Over 10 years	I prefer not to respond	
Currently, how often do you reference the binder of support material for the trolley objects when you volunteer?	Every time	1	0	0	3	0	0	0	4
	Often	0	1	1	0	0	0	0	2
	Sometimes	1	0	0	1	0	0	0	2
	Occasionally	0	1	0	1	0	0	0	2
	Rarely	1	0	1	2	0	0	0	4
Total		3	2	2	7	0	0	0	14

Table 3: Cross Tabulation Data of Length of Time at IWM London vs. Frequency of Referencing Binder

## 4.2 Focus Group Discussion

During Phase 2 of our design, we gathered a group of experienced volunteers who offered their perspective on the volunteer program. The process began as we asked this focus group about their views of the interaction program and what materials they find to be helpful in their roles as experienced volunteers and as mentors to newer volunteers. We then asked about

various aspects of the interaction program to find out where things could be improved. From that point we demonstrated the prototype to the focus group, and gained feedback about potential features.

#### **4.2.1 Volunteer Paperwork**

The previously implemented system for keeping track of day-to-day information in the Volunteer Program consisted of paper forms which had sections for visitor tallies as well as additional comments. Our focus group did not seem to have many qualms about the paperwork and described it as simple to complete. They did, however, say that they usually have difficulty in coming up with an accurate tally for the number of visitors. This is due to the fact that they are usually holding a helmet and engaging with visitors during their shift, and must approximate the number of visitors afterward as opposed to counting each visitor. Another difficult aspect comes with analyzing the data gathered by the volunteers. In order to gain a better perspective of the results, the information had to be entered into a computer since it was collected on paper sheets. A digital system remedied these issues by allowing users to easily input and automatically chart this data.

#### **4.2.2 Initial Prototyping**

After our focus group interview, we demonstrated the layout and basic functionality of our paper prototype. During this demonstration, two of our team members walked through the site's features and how we might expand upon them in a future prototype, while the other two team members recorded the focus group's responses. The feedback collected from this demonstration was used to guide the changes we made in our final prototype. In general, the feedback we received on the prototype was positive. The focus group liked the simplicity of the design and reported that they could easily see the organization of the layout. Most of the feedback we received came in the form of suggestions for additions to the prototype. In particular, the focus group was interested in having more media present on the website. They suggested adding separate galleries for showing images of related artifacts, and for short video clips, which may have been taken from longer documentaries or may be made by other volunteers. They also proposed having a comments section for each artifact, so that volunteers may share their stories or visitors' stories. Another recommendation was to include an

“interactive calendar” that showcased famous dates in history so that they may reference this for use in their interactions with visitors. Their last suggestion was to add a search feature so that it may be easy to find a specific artifact or group of related artifacts.

Aside from suggestions on what the focus group would like to see in our website, we also received some critical advice. The focus group stressed the importance that the website must be user friendly, be easy to update and change, have a unified volunteer login, and have a user guide to help future volunteers learn how to use the system. These requests reflect the need that the Volunteer Program has for a unified digital system to replace the old, paper-based system. Adjustments according to the suggested features as well as the addressed concerns were made throughout the prototyping process.

### **4.2.3 Digital Prototyping**

After demonstrating the initial prototype with our focus group and collecting their feedback, we moved toward designing our final prototype. This prototype was built in WordPress and included some of the suggestions that the focus group had for our future prototypes, primarily including the search function and comment sections on artifacts. Additionally, we included a link to the Collections archive on the IWM main site. The paperwork aspect was handled by linking to a survey which volunteers can fill out during their shift. We also contacted the survey hosts to find ways of making the survey more user friendly, and these suggestions were forwarded to their design team.

## **4.3 Website**

Our final prototype is a fully functional website which was created in WordPress and hosted by Zyma, a third-party website hosting service. It contains many of the features which were suggested by the focus group and survey respondents. In this version, users are presented with a login screen when they first access the website. Once they log in, they have access to the full site through an improved user interface. This new interface includes a menu at the top of every page, facilitating site navigation. The menu allows users to access the blue and orange trolley, digital forms, collections, contacts, and discussion pages. Under the discussion tab, a forum and an interactive calendar can be found. The forum allows volunteers to have discussions about topics relevant to interaction volunteering, such as frequently asked questions from visitors

or new information about the artifacts. Directly under the forums, the interactive calendar shows significant dates including historical anniversaries and scheduled events. Another addition to the resource is a standard for linking to the IWM Digital Collections, which can provide additional information and images for an artifact. Appendix A contains screenshots of some of the features on the website and descriptions of the different categories of pages.

## **CHAPTER 5: Conclusions and Recommendations**

As we developed our prototype, we concluded that WordPress would be capable of most of the functions that we hoped to implement, and is user-friendly enough that even individuals with minimal background can edit and refine content. Although we were able to accomplish our goal of creating a functional and satisfactory prototype for this project, it is possible and recommended that IWM continues to use what we have developed, and expand upon our project to improve the resource.

### **5.1 Conclusions**

There were many factors that persuaded our decision regarding selecting a website development program. Some of these factors included cost, capabilities, and user accessibility. Most programs require a host server in order to create a website, which requires some amount of funding. This, however, was fairly low on our priorities list, as hosting a server is relatively inexpensive. We also had to make sure that the program we used allowed us to implement all of the functions that we required our website to have. Although functionality is our top priority, we wanted to make sure that anybody taking over the website could easily add to and edit the content. We chose WordPress because, with the addition of plug-ins to the website, there was a wide range of functions we could add to the site. At the same time, WordPress is fairly easy to use and requires minimal technical background. In addition to the website, we have created a “How-To” guide (*see Appendix B for Website Tutorials*) that can aid volunteers in updating the website.



## 5.2 Recommendations

Our team has a few recommendations on how to expand upon the project. The first thing we recommend is to have the website hosted on an internal IWM server. Currently, we are using a third party server to host the website. Using an internal server eliminates any funding required in paying for the host as well as any general risks of relying on a third party. If the website is moved to IWM's own servers, IWM's IT team will have full control over any web server issues.

Our second recommendation is to expand the usage of this website to other branches. Currently, the website is only applicable to the Interaction Volunteer program in IWM London. However, we believe that this tool could be used among all of the branches of IWM. In order to expand the website, IWM would need to create new tabs and add artifacts into the existing website. The process should not be difficult, as the layout and design of the website does not need to be changed drastically in order to add new information.

We also strongly encourage IWM to consider hiring a web design professional to improve the design of the website. Currently, the website is built on simplicity and basic functionality. If a professional can improve upon the design, the website could look more elegant, be easier to use, and have more functions. Hiring a professional would also provide long term support for the site and provide the program with a more immediate contact if a change necessary. We also encourage IWM London to consider investing in an application for use on iPads to allow the site to be used offline.

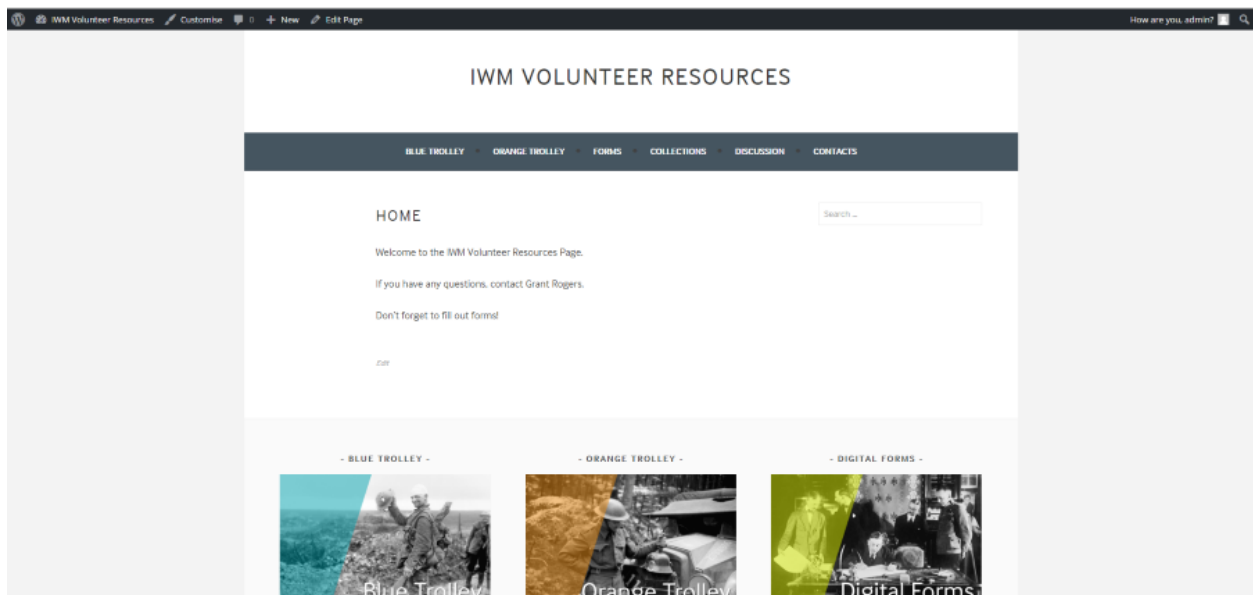
Our final suggestion we have for IWM London would be to consider using the current design to build an app. This should be done by hiring a professional mobile programming designer. Converting our website design into an app might prove useful to volunteers trying to access content while unable to connect to internet. The issue with using an app, however, is that an app will lose the website's feature of universal accessibility over a variety of different platforms, making it more difficult to edit. An app may be a better option for the Volunteer Program in the event that the museum's technological resources change.

# Bibliography

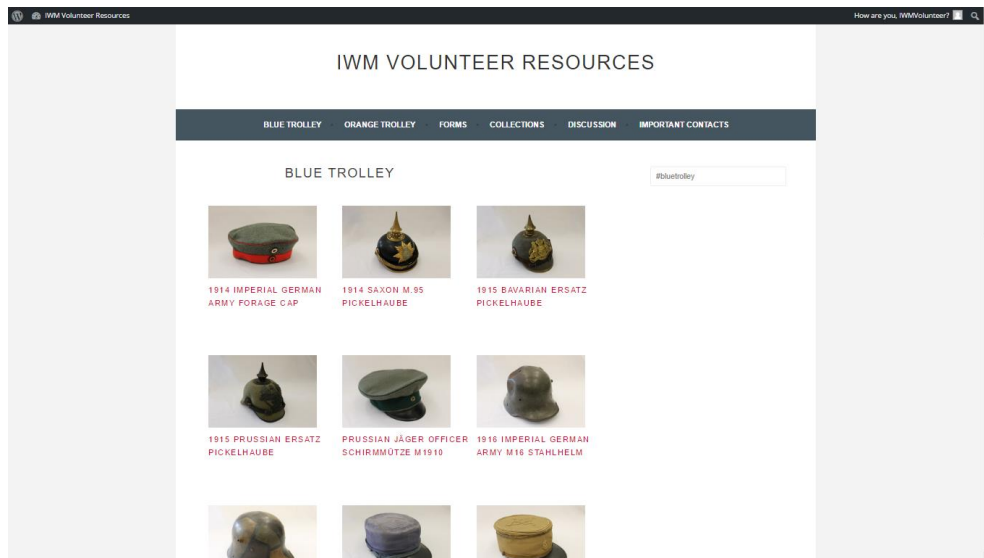
- Anj Bryant. (2014). Enterprise mobile content management (MCM) vendor list. Retrieved from <http://www.tomsitpro.com/articles/enterprise-mcm-vendors,2-741.html>
- Apps for volunteering. Retrieved from <http://appadvice.com/applists/show/apps-for-volunteering>
- Berners-Lee, T. (n.d.). The WorldWideWeb browser. Retrieved from <https://www.w3.org/People/Berners-Lee/WorldWideWeb.html>
- Berners-Lee, T. (1991). The HTTP protocol as implemented in W3. Retrieved from <https://www.w3.org/Protocols/HTTP/AsImplemented.html>
- Brown, D. (2009). HCI - poor interfaces cause... Retrieved from <http://web.cs.wpi.edu/~dcb/courses/CS3041/poor-interfaces.html>
- Cisco Systems. Global mobile data traffic from 2015 to 2020 (in exabytes per month). Retrieved from <http://www.statista.com/statistics/271405/global-mobile-data-traffic-forecast/>.
- Economou, M., & Meintani, E. (2011). Promising beginning? evaluating museum mobile phone apps. Retrieved from <http://eprints.gla.ac.uk/104173/>
- Han, Y. (2004). Digital content management: The search for a content management system. *Library Hi Tech*, 22(4), 355-365.
- Heick, T. (2014). Personalized learning. Retrieved from <http://www.teachthought.com/the-future-of-learning/why-digital-learning-is-just-different/>
- History of IWM. Retrieved from <http://www.iwm.org.uk/visits/iwm-london/about>
- IWM corporate plan 2014-17*. (). United Kingdom:
- Lamb, A., & Johnson, L. (2015). Interpretation, investigation, and imagination: Museum apps in the school library. *Teacher Librarian*, 42, 60-64. Retrieved from [http://libraries.state.ma.us/login?gwurl=http://go.galegroup.com/ps/i.do?id=GALE%7CA414004310&sid=summon&v=2.1&u=mhlin\\_c\\_worpoly&it=r&p=EAIM&sw=w&asid=04029cc8da18fb902cd28e0f7dd487d8](http://libraries.state.ma.us/login?gwurl=http://go.galegroup.com/ps/i.do?id=GALE%7CA414004310&sid=summon&v=2.1&u=mhlin_c_worpoly&it=r&p=EAIM&sw=w&asid=04029cc8da18fb902cd28e0f7dd487d8)
- Lewis, G. (2011). The history of museums. *Encyclopaedia Britannica*, 24
- Nurminen, J. K., Wikman, J., Kokkinen, H., Muilu, P., & Gronholm, M. (2008). Drupal content management system on mobile phone. *Consumer Communications and Networking Conference, 2008. CCNC 2008. 5th IEEE*, 1228-1229.
- Hall. Retrieved from <http://proquestcombo.safaribooksonline.com/9780133965315>

- Prototyping. Retrieved from <http://www.usability.gov/how-to-and-tools/methods/prototyping.html>
- Raghavan, N., & Ravikumar, S. Content management system.
- Røtne, O., & Kaptelinin, V. (2013). Design choices and museum experience: A design-based study of a mobile museum app. , 8278 9-13. doi:10.1007/978-3-319-03068-5\_3
- Rouse, Margaret. (2016). Definition: Integrated development environment (IDE). Retrieved from <http://searchsoftwarequality.techtarget.com/definition/integrated-development-environment>
- Shneiderman, B., Plaisant, C., Cohen, M., (Maxine S.), Jacobs, S. M., & Elmqvist, N. (2016). *Designing the user interface* (Sixth Edition ed.). Hoboken: Pearson.
- Stamer, D., Lerdall, K., & Guo, C. (2008). Managing heritage volunteers: An exploratory study of volunteer programmes in art museums worldwide. *Journal of Heritage Tourism*, 3(3), 203. doi:10.2167/jht043.0
- Tsai, H., & Sung, K. (2012). Mobile applications and museum visitation. *Computer*, 45(4), 95-98. doi:10.1109/MC.2012.143
- Volunteer opportunities. Retrieved from [http://www.britishmuseum.org/about\\_us/volunteers/current\\_opportunities/hands\\_on\\_desk.aspx](http://www.britishmuseum.org/about_us/volunteers/current_opportunities/hands_on_desk.aspx)
- Volunteering with IWM london, churchill war rooms and HMS belfast. (2016). Retrieved from <http://www.iwm.org.uk/connect/volunteers/london-branches>
- Vusiem. (2016). The british museum lite [mobile application software]. Retrieved from <https://play.google.com/store/apps/details?id=air.com.bm.london.vusiem>
- Walker, M., Takayama, L., & Landay, J. A. (2002). High-fidelity or low-fidelity, paper or computer choosing attributes when testing web prototypes. *Human Factors and Ergonomics Society Annual Meeting Proceedings*, 46(5), 661. Retrieved from <http://www.ingentaconnect.com/content/hfes/hfproc/2002/00000046/00000005/art00013>
- Wood, M. (2014, October 26). Tour a museum from anywhere. *New York Times* Retrieved from <http://search.proquest.com/docview/1616308657>

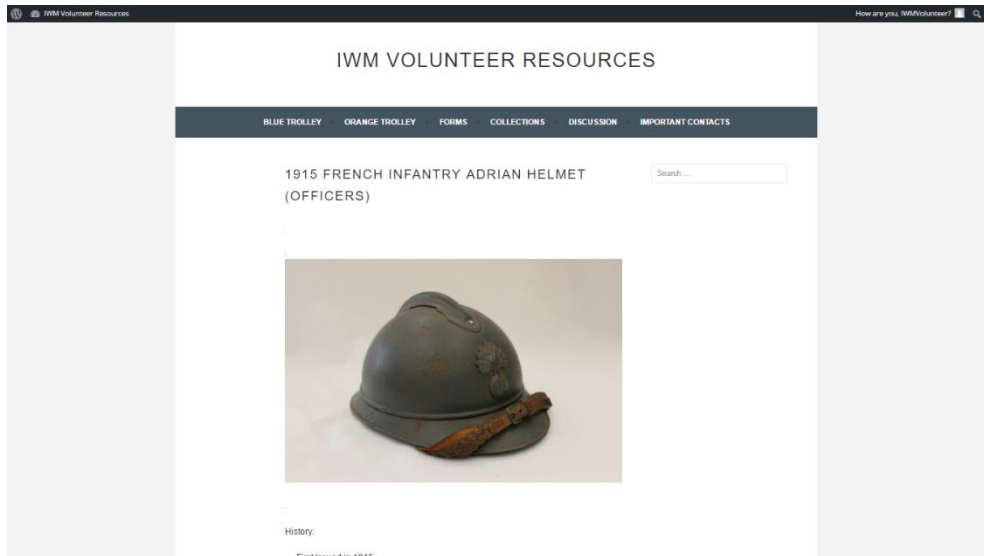
# Appendix A: Website Screenshots



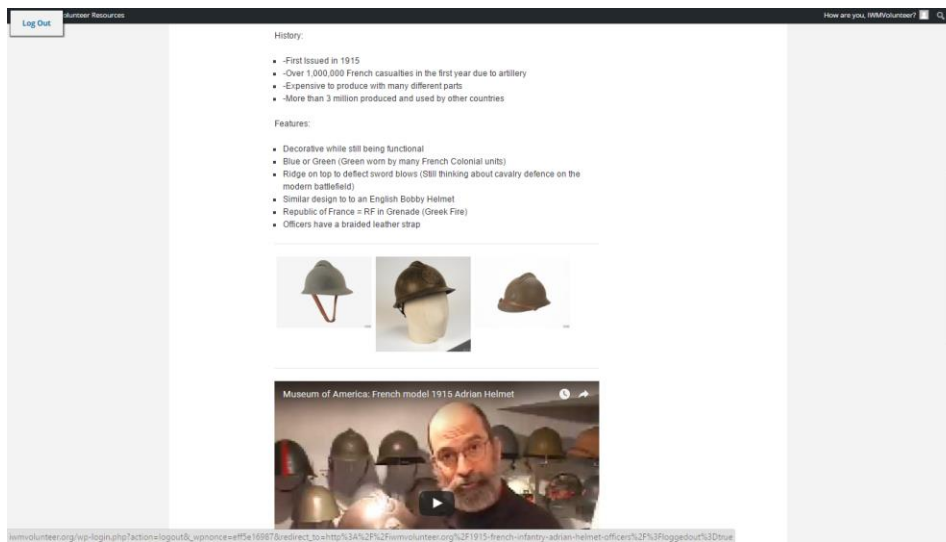
Site homepage which consists of a navigation bar to move through the site, buttons to select an artifact to learn more about, and a search bar to search through the artifacts.



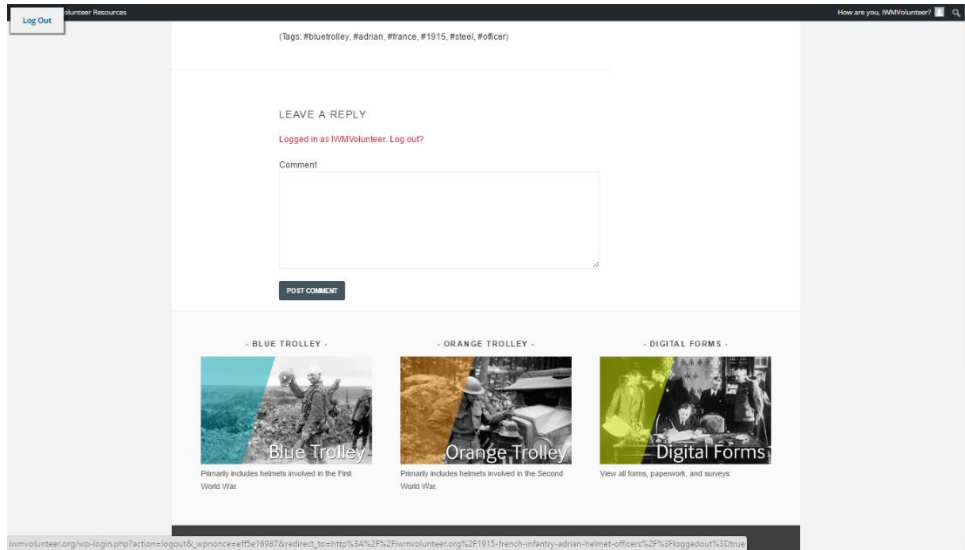
Trolley page that lists all the artifacts for that particular trolley. Clicking on the link or image will bring the user to that artifact page.



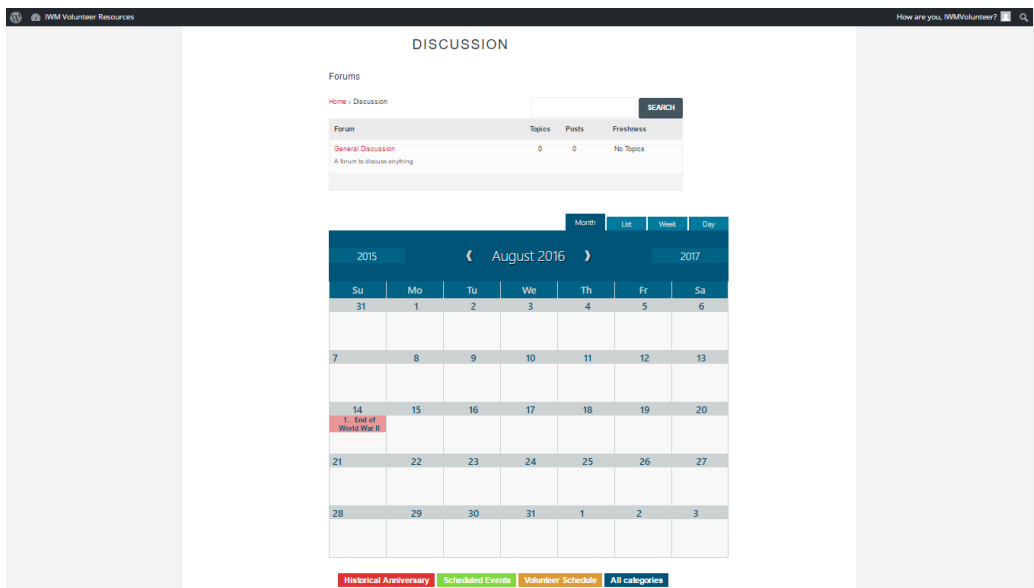
An example artifact page. The full title is displayed at the top of the page with a large image underneath.



Below the image is information about the artifact which may be used by volunteers to learn more about the artifact. Additional information is listed below the main artifact information. This information can take the form of additional images, videos, or links.



At the bottom of the page is a comment section which volunteers can use to suggest additional information or start discussions.



The discussion tab consists of a forum in which users can have discussions about topics relevant to interaction volunteering. Below the forum is an interactive calendar that may be used to record significant dates and to schedule volunteer shifts.

The image shows a screenshot of a web-based form titled "IWM London Volunteer Interaction Paperwork". The form is displayed within a browser window with a blue header bar. The form contains five numbered sections:

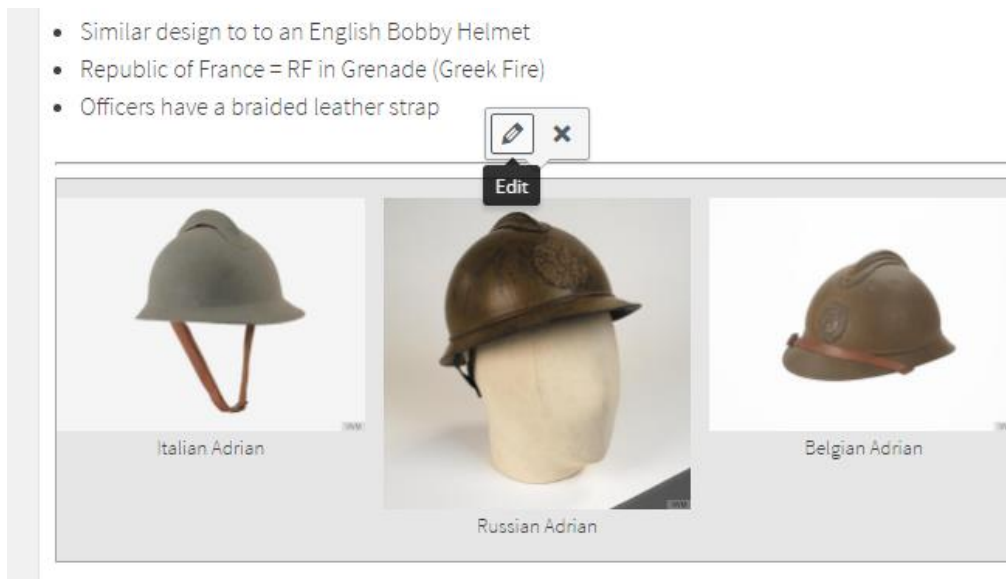
- 1. Names of all volunteers:** This section consists of eight numbered input fields (1-8) for recording volunteer names.
- 2. Date:** A single input field for recording the date.
- 3. Time:** A single input field for recording the time.
- 4. Tally the number of adults interacted with:** An input field for recording the number of adult visitors.
- 5. Tally the number of younger visitors (16 and below):** An input field for recording the number of younger visitors.

On the navigation bar is a link to the daily paperwork section. This is a survey intended for recording information from each volunteer shift. Aspects, such as the names of the volunteers working and the number of people they interacted with, is recorded for review.

## Appendix B: Website Tutorials

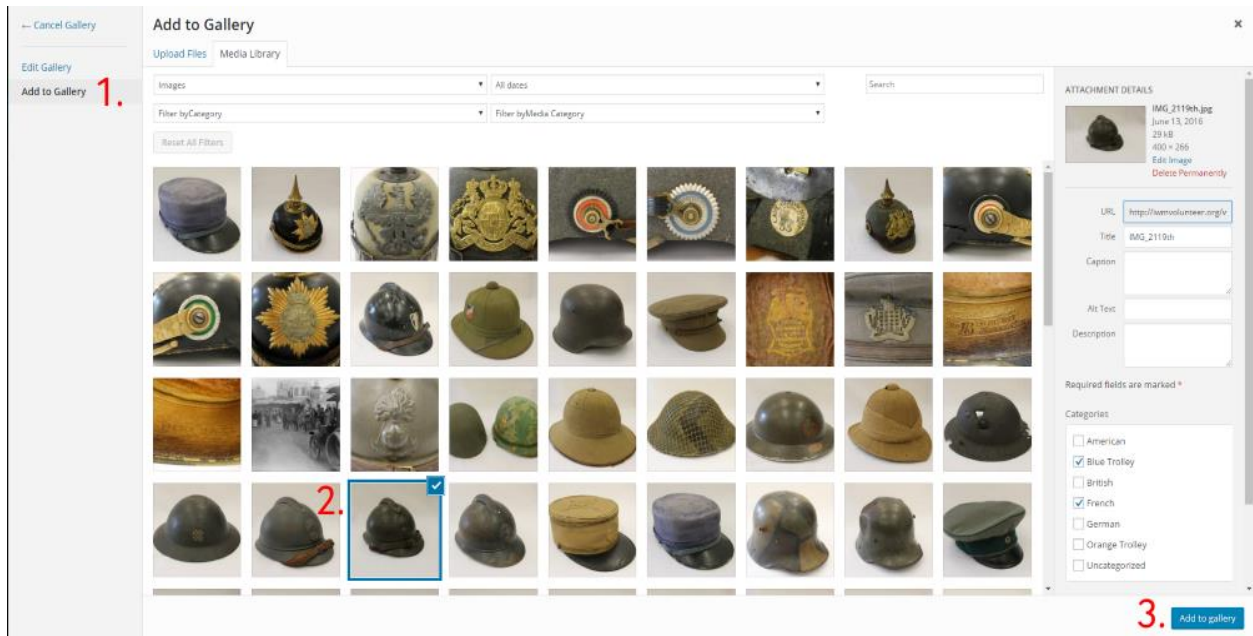
### Adding Images to an Existing Gallery

To add images to an existing gallery, open the editing tool for the page and find the gallery. Once you have found the gallery, click anywhere on the gallery widget to bring up its options. Select the “Edit” option, which is shown as a pencil.



Selecting the “Edit” option will open up the “Edit Gallery” window. To add new images to the gallery:

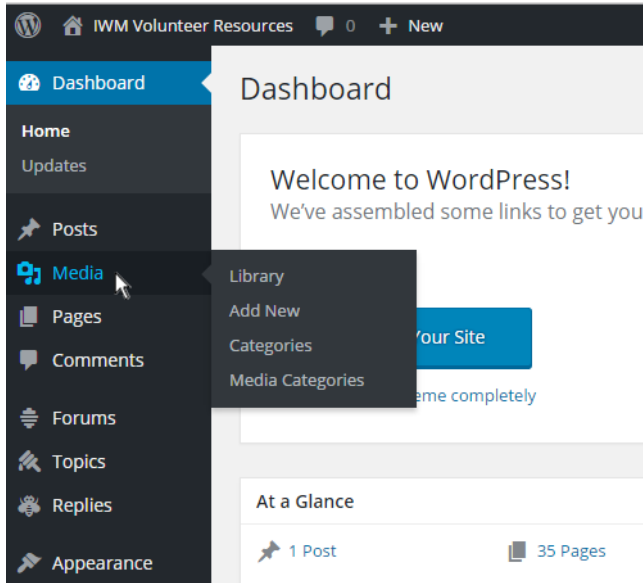




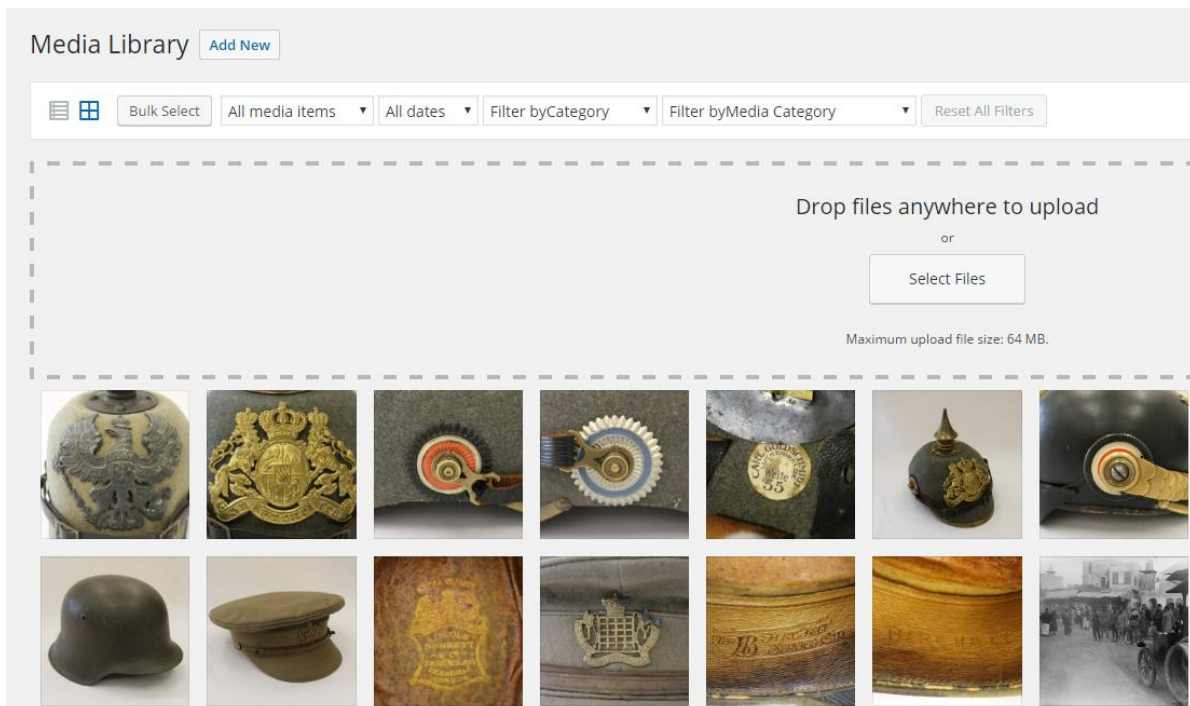
1. On the left side of the window, select the “Add to Gallery” tab.
2. Select the images you would like to add to the gallery by clicking on each image.
3. Once you have selected all the images you want to add to the gallery, select the “Add to Gallery” button in the bottom right corner of the window.

## Adding Media to the Media Library

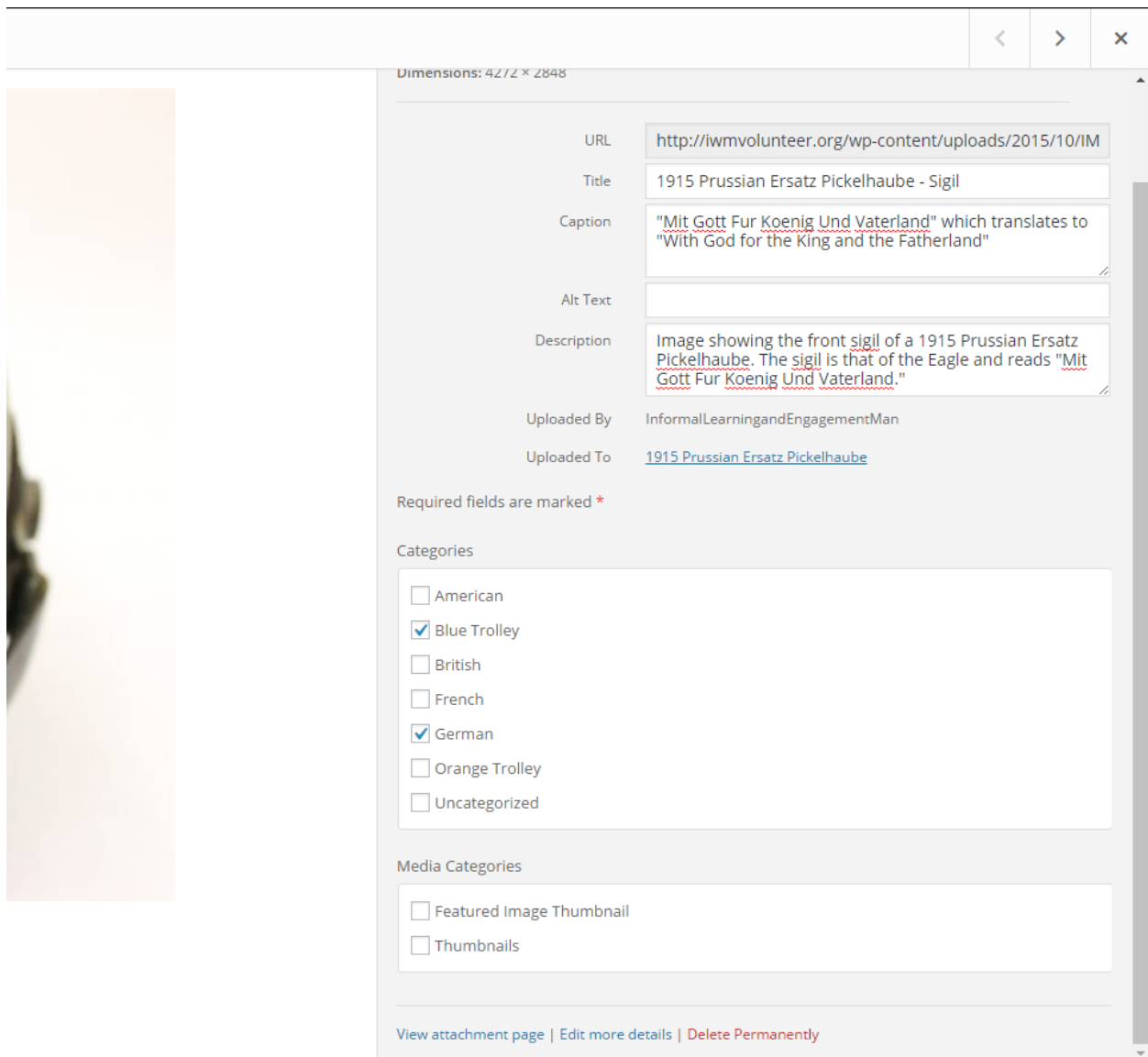
To add new media to the Media Library, select the “Media” tab in the menu on the left side of the screen. This will bring up the “Media Library” page.



On the “Media Library” page, select the “Add New” button in the top left corner of the page. This will bring up the file upload tool. Click the “Select Files” button to upload your file.



Once your file has finished uploading, it will appear in the “Media Library.” Select the file to edit its attributes. It is important to edit the attributes for each file so that files may be properly organized in the “Media Library.” At minimum, you should enter a title for the file and classify it under at least one category. When you are done, simply exit out of the file attribute editor by clicking the ‘x’ button in the top right corner of the Attachment Window and your changes will be saved.



The screenshot shows the WordPress attachment editor interface. On the left is a vertical image thumbnail of a dark, circular sigil on a light background. The main editor area on the right contains the following fields:

- Dimensions:** 4272 x 2848
- URL:** <http://iwmvolunteer.org/wp-content/uploads/2015/10/IM>
- Title:** 1915 Prussian Ersatz Pickelhaube - Sigil
- Caption:** "Mit Gott Fur Koenig Und Vaterland" which translates to "With God for the King and the Fatherland"
- Alt Text:** (Empty field)
- Description:** Image showing the front sigil of a 1915 Prussian Ersatz Pickelhaube. The sigil is that of the Eagle and reads "Mit Gott Fur Koenig Und Vaterland."
- Uploaded By:** InformalLearningandEngagementMan
- Uploaded To:** [1915 Prussian Ersatz Pickelhaube](#)

Required fields are marked \*

**Categories**

- American
- Blue Trolley
- British
- French
- German
- Orange Trolley
- Uncategorized

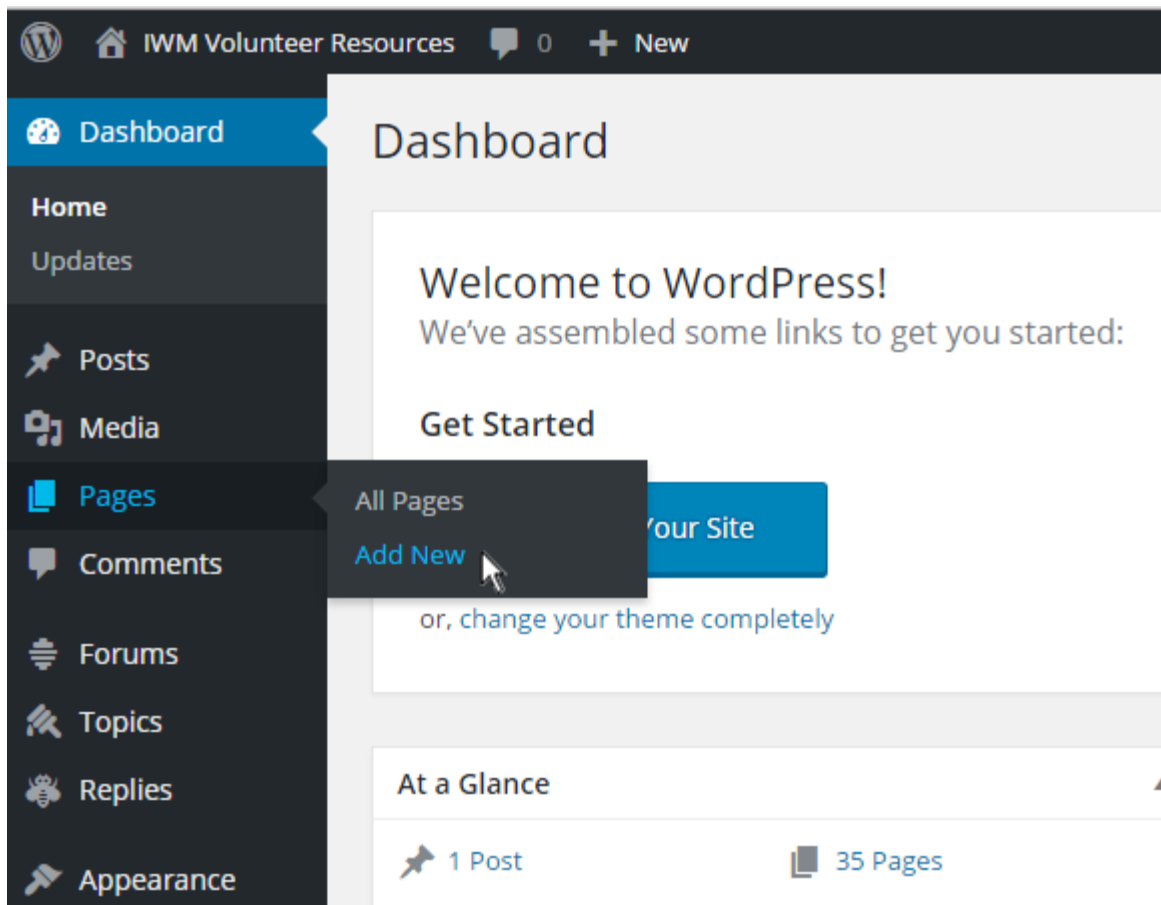
**Media Categories**

- Featured Image Thumbnail
- Thumbnails

At the bottom, there are three links: [View attachment page](#) | [Edit more details](#) | [Delete Permanently](#)

## Adding New Artefacts

Each artefact has its own page on the website. In order to add a new artefact to one of the trolleys, create a new page. To create a new page, hover over the “Pages” tab in the menu on the left side of the screen. This will bring up a drop-down menu. Select “Add New” to create a new page.



Once you have created a new page, follow the steps outlined below and in the pictures to fill it with content and properly organize it on the site.

Edit Page [Add New](#)


1914 French Officers Kepi **1.**

Permalink: <http://iwmvolunteer.org/blue-trolley/1914-french-officers-kepi-2/> [Edit](#)

[Add Media](#) **2.**

**B** *I* ABC **3.**

Paragraph



Features:

- Cloth cap with boiled leather peak
- "Horizon Blue" wool in colour with Blue Cloth Cover
- Some had a red crown
- Colonial soldiers wore a khaki variant (Example set by French Foreign Legion)

p » span

Word count: 137

1. Enter a title for the page. The title should be the name of the artefact.
2. Add the “main image” of the artefact to the page by selecting the “Add Media” button and choosing an image from the Media Library, or, upload a new image. The image used should be a full-sized image and not a thumbnail. Other images of any size may be added to the page in the same manner, but the “main image” should be full-sized.
3. Use the text box and text editor tools to input information on the artefact.
  - a. Add a horizontal line underneath the rest of the content, and underneath that insert the following:

- i. (Tags: )
- b. Then, separated by commas and beginning with #, add each relevant category inside. The most critical is to either add #bluetrolley or #orangetrolley, whichever is most appropriate, in order to add it to the appropriate index page.

Other (optional) common tags include:

1. Location of origin (#germany, #britain, #france)
2. Model year (#1914, #1942)
3. Type of headgear (#stahlhelm, #brodie, #pickelhaube)
4. Materials (#cloth, #leather, #steel, #wool)
5. Who would have worn it (#officer)

Screen Options Help

Visual Text

**6.** Update

**4.** Page Attributes


Parent  
Blue Trolley

Template  
Default Template

Order  
0

Need help? Use the Help tab in the upper right of your screen.

**5.** Featured Image










Last edited by admin on June 13, 2016 at 12:29 pm

4. Under page attributes, select the appropriate parent page by clicking on the “Parent” drop-down menu. If the new artefact belongs in the Blue Trolley, select the “Blue Trolley” page. If the new artefact belongs in the Orange Trolley, select the “Orange Trolley” page.
5. Add a featured image by clicking on the image field. This will bring up the Media Library, from which you can select an appropriate image. This image should be the same image as the “main image” on the page but with a width of 400px and height scaled to match.
6. When you are satisfied with your changes, click on the “Update” button to publish the page.

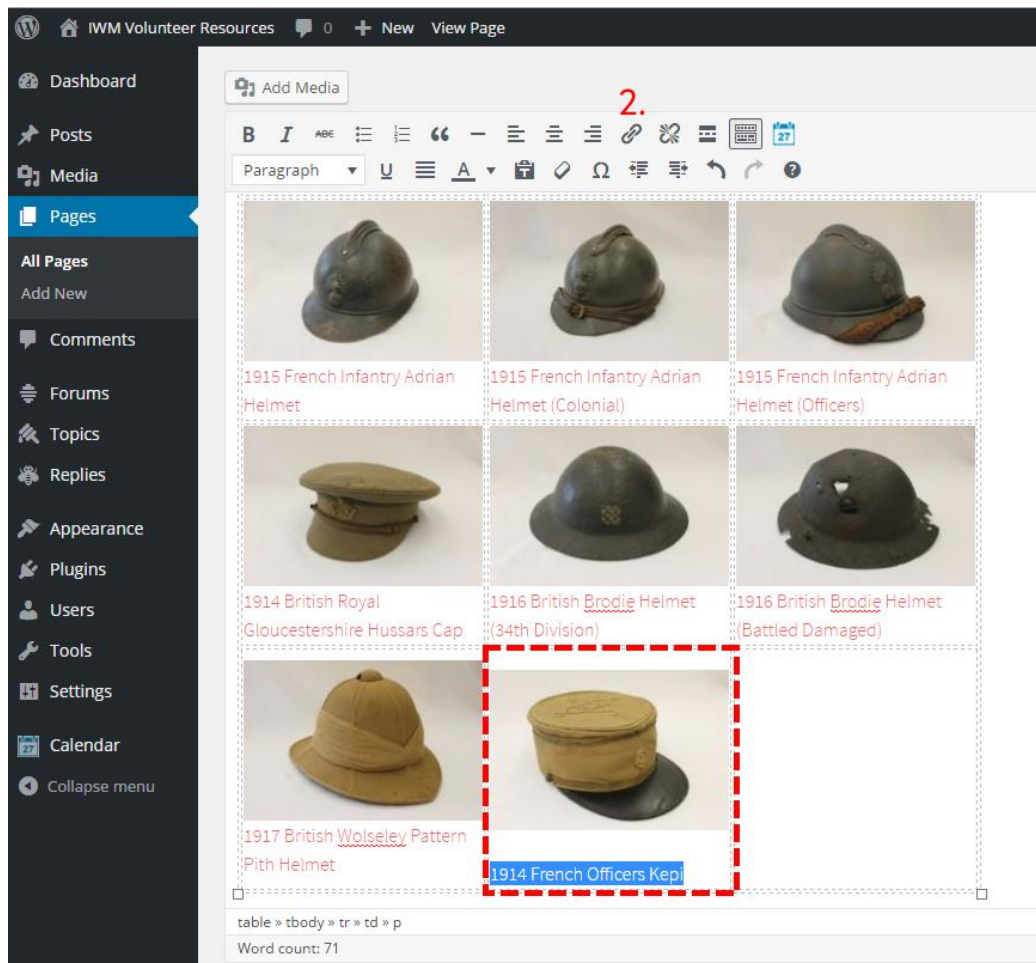
Now that the artefact page has been created, navigate to the trolley page in which the artefact should be placed. Blue Trolley artefacts should be placed on the Blue Trolley page, and Orange Trolley artefacts should be placed on the Orange Trolley page. In the page editor, select an empty table box to place the artefact image.

The screenshot shows the IWM Volunteer Resources page editor. The left sidebar contains navigation options: Dashboard, Posts, Media, Pages (selected), All Pages, Add New, Comments, Forums, Topics, Replies, Appearance, Plugins, Users, Tools, Settings, Calendar, and Collapse menu. The main editor area displays a grid of nine historical military helmets, each with a caption. The grid is structured as follows:

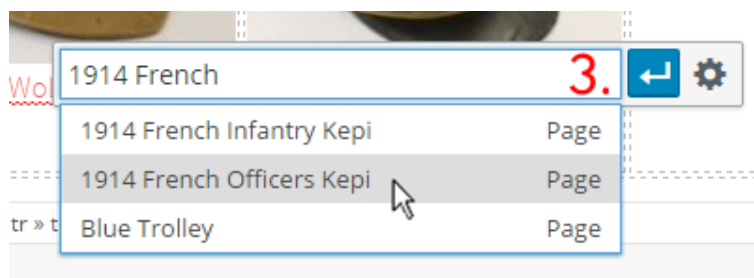
 1915 French Infantry Adrian Helmet	 1915 French Infantry Adrian Helmet (Colonial)	 1915 French Infantry Adrian Helmet (Officers)
 1914 British Royal Gloucestershire Hussars Cap	 1916 British Brodie Helmet (34th Division)	 1916 British Brodie Helmet (Battled Damaged)
 1917 British Wolseley Pattern Pith Helmet	<div style="border: 2px dashed red; width: 100%; height: 100%;"></div>	

At the bottom of the editor, the text "table » tbody » tr » td" and "Word count: 68" are visible.

1. After you have selected an empty table element, select “Add Media” in the top left of the screen. This will bring up the Media Library. Select the appropriate image for this artefact. The image should be a thumbnail image that is 200x134 pixels.
2. Next, type the name of the artifact below the image. Highlight this text and select the “Link” button. The “Link” button is denoted by a short chain link. This will bring up a search bar right above the highlighted text. Search for the the page name.



3. Search for the page name by typing in the name of the artefact and select the appropriate page from the search results. Then select the blue arrow button to insert the link in the text.





4. Repeat this process from Step 2 to add a link to the image. Select the image and then select the “Link” button. Type in the name of the artefact, choose the appropriate title from the search results, and then select the blue arrow button to insert the link into the image.

## Creating a Gallery

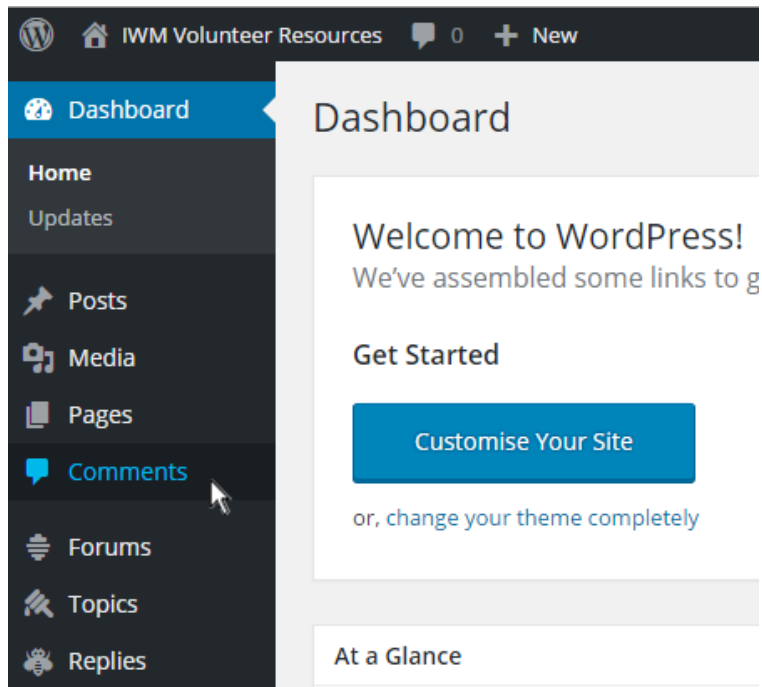
To create a gallery of related images, select the “Add Media” button on the top left of the page. This will bring up the “Insert Media” window.

The screenshot shows the 'Create Gallery' interface. On the left sidebar, the 'Create Gallery' option is highlighted with a red '1.'. The main area displays a grid of 48 images of military helmets. A red '2.' is placed over one of the selected helmet images. In the bottom right corner, a blue button labeled 'Create a new gallery' is highlighted with a red '3.'. The right sidebar contains 'ATTACHMENT DETAILS' for the selected image, including fields for URL, Title, Caption, Alt Text, and Description. Below these fields are 'Categories' with checkboxes for American, Blue Trolley, British, French, German, Orange Trolley, and Uncategorized. The 'Blue Trolley' and 'French' categories are checked. At the bottom left of the grid, it says '7 selected' and 'Clear'.

1. On the left side of this window, select “Create Gallery” to create a new gallery.
2. Select the images you would like to include in the gallery by clicking on each image. Or drag and drop additional images into this window from your computer.
3. Once you have selected all the images you want to include in the gallery, select the “Create a New Gallery” button in the bottom right corner of the window.

## Moderating Comments

The IWMVolunteer account may be used by volunteers to post comments on most pages. Any comments volunteers post will not appear until they are approved by a user with higher permissions (IWMApprover or admin). To see pending comments on all pages, navigate to the “Comments” page by selecting the “Comments” tab in the sidebar.



Hover the mouse pointer over each comment to bring up comment options. To approve, reply to, edit, mark as spam, or delete a comment select the appropriate option. The options will appear at the bottom of the comment.

## Comments

All (2) | Pending (2) | Approved (0) | Spam (0) | Bin (1)

Bulk Actions  All comment types

<input type="checkbox"/>	Author	Comment
<input type="checkbox"/>	 IWMVolunteer general@iwmvolunteer.org 212.44.9.122	Anyone want to get lunch? -George <a href="#">Approve</a> <a href="#">Reply</a> <a href="#">Quick Edit</a> <a href="#">Edit</a> <a href="#">Spam</a> <a href="#">Bin</a>
<input type="checkbox"/>	 IWMVolunteer general@iwmvolunteer.org 212.44.9.122	In 1914 most French soldiers wore their kepis to war. The highly visible colours were hidden by a medium blue-grey cover, example of the Foreign Legion and other North African units who had long worn their kepis with white (or later khaki) cover. With the adoption of "horizon blue" (light blue-grey) uniforms and steel Adrian helmets in 1915 to replace the conspicuous uniforms worn during the early months of war, the kepi was generally replaced by folding forage caps. Officers, however, still wore kepis behind the lines. -Liz
<input type="checkbox"/>	Author	Comment

## Appendix C - Volunteer Focus Group Questions

1. What aspects of the volunteer paperwork do you find straightforward or helpful? What aspects of the volunteer paperwork do you find difficult or annoying?
  - a. Do you feel like it is an efficient system?
2. How comfortable are you in using mobile devices such as a tablet?
3. Do you have a vision for a potential app?
  - . What features would you like to see in a museum app?

## Appendix D - General Volunteer Survey Questions

### Demographic Survey

- How long have you been volunteering at IWM London?
  - Less than 6 months
  - 6 - 12 months
  - 1 - 2 years
  - 3 - 5 years
  - 6 - 10 years
  - Over 10 years
  - I prefer not to respond
- Have you been in a Volunteer Programme at another museum before?
  - Yes
  - No
  - Not Sure
  - I prefer not to respond
- On average, approximately how much time do you spend filling out paperwork for IWM London each day you volunteer?
  - I do not fill out paperwork each day I volunteer
  - Under 1 minute
  - 1 - 5 minutes
  - 6 - 15 minutes
  - 16 - 30 minutes
  - 31 - 60 minutes
  - More than 1 hour
  - Not Sure
  - I prefer not to respond
- What was your motivation in joining the IWM Volunteer Programme?
  - [Open Response]

- Currently, how often do you reference the binder of support material for the trolley objects when you work as an interaction volunteer?
  - Every time
  - Often
  - Sometimes
  - Occasionally
  - Rarely
- How many of the Blue Trolley objects (First World War helmets and headgear) are you currently comfortable presenting to the public as an interaction volunteer?
  - Less than 2
  - 3-6
  - 7-12
  - More than 13
- Have you ever used mobile devices (ie., tablet, mobile phone, PDA) to complete tasks for your job or volunteering role, either through IWM London or another occupation?
  - Yes
  - No
  - Not sure
  - I prefer not to respond
- How comfortable are you with using mobile devices (ie., tablet, mobile phone, PDA) to look up information?
  - Extremely comfortable
  - Somewhat comfortable
  - Neither comfortable nor uncomfortable
  - Somewhat uncomfortable
  - Extremely uncomfortable
- Are there any features you would like to see incorporated in an app for mobile devices to assist with Volunteer Interaction?
  - [Open Response]

**After prototype launch**

- What features do you like in this app version?
  - [Open Response]
- What features do you dislike in this app version?
  - [Open Response]



## Appendix E - Glossary

App: a small program that runs on a mobile environment and that serves some function for its users. It is derived from the word “application.”

Compiler: A program that takes high-level code and converts it into low-level machine and assembly code that the operating system can use to run a program.

Content Management System (CMS): A program, often located online, that organizes files, text, and media for use in another program or interface, often a website.

CSS: A style language used for customizing the visual characteristics of HTML code for websites. CSS stands for “Cascading Style Sheet.”

Integrated Development Environment (IDE): A functional interface specially designed for creating and editing code in one or several programming languages. This program includes support for compilers (*see: Compiler*).

Low-fidelity: A term used to describe basic-level prototypes; it denotes that the prototype has little-to-no true interface functionality but mimics what the final design will look like and how it will work. One example is a paper prototype (*see: Paper Prototype*).

Mobile Content Management System (MCM): A type of CMS (*see: Content Management System*) that is specially designed for managing mobile platforms and systems.

Paper Prototype: An initial design of an interface, often created on sheets of paper or index cards, that represents the various screens of an application or program. It is used to test interface design and functionality when digital and financial resources are limited or not available.

Web Content Management System (WCM): A type of CMS (*see: Content Management System*) that is specially designed for managing websites and other online platforms.